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Instructions for Use of Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, or to the State matters of any particular State. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the electric railway, city or State to which the article applies. Groupings are made under the name of the city in which the main office of the company is located, but an exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad. City or State affairs appear direct under the names of the city or State involved.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the common keywords used in the index. This list has been subdivided for convenience into sixteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index. As an example, if a reader wished to locate an article on power-driven tower wagons he would obviously look in the list under the general subject "vehicles," and of the two keywords that appear under this caption, only "Service and tower wagons" could apply to the article in question. The reader would therefore refer to this keyword under "S" in the body of the index.

In addition to the groups of articles covered by these headings the papers and reports from railway associations and technical societies are grouped under the names of the various organizations. Proceedings of other associations are indexed only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair Shop Equipment" and are not indexed alphabetically, because of the wide choice in most cases of the proper keyword.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND LEGAL

Accidents (including wrecks)
Accident claim department
Legislation
Legal
Public service and regulative commissions
Public service corporations
Safety-first movement

CARS

Car design
Cars (descriptive)
Cleaning and washing of cars
Gasoline cars
Lubrication
Heating of cars
Lighting of cars
Storage battery cars
Ventilation of cars
Work and wrecking cars

CAR EQUIPMENT

Axles
Bearings
Brakes
Controllers and wiring
Couplers and bumpers
Current-collecting devices
Doors and steps
Fenders and wheel guards
Gears and pinions
Headlights
Motors
Seats and windows
Trucks, car
Wheels

EMPLOYEES

Employees
Insurance
Strikes and arbitrations
Wages

FARES

Fare collection (including apparatus)
Fares
Freight rates
Tickets
Transfers

FINANCIAL AND STATISTICS

Accounting
Appraisal of railway property
Financial
Franchises
Maps
Operating records and costs
Statistics
Traffic investigations

HEAVY ELECTRIC TRACTION

Heavy electric traction (general)
High-voltage d.c. railways
Interurban railways (general)
Locomotives
Low-voltage d.c. railways
Single-phase railways

MAINTENANCE OF EQUIPMENT

Cleaning and washing of cars
Inspection of cars
Maintenance records and costs
Paints and painting
Repair shop equipment
Repair shop practice
Repair shops
Tests of equipment
Welding, special methods

OPERATION

Carhouses and storage yards
Operating records and costs
Passenger handling records
Schedules and time tables
Signals
Stopping of cars
Train operating practice

POWER

Boilers and equipment
Cables
Energy consumption
Feeders
Overhead contact system
Poles
Power distribution
Power generation
Power stations and equipment
Purchased power
Substations and equipment
Third-rail contact system
Transmission lines
Turbo-generators and equipment

RECORDS

Maintenance records and costs
Operating records and costs
Passenger handling records
Record forms

STRUCTURES

Bridges
Carhouses and storage yards
Power stations and equipment
Repair shops
Terminal stations and terminals
Waiting stations

TRACK

Pavement
Rail joints and bonds
Rails
Special work
Ties
Track construction
Track maintenance

TRAFFIC

Freight and express
Public, Relations with
Publicity
Routing of cars
Traffic investigations
Traffic stimulation

VEHICLES (not on tracks)

Motor buses
Service and tower wagons

MISCELLANEOUS

Fire protection and insurance
Lightning protection
Loading limits for cars
Manufacturing conditions
Municipal ownership
Public, Relations with
Standardization
Storerooms
Timber preservation

374

INDEX TO VOLUME 51

PAGES BY WEEKS

Jan.	5	1	to	68
Jan.	12	69	to	116
Jan.	19	117	to	164
Jan.	26	165	to	212
Feb.	2	213	to	260
Feb.	9	261	to	304
Feb.	16	305	to	350
Feb.	23	351	to	398
Mar.	2	399	to	444
Mar.	9	445	to	488
Mar.	16	489	to	552
Mar.	23	553	to	598
Mar.	30	599	to	644
Apr.	6	645	to	688
Apr.	13	689	to	736
Apr.	20	737	to	792
Apr.	27	793	to	838
May	4	839	to	888
May	11	889	to	944
May	18	945	to	998
May	25	999	to	1038
June	1	1039	to	1080
June	8	1081	to	1122
June	15	1123	to	1176
June	22	1177	to	1218
June	29	1219	to	1262

A

Abilene, Tex.:
——Abilene Street Ry.:
Receiver appointed, n 105
Accidents:
——Akron, O., Fatal wreck, n 1255
——Boston Elevated Ry., Turbine wrecked, n 406; 564; Comment, 555
——Boston, Fire destroys carhouse *780
——Buffalo, N. Y., Fire destroys carhouses, n 197; Causes much damage *244
——Campaign, Ill., Crossing accident, n 298
——Chicago, Ill., Railroad crossing, n 789
——Cleveland, O., Fire destroys cars, n 781
——Columbus, O., Prevention record, *709
——Fort Wayne, Ind., Automobile accident report, n 681
——Graphical presentation of accident data, 626
——Kansas City power plant explosion, n 199
——Motorman sentenced to penitentiary for reckless driving, n 583
——New Albany, Ind., Fatal collision, n 254
——Newark, N. J., Fire destroys cars and carhouse, n 474; n 1255
——New York City report, n 158; Investigation, n 992
——New York Rys. Co., Report, n 254
——Ohio has severe storm, 148
——Salt Lake substation and car house damaged by fire, n 1024
——Severe storm in West, 7100
——Toronto, Can., Car house and equipment destroyed by fire, n 335
——Vancouver, Can. suffers tie-up from storm
——Wheeling, W. Va., Fire causes damage, n 287
Accounting:
——Classification for N. Y. electric railways, 228; n 986
Adirondack Lakes Tr. Co. (see Gloversville, N. Y.)
Administration work should be deputized, Comment, 490
Air-Piping precautions that prevent freezing, 242
Akron, O.:
——Northern O. Tr. & Lt. Co.:
Fatal wreck, n 1255
Fare increase sought, n 1255
Freight handling possibilities [Cole], *893
Interurban cars for city service objected to, n 729
Interurban terminal building, *465
Patriotic safety posters used, 1090
Safety campaign, [Fenton], *234
Statement of financial and operating conditions, 477
Albany, N. Y.:
——Albany Southern R. R.:
Fare increase sought, 990
——United Traction Co.:
Fare conference, n 993; Changes suspended, 1073; Increase sought, Hearing, 1253
Financial statement, 1067
Higher fares essential [Weatherway], 1234
Liberty loan activities, *604
Operating difficulties, 231
Six-cent fare pamphlet, *322
Wage increase, 1107
Albuquerque, N. M.:
——City Electric Co.:
Fare increase, n 1116
Allen & Peck, Inc. (see Syracuse, N. Y.)
Allentown, Pa.:
——Lehigh Valley Transit Co.:
Fare charge upheld, n 592
Fare increase sought, 934
Operating difficulties, 231
Statement of earnings, 385
Wage increase, n 929
Alliance, O.:
——Stark Electric R. R.:
Fare increase sought, n 729, n 1168
Wage increase, n 1247
Alton, Ill.:
——Alton, Granite & St. Louis Tr. Co.:
Fare increase sought, n 1116, n 1211; Hearing, 1252
Strike, 381, 1245
——Alton & Jacksonville R. R.:
Abandonment authorized, 248
Property sold for junk, n. 292
Suspension order rehearing sought, n 200
Amalgamated Assn. of Street & Electric Railway Employees of America:
——Actions of associations speak louder than their words, Comment, 840
American Cities Co. (see New York City)
American Electric Railway Association:
——Annual convention announcement, 795, 820
——Annual report, 374
——Article on freight haulage reprinted from tric Railway Journal in pamphlet form, 1199
——Committee on electric railway revenue, Subscription, Comment, 214
——Company Section Activities:
Advocated [Stoves], 136
Capital Traction Co., 866, 1018
Chicago Elevated, 43, 424, 625, 820, 1244
Connecticut Co., 43, 140; Need for higher fares, *187; Comment, 166, 424, 776, 866
Cumberland County Pr. & Lt. Co., 43, 470, 667, 866
Formation of company sections during war times, Comment, 599
Manila, 279, 525, Prizes awarded, 578, 820, 866, 1018, 1244
Membership cup awarded to Rhode Island Co., Comment, 1081
Milwaukee, 470, 1018, 1244
New section should be full, Comment, 795
Public Service Ry., 141; Economy meeting, *470, 624, 865; [Bolen], 865
Rhode Island Co., To organize, n 578; Committee appointed, 625; Largest section organized in smallest state, 715; Issues challenge, *776; Comment, 946; Receives charter membership cup, *980; Presentation of cup, 1104
Toledo, 141, 279, 1199
——Convention, Committee meeting, 926; October meeting assured, 469; Program for Atlantic City meeting, 1063
——War board:
Activities described at New England Street Railway Club banquet, 653; Discussed at Illinois Electric Railway Association meeting, 1231
Appointments and labor appeal of President, 719
Bulletin number 3 issued, *43; Coal for electric railways, 469; Government control, 624; Unnecessary improvements, 667; 16, 17, 18 and 19 issued, 1018; 25 issued, 1199
Co-operation with shipping board, *853
Financial relief for electric railways urged before House of Representatives, 1163
General suggestions, 140
Increased revenue to offset higher wages, [McCarter], 1227
Interurban rate of 3 cents a mile urged, 1099
Meeting, 140, 279, 526, 715; Special freight issue of Electric Railway Journal pleases, 080; Interurban rates and transportation discussed, 1157
Personnel changes, 469
Questionnaire issued, 139
Support of all railways needed, 1199
Traffic bureau organized, 139
Washington meeting with War Labor Board considers rates and wages, 1223; Comment, 1219
American Electric Railway Accountants Association (see Accountants Association)
American Electric Railway Engineering Association:
——Appointment of joint committee with American Society for Testing Materials, 776
American Institute of Electrical Engineers:
——Annual convention, Power generation and transmission progress, *1229
——Mid-winter convention, *373
American Pr. & Lt. Co. (see New York City)
American Railway Engineering Association:
——Annual convention, 565; Report, 618
American Railways (see Philadelphia, Pa.)
American Society of Mechanical Engineers:
——Fuel conservation and clean coal, Spring meeting, Comment, 1125
Appalachian Power Co. (see Bluefield, W. Va.)
Anderson, Ind.:
——Union Traction Co.:
Axles for electric railway cars, Should they be larger [Hemming], 423
Fare increase granted, 60; Sought, 935; Hearings concluded, 1073; Granted n 1116
Financial statement, 932
Freight handling possibilities [Cole], *893
Highway signal for dangerous crossing, *1101
Liberty loan activities, *603
Wage increase, n 929
Appraisal of Railway Property:
——Dallas Railway, Valuation, 337
——Dallas, Tex., Contract refused by city, n 199
——Minneapolis, Minn., 245
——Pittsburgh, Pa., Chooses commission, 582
——Rhode Island Co., *570
——St. Louis, Mo., 783
——Spokane, Wash., 201, 584, 985
Arbitration (see Strikes and arbitration)
Arkansas Association of Public Utility Operators:
——Annual convention, 1096
Arkansas Valley Ry., Lt. & Pr. Co. (see Pueblo, Colo.)
Army and Navy openings (see Recruiting notices)
Asbury Park, N. J.:
——Atlantic Coast Electric Ry.:
Appeal in transfer order case, 880
Fare increase sought, Franchise rate limit removed by supreme court, 1208
Ashville, N. C.:
——Ashville Pr. & Lt. Co.:
Wage increase, n 1252
Athol, Mass.:
——Northern Massachusetts Street Ry.:
Zone system approved by commission, 881
Atlanta, Ga.:
——Georgia Ry. & Pr. Co.:
Better public relations, 149
Fare increase sought, n 882; Opposed, n 993; Hearing, 1113, 1252
Fuel supplied to employees, 468
Relief sought by stockholders, 782
Wage increase, n 722
Atlantic City, N. J.:
——Atlantic City & Shore R. R.:
Fare increase sought, n 729; Granted, 1029
Jitney competition bill killed, n 883
Jitney riding cured by better public relations work, [Campbell], 233
Strike, 1063; Settled, 1106
Atlantic Coast Electric Ry. (see Asbury Park, N. J.)
Atlantic Shore Ry. (see Sanford, Me.)
Atlantic & Suburban Ry. (see Pleasantville, N. J.)
Attleboro, Mass.:
——Attleboro Branch R.R.:
Wage increase, n 1202
Zone system being studied, n 1256
——Interstate Consolidated Street Ry.:
Segregation of sober and intoxicated persons, n 883
Wage increase, n 1202
Zone system being studied, n 1256
Aurora, Elgin & Chicago R. R. (see Wheaton, Ill.)
Aurora, Ill.:
——Chicago, Aurora & DeKalb R. R.:
Receiver sought, n 200; Appointed, n 250
Austin, Tex.:
——Augusta & Aiken Ry.:
Auburn & Syracuse Electric R. R. (see Syracuse, N. Y.)
Augusta, Ga.:
——Augusta-Aiken Ry. & Elec. Corpn.:
Fare increase, n 591, 726
——Austin Street Ry.:
Motor bus extension installed, 787
Australia:
——Melbourne Suburban electrification, New type of cars, *718
Axles:
——Design, manufacture and service, [Litchfield] *235, *283; Comment, 261; 328
——Failure, Reasons for [Dee], 280; [Dalgleish], 380
——Interurban car axles, Experiences with [Metcalf], *94
——Larger axles for electric railway cars, Are they necessary [Hemming], 423
——Welding with electric arc, Third Avenue Ry. [Parsons], **1136

B

Ballston Spa, N. Y.:
——Eastern New York R. R.:
Property sold under foreclosure, n 1110

625.05
SR
v.51

Baltimore, Md.:
——United Rys. & Elec. Co.:
Employees to receive food at cost, 281
Employees prove what systematic saving will do, 777
Full car orders modified, 436
Holiday greeting card, •61
Motorman purchases $5000 Liberty Bond, n 873
Ship stops applied to entire system, 1207
Staggered skip stops installed, 882
Trainmen's poster, •862
Women conductors employed, n 1169
——Washington, Baltimore & Annapolis Elec. R. R.:
Cantonment service, •1097
Fare increase sought, n 1168
Bamberger Electric R. R. (see Salt Lake, Utah)
Bangor, Pa.:
——Bangor & Portland Tr. Co.:
Fare increase sought, n 546
Bartlesville, Okla.:
——Bartlesville Interurban Ry.:
Advertising on top of cars, •124
Batavia, N. Y.:
——Batavia Traction Co.:
One-man cars save property from failure, n 250
Bay State Street Ry. (see Boston, Mass.)
Bearings:
——Armature bearings, Good record of, Buffalo, 99
——Ball bearings on electric railways, 284
——Lubricants for anti-friction bearings, 769
——Waste Saturation tanks increase car mileage (Milwaukee Tank Works), •1154
Beaumont, Tex.:
——Beaumont Traction Co.:
Service to shipyard workers, 1185
Wage increase, n 984
Beaver Valley Traction Co. (see New Brighton, Pa.)
Beach Grove, Ind.:
——Beach Grove Tr. Co.:
Operation will continue, n 294
Berkshire Street Ry. (see Pittsfield, Mass.)
Berlin Street Ry. (see Germany)
Bethlehem, Pa.:
——Traffic investigation report, n 781
Billings, Mont.:
——Billings Traction Co.:
Property dismantled, n 724
Binghamton, N. Y.:
——Binghamton Ry.:
Fare case answer filed, 544
Tariff suspension ordered, n 482; Changes suspended, n 939
Birmingham, Ala.:
——Birmingham Ry., Lt. & Pr. Co.:
Wage increase, n 1108
Birmingham, N. Y.:
——Birmingham Ry.:
Wage increase, n 983
Blackwell and the electriv railway industry. [Dawson], 867
Bloomington, Ill.:
——Bloomington & Normal Ry. & Lt. Co.:
Wage increase, n 1159
Bluefield, W. Va.:
——Appalachian Power Co.:
Service improvements, 1016
Blue Hill Street Ry. (see Canton, Mass.)
Bluffton, Ind.:
——Bluffton, Geneva & Celina Tr. Co.:
Dismantlement proceedings, n 539
Junking of property advocated, 475
——Marion & Bluffton Tr. Co.:
Fare increase sought, n 298
Board of Supervising Engineers (see Chicago, Ill.)
Boilers and equipment:
——Carbon dioxide chart shows boiler room losses, •1020
——Coal, How to increase the energy output [Smith], •953
——Condensate, Automatic return from heating pipes to boiler [Foote], •765
——Control of excess air, Comment, 1123
——Efficient boilers from scrap pile, Little Rock, Ark., 189
——Feed water testing and cleaning [Smith], •751
——Gas firing produces economies, 976
——High-pressure boilers for Joliet plant, •146
——Remodeling of plant at Montreal, Can., •1085
——Tests of boiler operation [Smith], •514
——Uniform boiler laws sought, 133
——Walnut Creek plant, Columbus Ry. Pr. & Lt. Co., •407
——Windsor power plant of West Penn. Rys., •264
Boise, Idaho:
——Boise Valley Tr. Co.:
Financial statement, n 1027
Bonner Springs, Kan.:
——Kansas City, Kaw Valley & Western Ry.:
Fare increase sought, n 1253
Freight handling possibilities [Cole], •893
Strike, n 873
Boone, Ia.:
——Fort Dodge, Des Moines & Southern R. R.:
Freight handling possibilities [Cole], •893
Boston & Maine R. R. (Electric Branch) (see Concord, N. H.; Portsmouth, N. H.)
Boston, Mass.:
——Bay State Street Ry.:
Abandonment of lines authorized, 539
Appeal against jitney competition, n 1159
Arbitration agreement, 246
Fare increase conference approved, 1210
"Jim Jitney" poster, •325
New schedule of fares filed, 679
Public control provided for by legislature, 1093
Rate changes suspended, n 1115

Boston, Mass.:
——Bay State Street Ry.: (Continued)
Reorganization plans, 1250
Skidding test on cast-steel wheels [Quinn], •1102
Triangle talks prove profitable, 227
Wage increase, n 1159
Zone fare arrangement made for Lynn, 785; Schedule postponed, n 882; Case closed, 937
——Boston Elevated Ry.:
Address of 85,000 words at one hearing, 1050
Car design, Changes in new equipment, 1136
Car equipped for hospital service, •766
Carhouse destroyed by fire, •780
Commission recommendations to legislature, 272
Fare increase prospects, 871
Governor sends relief message to legislature, 472
Labor situation is critical, 429
Legislative action likely, 778
Liberty loan activities, •606
Maintenance practice discussed before commission, 660
M. C. Brush turns over property to state, •1170
New head should be picked from company, Comment, 1222
Public control law of Massachusetts Legislature, 1057; Comment, 1040; Not municipal ownership, Comment, 1083; Approved by stockholders, 1106.
Public Service Commission offers aid, 204
Relief urged by governor, n 419; Provisions are worthy of enactment, Comment, 796; Bill redrafted, 928; Passed by Governor and Senate, 1023
Service-at-cost plans discussed by legislative committee, 575
Six-cent fare bill introduced, n 158; Favored rather than zone system, 229; 324
Skip stop will be used, 1029
Sleet causes tie-up, 150
Subway stations overcrowded, n 426
Trustees named for new plan of operation, 1247
Turbine accident, 504; Comment, 555
Unions, What they should stand for, 803
Wage increase sought, 1158; Referred to new trustees, n 1203
War conditions discussed, 252
——Boston & Worcester Street Ry.:
Wage award accepted, n 630
——Garfield order, Effect on railways, 182
——Stone & Webster:
Texas men meet, n 929
——Traffic investigation report, 313
Bowling Green, Ky.:
——Southern Traction Co.:
Abandonment prevented by Court, 104
Brakes:
——Air cut-off mechanism at Springfield, O., •378
——Air-piping, Precautions that prevent freezing, 242
——Effect of braking on energy consumption [Squier], •504
——Levers made in wheel press at Spokane, Wash., 379
——Sander designed to prevent causes of stoppage (Holden & White Inc.), •49
——Slack adjusters as a war-time economy, •825; Produce economy at Brooklyn, N. Y., •1019
——Squealing shoes to be eliminated in New York City, n 984
——Stops which insure action on double truck cars, Columbus, O., [Foote], •282
Brantford, Can.:
——Brantford Municipal Ry.:
Wage increase, n 1108
Brazil:
——Electrification plans, 197
Brazil, N. D.:
——Northwestern Traction Co.:
Property scrapped, n 1110
Bristol, Tenn.:
——Holston Valley Ry.:
Operation discontinued, n 1205
British Columbia Electric Ry. (see Vancouver, Can.)
Brockton & Plymouth Street Ry. (see Plymouth, Mass.)
Brookfield, Mass.:
——Worcester & Warren Street Ry.:
Fare increase and its results, •457
Brooklyn, N. Y.:
——Brooklyn Rapid Transit Co.:
Brake slack adjusters produce economy, 1019
Bridge toll decision favors company, n 722
Calibration of switchboard watt-hour meters [Smith], 716
Car order controversy, Hearing, 247; Settled, Two car train operation, 381
Car with raised motors for flooded streets, 709
Coal, How to increase the energy output [Smith], •953
Coal saving number of B. R. T. Monthly, 322
Coasting records, 242
Compromise on commission schedule order, 638
Convex versus concave bonding compressor screw terminals [McKelway], 527
Feed water testing and cleaning [Smith], •751
Freight car made from old passenger equipment, •924

Brooklyn, N. Y.:
——Brooklyn Rapid Transit Co.: (Continued)
Hand tools for way department, Selection and care of [Cram], •959
Heating of cars ordered, 254
Labor conditions, 424
Labor saving methods in the way department [Cram], •517
Line testing [McKelway], 742
Mayor's statement not authentic, n 583
New mortgage proposed, 876
New series of publicity talks, n 482
Newspapers praise appointment of Vice-president, n 102
Oil rehabilitation for steam turbine plants [Smith], •1131
Protest to commission order, 543
Rail wear, Early experimental study [Cram], •168; Comment, 167
Schedule order extension granted, n 789; Final issue, n 989; Ordered posted, n 1032
Service order of commission, 481
Special work, Construction cost data [Bernard], •195; Developments [Bernard], •863; Shop facilities for maintenance [Cram], •1137
Spring duties of the maintenance of way department [Cram], •740
Testing organization of electric railways [Smith], •511
Third Liberty Loan [Williams], 603
Time table cards posted in all cars, n 1116
Track spiral standardization [Bernard], 1017
War Finance Corporation hearing, 1025; Assistance given, 1204
Women labor protested by union, 253; Meet the test, n 391; Labor Bureau and Federal investigation report, •1008
Buffalo, Lockport & Rochester Ry. (see Rochester, N. Y.)
Buffalo, N. Y.:
——Belt line electrification requested, 335; Assured, 535
——Buffalo & Lake Erie Tr. Co.:
Abandonment of some lines sought, 876
Fare increase sought, 930; Commission sees need but cannot grant relief, 1165, n 1253
Navy will finance improvements, n 1248
Wage increase sought, n 983
——Frontier Electric Ry.:
Purchase of property by steam line allowed, 677; Appealed, n 933
——Garfield order, Effect on railways, 183
——International Ry.:
All-steel interurban cars being placed in service, n 803
Armature bearings, Good record of, 99
City will not co-operate for improvements, 54; May buy and loan equipment to railways, 253; Authorities show hostile attitude, 426
Conductors fined for stealing fares, n 1203
Electrical interlock for folding car steps, •46
Fare decrease sought, n 1255
Fare increase sought, 992, 1105, 1115; Advocated by city, 1209, 1253
Fire destroys carhouses, n 197, •244
Legislation protested, 537
Liberty loan activities, •605
New line opened, n 1247
Offices moved to new location, n 824; Occupied, n 1108
Smoke fund for soldiers helped, n 151
Traffic recommendations accepted, 203; Investigation report, 341
Strike agitators active, n 984
——Jitney measure passed, n 789; Vetoed by Governor, 1023
——Traction expert employed, 154
Bumpers (see Couplers and bumpers)

C

Cairo, Ill.:
——Cairo Elec. & Tr. Co.:
Wage increase, n 984
Calais, Me.:
——Calais Street Ry.:
Fare increase sought, n 1032
California:
——Automobile regulation, 880
——Commission recommends electricity in place of steam, 437
——Inductive interference report of Committee, 38
——Transbay rate case suggests consolidation of three systems, 878; Hearing, n 1164
Canada:
——Bond issues under regulation, n 57
Canton, Mass.:
——Blue Hill Street Ry.:
Fare increase sought, n 1032
Cape May, N. J.:
——Cape May, Delaware Bay & Sewell's Point R. R.:
Property purchased and operated by Navy Department, n 724
Cape Town, South Africa:
——Cape Elec. Ry., Ltd.:
Financial statement, 540
Capital Traction Co. (see Washington, D. C.)
Carbon Transit Co. (see Mauch Chunk, Pa.)
Car Design:
——Classification of cars for given conditions [Litchfield], •370
——Considerations in the choice of car equipment [Squier], •354
——Economy as well as strength must be considered [Litchfield], •754

Car Design: (Continued)
——Front-entrance, center-exit car makes for higher schedule speed, •120
——Fundamentals of successful transportation [Eddy], 91
——Savings attainable [Litchfield], •496
——Special features of Montreal interurban cars (Ottawa Car Mfg. Co. Ltd.), •377
——Stanchions for longitudinal seat cars [Wing & Lipps], •363
——Standarization shown by 1917 statistics, Comment, 70
——Steel car body adapted to resist stresses [Litchfield], •965
——Underframe construction development and durability [Litchfield], •1142
Carhouses and storage yards:
——Eliminating unnecessary lighting and heating [Mullaney], 668
——Inspection shop reconstruction at Columbus, O., •972
——Sand storage for car service at Springfield, Mass., •774
——Trenton, N. J., Rebuilding after fire, •471
Carolina Power & Light Co. (see Raleigh, N. C.)
Carolina Traction Co. (see Rock Hill, S. C.)
Car order details:
——Boston, Mass., 1175
——Brooklyn, N. Y., 487, 1121
——Buffalo, N. Y., 793
——Charleston, S. C., 1261
——Cleveland, O., 644
——Fort Wayne, Ind., 837
——Gary, Ind., 1217
——Harrisburg, Pa., 487
——Hot Springs, Ark., 735
——Murphysboro, Ill., 644
——Newark, N. J., 1217
——Pen Argyl, Pa., 598
——Philadelphia, Pa., 443, 552
——Saginaw, Mich., 597
——Springfield, Mo., 735
——Syracuse, N. Y., 997
——Washington, D. C., 793, 794
Cars:
——Air-operated doors and steps installed at New Brighton, N. Y., •1060
——Better maintenance an urgent necessity [Lambert], •524
——Boston Elevated Ry. orders cars of new design, 1136
——Cleveland, O., Small wheels and motors on new cars, n 654
——Converting to prepayment type, New York Rys., •529
——Dayton, O., Center entrance and exit pay-as-you-pass trailers, •669
——Equipment, Betterments available in [Squier], •500
——Equipment failures should be analyzed, Comment, 490
——Four-motor multiple-unit cars at Dayton, O., •814
——Freight car made from passenger equipment, Brooklyn, N. Y., •924
——Gasoline rail car de Luxe (Commercial Cars Construction Co.), •99
——Hospital car built at Boston, •766; At Chicago, •1153
——Interurban car of Montreal & Southern Counties Ry., [Wilson], •331
——Melbourne, Australia uses new type on suburban electrification, •718
——Motor equipment determined by service conditions [Squier], •748
——Pas-as-you-pass, How it was developed [Witt], •30
——Raised motors for flooded streets, Brooklyn, N. Y., 709
——Rebuilding old heavy cars versus buying new light-weight cars, Comment, 600
——Remodeling 150 cars at Rochester, •773
——Zone system, Advantages [E. B. M.], 775
Cartoon on teamster nuisance ("Electrogram"), 590
Cedarburg, Wis.:
——Milwaukee Northern Ry.:
Fare increase sought, n 1115
Central Electric Railway Association:
——Accountants' Association, Work of [Van Driesen], 419
——Annual Brown Book issued, 1016
——Annual meeting program, 384; Meeting, 418; Proceedings, 453; Papers [Wilcoxon], 454
——Tariff No. 17 issued, n 1074
Central Electric Traffic Association:
——Annual meeting and report, 176
Central Illinois Public Service Co. (see Mattoon, Ill.)
Central New York Southern R. R. Corp. (see Ithaca, N. Y.)
Chambersburg, Greencastle & Waynesboro Street Ry. (see Waynesboro, Pa.)
Charleston, S. C.:
——Charleston Consolidated Ry. & Ltg. Co.:
Fare increase sought, 638; Denied, n 1032
How railways can help win the war [Gadsden], 714
Skip stop preparation, 993
Charlotte, N. C.:
——Piedmont & Northern Ry.:
Army camp increases revenues 55 per cent, n 784
Financial statement, 676
Freight handling possibilities [Cole], •893
——Southern Public Utilities Co.:
Camp extensions help win the war, •1048
Publicity always the best policy, [Carraway], 280
Red Cross activities, 473
Wage increase, n 1024; n 1066
Charlottesville, Va.:
——Charlottesville & Albemarle Ry.:
Fare increase, n 831, 1030
Chattanooga, Tenn.:
——Chattanooga Ry. & Lt. Co.:
Strike, Declared off, n, 335
Chester, Pa.:
——Southern Pennsylvania Tr. Co.:
Double track laid by Shipping Board Emergency Fleet Corporation, 1202
Fare increase, n 1032
Chicago, Aurora & DeKalb R. R. (see Aurora, Ill.)
Chicago, Harvard & Geneva Lake Ry. (see Walworth, Wis.)
Chicago & Joliet Elec. Ry. (see Joliet, Ill.)
Chicago, Ill.: ....
——Board of Supervising Engineers:
Ninth annual report ready, n 1066
Spiral standardization, Simplicity is desirable [Weston], •1156........
——Chicago Elevated Rys.:
Annual report, 337
Coasting records, 97
Damage suit against construction denied, n 1248
Fare increase sought, 59; Comment, 165
Liberty loan activities, •606
Skip stop tried out, n 1032
Wage increase sought, 1022, n 1066; Men appeal to Washington, n 1158
——Chicago Stage Co. granted operation privilege, 198
——Chicago Surface Lines:
Billy Sunday revival causes traffic problem, n 592
Hospital car built for Cook County, •1153
Liberty loan activities, •602
Snow plows made from sprinklers and work cars, •285
Track construction method in great street widening plan, •609
Traction fund payment, 781
Wage increase sought, 1022, n 1066; Men appeal to Washington, n 1158
Work cars converted into snow plows, •332
——Chicago & Interurban Tr. Co.:
Financial statement, n 1027
——Chicago & West Towns Ry.:
Accident, Railroad crossing, n 789
Fare increase, 295
Financial statement, n 877
Title taken to Suburban R. R., 875
——Freight handling plans of surface and elevated lines discussed, n 108; Endorsed, 325; Discussed, n 384; Ordinance not yet drafted, 1065
——Garfield order, Effect on railways, 183
——H. M. Byllesby & Co.:
Military service folder, n 873
——Northern States Pr. Co.:
Financial statement, 1068
——Parcel freight plan for elevated and surface lines, 85
——Standard Gas & Elec. Co.:
Dividend policy outlined, 723
Financial statement, 1204
——Storm emphasizes need of subways, 196
——Street railway service pays, 279
——Traction and subway development:
Authorities should read Boston traffic report, Comment, 490
Controversy, 927
Discussion makes headway, 722
Franchise controversy, New proposal, 872; Settlement terms, 982; Essentials fixed, 1105
New plans for operation placed before bankers, 1159
Ordinance hearing, n 384; Acceptable, 1201
Partnerships feature of new ordinance proposal, Comment, 1222
Plans advanced, 582; Moving well, 629
——Traction report issued, n 155
——Wage payments by credit system on Motor Bus line, •89
Chicago, Lake Shore & South Bend Ry. (see Michigan City, Ind.)
Chicago, Milwaukee & St. Paul Ry.:
——Flash suppressor application [Storer & Hague], 858; Comment, 891
——Locomotive, New design for passenger service, •237
——New 266-ton locomotive [Shepard], •559; Comment, 554
——New 3000-volt gearless locomotive [Armstrong], •561; Comment, 554
——Substation equipment for new electrification, 1198
Chicago, North Shore & Milwaukee R. R. (see Highwood Ill.)
Chicago, Ottawa & Peoria Ry. (see Ottawa, Ill.)
Chicago, South Bend & Northern Indiana Ry. (see South Bend, Ind.)
Chickasha, Okla.:
——Chickasha Street Ry. Co.:
Fare increase, n 681
Valuation adjustment made, n 105
Wage increase, n 722
Chico, Cal.:
——Northern Electric Ry.:
Bondholders purchase property at public auction, n 1111
Financial statement, 930
Foreclosure sale ordered, n 676; Sale, n 827
Reorganization planned, 1161
Chillicothe, O.:
——Chillicothe Elec. R. R., Lt. & Pr. Co.:
Purchase by Chillicothe & Camp Sherman Elec. Ry. authorized, n 1251
China:
——Hongkong railway profits almost equal capitalization, 782
——Peking merchants petition for railway system, n 983
——Shanghai railways show great progress, 876
——Tokio subway plans, n 56
Cincinnati, Dayton & Toledo Tr. Co. (see Hamilton, O.)
Cincinnati, O.:
——Cincinnati & Dayton Tr. Co.:
Operation to be carried on by Warren Bicknell Co., n 1250
Successor to the Cincinnati, Dayton & Toledo Tr. Co., n 877
——Cincinnati, Georgetown & Portsmouth R. R.:
Freight rate increase granted, 295
——Cincinnati, Milford & Loveland Tr. Co.:
Fare increase, n 992
——Cincinnati Traction Co.
Double stops eliminated, n 155
Electric shovels prove their value, •534
Franchise revision hearing, n 824; Plans, n 929
Skip-stop plans revised, n 789
——Coal saving from economy measures reach large total, 460
——Columbus, Delaware & Marion Ry.:
Freight handling possibilities [Cole], •893
——High water interrupts all street railway traffic, 295
——Interurban Ry. & Ter. Co.:
Abandonment of division proposed, n 58; Authorized, n 634; Carried out, n 1070
Fare increase movement, 252; Sought, n 391
Freight handling possibilities [Cole], •893
——Rapid transit progress, 536; Negotiations, 672
——Street railway department established, n 103
Circuit breakers (see Switchboard equipment.)
City Ry. Co. (see Mt. Vernon, Ill.)
Claremont, N. H.:
——Claremont Ry. & Ltg. Co.:
Fare increase granted, 788
Freight rate increase allowed, n 591
Cleveland, O.:
——Cleveland & Chagrin Falls Ry. Co.:
Fare increase, n 992
——Cleveland & Eastern Tr. Co.:
Fare increase order appealed, n 206; Case won, n 681
——Cleveland Ry.:
Allowance increases approved by city, 335
Annual meeting, 336
Arbitration of wage demand, 871
Cars with small wheels and motors, n 654
City representatives inspect railway, n 583
City wishes to avoid further fare increase, 1165
Discharge of employee sustained, n 474
Fare increase movement, 252; Rate not sufficient, n 543; Increase sought, 635; Dispute, 680; Highest rate in effect, 785; Increase sustained by court, n 883
Financial statement, n 1070
Investigation by Chamber of Commerce committee, 1031
Liberty loan activities, •606
New franchise arrangements, n 103
Paving case decided, n 291
Service-at-cost plan explained, 627
Substation design and operation for maximum efficiency, •700
Towline helps to keep track clear, 534
Wage increase sought, 779; Discussion, 821; Decision liberal, 927; Situation under advisement of War Labor Board, 1064
Zone systems being studied, n 1256
——Cleveland, Southwestern & Columbus Ry.:
Fare increase sought, n 1253
Freight handling possibilities [Cole], •893
Increase in class and comodity rates sought, n 1253
——Elevated railway plans suggested, 382
——Garfield order, Effect on railways, 183
——Lake Shore Elec. Ry.:
Fire destroys cars, n 781
Freight handling possibilities [Cole], •893
——Near-side stops desired, n 109
——Rapid transit survey begun, n 929
——Subway, Preliminary survey, 55; Commission meeting, 198; Cases heard, 471; Ordinance declared legal, n 722; Survey fund sought, 780
Coal:
——(see also Market conditions, Coal)
——Conservation:
Boiler room employees need instruction, 51
Cincinnati, O., Electric railways, 460
Clean coal, A. S. M. E. Spring meeting, Comment, 1125
Coal saving number of B. R. T. Monthly, 322
Commissioners indorse saving, 97
Conference between public utility representatives and Fuel Administration, 1186
Connecticut commission recommendations, 135
Connecticut Co. campaign, 468
Denver, Colo., •277
Fuel administration issues skip stop bulletin, 340; Announces zone system of distribution, 623; Conference, 776
Fuel administrator for Rhode Island appointed, n 1024
Fuel order, Effect on electric railways, 137
Fuel problem discussed at N. E. L. A. convention, •1180
Garfield order, Cooperation of electric railways, 182; Ordered continued, 290
Getting more energy out of coal [Smith], •953

Coal:
——Conservation: (Continued)
Government control of railroads does not remove duty to save. Comment. 1
How use will be economized. 87
Manila reduces consumption by bonus plan [Blaisdell]. •308
Motormen can voluntarily aid. Comment. 213
New York committee recommendations. 135
New York Second District campaign begins. 42
Organization Chart of Fuel Administration. 134
Portland, Me., 183
Posters from the Fuel Administration. •577
Power checking devices on cars should be installed. Comment. 1039
Rochester, N. Y. [Hamilton]. 270; Comment. 261
Service economies in several sections of the Country. 44
Skip stop; Massachusetts railways adopt. 988; Estimated savings. 1102; Should be adopted by every city. Comment. 1123
Sources of fuel waste. 98
True thrift. Comment. 553
Washington, D. C. recommendations. 267; Comment. 261
Why waste 85 per cent of heat in fuel. Comment. 491
——Effect of inferior quality upon operation [Wood]. •573
——Energy. How to obtain more. •463
——Handling of coal at Windsor power plant of West Penn Ry., •264
——Investigation to increase output. 667
——Organization formed to insure clean coal. 1065
——Preventing spontaneous combustion in storage. 662
——Priority order revoked. 473
——Production of bituminous coal better. n 621
——Rate of production. 241
——Relation to power production in war times [Slade]. 567
——Requirements per kilowatt-hour. 525
——Should be purchased and stored this summer. Comment. 1041
——Storage and distribution. 780
——Storage difficulties and precautions. 1061
——War Board bulletin. 469
——Shortage at Kansas City. 92; Ohio. 92
——The zone system of distribution instituted. 667; Embarasses railway. 810; System explained. •968

Columbus, Delaware & Marion Ry. (see Cincinnati, O.)

Columbus, Ga.:
——Columbus R. R.
Wage increase. n 929

Columbus, Marion & Bucyrus Ry. (see Marion, O.)

Columbus, O.:
——Columbus Ry., Lt. & Pr. Co.:
Accident prevention record. •709
Annual report. 337
Fare collection pamphlet issued. 544
Fare increase movement. 252; Refused by city. 480; President McMeen explains. 589; Increase sought. 934, 1167; Hearing. 1207
Liberty loan activities. •606
Loading and unloading stations to handle large fair crowds. •846
Operating conditions explained. 727
Publicity campaign for fare increase. 536; •1013
Service-at-cost plan discussed. 728; Ordinance introduced. 1245
Shop reconstruction. •972
Walnut Creek power station and equipment. •407

Commonwealth Pr., Ry. & Lt. Co. (see Grand Rapids, Mich.)

Company sections (see American Electric Railway Association.)

Concord, N. H.:
——Boston & Maine R. R. (Electric Branch):
Financial statement. 875

Connecticut Co. (see New Haven, Conn.)
Connecticut Valley Street Ry. (see Greenfield, Mass.)
Consolidated Street Ry. (see Strong City, Kan.)
Contact System (see Overhead contact system: Third rail contact system.)

Controllers and wiring:
——Field control. How savings are possible [Squier]. •502
——Governor maintenance decreased [Brown]. •93
——Lightning arrester selection to suit requirements [Brackett]. •1145
——Lightning protection equipment for cars [Wagner]. •758
——Reclaiming warped resistance grids. Denver [McAloney]. •47
——Renewing worn controller parts. Wilkes Barre & Hazelton Ry [Brown]. •144
——Six-Motor multiple-unit trains for Montreal [MacLeod]. •403; Comment 399

Conventions. May be patriotic duty to resume. Comment 352; Afford educational opportunities for students. Comment. 739

Conway, Mass.:
——Conway Elec. Street Ry. Co.:
Financial statement. 875

Cooperstown, N. Y.:
——Southern New York Pr. & Ry. Corp.:
Increase in class and commodity rates sought. n 1253
New time schedule for Sunday and holiday excursions. n 831

Council of National Defense:
——Report. 92

Couplers and bumpers:
——Automatic couplers accelerate train make-up [Squier]. •505

Covington, Ky.:
——South Covington & Cincinnati Street Ry.:
Fare increase suggested. n 681
Franchise ruled perpetual by court. 822

Crossing signals (see Signals.)
Croydon Corporation Tramways (see Great Britain, London)
Cumberland County Pr. & Lt. Co. (see Portland, Me.)

Cumberland, Md.:
——Cumberland & Westernport Elec. Ry.:
Fare increase sought. n 1116

D

Dallas, Tex.:
——Dallas Ry.:
Advertising campaign. n 789
Aviation camp service. 1185
Financial statement. 586
Improvement sanctioned by city commission. 821
Metal ticket use begun. n 298; Supply exhausted. n 939
Officials study operating conditions on other properties. 1166
Owl car service considered. n 592
Power contract change. n 151
Receipts for first month of operation. 57
Reorganization cost allowances. n 725
Returns decrease. n 153
Skip stop instituted. n 546; Experiment. n 882; Inaugurated. n 992
Statement of earnings. 475
Valuation report. 337
Wage increase. n 428. n 983
——Jitneys lose in election. 1031; n 1074
——Speed limits increased by ordinance. n 159
——Texas Electric Ry.:
Annual meeting of stockholders. n 433
Strike at Waco. n 583; Ended. n 722; Strike. n 929
Wage increase. n 383. n 675; Bonus. n 983; n 1255
——Traffic investigation arranged for. 981
——Valuation contract of street railways refused by city. n 199

Danbury, Conn.:
——Danbury & Bethel Street Ry.:
Claim period set. n 58

Davenport, Ia.:
——Tri-City Ry.:
Fare increase sought. n 1255
Power house flooded. n 1248
Wage increase. n 1203

Daylight saving. Comment. 70; Peak flattening crusade. Comment. 599

Dayton, Covington & Piqua Tr. Co. (see West Milton, O.]

Dayton, O.:
——City Ry.:
Strike. n 1203
——Dayton, Springfield & Xenia Southern Ry.:
Abandonment appeal dismissed. n 387
Fare increase sought. n 391
Unprofitable line tied up. n 152
——Dayton Street Ry.:
Strike. n 1203
——Merger of all railways proposed. n 1164
——Oakwood Street Ry.:
Cars of four-motor multiple-unit construction. •814
Grinding wheels. Quick method [Merrick]. •240
——Peoples Ry.:
Center entrance and exit pay-as-you-pass trailers. •669
Strike. n 1203
——Skip stop plan adopted. n 206; Retained. n 831
——Strike. n 1246
——Traffic problem given attention. n 1032

Decatur, Ind.:
——Fort Wayne & Decatur Tr. Co.:
Freight rate increase granted. 295

Denton, Tex.:
——Denton Traction Co.:
Property sold for junk. n 877

Denver, Colo.:
——Denver & Interurban. R. R.:
Fare increase denied. n 1032
Receiver appointed. n 1250
——Denver & South Platte Ry.:
Fare increase sought. n 831
——Denver Tramway:
Bonding equiment increased in usefulness. •579
Crane car built in shops [McAloney]. •772
Fare increase sought. 937
Fuel saving records. •277
Insulation cutter for overhead lines [Morse]. •1101
Inter-departmental co-operation. 379
Reclaiming warped resistance girds [McAloney]. •47
Reducing lighting maintenance costs [Wefel]. 978
Special work designed for longer life [Whitlock]. •527
Track. Built-up sections for diverting traffic [Whitlock]. •770

Depreciation (see Appraisal of railway property)

Des Moines, Iowa:
——Des Moines City Ry.:
Cross-town service abandoned. n 298
Fare Increase request dropped. 202; Increase sought. n 1032. n 1168
Railway dragged into politics. n 583
Skip stop being tried out. n 298. n 591
Statement of earnings. 475
Strike. n 630
Wage advance and increase in fares suggested. n 824
Wage increase. n 430. n 1159

Des Moines, Iowa: (Continued)
——Inter Urban Ry.:
Freight handling possibilities [Cole]. •893

Detroit, Mich.:
——Detroit United Ry.:
Age limit for employees raised. 1158
Arbitration of wage request. n 823
Financial condition not "shrouded in mystery." •133
Financial statement. 1025
Freight handling possibilities [Cole]. •893
Loading surface cars at 400 passengers per minute [Cann]. •88
Queve loading and orderliness. 726
Reduced schedule speed. Comment. 117
Skip stop resumed by permission of Fuel Board. 55
Speed diagram. •107
Statement of earnings. n 387
Strike settlement basis. 928
Traffic investigation recommendations. 788
Wage situation under advisement of War Labor Board. 1064
War attitude made plain. 1107
——Rapid Transit plans. 289; Report. •420

District of Columbia (see Washington, D. C.)

Dixon, Cal.:
——Sacramento Valley Elec. Ry.:
Property abandoned. n 105

Dixon, Ill.:
——Sterling, Dixon & Eastern Ry.:
Fare increase sought. n 938

Doors and steps:
——Air operation installed at New Brighton, N. Y., •1060
——Electrical interlock for folding steps. Buffalo. •46
——Gutters on cars protect passengers [Potter]. •978
——Pneumatic control [Squier]. •506; Philadelphia, Washington and Kansas City. 765

Dover, N. H.:
——Dover, Somersworth & Rochester St. Ry.:
Fare increase. n 158

Dubuque, Ia.:
——Dubuque Electric Co.:
Arbitration of wage request. n 824
One-man car petition tabled. n 343
——Union Electric Co.:
Wage increase. n 984

Duluth, Minn.:
——Duluth-Superior Tr. Co.:
Wage increase. 722

Dunkirk, N. Y.:
——Dunkirk Street Ry.:
Service reduction and higher fares sought. n 58

Durham, N. C.:
——Durham Traction Co.:
Fare increase sought. n 546
Publicity campaign for increased fare. •635

E

Eastern New York Railroad (see Ballston Spa, N. Y.)
Eastern Pennsylvania Rys. (see Pottsville, Pa.)
Eastern Wisconsin Electric Co. (see Sheboygan, Wis.)

East Liverpool, O.:
——Steubenville, East Liverpool & Beaver Valley Tr. Co.:
Paint gun. Economies in the shop [Pettinger]. •164
Wage increase. n 1066

Easton, Pa.:
——North Hampton, Easton & Washington Tr. Co.:
Fare increase sought. n 482; Granted. 588

East St. Louis, Ill.:
——East St. Louis & Belleville Elec. Ry.:
Freight handling possibilities [Cole]. •893
——East St. Louis & Suburban Ry.:
Constructive co-operation from Merchants' Association. 363
Fare increase sought. n 1211; Hearing. 1252
Freight handling possibilities [Cole]. •893
Strike. 1159
Wage controversy. 1245
——East St. Louis Ry.:
Fare increase sought. n 1211; Hearing. 1252
Wage controversy. 1245

Edmonton, Can.:
——Edmonton Municipal Street Ry.:
Fare increase discussed. 1030
——Edmonton Radial Ry.:
Fare increase. 1073
One-man cars. Novel entrance door. •194

Electrical Properties of Vulcanized Fibre [Eves]. •238

Electric Bond & Share Co. (see New York City.)

Electric Railway Journal:
——A. E. R. A. company section trophy cup awarded. Comment. 946; Presented to Rhode Island Co., •980
——Announcement of Freight Handling Number. 839
——Changes in make-up. Comment. 1
——Mechanical and engineering number announcement. 327
——Monthly mechanical issue broadens Journal service. Comment. 351
——Periodical Publishers' Association criticises zone law. 862
——Special monthly issues. Comment. 946

Electric Railway Journal: (Continued)
——Supplement "Our Marines," Comment, 1177
——War Board pleased with special freight issue, 980
Electric Railways:
——Aversion of many railways to use of equipment holding patent rights, Comment, 351
——Construction where unnecessary should cease, Comment, 447
——Co-operation more essential than ever, Comment, 2
——Co-operation with technical schools [Ewing], 423
——Crisis exists, Reasons for, 461
——Filing systems for keeping track of information, Comment, 400
——Making both ends meet a real job, Comment, 2
——Officials should use cars more and automobiles less, Comment, 447
——Partnership plan of operation worth further extension, Comment, 305
——Planning for the future very important, Comment, 401
——Radical readjustment of situation necessary [Wilcoxon], 454
——Review and prophecy, Comment, 1
——Statistics 34, 36, 39, 41
——Wartime conditions:
Air-raid warning sign at Croydon, England, •846
Ambulance presented to army by Interborough Rapid Transit employees, •535
Associations should resume their conventions, Comment, 445
Automatic operation of equipment, Comment, 947
Beaumont, Tex, has 3,500 shipbuilders, 1185
Bill for government operation of shipyard lines introduced, n 384
California commission disapproves construction during the war, 627
Cantonment service of Washington, Baltimore & Annapolis Elec. R. R., •1097
Car equipped for hospital service at Boston, •766
City may buy and loan equipment to railway at Buffalo, N. Y., 253
Charlotte, N. C., Company extends service to camp, •1049
Commandeering of railways asked, 61
Commission of California discusses problems, 761
Conservation study proposed, 823
Co-ordinated control for any properties needed by government, Comment, 647
Dallas, Tex., Service to aviation camps, 1185
Drafted men will be moved over interurban lines where facilities permit, 1195
Effect of war on cost and quality of public utility service, 75; On railway industry, Comment, 447
Efficiency and output must be increased, Comment, 262
Electrical engineers organize regiment, 537
Electrification should be stimulated by War, Comment, 3
Fair rate of return especially necessary now, Comment, 213
Federal authorities co-operate to increase service for munition workers, 390
Federal government can raise utility rates [Gadsden], 1091; Comment, 1082
Freight handling activities and possibilities of electric railways in the United States [Cole], •893
Gardens for employees should be urged by railways, Comment, 891
Government not planning to take over electric lines 102; Co-operation needs outlined, 326; Control of railroads will not affect electric lines, 630; Should get together with industries, 762; Operation of railways and freight handling, 862; Has power to take over lines, n 929; Takes over electric lines of Southern Pacific R. R., 1021
Greater coherence needed in railway industry, Comment, 117
How railways can help win the war [Gadsden], 714
Kansas City Ry. service flag, 97
Labor, Questions to be investigated by Federal Commission, Comment, 399; Program of Council of National Defense, 426
Liberty loan activities, The Third Liberty Loan, Comment, 599; [Shonts], 602; [Williams], 603; Chicago, Ill., •602; Rochester, N. Y., •602; Minneapolis, Minn., •603; Anderson, Ind., •603; Washington, D. C., •604; Richmond, Va., •604; New Haven, Conn., •604; Albany, N. Y., •604; Providence, R. I., •605; Newark, N. J., •605; Washington, D. C., •605; Buffalo, N. Y., •605; Peoria, Ill., •606; Cleveland, O., •606; Kansas City, Mo., •606; Columbus, O., •606; Chicago, Ill., •606; Boston, Mass., •606; Toledo, O., •607; Portland, Me., •607; Youngstown, O., •607; Third Liberty Loan boosting, •819; Pittsfield, Mass., •857; Connecticut Co. tank, •1059
Loading at congested industrial points, Comment, 307
Electric Railways:
——Wartime Conditions: (Continued)
Machine tools needed for gun manufacture, 137; Comment, 117
Meeting war burden at Croydon, Eng. [Goodyear], 200; Comment, 214
Mobile, Ala., handles ship builders, •1185
Navy Yard traffic problems at Philadelphia, 389
Necessity of unhindered public utility operation, Comment, 399
New Orleans saves coal by rerouting, 1184
Newport News line accelerates aviation and shipbuilding, •1048
Norfolk, Va., handles an extra hundred thousand, •1187
Operation and manufacturing, Comment, 946
Power to take over operation of properties delegated to U. S. Shipping Board, 1247
Present situation will prove blessing [Doherty], 222
Price level statistics [Hagenah], •970
Public improvements should be deferred wherever possible, Comment, 400
Public utility situation outlined by national committee, 619
Railroad electrification as a war measure [Wynne], 81
Red Cross, Activities at Charlotte, N. C., 473; Car at New York City, n 1033
Safeguarding property from enemies within, n 781
Ship building transit bill passed by Senate, 672
Shipping board and war board co-operate, •853
Shipyard transportation survey, 779
Skip-stop adoption may be ordered nationwide, 428
Staten Island cars operated by shipyard workers, 1186
Substation employees, Suggestions for employment, Comment, 1124
St. Louis, Comment, 214
Thrift stamp campaign, Backed, Comment, 796; Car in New York City, •991
Transportation of war workers an immense problem, Comment, 306; Bill passed by House, n 675; Housing should be put under same head, Comment, 832
Unnecessary work should be avoided, 581
Utility efficiency is vital to nation, 427
War Board (see American Electric Railway Association.)
Wilmington, N. C. company increases service for shipbuilding plant, 1050
War direction of security issues sought by investment bankers, 200
War Finance Corporation (see Financial.)
Working and fighting go hand in hand, Comment, 839
Zone system of distribution of bituminous coal, •968
Elkhart, Ind.:
——St. Joseph Valley Ry.:
Sale of property ordered, n 433; Offered for sale, n 586; Sold under foreclosure, n 725; Partly reclaimed, n 1110, n 1251
Elmira, N. Y.:
——Elmira Water, Lt. & R. R. Co.:
Fare increase petition withdrawn, n 992; Increase sought, n 1074
Emergency Fleet Corporation (see U. S. Shipping Board)
Empire State Railroad Corp. (see Syracuse, N. Y.)
Employees:
——(See also Strikes and abitrations; Wages.)
——Advisory council on labor formed at Washington, 289
——Applying engineering and selling principles to electric railway transportation [Lang], •8
——Baltimore, Md., conductor says what systematic saving will do, 777; Trainmen's poster, •662
——Bay State Street Ry. bulletin proves profitable, 227
——Bulletin of wages, Department of Labor, 186
——Causes of labor unrest, 333
——Checking devices for motorman, Economy of [Gould], 1103
——Coasting instructions at New Haven, •412
——Conductors knit socks at Minneapolis, 1061; Fined for stealing fares at Buffalo, N. Y., n 1203
——Co-operation from old and new men [Winsor], 1189
——Fare increase co-operation, Comment, 945
——Fundamentals of successful transportation [Eddy], 961
——Good judgment more important than strict obedience to rules, 526
——Government employment agency opened, n 1024
——Inspectors, Instruction of, Syracuse, N. Y., •379
——Jamestown, N. Y., Conductors sentenced for theft, n 158
——Keeping in touch with the boys at the front, 715
——"Knocking" the management, Comment, 645
Employees: (Continued)
——Labor:
Administrator appointed, n 984
Brooklyn Rapid Transit Co., 424
Decisions, Trend of, 466
Must co-operate with capital, Comment 351
Problems discussed at N. E. L. A. convention, 1181
Seattle, Wash., 155
——Legislation to protect women, 291
——Magazine published at Vancouver, Can., 778
——Mahoning & Shenango Ry. & Lt. Co. Men explain car situation to public, 428
——Master mechanics, Two distinct kinds, Comment 351
——Merit and demerit system at Portland, Ore., 809
——Minneapolis conductor sings his instructions, 298
——Motormen:
Can voluntarily save coal, Comment, 213
Licensing bill rejected at St. Paul, n 722
Operation should be checked for conservation of power, Comment, 1039
Purchases $5000 Liberty Bond, n 873
Sentenced to penitentiary for reckless driving, n 583
——Organized labor should not profiteer, Comment, 71
——Portland, Ore. club appoints new officers, n 151
——Power checking devices (see Energy consumption)
——Technical men in the power plant [Smith], •361
——Trainmen's pledges subject of War Board bulletin No. 3, •47
——Union:
Button agreement at Kansas City, 820
Leaders should enforce their contracts, Comment, 840
Membership, What it should stand for, 803
——United Rys. & Elec. Co. distributes food at cost, 251
Value of courtesy [Hamilton], 1191
——Wages of shopmen not conducive to long service, Comment, 947
——War Labor Board discussion important, Comment, 1124
——Washington Ry. & Elec. Co. employs students, 1113
——War garden assistance should again be extended by railways, Comment, 891
——Welfare work should be sympathetic, not paternalistic, Comment, 353; Reviewed, Comment, 1177
Energy consumption:
——(see also Coal, Conservation; Employees; Sale of power; Purchased power)
——Checking devices for motormen, Economy of [Gould], 1103
——Power checking devices should be installed on cars, Comment, 1039
——Power saving campaign produces results at New Haven, 1152
——Power saving recorder; Improvements [Arthur], •770
Evansville, Ind.:
——Public Utilities Co.:
Cars heated by coke, 376
Fare increase granted, n 831
Everett, Wash.:
——Puget Sound International Ry. & Pr. Co.:
Wage increase, n 873
Exeter, Cal.:
——Visalia Electric R. R.:
Proposed sale of property, 539
Exeter, N. H.:
——Exeter, Hampton & Amesbury St. Ry.:
Property will not be abandoned, n 678

F

Fairmont, W. Va.:
——Monongahela Valley, Tr. Co.:
Fare increase, n 789
"Service" is slogan, 156
Water circulation impeded by scale in heaters [Folwell], 925
Fare collection:
——Fare boxes replace ticket choppers on Hudson Tunnel Line, 422
——Front-end collector accelerates schedules, Comment, 490
——Pay-as-you-leave one-man car at Plymouth, Mass., •241
——Pay-as-you-pass car, How it was developed [Witt], •30
Fares:
——Discussed at New York Electric Railway Association meeting, 1232
——Equitable rates urged of Massachusetts Governor, 107
——Federal government can raise utility rates [Gadsden], 1091; Comment, 1082
——France grants increases to cover war bonuses, 1047
——Guarantee of utility investment or state ownership must come, 1092
——Higher fares essential [Weatherwax], 1234
——Increased fare refusal is "bunghole economy" for public, Comment 738
——Increase fare movement:
Big gain in number of companies securing financial relief 541
Commissions should face question squarely, Comment, 446
Edmonton, Can., 1030.
Illinois Association, •417
Increased revenue to offset higher wages [McCarter], 1227

(Abbreviations. •Illustrated. n Short news item.)
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

Fares:
——Increase fare movement: (Continued)
More publicity needed [Hegeman], 1239
Municipal Counsel often deserves severe reprimand, Comment, 1001
Now is the time to act, Comment, 215
Pamphelet on the problems of the street railway issued at Kansas City, •1228
Petitions should be based on facts Comment, 400
Prepare Commission cases thoroughly [Geisse], 698
Publication of financial statement will aid campaign, Comment 797
Six-cent fare pamphlet of United Traction Co., •322
Status of higher fare [Conway], 1235
Steam railroad passenger rate increase to help electric railways, Comment, 445

——Increases:
Albany, N. Y., Changes suspended 1073
Albuquerque, N. M., n 1116
Anderson, Ind., n 1116
Atlantic City, N. J., 1029
Augusta, Ga., n 591; 726
Aurora, Ill., 342
Boston, Mass., Bay State files new schedule, 670; Sliding scale, 1057; Bay State compromise approved, 1210
Brookfield, Mass., Results, •457
Charlottesville, Va., n 831; 1030
Chester, Pa., n 1032
Chicago & West Towns Ry. 295
Chickasha, Okla., n 681
Cincinnati, O., n 992
Claremont, N. H., 788
Cleveland O., Increase order appealed, n 206; Disputes, 680; Highest rate placed in effect, 785; Increase, n 992
Dover, N. H., n 158
Easton, Pa., 588
Edmonton, Can., 1073
Evansville, Ind., n 831
Fairmont, W. Va., n 789
Fort Wayne, Ind., 541
Greenfield, Mass., Reduced rate tickets withdrawn, 786
Greensboro, N. C., n 158
Holyoke, Mass., •77
Houghton, Mich., Sustained, n 437
Indiana interurbans granted blanket increase to 2½ cents a mile, 1114
Indianapolis, Ind., 204, 225
Jackson, Mich, 787
Johnstown, Pa., Protested by city, n 831
Kansas City, Kan., 934
Kansas City, Mo., 1254
Keene, N. H., n 681
Lewiston, Me., n 1116
Lexington, Ky., n 729
London, Can., n 789
Lynchburg, Va., n 1116
Manchester, N. H, n 1116
Manistee, Mich., n 938
Mauch Chunk, Pa., n 729
Milwaukee, Wis., 1112
Mount Carmel, Pa., n 62
Necessities of long standing and vital [Treat], 1053
New Bedford, Mass., n 1115
New Brighton, Pa., n 109
Newell, W. Va., n 1032
New Haven, Conn., Hartford controversy, 588; Increase sustained by Commission, 620; Hartford will appeal decision, 729; Appealed, 830
New York City, 1115; Hudson & Manhattan fare increase postponed, 1169
Oakland, Cal., 1208
Ocean City, N. J., 881
Ossining, N. Y., n 1116
Paducah, Ky., n 938
Peekskill, N. Y., Rehearing asked by city, 436; Increase, n 939
Peoria, Ill., 1029; Decision reviewed 1072
Pittsburg, Kan., n 546
Pittsburgh, Pa., 204; Results, •278, 1254
Portland, Ore., 108, 184; Protested by city, n 297; Appeal by city council 388, 437; Commission ruling upheld by court, 617; Appealed by city, 681
Poughkeepsie, N. Y., 1209
Reading, Pa., 154
Rockford, Ill., n 158
St. Louis, Mo., 988, 1014; Results of initiation, 1166; Appeal, 1253
Salt Lake, Utah, n 158; Upheld by court, 1030
Scranton, Pa., n 437
Shawnee, Okla., n 158
Sheboygan, Wis., n 1117
Sioux Falls, S. D., Granted by city election, 1113
Sistersville, W. Va., n 992
Spokane, Wash., 251
Taunton, Mass., 199
Toledo, O., 982
Trenton, N. J., n 1032
Warehouse Point, Conn., 1028
Waverly, N. Y., 342; n 1074
West Milton, O., n 391
Wheeling, W. Va., 1114
White Plains, N. Y., n 1115
Wilmington, Del., n 1169

——Increases denied:
Charleston, S. C., 1032
Columbus, O., 480
Denver, Colo., n 1032

Fares:
——Increases denied: (Continued)
Lincoln, Nebr., n 1256
London, Can., 1028
Roslyn, N. Y., 125; Comment, 118
Springfield, O., Indiana line, 789
Syracuse, N. Y., n 1255
Toronto, Can., 878
Trenton, N. J., 481
Youngstown, O., 252

——Increases in interurban fares necessary [C. E. R. A. annual meeting], 453

——Increases necessary to pay higher wages, War Labor Board, 1223; Comment, 1219

——Increases sought:
Akron, O., n 1255
Albany, N. Y., 990; Hearing, 1253
Allentown, Pa., 934
Alliance, O., 729; n 1168
Alton, Ill., n 1116, n 1211
Anderson, Ind., 935
Atlanta, Ga., n 882; Opposed by city, 993; Hearing, 1113 1252
Atlantic City, N. J., n 729
Baltimore, Md., n 1168
Bangor, Pa., n 546
Bluffton, Ind., n 298
Bonner Springs, Kan., n 1253
Boston, Mass., Relief message of governor to legislature, 472; Prospects, 871; Bill for elevated railway passed by governor and senate, 1023; Record address, 1050
Buffalo, N. Y., 930, 1105, n 1115; Commission sees need but cannot grant relief, 1165; Advocated by city, 1209; 1253
Calais, Me., n 1032
Canton, Mass., n 1032
Cedarburg, Wis., n 1115
Charleston, S. C., 638
Charlotte, N. C., 341
Chicago, Ill., 59; Comment, 165
Cincinnati, O., n 206; n 391
Cleveland, Ohio, 635, 1253
Columbus, O., 536; President McMeen explains, 589, 934; Publicity methods, •1013, 1167; Hearing, 1207
Covington, Ky., n 681
Cumberland, Md., n 1116
Davenport, Ia., n 1255
Dayton, O., n 391
Denver, Colo., n 831, 937
Des Moines, Ia., n 1032, n 1168
Dixon, Ill., n 938
Dunkirk, N. Y., n 58
Durham, N. C., n 546, •635
Easton, Pa., n 482
East St. Louis, Ill., n 1211; Hearing, 1252
Elmira, N. Y., Petition withdrawn, n 992; n 1074
Findlay, O., n 638
Foxboro, Mass., n 1115
Frankfort, Ky., n 343
Gettysburg, Ill., n 254
Grand Rapids, Mich., n 1169
Great Britain, 1057
Houston, Tex., n 1255
Indianapolis, Ind., 109; Hearing concluded, 1073
Jackson, Mich., n 591
Joliet, Ill., n 1211
Kalamazoo, Mich., n 831
Kansas City, Mo., 388, 542, n 591; Hearing, 828, 931
Keene, N. H., n 591
Keyport, N. J., n 729, n 939
Lewiston, Me., n 992; Hearing, n 1074
Lexington, Ky., n 254
Lincoln, Neb., Emergency petition denied, 435; Hearing, 587, n 1074
Little Rock, Ark., n 729
London, Can., 545; Publicity campaign, •829
Los Angeles, Cal., 1114
Lynchburg, Va., 158; Hearing, n 883
Manchester., N. H., n 882
Mansfield, O., n 391
Mattoon, Ill., n 831
Memphis, Tenn., n 482
Milwaukee, Wis., 83; Hearing, n 831
Minneapolis, Minn., n 1032, n 1116
Missoula, Mont., n 1255
Missouri convention discussion, 1053
Moncton, Can., n 992
Muskegon, Mich., n 1115
New Albany, Ind., n 546, n 638; Hearing, n 883
Newark, N. J., 478; Hearings, 680, n 939; Hearings, 990, 1071, 112
New Jersey Supreme Court removes franchise rate limit, 1208
New York City, Hearing, 437; Requests dismissal of Third Avenue case, 480; Lively discussion between mayor, railways and commissioners, 628; Third Avenue Ry., 679; Court decision blocks financial relief, 812; Employees appeal to public 1248
New York State, n 109, 590; Review of six cases, 636; Court decision further removes justice, 696; Comment 691; Renders commissions without power, 811; Comment, 797; Mayor's conference has injured public by preventing increase, Comment 841 880; Movement, Comment, 947
Northampton, Mass., n 939
Oakland, Cal., 341
Ogdensburg, N. Y., 479
Olean, N. Y., n 1253, 1255
Omaha, Neb., n 992; n 1032
Ottawa, Ill., n 883
Paducah, Ky., n 729

Fares:
——Increases sought: (Continued)
Patton, Pa., n 1168
Peekskill, N. Y., 541
Peoria, Ill., 295; Hearing, 389, 479, 591
Philadelphia, Pa., 981, 1031
Pittsburg, Kan., 935
Pittsburgh, Pa., 60 n 108, n 831
Pleasantville, N. J., n 939
Portland, Me., 339, •456; Hearing, 479; Application for dismissal refused, n 831, n 1074
Portland, Ore., Existence of commission threatened, 479, 543; Controversy, 728
Pottsville, Pa., n 938
Providence, R. I., Zone system recommended, 480, 515, 591, 679; Six-cent fare refused in favor of zone system, 710
Quebec, Can., n 638
Reading, Pa., 435
Rochester, N. Y., n 391
Saginaw, Mich., n 592; Publicity campaign, n 789
San Diego, Cal., n 1168
Scranton, Pa., n 1253
Seneca Falls, N. Y., Hearing, 990
St. Joseph, Mo., n 1074
St. Louis, Mo., 390, 544; Hearings, 785, 879
Sanford, Me., n 1255
Schenectady, N. Y., n 1211
Scranton, Pa., 342, n 787, 1255
Seattle, Wash., 251
Sheboygan, Wis., n 1256
Sioux Falls, S. D., n 1032
South Bend, Ind., interurban lines, 1071
Spokane, Wash., 156, n 1256
Springfield, Mo., n 1256
Springfield, O., 252
Stockton, Cal., n 1168
Syracuse, N. Y., 1072
Tacoma, Wash., Case to determine status of franchise, 629; Applications involved, 727; Denied by court, 936
Tennessee state-wide appeal for relief, 1071
Titusville, Pa., 312
Toledo, O., Controversy, 1021
Trenton, N. J., n 437, 589; President McCarter explains need, 622; Hearing, 726, 789, 988, 1028, n 1116, n 1117, 1207
Tuscaloosa, Ala., n 1169
Walla Walla, Wash., n 681
Warsaw, Ind., n 681
Waynesboro, Pa., n 546
Wheaton, Ill., Partial relief granted, n 1165
Wheeling, W. Va., n 1256
Williamstown, Pa., n 546
Wilmington, N. C., n 1074
Worcester, Mass., n 1115
York, Pa., 1254
Youngstown, O., n 1032
——Interurban rates should be raised now, Comment, 1083
——Local community responsible for adequate rates, Comment, 1039
——Mexican fare reduction explained, 786
——Montreal rate to be fixed by new commission, 873
——Passengers should pay only transportation charges, Comment, 738
——Philadelphia Rapid Transit lease agreement, 179; Comment, 166
——Rail rate increase, Effect on utilities [Putnam], 1103
——Reduction at Hoboken refused, 1029
——Seattle Municipal Ry. proposes to reduce fares, n 436
——Service-at-cost, Plans for Boston discussed by legislative commission 575; Explained, 627; Discussed at Columbus, O., 728; Boston, 778; Measures provided for all Massachusetts railways, 1093
——Six-cent fares rather than Zone system favored at Boston, 229
——Sliding scale of rates recommended, •463
——Three cents a mile for interurbans urged War Board, 1099
——Who put the nick in the nickel, Cartoon, •411
——Zone system:
Athol, Mass., 881
Boston Elevated Ry., Believed possible for, 324, 785, 937
Deserves fair trial Comment, 69
Effect on congestion of cities, Comment, 401
Holyoke, Mass. to give trial, •77
Lewiston, Me., •654
Milford, Mass., 992
Peoria, Ill., 297
Pittsburgh, Pa., 1072
Practise on Shore Line Elec Ry. [Perkins], •86
Providence, R. I., Recommended by special legislative commission, •570, 786, 830
Should be used under franchise limitations Comment, 1039
Springfield, Mass., Approved by commission, 663 882
Traffic study shows reasons for zoning, Comment, 1177

Feeders:
——Insulated negative return system at Lynchburgh, Va., [Way], •861

Financial:
——Annual reports (Indexed under the railway)
——Bankers' duty to finance utilities, Comment, 1082

Financial: (Continued)
——Boston Elevated Ry., Rehabilitation recommendation, 272
——California Ry. & Pr. Co. brings suit against United R. R.s, n 152
——Earnings of electric railways:
Albany, N. Y., 1067
Allentown, Pa., 385
Anderson, Ind., 932
Boise, Idaho, n 1027
Boston & Maine R. R (Electric Branches), 875
Cape Town, South Africa, 540
Charlotte, N. C., 675
Chicago, Ill., 337, n 877, n 1027, 1068, 1204
Chico, Cal., 930
China, 782
Cleveland, O., n 1070
Columbus, O., 337
Dallas, Tex., 57, 475, 586
Des Moines, Ia., 475
Detroit, Mich., n 387, 1025
Fort Worth, Tex., n 677
Geographical analysis of A. E. R. A., 249, 432, 632, 826, 1067, 1249
Glens Falls, N. Y., 1067
Harrisburg, Pa., n 784
Increase 10 per cent in 1917, 985
Indianapolis, Ind., n 877
Iowa interurban lines, 784
Jamestown, N. Y., n 784
Kansas City, Mo., 931
Kewanee, Ill., n 1164
Kingston, Jamaica, 876
Lethbridge, Can., n 1205
Lima Peru, 1204
London, Can., 539
Los Angeles, Cal., 1161
Louisville, Ky., 540
Macon, Ga., 250
Minneapolis, Minn., 986
Newark, N. J., 782
New York City lines 248, 293, 338, 1026, 1027, 1110, 1161, 1163
Ottawa, Can., 584
Plattsburgh, N. Y., 1067
Port Arthur, Can., 475
Portland, Ore., 1026
Publicity of figures advantageous to company, Comment, 739
Publication of financial statement will aid in fare increases, Comment, 797
Raleigh, N. C., n 1027
San Francisco, Cal., 104, n 387, n 1070
Seattle, Wash., n 387
Spokane, Wash., 825
Tacoma Municipal Ry., 338
Toronto, Can., 431
Troy N. Y., 1067
Vancoucer, Can., 584
Walworth, Wis., n 932
York, Pa., 585
——Electric railway relief urged before House of Representatives, 1163
——Fair rate of return especially necessary now, Comment, 213
——Federal Corporation urged, 248
——Federal Reserve Board passes on new financing, 152; Committee requires full data, 431
——Great Britain in 1917, 293
——Helena, Mont., Company pays bonus to city, n 338
——Income tax data, 249
——Ithaca, N. Y., Properties acquired by Ford. Bacon & Davis, n 152
——Oakland, Antioch & Eastern Ry reorganization, 103
——Reasonable rate of return has advanced, 83; What is reasonable now, Comment, 737
——Receiverships and foreclosures of 1917, 39
——Reorganization at Chico, Cal., 1161
——Revenue hearings of ways and means committee begun, 1109
——Tax question before House of Representatives, 677
——War burden chart, 1026
——War direction of security issues sought, 200
——War Finance Corporation:
Advance made to Brooklyn Rapid Transit Co., 1204
Bill, Introduced in Congress, 292; amended, 431; Agreement, 676; Signed by President, 724; Unsatisfactory to utilities, Comment, 1179
Board named, 875, Sworn in, 1025
Cannot finance companies in need of increased revenue, Comment, 1039
Directorship appointment confirmed, n 932
Federal Reserve Board passes on new financing, 152; Corporation urged, 248
New York bankers refuse to indorse public utility obligations, 1162
New York State Rys., seeks aid, n 987
Organization delay embarrasses railways, 825
Scope of bill, Comment, 601
United Rys. of St. Louis seeks aid, n 987; Given assistance, 1069; Explained, 1109
Urges prompt consideration of application for rate increases, Comment, 1041
Warning given concerning direct federal financing, 1069
Findlay, O.:
——Toledo, Bowling Green & Southern Tr. Co.:
Fare increase sought, n 638
Fire Protection & Insurance:
——Fire test of building columns, •194
Fires (see Accidents)
Food price increases since 1907, 464
Fort Dodge, Des Moines & Southern R. R. (see Boone, Ia.)
Fort Scott, Kans.:
——Fort Scott Gas & Elec. Co.:
Receivership proceedings against, 476; Operation discontinued n 725
Fort Smith, Ark.:
——Fort Smith Lt. & Tr. Co.:
Two-man operation controversy, n 883
——Fort Smith-Oklahoma Lt. & Tr Co.:
Personnel changes, n 386
Fort Wayne & Decatur Tr. Co. (see Decatur, Ind.)
Fort Wayne, Ind.;
——Fort Wayne & Northern Indiana Tr. Co.:
Automobile accident report n 681
Bulletin to patrons explaining necessity of fare increase, 226
Fare increase, n 482 541
Freight, Rate increase granted, 295; Handling possibilitis [Cole], •893
Skip-stop adopted, n 482
Ticket elimination desired, n 1073
Wage increase, n 630
Fort Worth, Tex.:
——Northern Texas, Tr. Co.:
Financial statement, n 677
Staggered hours of business in effect, n 1116
Fostoria, O.:
——Lake Erie, Bowling Green & Napolean Ry.:
Abandonment confirmed, 249
Foxboro, Mass.:
——Norfolk & Bristol St. Ry.:
Fare increase sought, n 1115
France:
——Rate increase granted to cover war bonuses, 1047
Franchises:
——Chicago settlement terms, 982: Essentials fixed, 1105
——Effect on freight handling possibilities of electric railways [Cole], •893
——Fares not controlled by franchise restrictions [Conway], 130
——Montreal, Can., Tramways, 288
——Philadelphia Rapid Transit lease agreement, 179; Comment, 166
——St. Louis, Mo., 244; Controversy, •468
——Toledo, O., proposal, 289
Freight and express:
——Census of all freight cars, 157
——Chicago, Parcel freight plans, 85; Discussed, n 108, n 384; Endorsed, 325; Ordinance not yet drafted, 1065
——Development essential to the war [Gadsden], 889
——Electric freight handling a necessity, Comment, 889
——Electric lines must move more freight, Comment, 839
——Electric railways in a position to haul more freight [Cole], •893
——Indiana, Rate hearing, 155; Increase allowed, 206, 271
——More railways should handle L. C. L. business, Comment, 999
——Motive power equipment [Woods], •1059.
——New England Electric Freight Association formed, 175
——New Jersey permits day delivery by electric railways, n 430
——Ohio interurban lines confer on freight handling at Columbus, 635
——Passenger cars re-arranged for freight hauling, •924
——Rhode Island Co., Increased business during eight years, •1003
Freight Rates:
——Connecticut commission plans simpler classifications, [Curtis], 323; Comment, 507
——Increases:
Cincinnati, O., n 295
Decatur, Ind., n 295
Fort Wayne, Ind., n 295
Indiana, Hearing, 155; Increase, 206, 271
Providence, R. I., n 939
——Throught rate for electric lines in Central States, 917
Frontier Electric Ry. (see Buffalo, N. Y.)

G

Galesburg & Kewanee Elec. Ry. (see Kewanee, Ill.)
Galt, Can.:
——Lake Erie & Northern Ry.:
Aluminum catenary construction, 142
Galveston, Tex.:
——Galveston Electric Co.:
Wage increase, n 474, n 984
——Galveston-Houston Elec. Co.:
Wage increase, n 383, n 984
Gary, Ind.:
——Gary & Interurban R. R. Co.:
Part of property dismantled, n 386
Wage increase depends upon fare raise, 927
Gears and pinions:
——Effect of poor gears on power consumption [Squier], •502
Geneva, Seneca Falls & Auburn R. R. (see Seneca Falls, N. Y.)
Genoa, Ill.:
——Woodstock & Sycamore Tr. Co.:
Foreclosure sale, n 1262
Property sold for junk, n 827, n 1111
Georgia Lt., Pr. & Rys (see Macon, Ga.)
Georgia Ry. & Pr. Co. (see Atlanta, Ga.)
Germany:
——Berlin Street Ry.:
Ball bearing tests on street cars, 284
Gettysburg Ill.:
——Gettysburg Ry. Ltg. & Pr. Co.:
Fare increase sought, n 254
Glens Falls, N. Y.:
——Hudson Valley Ry.:
Financial statement, 1067
Gloversville, N. Y.:
——Adirondack Lakes Tr. Co.:
Auction sale of property, 930
Grade crossing signals (see Signals.)
Grand Rapids, Mich.::
——Commonwealth Pr., Ry. & Lt. Co.:
Cost increases explained, 723
——Grand Rapids, Grand Haven & Muskegon Ry.:
Freight handling possibilities [Cole], •893
Increase in class and commodity rates sought, n 1253
——Grand Rapids Ry.:
Fare increase sought, n 1169
Great Britain:
——Fare increase petition, 1057
——Financing for 1917, 293
——London:
Croydon Corpn. Tramways meet war burden [Goodyear], 220; Comment, 214; Air raid warning sign, •846
Letters from, 52, 243, 425, 671, 870, 1062
London United Tramways reaches agreement with County Council, 471
Safety-First Council report, 1059
——Municipal Tramways Association report, 128
——Outside-switch and double-switch types of special work, •1061
——Rush-hour shoppers warned against use of tramway cars, 1005
Greenfield, Mass.:
——Connecticut Valley Street Ry.:
Abandonment of part of property, n 877
Reduced rate tickets withdrawn, 786
Greensboro, N. C.:
——North Carolina Pub. Ser. Co.:
Fare increase, n 158
Legislation to help one-man cars, n 391

H

Hamilton, Can.:
——Hamilton Street Ry.:
Wage increase sought, n 583; Recommended by arbitrators, n 874
Hamilton, O.:
——Cincinnati, Dayton & Toledo Tr. Co.:
Reorganized as Cincinnati & Dayton Tr. Co., n 634; Plans outlined, 723
Harrisburg, Pa.:
——Harrisburg Rys.:
Financial statement, n 784
Skip-stops inaugurated, n 437
Wage increase, n 781
——Walkers' club formed, 545
Hartford & Springfield Street Ry. (see Warehouse Point, Conn.)
Haverhill, Mass.:
——Massachusetts, Northeastern Street Ry.:
Appeal against jitney competition, 1159
Zone system sought, 828
Hazelton, Pa.:
——Wilkes-Barre & Hazelton Ry.:
Governor Maintenance decreased [Brown], •93
Renewing worn controller parts [Brown], •144
Headlights:
——New floodlighting unit (Electric Service Supplies Co.), •147
Heating of Cars:
——Brooklyn Rapid Transit Co. receives order, 254
——Circulating water in heaters, Columbus, O., 239
——Coke, Use at Evansville, Ind., 376
——Effect on winter power consumption [Hammond], 577
——Scale impedes water circulation [Folwell], 925
Heavy Electric Traction:
——Electrification as a means to conservation of national resources [Rice], 367
——Electrification progress in Scandanavia, 652
——Further railroad electrification important [Shepard], •4
——Pennsylvania R. R., New extension, 672; Extension to Chestnut Hill, •799; Comment, 795
——Progress during 1918, Comment, 1081
——Railroad electrification as a war measure, [Wynne], 81
——War should stimulate electrification, Comment, 3
Helena, Mont.:
——Helena Lt. & Ry. Co.:
Abandonment of line approved, n 338
Bonus paid to city, n 338
Highway crossing protection (see Signals)
Highwood, Ill.:
——Chicago, North Shore & Milwaukee R. R.:
Freight handling possibilities [Cole], •893
McAdoo travels via electric, •860
Midnight interurban express service popular, 156
Service during severe storm praised by newspaper, 436
Special train carries Secretary Daniels, 779
Wage increase sought, n 1247
H. M. Byllesby & Co. (see Chicago, Ill.)
Holston Valley Ry. (see Bristol, Tenn.)
Holyoke, Mass.:
——Holyoke Street Ry.:
Zone system to be given trial, •77
Honolulu, T. H.:
——Honolulu Rapid Transit & Land Co.:
Employees entering military service may retain seniority, n 1203
Wage increase, n 824

Hot Springs, Ark.:
——Hot Spring Street Ry.:
Reduced rate ticket sale discontinued, n 437, n 546
Houghton, Mich.:
——Houghton County Tr. Co.:
Fare increase sustained, n 437
Houston, Tex.:
——Houston Electric Co.:
Fare increase sought, n 1255
One-man cars installed, n 591, n 681
Wage increase, n 474, n 984
——Jitney drivers arrested, n 158
——Trainmen requested to help enforce law, n 254
Hudson & Manhattan R. R. (see New York City.)
Hudson River & Eastern Traction Co. (see Ossining, N. Y.)
Hudson Valley Ry. (see Glens Falls, N. Y.)
Huntington, N. Y.:
——Huntington R. R.:
Rate decision of Second District Commission [Conway], 130
Huntington, W. Va.:
——Ohio Valley Elec. Ry.:
Newspapers praise general manager, 382
Wage increase, n 630
Hutchinson, Kan.:
——Hutchinson Inter-Urban Ry.:
Radial trucks for power saving and better riding •815

I

Illinois:
——Soldiers must pay full fare, n 789
——Utilities make blanket relief petition, 295
Illinois Electric Railway Association:
——Annual meeting, War Board activities, 1231
Illinois Traction System (see Peoria, Ill.)
Indiana:
——Class rate increase asked by all interurban railways, 1209
——Fuel economy committee appointed, 44
——Rate case decision, 157
Indianapolis, Ind.:
——Garfield order, Effect on railways, 183
——Indianapolis & Cincinnati Tr. Co.:
Fare increase sought, 109; Granted, 204, 225
——Indianapolis Street Ry.:
Security holders anxious, n 1111
——Indianapolis Tr., & Ter. Co.:
Commission upheld in fare case, 59
Financial statement, n 877; Condition serious, n 784
Increased revenue is needed, n 784
Interurban freight terminal [McMath], 816
Skip-stop instituted, n 546; Operation extended, n 789
Spiral standardization should be stimulated [McMath], 1155
——Interurban lines contribute Liberty Loan advertisement, n 781
——Terre Haute, Indianapolis & Eastern Tr. Co.:
Freight handling possibilities [Cole], •893
Hearing on purchase of Western Indiana Utilities Co., n 784
Permission to take over the West Indiana Utilities Co., n 338
Indianapolis & Louisville Tr. Co. (see Scottsburg, Ind.)
Interborough Consolidated Corporation (see New York City)
Interborough Rapid Transit Co. (see New York City)
International Ry. (see Buffalo, N. Y.)
Interstate Commerce Commission:
——Report for 1916, n 569
Interstate Consolidated Street Ry. (see Attleboro, Mass.)
Inter Urban Ry. (see Des Moines, Ia.)
Interurban railways:
——Freight handling electric lines of the United States [Cole], •893
——Rates should be raised without delay, Comment, 1083
——Three cents per mile rate urged by War Board, 1099
Interurban Railway & Terminal Co. (see Cincinnati, O.)
Iowa:
——Financial report for interurban lines, 784
Iowa Electric Railway Association:
——Annual convention, 1090
Ithaca, N. Y.:
——Central New York Southern R. R. Corp.:
Financial interest acquired by Ford, Bacon & Davis, n 152

J

Jackson, Mich.:
——Michigan United Rys.:
Fare increase sought, n 591; Granted, 787
Jamaica:
——West India Elec. Co., Ltd.:
Financial statement, 876
Jamestown, N. Y.:
——Jamestown Street Ry.:
Conductors sentenced for theft, n 158
Financial statement, n 784
Japan:
——Government Rys., Statistics, 724
——Railway taxes cancelled, n 289
——Tokyo will have rapid transit, 767
Jersey Central Traction Co. (see Keyport, N. J.)
Jitney buses:
(see also Motor buses)
——Abolished at Winnipeg, Can., 989
——Appeal against competition made by Massachusetts railways, 1159

Jitney buses: (Continued)
——Bay State Street Ry. poster on "Jim Jitney," •325
——Bonding company retires, n 62
——Dallas, Tex., Defeated at election, 1031, n 1074
——Duplication of service must be eliminated, Comment, 263
——Los Angeles, Cal. Report on operation, •467
——Minneapolis ordinance, n 883
——New York municipal jitney bus bill vetoed by Governor, 1023
——Portland, Ore., Jitneys win in election, 1065
——Tacoma, Wash., Sanctions free bus operation, n 298; Service resumed, n 638
——Terre Haute, Ind., Licensing measure upheld by City Council, n 729
——Waste man power in unessential work, 1199
Johnstown, Pa.:
——Johnstown Traction Co.:
Fare increase protested, n 831
Joliet, Ill.:
——Chicago & Joliet Elec. Ry.:
Fare increase sought, n 1211
Joplin & Pittsburg Ry. (see Pittsburg, Kans.)

K

Kalamazoo, Mich.:
——Michigan Ry.:
Battle Creek, Mich. cannot grant 6-cent fare, n 1169
Fare increase sought, n 831
Freight handling possibilities [Cole], •893
Kankakee, Ill.:
——North Kankakee Electric Lt. & Ry. Co.:
Sale of property to Chicago & Interurban Tr. Co. desired, n 1110
Kankakee & Urbana Traction Co. (see Urbana, Ill.)
Kansas City, Kan.:
——Kansas City-Western Ry.:
Fare increase, 934
Freight handling possibilities [Cole], •893
Strike, 927
Kansas City, Kaw Valley & Western Ry. (see Bonner Springs, Kan.)
Kansas City, Mo.:
——Interurban Union Station ordinance passed, 205
——Kansas City, Clay County & St. Joseph Ry.:
Freight handling possibilities [Cole], •893
Joint rates with steam road adopted, n 391
Personnel changes, 293
——Kansas City Rys.:
Asphalt plant used also for sand drying [Harvey], •46
Coal zoning plan causes embarrassment, 810
Commission rules that it has jurisdiction over fares, 728
Fare increase sought, 388, 542, 931; Hearing, 991; Granted, 1254
Financial statement, 931
Folder of "Where to Go in Kansas City" published, n 789
Freight handling possibilities [Cole], •893
Increased rate for sale of power to light company granted, n 1027
Industrial slackers scored, 197
Labor conditions aided by weekly publication, 481
Liberty loan activities,•606, •819
Operating difficulties, 231
Pamphlet issued on the problems of the street railway, •1228
Pneumatic door and step control, 765
Poem "The Nickel," 728
Power plant accident, n 199
Public Service Commission to study conditions, 205
Service flag, 97
Service investigation by Commission, 61
Skip-stop plan looked upon favorably by city, n 1117
Skip-stop proposed, 935
Staggered business hours urged, n 1116
Strike settled, 674
Track spiral standardization limitations, 775
Traffic problems placed before commission, 436; Changes, 545
Union button agreement reached 821
Women conductors trained, n 206; Employed, •1145
——Missouri & Kansas Interurban Ry.:
Fare increase sought, n 591; Hearing, 828
——Police reinstated, n 824
——Sympathetic strike of labor unions does not affect railways, 629
Keene N. H.:
——Keene Electric Ry.:
Fare increase sought, n 591; Granted, n 681
Kenosha, Wis.:
——Wisconsin Gas & Electric Co.:
Strike of women employees, n 1066
Women conductors, Strike and operating conditions, •1147
Kentucky Traction & Terminal Co. (see Lexington, Ky.)
Kewanee, Ill.:
——Galesburg & Kewanee Electric Ry.:
Financial statement, n 1164
Keyport, N. J.:
——Jersey Central Tr. Co.:
Fare increase sought, n 720, n 939

L

Lackawanna & Wyoming Valley R. R. (see Scranton, Pa.)
La Crosse, Wis.:
——Wisconsin Ry., Lt. & Pr. Co.:
Metal electrode welding [Treat], 665
Lake Erie, Bowling Green & Napoleon Ry. (see Fostoria, O.)
Lake Erie & Northern Ry. (see Galt, Can.)
Lakewood, N. J.:
——Trenton, Lakewood & Seacoast Ry.:
Application made for receiver, 585; Denied, n 634
Lancaster, Pa.:
——Consolidation of all Lancaster County electric railways proposed, n 294
Leetonia, O.:
——Youngstown & Ohio River R. R.:
Freight handling possibilities [Cole], •893
Strike, n 1159
Legal:
——Bridge toll case decided in favor of Brooklyn Rapid Transit System, n 722
——Bridge suit won by city of Seattle against Puget Sound Tr., Lt. & Pr. Co., 1023
——Court ruling blocks New York fare increases, 696; Comment, 691
——Electric railway legal decisions, 438, 832, 1033
——Labor decisions, Trend of, 466
——New York ruling renders commissions without power, 811; Comment, 797
——Paving case decided in favor of New York Rys., n 723
——Rate case decision in Indiana, 157
——San Francisco sued by United Railroads for construction of competing line, 1160
——Washington court denies application for investigation, 936
Lehigh Valley Transit Co. (see Allentown, Pa.)
Lethbridge, Can.:
——Lethbridge Municipal Ry.:
Financial statement, n 1205
Lewisburg, W. Va.:
——Lewisburg & Ronceverte Elec. Ry.:
Property sold, n 294
Lewiston, Me.:
——Lewiston, Augusta & Waterville Street Ry.:
Fare increase sought, n 992; Hearing, n 1074; Granted, n 1116
Zone rearrangements authorized, •654
Lexington, Ky.:
——Kentucky Tr. & Terminal Co.:
Fare increase sought, n 254; At Frankfort, n 343, n 391; Granted, n 729
Legislators will not be favored, n 62
Liberty Loan activities (see Electric railways, War time conditions)
Lighting of Cars:
——Motor generator set for interurban car lighting, (General Electric Co.), •331
——Reducing costs [Johnson], •612
——Reducing maintenance costs [Wefel], 978
Lighting protection:
——Arrester selection to suit requirements [Brackett], •1145
——Car protection equipment [Wagner], •758
——Lightning arresters, Co-operation between departments, Comment, 690
Lima, Peru:
——Lima Lt. Pr. & Tramway Co.:
Financial statement, 1204
Lincoln, Ill.:
——Municipal operation of railway a success, 426
Lincoln, Nebr.:
——Lincoln Traction Co.:
Emergency petition denied, 435
Fare increase sought, Hearing, 587, n 883, n 1074; Denied, n 1256
Little Rock, Ark.:
——Little Rock Ry. & Elec. Co.:
Boilers from scrap pile made efficient, 189
Fare increase sought, n 729
Wage increase, n 1247
Locomotives:
——Class-T locomotives of the New York Central line, 695
——Design, Mechanical problems in, 99
——Development during 1917, 47
——Flash suppressor applied on the St. Paul [Storer and Hague], 858
——Freight equipment characteristics [Woods], •1055
——Freight handling electric lines of the United States [Cole], •893
——Industrial locomotive made more efficient, •864
——Latest commercial type [Hill], •556; [Shepard], •559; [Armstrong], •561; [Kattel], •564; Comment, 554
——New York Central R. R. costs, n 1111
——Passenger locomotive for Chicago, Milwaukee & St. Paul Ry., •237
——Switzerland railroad new 50-ton electric locomotive, •805
London, Can.:
——London & Lake Erie Ry. & Transportation Co.:
Municipal ownership negotiations, 631
Report on abandonment and consolidation with London & Port Stanley R. R., 1021
Sale of property Offered to city, n 1164
——London & Port Stanley Ry.:
Fare increase, n 789
——London Street Ry.:
Fare increase favored by labor, 545; Publicity campaign, •829; Refused, 1028
Financial statement, 539
London United Tramways (see Great Britain)
Long Island R. R. (see New York City)

(Abbreviations. •Illustrated. n Short news item.)
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

Los Angeles, Cal.:
——Los Angeles Ry.:
  New publication, n 482
  Woman conductor employed, n 882
——Pacific Electric Ry.:
  Construction disapproved by commission, 627
  Fare increase sought, 1114
  Financial statement, 1161
  Freight handling possibilities [Cole], •893
  Wage increase, n 874, 1159
  Watch inspection methods, 1098
  Women employees only in a case of emergency, n 1117
——Transfer interchange sought by city, n 592
Louisville, Ky.:
——Garfield order, Effect on railways, 182
——Louisville & Interurban R. R.:
  Live stock business increased, n 159
——Louisville Ry.:
  Financial statement, 540
  Regulation recommendations withdrawn, n 474
  Ship stop installed, n 1255
  Wage increase, n 722
——Street railway commissioner appointment suggested, n 291
Louisville & Southern Indiana Tr. Co. (see New Albany, Ind.)
Low-voltage d.c. railways:
——Switzerland railroad, New 50-ton locomotive, •805
Lubrication:
——Waste saturation tanks increase car mileage (Mulwaukee Tank Works), •1154
Lykens Valley Ry. (see Williamstown, Pa.)
Lynchburg, Va.:
——Lynchburg Tr. & Lt. Co.:
  Fare increase sought, n 158; Hearing, n 883; Granted, n 1116
  Insulated negative return feeder system [Way] •861
Lynn: Mass.:
——Nahant & Lynn Street Ry.:
  Appeal against jitney competition, 1159

M

Macon, Ga.:
——Georgia Lt. Pr. & Rys.:
  Financial report, 250.
Mahoning & Shenango Ry. & Lt. Co. (see Youngstown, O.)
Maintenance records and costs:
——Better car maintenance an urgent necessity [Lambert], •524
——Labor-saving methods in the way depart-
——Insurance against obsolesence a prime necessity, Comment, 1221
  ment [Cram]., •517
——Memphis Street Ry. keeps valuable records, •807
——Pneumatic tie tamping at San Francisco, 974
——Spring duties of the way department [Cram], •740
——Track construction and maintenance [Cram], •357
Manchester, N. H.:
——Manchester Street Ry.:
  Fare increase sought, n 882; Granted, n 1116
Manhattan & Queens Traction Corp. (see New York City)
Manila, P. I.:
——Manila Electric R. R. & Lt. Corp.
  A kilowatt-hour and the coal required to produce it, 525
  Coal consumption reduced by bonus plan, [Blaisdell], •308
  Farewell tribute to Mr. Cairns, •38
  Shortage of coins for carfares, n 591
Manistee, Mich.:
——Manistee City Ry.:
  Fare increase, n 938
Mansfield, O.:
——Mansfield Public Service & Utility Co.:
  Fare increase sought, n 391
Manufacturers Ry. (see St. Louis, Mo.)
Maps:
——Freight handling electric lines of the United States, •893
——Lynchburg, Va., •861
——Montreal Tramways power rehabilitation, •72; Comment, 71
——Newport News & Hampton Ry., Gas & Electric Co., Railway lines, •1048
——New York Connecting R. R., 556
——Pittsburgh, Pa., Traffic investigation report, •842
——Rhode Island Co., 572, •1003
——Washington, D. C., •849
——Zone system of coal distribution, •968
Marion & Bluffton Tr. Co. (see Bluffton, Ind.)
Marion, O.:
——Columbus, Marion & Bucyrus Ry.:
  Freight handling possibilities [Cole], •893
Market Conditions:
——(Current prices of materials appear in each issue.)
——Advance in prices of materials during three years, 1260
——Air-brake devices, 302
——Alloy Steel, 1261
——Armature and field coils, 1078
——Asphalt paving, 735
——Atlantic Welding Co., Re-organization as Lincoln Rail Welding Co., 1121
——Australian Railways, 597
——Ball bearings, 487
——Bituminous coal, 1079, 1216, 1260
——Boilers, 442, 596
——Brake shoes, Self-truing, 396
——Brush-holders, 734

Market Conditions: (Continued)
——Buying at low ebb, 642
——Carnegie sales organization changes, 686
——Cars, 442; Design, 642; Equipment and material, 303; Manufacture Statistics, 486; Seating, 596; Materials, 1217
——Cash in payment of freight bills, 1121
——Catalogue dates, 349
——Cedar poles, 258
——Cleveland Armature Works, Inc., 1079
——Coal, 1036; Crushing apparatus, 642; Price regulation, 486; Production, 792, 942; Situation, 886; Supply, 837; 1174
——Commercial bribery criminal offense, 1078
——Commutator brushes, 487
——Copper, 211 1037; Wire, 67; Wire products, 686
——Cost of railway material advanced, 1260
——"Cost-Plus" basis abandoned, 1078
——Curtain specialties, 734
——Curtain Supply Co., 1036
——Dumping cars, 735
——Effect of favorable legislation, 1037
——Effect of Federal control of railroads, 115
——Electric Hoist Manufacturers' Association, 597
——Electric railway credits, 997
——Equipment and operating costs Southeast, 996
——Fare boxes, 1079
——Financial and natural conditions, 162
——Freer buying expected, 67
——Freight, Cars, 943; Congestion, 114; Handling, 67
——Gear manufacturers hold convention, 887
——General Electric business, 836
——Goldschmidt Thermit consolidation, 349
——Government contracts, 211; Purchasing department created, 754; Work, 396
——Hardware, 997
——Iron and steel, 303, 442; Prices 687
——J. G. Brill Co., 396
——Laconia Car Co., 348
——Lightning arresters, 258
——Line material, 210
——Lubricants and oils 596
——Machine tools, 943
——Manufacturers work close to government, 67
——Metal conduit, 1079
——Metal prices, 162
——Ohio Electric & Controller Co., 943
——Open-car equipment, 887
——Overhead material, 349
——Pacific Coast Rys., 210
——Pneumatic door control, 996
——Pole deliveries, 687
——Power house equipment, 443, 1120
——Price fixing, 163
——Priority transportation, 115; Rules, 348; Allocation of Steel, 1121
——Purchsing, 162
——Purchasing agents should use foresight, 596
——Rail manufacture, 114
——Railroad Administration car orders, 887
——Rails, 942
——Railway, Appliance exhibit, 642; Credits in Middle West, 1078; Credits in Southeast, 258; Lamp stocks, 1036; Material deliveries, 836
——Raw material supplies, 643, 793
——Repair equipment and material, 550
——Review of conditions for 1917, 66
——Revised prices, 1260
——Rolling stock, 597, 792; Second-hand, 211
——Roofing materials, 348
——Rotary converters, 886
——Safety devices, 210
——St. Louis Car Company's strike, 1037
——Sangamo Economy watt-hour meters, 1037
——Scrap metals and licenses, 259, 942
——Shipbuilding activity increases railway traffic, 396
——Shop equipment, 397
——Sleet scrapers, 115
——Small tools, 1174
——Snow and ice removal equipment 302
——Snowplow equipment, 792
——Southeastern roads, 1174
——Standardization, 163; Catalogue sizes, 837 1120
——Steel, 115, 1120; Galvanizing, 687; Orders 886
——Ties, Combined wood and steel, 1261
——Tin shortage and higher prices, 687
——Track material, 259, 686
——Transformers, 943
——Transportation service, 258
——Trolley cord, 114, 734, 1216
——Varnish and paint, 551
——Western Electric Co., 837
——Western prices higher, 550
——Westinghouse Elec. & Mfg. Co., 1036; Ship plant, 1078
——Window glass, 348, 397, 550
——Wire, 115, 258, 793, 942, 1079, 1216
——Women employees in railway supplies plant, 1175
——Wood handles for tools, 996
——Wool waste, 302
Mason City, Ia.:
——Mason City & Clear Lake R. R.:
  Freight handling possibilities [Cole], •893
Massachusetts:
——Equitable rates of fare urged by Governor, 107
——Service at cost, Approved by commissions, 226; Before legislature, 290; Investigated by legislature, 246; Provided for all railways in the State, 1093
——Skip-stop to be adopted throughout State, 988
——State directors, not public ownership, urged by legislature, 100

Mason City, Ia.: (Continued)
——Suburban and interurban operation a losing proposition, 818
——Massachusetts Northeastern Street Ry. (see Haverhill, Mass.)
Mattoon, Ill.:
——Central Illinois Public Service Co.:
  Fare increase sought, n 831
Mauch Chunk, Pa.:
——Carbon Transit Co.:
  Fare increase, n 729
Memphis, Tenn.:
——Memphis Street Ry.:
  Fare increase sought, n 482
  Maintenance records that prove invaluable, •807
Mexico:
——Fare reduction explained, 786
Mexico, Mo.:
——Mexico Investment & Construction Co.:
  Property abandoned, n 105
  Reorganizing plans rejected, 386
Michigan City, Ind.:
——Chicago, Lake Shore & South Bend Ry.:
  Electric railway situation needs radical readjustment [Wilcoxon], 454
  Freight handling possibilities [Cole], •893
  Freight transfer ruling of commission protested by steam railroad, n 592
Michigan Ry. (see Kalamazoo, Mich.)
Michigan United Rys. (see Jackson, Mich.)
Middlesex & Boston Street Ry. (see Newtonville, Mass.)
Milford, Mass.:
——Milford, Attleboro & Woonsocket Street Ry.:
  Wage increase, n 1202
  Zone fare system sought, n 883, 992
Military Openings (See recruiting notices.)
Milwaukee Northern Ry. (see Cedarburg, Wis.)
Milwaukee, Wis.:
——Milwaukee Elec. Ry. & Lt. Co.:
  Fare increase sought, Hearing n 831; Granted, 1112; Referendum conducted through newspapers, 1166
  Purchase of Milwaukee Lt. Ht. & Tr. Co., proposed, 293
  Rail rate increase, What it means [Putnam], 1103
  Reasonable rate of return has advanced, 83
  Service praised by newspaper, n 247
  Wage increase, 982
  Women employment order will be complied with, n 1066
Minneapolis, Minn.:
——Franchise settlement with street railway urged, n 384
——Jitney ordinance, n 883
——Minneapolis, St. Paul, Rochester & Dubuque Elec. Tr. Co.:
  Operating prospects brighter, n 827
  Re-organization plans, 57
  Service-at-cost proposal, 719
  Track spiral standardization [Wilson], 926
  Valuation report, 245
——Twin City Rapid Transit Co.:
  Arbitration commission report, 382
  Conductor puts song into his work, 298
  Conductors knit socks, 1061
  Ex-employees demand reinstatement, 430
  Fare increase sought, n 1032, n 1116
  Financial statement, 986
  Labor, Report, n 538; Investigation, n 675
  Liberty loan activities, •603
  Pay-as-you-enter service experiment, n 822
  Shop floor made of asphalt mastic, 923
  Wage increase, n 1024
Missouri Association of Public Utilities:
——Annual meeting, 1053
Missoula, Mont.:
——Missoula Street Ry.:
  Fare increase sought, n 1255
Missouri & Kansas Interurban Ry. (see Kansas City, Mo.)
Mobile, Ala.:
——Mobile Lt. & R. R. Co.:
  Shipbuilding necessitates greatly increased facilities, •1185
Moncton, Can.:
——Moncton Tramways, Electricity & Gas. Co.:
  Fare increase sought, n 992
Monongahela Valley Tr. Co. (see Fairmont, W. Va.)
Monroe, La.:
——Municipal Street, Ry.:
  Strike, 245
Montreal, Can.:
——Commission appointed and will fix fare charges, 873
——Montreal & Southern Counties Ry.:
  Interurban cars, Special features, [Wilson], •331, 377
——Montreal Tramways:
  Car hoists for changing wheels [MacLeod], •142
  Cars moved through congested intersection [Gaboury], 233
  Franchise report, 196; New provisions, 288; Agreement approved, n 383
  Power, Rehabilitation, •72; Comment, 71; Distribution, •449; Comment, 446; Plant remodeling, •1085
  Six-motor multiple-unit train operation, [MacLeod], 403; Comment, 399
  Wage increase, n 1247
Morristown, N. J.:
——Morris County Tr. Corp.:
  Lease agreements proposed n 294
  Wage increase, n 1107

Motor buses:
(See also Jitney buses)
——Auto trucks. Flanged wheels and demountable rubber tires could be used for freight delivery [Witt], 1200; Waste gasoline needed at the front, comment, 1178
——Austin, Tex.:
Railway installs extension, 787
——Chicago Stage Co., granted operation privilege, 198
——Electric railways vs. motor trucks [Lintern], 926
——New York City, Application put over, n 781
——Private automobile competition, Comment, 1000
——Report on automobile registration, n 154
——San Francisco installs traffic feeders, [Eckart], •327; Extends service 984
——Serious menace to electric railway operations, 1250
——Springfield, Ill., Application denied, n 781.
——Winnipeg, Can., Extension to railway, n 681
Motors:
——Commutator brushes, Causes of streaking, 510
——Current and power cures [Squier], •1134
——Dipping and baking equipment to decrease troubles [Dobson], •1149
——Effect of various types on economical operation [Squier], •500
——Series motor for emergency constant speed work [Foote], •1197
——Service conditions determine type of motor [Squier], •748
——Six-motor multiple-unit trains for Montreal [MacLeod], •403; Comment, 300
——Speed-time curve determines character of equipment [Squier], •956
——Ventilated motors during a strenuous winter [Hellmund], •507
Mount Carmel, Pa.:
——Shamokin & Mount Carmel Transit Co.:
Fare increase, n 62
Rebates for excess fare ordered, n 882
Mount Vernon, Ill.:
——City Railway Co.:
Property sold for junk, n 105
Municipal ownership:
——Charm has been lost with increased public knowledge of conditions, Comment, 737
——Conference of New York mayors, n 428
——East San Francisco Bay City's plans, 197
——Favored by New York mayors, n 538
——Lincoln, Ill. finds it successful, 426
——London, Can., Negotiations, 631
——New York Merchants opposed, n 583; State creates committee to investigate, 628; Bills dead, n 722; Investigation 1022
——San Francisco, Cal., Considers further operation of private lines, 383; Negotiations, 536, n 630
——Seattle, Wash., Operation at a loss, n 725
——Tacoma, Wash., Proposes, 471; Controversy, n 583; Defeated, n 722
——Toronto votes to take over railway, n 151
——Washington report unfavorable, 777
——Windsor, Can., votes favorably, n 247
Muskegon, Mich.:
——Muskegon Traction & Lighting Co.:
Fare increase sought, n 1115

N

Nahant & Lynn Street Ry. (see Lynn, Mass.)
Nashua, N. H.:
——Nashua Street Ry.:
Lease agreement rejected, n 387
Nashville Tenn.:
——Nashville Ry. & Lt. Co.:
One-man car tried out, n 729
Union activity restrained, n 929
National Association of Ry. & Utility Commissioners:
——Purpose of association, 198
National committee on public utilities:
——Pamphlet on higher rates, n 667
——Statement on public utility situation and appointment of regional state committees, 619
National Electric Light Association:
——Convention, War time questions, •1180; Comment, 1179
National Foreign Trade Council:
——Arrangements for February meeting, n 56
National Safety Council:
——Complaint safety poster, •80
——Guard rails for shop use, Pamphlet, •668
——Kansas City Rys. active in local council, 612
——Patriotic poster, •455
——Poster, •971
New Albany Ind.:
——Louisville & Southern Indiana Tr. Co.:
Accident fatal, n 254
Fare increase sought, n 546, n 638; Hearing, n 883
Newark, N. J.:
——Public Service Corp.:
Bus operation by railway, n 883
Financial statement, 782
Immediate relief for utilities a prime national necessity [McCarter], 713
"Trolley Weal" changed to quarterly, n 109
——Public Service Ry.:
Accident, n 1255
Fare increase sought, 478, 939; Case postponed, 543; President McCarter explains need, 622; Hearings 680, 990, 1071, 1112; Hearing postponed, n 882
Fare reduction at Hoboken refused, 1029
Fire destroys cars and carhouse at Camden, n 474

Newark N. J.:
——Public Service Ry.: (Continued)
Liberty loan activities, •605
Patriotism on the platform poster, •468
Skip-stop instituted, n 681
Staggered working hours tried at Camden n 882
Strike, 1107; Settled, 1158
Traffic report, n 482
Wage increase at Camden, n 1108, n 1160
Welded rail joints, •190
Woman conductors employed, 1147
New Bedford, Mass.:
——New Bedford & Onset Street Ry.:
Fare increase granted, n 1115
——Union Street Ry.:
Appeal against jitney competition, 1159
Twenty-ton sand car built in railway shops [Taber] •189
New Brighton, N. Y.:
——Richmond Lt. & R. R. Co.:
Air-operated doors and steps installed, •1060
Open car operation permitted, 298
Ship builders operate cars to shipyards, 1186
New Brighton, Pa.:
——Beaver Valley Trac. Co.:
Fare increase, n 109
Package car service discontinued, n 1074
War data card for patrons, •186
Newell, W. Va.:
——Newell Bridge & Ry. Co.:
Fare increase, n 1032
New England Electric Freight Association.:
——Organization and meeting 175
New England Street Railway Club:
——Annual banquet dominated by martial note, 653
——"Manufacturers' Night" annual meeting, 230
New Haven, Conn.:
——Connecticut Co.:
Coal, Effect of inferior quality upon operation [Wood], 573
Compromise on wages accepted, n 1107
Evolution of concrete poles [Harte], •1126
Freight rate classification [Curtis], 323; Comment, 307
Hartford, Fare brief filed, 588; Controversy settled, 620; Appealed by city, n 729, 830, n 992; Zone system rather than six-cent fare, 339
Liberty loan activities, •604, •1059
Overhead department economies [Harte], •494
Poles, Proper wood for electric railway service with their respective values [Harte], •743
Power-saving campaign [Arthur], •412; 468; Produces results, 1152
Safety code standards for transmission lines [Harte], 979
Service increase ordered at Waterbury by commission, 206
Steel supports for overhead construction, Virtues and limitations [Harte], •948
Track spiral standardization [Dunham], 1017
New Iberia, Ia.:
——Southwestern Tr. & Pr. Co.:
Reduction in operation sought, n 992
New Jersey:
——Bill passed to tax gross incomes, n 583
——Franchise rate limit removed by highest court, 1208
——Freight bill for electric railways signed by governor, n 482
——Notice of change of rate demanded by commission, 879
——Skip-stop adoption lies with company, n 638
——Tax bill on gross receipts passed, 677
New Jersey & Pennsylvania Tr. Co. (see Trenton, N. J.)
New Orleans, La.:
——Franchise report discussed, 202
——New Orleans Ry. & Lt. Co.:
Community plan of operation likely, 1246
Rerouting conserves coal and eliminates congestion, 434, 1184
——Orleans, Kenner Electric Ry.:
Foreclosure sale, n 250; Transferred to Orleans-Kenner Tr. Co., Inc., n 634
Newport News, Va.:
——Newport News & Hampton Ry., Gas & Electric Co.:
Aviation and shipbuilding accelerated by extensions of service, •1048
New Publications, 254, 438, 832, 1034, 1169, 1258
Newtonville, Mass.:
——Middlesex & Boston Street Ry.:
Fare rate schedule revised, n 638
One-man car operation begun, 828
Public represented on board of directors, n 57
New York Central R. R.:
——Bi-polar motor locomotives prove satisfactory [Katté], •564; Comment, 554
——Electric locomotive costs, n 1111
——Locomotives, Class-T design, 695
——Pneumatic tie tampers solve labor problems, 1020
New York City:
——Administration plans, n 56
——All-steel cars and Mayor Hylan, 674
——American Cities Co.:
Financial statement, 1110
——American Pr. & Lt. Co.:
Financial statement, 1161
——Bus line application put over, n 781

New York City: (Continued)
——Central Crosstown [illegible]
Foreclosure sale ordered, n 1027; Sold, n 1206
——Daylight saving conference, n 583
——Dual Subway system:
Broadway [illegible] opened [illegible]
Increase in mileage for 1917, 53
Labor situation 537, n 1108, n 1158, n 1203
New line opened, n 1024
Priority orders for steel secured, n 151
Rapid Transit deficits, 724
Relief proposed for contractors, n 722; Bill signed by mayor, n 874
——Financial report of city lines, 293, 1026
——Electric Bond & Share Co.:
Financial statement, n 1027
——Fare increase movement:
Hearings, 437
Lively discussion by mayor, railways and commissioners, 628
Transfer charge refused, 1167
——Garfield order, Effect on railways, 183
——Hudson freight tunnel plans, 198
——Hudson & Manhattan R. R.:
Fare boxes replace ticket choppers, 422
Fare increase, 1115; Postponed, 1158
Operated by government, n 383
Steam lines may enter New York through Hudson River tunnels, n 430
Women guards employed, n 158
——Hudson Tunnel bill signed, n 474
——Interborough Consolidated Corporation:
Annual report, 248
——Interborough Rapid Transit Co.:
Age limit for employees raised, 1158
Ambulance donated to army, •535
Elevated railway rebuilding under schedule traffic, •320
Merchants' Association favors fare increase on subway line n 992
Publicity work sets public to thinking, •217
Squealing brakeshoes to be eliminated, n 984
The Third Liberty Loan [Shonts], 602
War activities of Major Belmont, 472
War saving stamp advertising donated, n 1248
——Long Island R. R.:
Financial statement, 1163
——Manhattan & Queens Tr. Corp.:
Injunction against contract for future granted, n 1209
Red Cross car, n 1033
Thrift stamp car, •991
Uniform of new design for women conductors, n 298
Women conductors employed, n 158
——Municipal ownership bill again referred, 199; Killed, n 430
——New York Rys.:
Accident report, n 254
Age limit for employees raised, 1158
Converting cars to prepayment type, •529
Court rules that commission has no power over depreciation rate, 1068
Depreciation fund case decision, 199
Employees appeal to public for fare increase, 1246
Owl car operation may be discontinued, n 1117
Paving case won by railway, n 723
Publicity sets public to thinking, •217
War savings stamps sold, 784
Women conductors, Labor bureau and federal investigation report, •1006
——New York, Westchester & Boston Ry.:
Gutters on cars reduce labor and protect passengers [Potter], •978
——North American Co. (The):
Selling service for a fair price [Putnam], 851
——Passenger traffic report, 434
——Third Ave. Ry.:
Axles welded with electric arc [Parsons], •1136
Eliminating unnecessary lighting and heating in the carhouse [Mullaney], 668
Fare case dismissal requested by city, 480; Increase hearing, 679
Foot control mechanism facilitates operation, •977
Reducing car lighting costs [Johnson], •612
Track spirals, Greater uniformity will conduce to economy [Ryder], •649; Comment, 645
——Union Railway Co.:
Ordered to purchase more snow fighting equipment, n 109
——United Gas & Elec. Enging. Rys Corp.:
Power plant built with convict labor, 1198
——Wage question before commission, 721
——West Side improvements:
Recommendations of T. P. Shonts, 150
Report to legislature, 287
——Women employees, n 391
New York Connecting R. R.:
——Electrical operation over Hell Gate Bridge Comment, 1081
——Overhead construction for electrification, •1043; Follows closely early development [Murray], 1155
New York Electric Railway Assn.:
——Annual meeting, 1232
——War Board work reviewed, 187
New York, New Haven & Hartford R. R.:
——New 180-ton locomotive [Hill], •556; Comment, 554
New York-New Jersey Joint Port Improvement Commission recommendations, n 474
New York & North Shore Traction Co. (see Roslyn, N. Y.)

New York & Pennsylvania R. R.:
——Property purchased for junk or electrification, n 58
New York Railroad Club:
——Annual "Electrical Night," •556; Comment, 554; Addresses [Hill], •556; [Shepard], •559; [Armstrong.] •561; [Kattel, •564
New York State:
——Commission, Bill passed to consolidate First and Second Districts, 721
——Fare increase movement:
Commission decision emphasizes necessity for local publicity work, Comment, 890
Court decision, Blocks fare increases, 696; Comment, 691; Makes situation grave, 697; Blocks financial relief, 812
Mayors' Conference has injured the public by preventing increases, Comment, 841
Railways seek legislative enactment, 544
Review of six fare cases, 636
Rochester court decision renders commissions without power, 811; Comment, 798
Senate bill destructive of fare legislation, Comment, 166
Slow progress for relief, 590
Status of higher fare [Conway], 1235
Transfer cases adjourned, 880
Upstate decision causes trouble, Comment, 947
——Fuel economy campaign begins, 42
——Legislature does little constructive work, 777
——Municipal jitney bus bill vetoed by Governor, 1023
——Municipal ownership favored, n 538; Opposed by merchants, n 583; Bills dead, n 722; Investigation, 1022
——Public service commission (see Public service and regulative commissions)
——Senate creates committee to investigate municipal ownership, 628
——Traffic rules for all cities made uniform, 251
New York State Railways (see Rochester, N. Y., Syracuse, N. Y., Utica, N. Y.)
Norfolk & Bristol Street Ry. (see Foxboro, Mass.)
Norfolk & Western Ry.:
——Electric locomotives have good record, 804
North American Co. (see New York City)
Northampton, Easton & Washington Tr. Co. (see Easton, Pa.)
Northampton, Mass.:
——Northampton Street Ry.:
Fare increase sought, n 882, n 939
North Carolina:
——Increased revenue sought by electric railways, 296
North Carolina Public Service Co. (see Greensboro, N. C.)
North Coast Pr. Co. (see Vancouver, Wash.)
Northern Cambria St. Ry. (see Patton, Pa.)
Northern Electric Ry. (see Chico, Cal.)
Northern Massachusetts Street Ry. (see Athol, Mass.)
Northern Ohio Traction & Light Co. (see Akron, O.)
Northern Texas Tr. Co. (see Fort Worth, Tex.)
Northern States Power Co. (see Chicago, Ill.)
North Kankakee Electric Light & Ry Co. (see Kankakee, Ill.)
Northwestern Traction Co. (see Brazil, N. C.)
Norwich, Conn.:
——Shore Line Elec. Ry.:
Test car investigates sources of waste, 1144
Wage increase sought, n 929
Zone system in practice [Perkins], •86

O

Oakland, Cal.:
——Municipal ownership urged by Mayor, n 151
——Oakland Antioch & Eastern Ry.:
Reorganization to form San Francisco, Oakland & Sacramento Ry., 103
——San Francisco-Oakland Terminal Rys.:
Fare increase sought, Hearing, 341; Increase, 1208
Franchise resettlement session resumed, n 1066
"Key System News" popular, 1028
Prevention of automobile accidents [Mills], 1195
Skip-stop measures passed, n 546, 728
Wage increase, n 1066
——Union terminal for Oakland mole planned, 780
——U. S. Shipping Board to construct new line, 1161
Oakwood Street Ry. (see Dayton, O.)
Ocean City, N. J.:
——Ocean City Electric R. R.:
Fare increase granted, 881
Ogden, Utah:
——Ogden, Logan & Idaho Ry.:
Freight handling possibilities [Cole], •893
Name changed to Utah-Idaho Central R. R., n 153
Ogdensburg, N. Y.:
——Ogdensburg Street Ry. Co.:
Fare increase sought, 479
Ohio:
——Franchise provisions ruled supreme by court, 1254
——Freight handling conference of interurban lines held at Columbus, 635
——Interurban railways suspend "limited" service to save 44; Present application for higher fare and freight rates, 1254
——Severe storm, 148
Ohio Electric Ry. (see Springfield, O.)
Ohio Valley Electric Ry. (see Huntington, W. Va.)
Oklahoma City, Okla.:
——Oklahoma Ry.:
War needs of electric railways [Treat], 1053
Oklahoma Gas, Electric & Street Ry. Association:
——Annual convention, 1051
Olean, N. Y.:
——Western N. Y. & Pa. Tr. Co.:
Fare increase sought, n 1253, 1255
Omaha, Neb.:
——Omaha & Council Bluffs Street Ry.:
Fare increase sought, n 992, n 1032
Wage increase, n 824
One-man cars:
——Applying engineering and selling principles to electric railway transportation [Layng], •8
——Batavia, N. Y., n. 250
——Criticised by Amalgamated Association, n 538
——Edmonton, Can., •194
——Efficiency of reconstructed cars [Cooper], 1200
——Favored by Captain Gonzenbach, 44
——Foot control mechanism facilitates operation, •977
——Houston, Tex., n. 591, n 681
——Light-weight safety cars best for all concerned [Kaylor], 173
——Nashville, Tenn., n 729
——Newtonville, Mass., Operation begun, 828
——Pay-as-you-leave-car at Plymouth, Mass., •241
——Rome, Ga., Economical design [Wade], •769
——Seattle, Wash., 437, •576; Operation authorized, n 482
——Tampa, Fla., Operation begun, 154
——Vancouver, Wash., n 343
Operating records and costs:
——Applying engineering and selling principles to electric railway transportation [Layng], •8
——Attention should be confined to essential transportation, Comment, 1123
——Checking devices for conservation (Economy Electric Devices Co.) 533
——Coasting at Chicago, 97
——Coasting records and instructions at New Haven, •412
——Conserve resources by abandoning unprofitable lines, Comment, 601
——Effect of war conditions on cost and quality of public utility service, 75
——Fares should not be obliged to pay non-transportation charges, Comment, 738
——Grand Rapids, Mich., Increases explained, 723
——Hand-to-mouth-purchasing policy poor economy, Comment, 99
——Increase mileage production per car, Comment, 1001
——Intelligent economy the slogan for 1918, Comment, 491
——Motor equipment determined by service conditions [Squier], •748
——Peak load, Advantages of spreading becoming better known, Comment 554
——Progress in pulling down the rush hour peak is being made, Comment, 1178
——Purchasing agents should be real factor in economy, Comment, 999
——Rush-hour service is not profitable, Comment, 1040
——Train order register for interurban roads, (Standard Register Co.), •378
——Transportation engineers needed [Holst], 577
——Unprecedented difficulties on railway properties, Report of canvass, 231
Organization chart of Fuel Administration, 134
Orleans-Kenner Elec. Ry. (see New Orleans, La.)
Ossining, N. Y.:
——Hudson River & Eastern Tr. Co.:
Fare increase granted, n 1116
Ottawa, Can.:
——Ottawa Electric Ry.:
Newspapers praise company's president, n 472
——Ottawa Traction Co.:
Financial statement, 584
Ottawa, Ill.:
——Chicago, Ottawa & Peoria Ry.:
Fare increase sought, n 883
Overhead charges (see Appraisals of railway property)
Overhead contact system:
——Aluminum catenary construction, 142
——Economies, Possibilities of [Harte], •492
——New York Connecting R.R., •1043
——Malleable overhead fittings [Turpin], 666
——Steel supports, Virtues and limitations [Harte], •948
——Trolley ear length, Effect on wire-wear [Bolus], •975

P

Pacific Claim Agents' Association:
——Annual convention, n 1024; Automobiles, Inexperienced labor and accident topics, 1185
Pacific Electric Ry. (see Los Angeles, Cal.)
Pacific Gas & Electric Co. (see Sacramento, Cal.)
Pacific Traction Co. (see Tacoma, Wash.)
Paducah, Ky.:
——Paducah Traction Co.:
Fare increase sought, n 729; Granted, n 938
Paints and painting:
——Angle iron posts for car painters' platforms, •1197
Pan-Handle Traction Co. (see Wheeling, W. Va.)
Passenger handling records:
——Short-haul rider contributes the profit, Comment, 691
Queue loading in Detroit, 726
Patton, Pa.:
——Northern Cambria Street Ry.:
Fare increase sought, n 1168
Foreclosure sale, n 634, n 933
——Northern Cambria Ry.:
Organized to succeed the Northern Cambria Street Ry.: n 1110
Pavement:
——Basalt block in San Francisco, 98
——Concrete used between tracks at San Diego, 378
——Disintegration along rail-head prevented by new method, •1241
——Pavement plow as an economy factor [Cram], •519
Peekskill, N. Y.:
——Peekskill Lighting & R. R. Co.:
Fare increase, Rehearings asked by city, 436; Postponed, 541; Increase, n 939
——Putnum & Westchester Tr. Co.:
Fare increase, Rehearings asked by city, 436; Postponed, 541
Pennsylvania, R. R.:
——Electrification, New Extensions, 672; Extended to Chestnut Hill, •799; Comment, 795
Pennsylvania Street Railway Association:
——Annual meeting, 1133
——Meeting, 150
People's Railway (see Dayton, O.)
Peoria, Ill.:
——Illinois Traction System:
Crossing accidents at Champaign, n 298
Fares, Flat rate allowed, n 109; Increase sought, 295; Hearing, 389; 479; Need explained, 585; Case closed, 591; Increase granted, 1029; Rates reviewed, 1072
Freight handling possibilities [Cole], •893
Holiday greeting, n 62
Liberty loan activities, •606
Private car for Illinois Governor, 860
Publicity posters, •389
Service changes, 1112
Special rate cancellation requested, n 1169
——Peoria Ry.:
Wage increase sought, n 983
Petaluma, Cal.:
——Petaluma & Santa Rosa Ry.:
Annual report, 104
Reorganization agreement operative 385
Philadelphia, Pa.:
——American Rys.:
Proposed uniform track spirals [Keen], 869
——Philadelphia Rapid Transit Co.:
Fare and wage increases coupled, 981
Fare increase sought, 1031
Navy yard traffic problems, 389
Operating difficulties, 231
Pneumatic door and step control, 765
Power rate of electric company protested, 101
Seeks to have war taxes paid by underlying companies, n 1206
Slack adjusters as a war-time economy, •625
Strike, 1023
Wage increase, n 874, 1106, n 1203
——Rapid transit lease controversy:
Agreement shows foresight, 179; Comment, 166
Approved by stockholders, 234
Before public service commission, n 430
Construction delay recommended, n 474
Hearings, n 535, 673, n 874
Lease objected to, n 722
Measure passed, 55
Signed, 102
——Report of department of city transit, •1196
——Union Traction Co.:
Pittsburgh bond holders file bill in equity, 385
Philadelphia & Western Ry. (see Upper Darby, Pa.)
Piedmont & Northern Ry. (see Charlotte, N. C.)
Pittsburg, Kan.:
——Joplin & Pittsburg Ry.:
Fare, Increase granted, n 546; Sought, 935, n 1211
Strike, n 384; Ended, n 583, 720
Pittsburgh, Pa.:
——Fuel engineer appointed, n 984
——Pittsburgh, Harmony, Butler & New Castle Ry.:
Freight handling possibilities [Cole], •893
——Pittsburgh, Mars & Butler Ry.:
Freight handling possibilities [Cole], •893
——Pittsburgh Rys.:
City protests zone system, n 1116
Emergency transportation committee appointed, 251
Employees back fare increase petition, n 1108
Fare increase sought, n 108; Increase, 204; Results, •278; Revenue will be used in maintenance, 1254
Freight handling possibilities [Cole], •893
Interest payment for underlying companies arranged, 57
Manufacturer furnishes power for peak load, 324
Receiver, Application answered by request for dismissal, 631; Appointed, 825; Favors zone system, n 992, 1029
Skip stop installed, 830
Traffic changes recommended by commission, n 592

Pittsburgh, Pa.:
——Pittsburgh Rys.: (Continued)
Valuation commission chosen, 582; Work started, n 988
Wages. Increase dependent on fares, 60; Agreement, 928
Zone rate schedules, 1072; Objections heard, 1168
——Traffic investigation report, •848
——Traffic recommendations of transit commission, 148
——West Penn Rys.:
Fare increase sought, n 831
Power plant of great capacity, •264, •314
——West Penn Tr. Co.:
Freight handling possibilities [Cole], •893
Pittsfield, Mass.:
——Berkshire Street Ry.:
Liberty Loan "tank," •857
Plattsburgh, N. Y.:
——Plattsburgh Traction Co.:
Financial statement, 1067
Pleasantville, N. J.:
——Atlantic & Suburban Ry.:
Fare increase sought, n 939
Plymouth, Mass.:
——Brockton & Plymouth Street Ry.:
Pay-as-you-leave one-man car, •241
——Plymouth & Sandwich Street Ry.:
Operation suspended, n 827
Poles:
——(See also Power distribution.)
——Concrete poles. Costs, construction and evolution [Harte], •1126
——Proper poles for electric railway service [Harte], •743
——Specifications for red cedar, 1152
Port Arthur, Can.:
——Port Arthur Municipal Ry.:
Statement of earnings shows net loss, 475
Port Arthur, Tex.:
——Port Arthur Tr. Co.:
Wage increase, n 984
Portland, Me.:
——Cumberland County Pr. & Lt. Co.:
Fare increase and zone system sought, 339, 1074; Hearing, 479; Application for dismissal refused, n 831; Increase suspended, n 1116
Fuel saving, 183
Liberty loan activities, •607
Publicity methods for increased fares, •456
Tariff suspended, n 546
Portland, Ore.:
——City attorney wishes to change commission law, n 630
——Jitneys win out in election, 1065
——Portland Ry., Lt. & Pr. Co.:
Accident prevention work [Boynton], 1189
Civic associations aid in abolishing non-operating charges, 823
Commission ruling upheld by court, 587
Employees' club appoints new officers, n 151
Fare increase. Granted, 108, 184; Protested by city, n 297; Action of commission praised, 337; Increase appealed by city, 388, 437; Solution offered by franchise proposal, 477; Controversy threatens existence of commission, 479; Case closed, 543; Ruling of commission upheld by court, 617; Appealed by city, n 681, 728, n 831
Financial statement, 1026
Freight rate increase allowed, n 206
Fuel conservation methods, 975
Jitneys again become a problem, n 939
Merit and demerit system revised, 809
Revoke of franchise carried over, n 538
Shop planning system, 869
Wear on brake hangers taken up by spot welding, 1242
Portsmouth, N. H.:
——Boston & Maine R. R. (Electric Branch):
Financial statement, 875
Pottsville, Pa.:
——Eastern Pennsylvania Rys.:
Fare increase sought, n 938
Operating difficulties, 231
Wage increase, n 151
Poughkeepsie, N. Y.:
——Poughkeepsie City & Wappingers Falls Elec. Ry.:
Fare increase, 1209
Power (see also Purchased power; Sale of power.)
Power distribution:
——Insulation cutter for high-tension lines [Morse], •1101
——Montreal Tramways power rehabilitation, •72; Comment, 71, •449; Comment, 446
——Split conductor and aerial cable, A. I. E. E. meeting, •1229
——Steel supports, Virtues and limitations [Harte], •948
——Testing a line to see if it is alive [McKelway], 742
——Three-wire distribution [Harte], •495
——Vulcanized fibre, Electrical properties of [Eves], •238
Power generation:
——(See also coal)
——Flash suppressor application, Comment, 891
——Government requisitions Niagara power, 136
——Hydroelectric development, Economies of [Townley], 177; Comment, 165
——Montreal Tramways power rehabilitation, •72; Comment, 71
Power generation: (Continued)
——Power resources of the country, A. I. E. E. meeting, •1229
——Production of power in war times [Slade], 567
——Progress in power generation and transmission, A. I. E. E. meeting, •1229
——U. S. Chamber of Commerce asks that water power be developed, 627
——Waste of heat in fuel, Comment, 491
Power stations and equipment:
——Circuit breakers, Importance of, Comment, 445
——Coal, How to increase the energy output [Smith], •953
——Cooling water for power plant purposes, 48
——Development in electrical apparatus during 1917, 47
——Electrical machinery progress and wartime problems are discussed at N. E. L. A. convention, •1181
——Feed water testing and treating [Smith], •751
——Manila reduces coal consumption by bonus plan, [Blaisdell] •308
——Montreal Tramways power rehabilitation, •72; Comment, 71, •1085
——Oil rehabilitation for steam turbines [Smith], •1131
——Personnel of railway power plant [Smith], •361
——Pressure-governor for gas and liquid systems (General Electric Co.), •974
——Steam-ejector condenser air pump (C. H. Wheeler Mfg. Co.), •533
——Testing of water and other elements [Smith], •512
——Toledo plant construction progressing, 580
——Walnut Creek plant of Columbus Ry., Pr. & Lt. Co., •407
——Windsor power plant of West Penn Ry, •264, •314
Power transmission:
——Steel supports, Virtues and limitations [Harte], •948
Providence, R. I.:
——Providence, Warren & Bristol R. R.
Freight rate increase, n 939
——Rhode Island Co.:
Agreement on lay-offs reached, n 474
Franchise relief conference, 873
Freight business increases in period of eight years, •1003
Largest company section of A. E. R. A. organized, 715
Legislature orders commission not to change fares, 545
"Looking Backward" souvenir, •82
Liberty loan activities, •605
Owl service reduction, n 158
Pamphlet issued asking co-operation of automobile drivers, n 1168
Power production in war times [Slade], 567
Recommendations of special commission defended, 591
Six-cent fare recommended, 679; Refused in favor of zone system, 710
State controlled utilities trust suggested by legislative committee, 637
Wage increase, n 1024
Who put the nick in the nickel, Cartoon, •411
Zone fare system recommended for relief, 480, •570; Wins, 786, 830, 882
Publicity:
——Advertising policy of British Columbia Elec. Ry. explained, 1113
——Advice request brings caustic response, 60
——Always best policy [Carraway], 280
——Brooklyn Rapid Transit publication, n 482
——Columbus, O., Increase fare movement, •1013
——Commissions should be backed up by persistent publicity, Comment, 647
——Doherty properties consider publicity essential, 172
——Durham, N. C., Increased fare campaign, •635
——Fare increase cases should be thoroughly prepared before application [Geisse], 698
——First condition of peace, Comment, 69
——Fundamentals of successful transportation [Eddy], 91
——Illinois Traction Sys., •389
——Interboro Rapid Transit Co., •217
——Kansas City Ryrs. issues pamphlet on the problem of the street railway, •1228
——Modernizing an old fable [Dreier], 704
——More publicity needed [Hegeman], 1239
——Necessity for local publicity emphasized by New York decision, Comment, 890
——Need for increased fares must be explained, 1053
——Portland, Me., Methods to secure increased fares, •456
——Proving itself in electric railway situation [Lee], 188
——Selling service for a fair price [Putnam], 851
——Shortcomings of railways should be discussed, Comment, 165
Public, Relations with:
——Appeal to shop early, 61
——Applying engineering and selling principles to electric railway transportation [Layng], •8
——Better public relations, 149
——"Clean-up week" co-operation, Comment, 890
——Complaints of poor service have potential value, Comment, 690
——Ft. Wayne, Ind., Bulletin on necessity of higher fares, 226
Public relations with: (Continued)
——Huntington, W. Va., Company praised by newspapers, 382
——Monongahela Valley Tr. Co. adopts "service" slogan, 156
——Oklahoma commission co-operation [Mitchell], 1051
——Public control plan not municipal ownership, Comment, 1083
——Publicity futile without the proper organization to back it up, [Dreier], 318
——Salt Lake company establishes publication, •391
——San Diego Elec. Ry. issues monthly pamphlet, n 62, 108
——Straightforward explanation not application for sympathy necessary [Morrow], 1051
——Time to disarm criticism, Comment, 553
Public service and regulative commissions:
——Back up the commissions by persistent publicity, Comment, 647
——Bill introduced to amend vestibule law, n 583
——California:
Wartime problems discussed, 761
——Commissioner Santvoord's letter to Gov. Whitman, 287
——Commissioners confer on finances at Washington, 475
——Commission made rates are paramount [Conway], 130
——Commissions working themselves out of a job, 1092
——Connecticut:
Increase of service ordered at Waterbury, 296
——Fares, Need of increases should be faced squarely, Comment, 416
——Fuel saving endorsed, 97
——Indiana:
Blanket fare increase to interurbans, 1114
Change in procedure, n 148
Freight rate hearing, 155
Freight rates increased, 206, 271
War attitude explained, 720
——Maine:
New zone system authorized, •654
——Massachusetts:
Approves zone system for Holyoke, •77; For Springfield, 663
Boston Elevated Railway recommendations, 272
Decides through service case, 107
Personnel changes, 1247
Procedure explained, 149
Reasons for railway crisis explained, 461
Service-at-cost plan approved, 226
Views on railway problems, 101
——Massachusetts Legislature places Boston Elevated Ry. under public control, 1057; Comment, 1040; Provides for public control of Bay State St. Ry. and other properties, 1093
——Missouri:
Franchise rates can be changed, 1014
Reports, 847
Rules that it has jurisdiction over fares, 728
Study of Kansas City conditions, 250
——Municipal counsel often deserve severe reprimand, Comment, 1001
——New Jeresy:
Bill to increase membership, n 384; Increased, n 583
——New York:
Appointments confirmed, n 430
Bill passed to consolidate commission, 721
Commissioners confer on finances at Washington, 475
Have they outlived their usefulness, Comment, 305
Opposes use of turnstiles, n 883
Rendered without power by court ruling, 811; Comment, 797
——New York, First district:
Annual report, 334
Gives companies little chance, Comment, 119
Hearings, 150
More men like Mr Straus needed on commissions, Comment, 1125
No power over depreciation rate, 1068
Refuses increase to New York & North Shore Ry., 125; Comment, 118
Report, 526
Transfer charge for New York City refused, 1167
——New York, Second District:
Account conference with railway men, 1068
Eleventh annual report, 1068
——Oklahoma:
Praised by railway investor, 337
——Oregon:
Fare increase granted at Portland, 184
Fare increase ruling upheld by court, 617
Portland fare case closed, 543
Refuses to reopen fare increase case, 339
Ruling upheld by court, 587
——Pennsylvania:
Advised by attorney-general that it has power to regulate rates, n 1108
Docket crowded, n 1203
——Portland, Ore., wishes to change commission law, n 630
——Rate-making opinion of commissions differ, Comment, 555
——Regulation of utilities, Will municipalities eventually control, 817
——Rules that soldiers must pay full fare, n 789
——Should receive greater recognition by industries, Comment, 262

(Abbreviations. •Illustrated. n Short news item.)
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

Public service and regulative commissions: (Continued)
——**Utah:**
Salt Lake fare decision, 340
——**Washington:**
Will not permit employment of women in Seattle, 202
Public service corporations:
——**Financial situation improving, 709**
——**Immediate relief a prime national necessity [McCarter], 713**
Public Service Corporation (see Newark, N. J.)
Public Service Railway (see Newark, N. J.)
Public Utilities Co. (see Evansville, Ind.)
Pueblo, Colo.:
——**Arkansas Valley Ry., Lt. & Pr. Co.:**
Gain in lighting and power business, n 715
Puget Sound International Ry. & Pr. Co. (see Everett, Wash.)
Puget Sound Tr. Lt. & Pr. Co. (see Seattle, Wash.)
Purchased power:
——**(See also Sale of power)**
——**Dallas Ry. makes new arrangements, n 151**
——**Philadelphia Rapid Transit Co. protests increase in power rate, 101**
Putnam & Westchester Traction Co. (see Peekskill, N. Y.)

Q

Quebec, Can.:
——**Quebec Ry., Lt. & Pr. Co.:**
Fare increase sought, n 638

R

Rail joints and bonds:
——**A 140-lb. welding outfit (Electric Ry. Improvement Co.), •580**
——**Arc welding, Economies of [Cram], •517**
——**Bonding equipment increased in usefulness, •579**
——**Convex versus concave bonding compressor screw terminals [McWelway], 527**
——**Grinding equipment [Cram], •518**
——**Metal electrode welding [Treat], 665**
——**Plates for welded joints (Atlantic Welding Co.), •532**
——**Vulcanized fibre, Electrical properties of [Eves], •238**
——**Wear of rails, Early Experimental study, Brooklyn [Cram], •168; Comment, 167**
——**Welded rail joints, Newark, N. J. [Schreiber], •190**
Rails:
——**Annual convention American Railway Engineering Association, 565**
——**British and American rail sections [Bland], •666**
——**Cure for surface bends [Sullivan], •528**
——**Wearing of rails, Early experimental study, Brooklyn, N. Y., [Cram], •168; Comment, 167**
Raleigh, N. C.:
——**Carolina Pr. & Lt. Co.:**
Financial statement, n 1027
Reading, Pa.:
——**Reading Transit & Lt. Co.:**
Fare increase, 154; Hearing, 435
Strike, 1065
Wage increase, n 1024, 1107
Record Forms:
——**Train order register for interurban roads, (Standard Register Co.), •378**
Recruiting notices:
——**Electric railway accountants needed, 1247**
——**Engineers and mechanics needed for aviation service, 247**
——**Engineers wanted by U. S., n 56**
——**How to join army engineers, 581**
——**Naval opportunity for technical men, 983**
——**Ordnance department needs men 247**
——**Ordnance department opportunities, 778**
——**Signal corps needs electrical men, 630**
——**Trained men wanted at Washington, n 874**
Regeneration (see Brakes.)
Regina, Can.:
——**Regina Municipal Ry.:**
Operation loss, n 827
Relays (see Switchhboard equipment.)
Repair shop equipment:
——**Cutting gun operated by air saves time (Rivet Cutting Gun Co.), •979**
——**Drill for light work (Ingersoll-Rand Co.), •98**
——**Drills and grinders, Portable electric, (Gilfillan Bros., Smelting & Refining Co.), •380**
——**High-potential test set, •864**
——**Labor conditions control selection, Comment, 553**
——**Magnetic separator for screws and filings at Syracuse, •377; For Shop use, •772**
——**Motor dipping and baking equipment [Dobson], •1149**
——**Paint gun, Economy of [Pettinger], •464**
——**Portable electric grinder (Wisconsin Electric Co.), •532**
——**Portable pipe vise (Gerolo Mfg. Co.), •330**
——**Series motors for emergency constant speed work [Foote], •1197**
——**Storage rack for wooden car-repair parts, Syracuse, 49**
——**Wheel grinder made from scrap material [Copley], •976**
Repair shop practice:
——**Empire State shop notes, •93**
——**Grinding wheels Quick method at Dayton, O. [Merrick], •240**
——**Shop kinks not always real economy, Comment, 490**
Repair shops:
——**(See also Car houses and storage yards)**
——**Asphalt mastic makes good floor, 923**
——**Facilities for maintenance of special work [Cram], •1137**
Repair shops: (Continued)
——**Guard rails for safety, •668**
——**Re-arrangement at Rochester, •530**
——**Shop reconstruction at Columbus O., •972**
——**Statistics published by Census Bureau, 768**
Rhode Island:
——**Municipal ownership of all railways agitated, n 102**
Rhode Island Co. (see Providence, R. I.)
Richmond Light & Railroad Co. (see New Brighton, N. Y.)
Richmond, Va.:
——**Richmond & Chesapeake Bay Ry.:**
Operation suspended, n 105
Option secured on abandoned road, 634
——**Richmond & Rappahannock River Ry.:**
Seven Pines line sold, n 106
——**Virginia Ry. & Pr. Co.:**
Bonus to employees, n 538
Franchise negotiations at Norfolk fail, 1106
Handling an extra hundred thousand workers, •1187; Comment, 1177
Liberty loan activities, •604
New franchise suggested for Norfolk, 581
Rochester, N. Y.:
——**Buffalo, Lockport & Rochester Ry.:**
Fare increase sought, n 391
Interchangeable fares canceled, n 109
Service order of commission, 637
Wage increase, n 1203
——**City will appeal fare case decision, n 343**
——**New York State Rys.:**
Car remodeling work, •773
Danger signs, •240
Dispatching trucks and work trains [Cadle], •45
Financial assistance sought from War Finance Corporation, n 987
Fuel saving accomplished [Hamilton], 270; Comment, 261
Interchangeable fares canceled, n 109
Liberty loan activities, •602
Shop rearrangement, •530
Strike, 981
Ticket commutation book, •90
Transfer issuing simplified by color scheme, •325
Wage increase sought, n 874, n 983; Increase, n 1248
——**Rochester, Syracuse & Eastern R. R. (See Syracuse, N. Y.)**
Rockford, Ill.:
——**Rockford City Tr. Co.:**
Fare increase suspended, n 789
——**Rockford & Interurban Ry.:**
Fare increase granted, n 158
Rock Hill, S. C.:
——**Carolina Traction Co.:**
Operation suspended, n 153
Rock Island, Ill.:
——**Rock Island Southern Ry.:**
Freight handling possibilities [Cole], •893
Rockland, Me.:
——**Rockland, South Thomaston & St. George Ry.:**
Property ordered sold at public auction, n 1110, n 1250
——**Rockland Thomaston & Camden Street Ry.:**
Wage increase, n 1247
Rome, Ga.:
——**Rome Ry. & Lt. Co.:**
One-man cars of economical design [Wade], •769
Rome, N. Y.:
——**Rome Ry.:**
Accident from wind, n 474
Roslyn, N. Y.:
——**New York & North Shore Tr. Co.:**
Fare increase refused by First District, 125; Comment 118
Rutland, Vt.:
——**Rutland Ry., Lt. & Pr. Co.:**
Partial abandonment of prorperty, n 986
Survey of traffic for abandonment, n 1110

S

Sacramento, Cal.:
——**Pacific Gas & Electric Co.:**
Wage increase, n 1065
Sacramento Valley Electric Ry. (see Dixon, Cal.)
Safety first movement:
——**Accident prevention work [Boynton], 1189**
——**Guard Rails, Pamphlet of National Safety Council, •668**
——**How a municipality teaches safety [Coffin], 1192**
——**London Safety-First Council report, 1059**
——**Medal competitions, Comment 261**
——**Patriotic posters used at Akron, O., 1090**
——**Prevention of automobile accidents [Moore], 1194; [Mills], 1195**
——**San Francisco, United Railroads pamphlet on automobile accidents, n 681**
——**Toledo, O. decreases accidents, 590**
——**Unpatriotism of recklessness featured at Akron, O. [Fenton], •234**
Saginaw, Mich.:
——**Saginaw-Bay City Ry.:**
Fare increase sought, n 592
Publicity campaign to increase fares, n 789
——**St. Joseph Ry., Lt., Ht. & Pr. Co.:**
Fare increase sought, n 1074
Wage increase, 721
St. Joseph Valley Ry. (see Elkhart, Ind.)
St. Louis, Mo.:
——**Garfield order, Effect on railways, 183**
——**Interurban extensions and terminal urged, 55**
——**Manufacturers' Ry.:**
Electrification plans adopted, n 428
——**St. Louis, Lakewood & Grant Park Ry.:**
Property sold for junk, 826
Receiver appointed, n 105
St. Louis, Mo.: (Continued)
——**United Rys.:**
Conditions said to be local symptom of general disease, 1144
Fare increase sought, 390, 544; Commission ruling, 477; Hearing, 785; Brief filed, 879; Increase, 988, 1014; Insufficient, 1073; Appeal of city disallowed, n 1115; Result of initiation, 1166; Appeal by city, 1253
Financial reconstruction, 930
Franchise, Controversy, 196; Approval, 244; Conference, 381; Controversy, •468, 535, n 582, 590
Fuel saving economies, 44
Line truck for removing snow, •579
Metal tickets for 6-cent fare, n 1032
Ordinance, Expert will not be employed, n 62; Controversy, 675, 822; Signed by mayor, n 824; Settlement and compromise, Comment, 840
Publicity given to railway situation, n 538
Receiver, Asked by stockholder, 103; Dismissal sought, n 294; Application denied, n 338, 386
Referendum on franchise settlement asked, n 1024
Strike, 291; Settled, 333
Tax value fixed, n 987
Third Liberty Loan boosting, •819
Thrift stamp selling arrangement, Comment, 214
Transformer repaired in record time, 1141
Valuation report, 783
Wage, Demands presented, 429; Increase sought, n 474; Conference, n 1024; Increase, 1106
War Finance Corporation gives aid, 1069; Assistance explained, 1109
Women conductors employed, n 202
St. Paul, Minn.:
——**Motormen license bill rejected, n 722**
——**St. Paul Southern Electric Ry.:**
Receiver appointed, n 540
St. Petersburg, Fla.:
——**St. Petersburg & Gulf Ry.:**
Receiver appointed, n 986
Salt Lake, Utah:
——**Bamberger Electric R.R.:**
Fire damages substation and carhouse, n 1024
Publication established, •391
Snow plow equipment, •240
——**Salt Lake & Utah R. R.:**
Freight handling possibilities [Cole], •893
Ticket commutation book, •90
——**Utah Lt. & Tr. Co.:**
Arbitration decision, 873
Fare increase, n 158; Decision reviewed, 340; Rehearing denied, n 391; Upheld by court, 1030
Operation of one-man cars and charge for transfers sought, n 1117
Wage discussion, n 824; Increase, 1023
Weekly publication begun, •589
San Angelo, Texas:
——**San Angelo Pr. & Street Ry. Co. sold to local light and power company, n 294**
San Diego, Cal.:
——**San Diego Elec. Ry.:**
Accident fund dividend distributed, n 482
Concrete pavement between tracks, 378
Fare increase sought, n 1168
Monthly pamphlet issued for patrons, n 62, 108
Prevention of automobile accidents [Moore], 1194
Skip stop inaugurated, n 1169
Wage increase, 1065
——**San Diego & Southeastern Ry.:**
Sale of property to San Diego & Arizona Ry. authorized, n 634
Sanford, Me.:
——**Atlantic Shore Ry.:**
Fare increase sought, n 1255
San Francisco, Cal.:
——**Joint operation suggested, 150**
——**Loop improvements increase service, 1202**
——**Municipal bus service extended, 984; Operation of private lines considered, 383; Ownership plans of East San Francisco Bay Cities, 197; Railway traffic needs, 473**
——**Municipal Ry.:**
Auto bus traffic feeders, [Eckart], •327
Sprinkler car for washing ballast in Twin Peaks Tunnel, •774
Statement of earnings, n 387
Twin Peaks Tunnel opened, n 151; Operation begun, n 383
——**Southern Pacific Co.:**
Fare increase sought, Hearing, 341
Government takes over electric division, 1021
——**United Railroads:**
Auto tower truck, [Foster], •281
Auto tower versus horse-drawn tower [Foster], 143
Basalt blocks make good headers, 98
City sued for construction of competing lines, 1160
Financial report, n 1070
Municipal ownership negotiations, 536, n 630
Pneumatic tie tamping cost, 974
Safety pamphlet on automobile accidents, n 681
San Francisco municipal line sues for damages, n 781
Tower car, Special features [Foster], •1129
Tower wagon with three platforms for pole painters [Foster], •815

San Francisco, Cal.:
——United Railroads: (Continued)
Use of depreciation funds authorized by commission. 476
Wages. Minimum guaranteed platform men n 383; Increase. n 929
San Francisco-Oakland Terminal Rys. (see Oakland, Cal.)
Sapulpa, Okla.:
——Sapulpa Electric Interurban Ry.:
Abandonment protested by city. n 827
Scandinavia:
——**Electrification progress. 652**
Schedules and timetables:
——Applying engineering and selling principles to electric railway transportation [Layng]. •8
——Automatic acceleration. Effect on schedules [Squirer]. •504
——Car delays at Toledo. Causes of. 147
——Detroit speed diagram. •107
——Headway recorder. Progress of (Nachod Signal Co.). •717
——Higher schedule speed aided by front-entrance, center-exit car. •120
——Interurban cars slow up city service. 405
——Reduced schedule speed at Detroit. Comment. 11
——Schedule speed must be increased to compete with automobile. Comment. 118
——Service restoration after interruptions. Comment. 446
——Turn-back service. Comment. 353
Schenectady, N. Y.:
——Schenectady Ry.:
Automatic signal installation. •1020
Fare petition withdrawn. n 1073; Increase sought. n 1211
Strike. 1107; Settled. n 1201
Scottsburg, Ind.:
——Indianapolis & Louisville Tr. Co.:
Skip-stop in local interurban service. n 591
Scranton, Pa.:
——Lackawanna & Wyoming Valley R. R.:
Wage increase sought. n 1066
Fare increase sought. n 1253, 1255
——Scranton Ry.:
Arbitration under way. 1107
Citizen pleads for fare increase. n 546
Fare increase sought. 342; Granted. n 437; Controversy. n 883
Strike. n 1066
——Scranton & Binghamton R. R.:
Receivers appointed. n 1110
Wage increase sought. n 1066
Seattle, Wash.:
——Donation bus bill vetoed. n 546
——Municipal. Car line operated at a loss. n 725; Ownership bond bill recommended. 198; Railway extension planned. 719. Fund provided. n 630
——One-man car operation authorized by city. n 482
——Puget Sound Tr. Lt. & Pr. Co.:
Arbitrators' statement. 196
Bridge suit won by city. 1923
City anticipates fare increase movement. 434
Claim department learns motorman's viewpoint. 822
Commission ruling on car diversion not upheld by court. n 592
Contempt case dismissed. 871
Eight hour day established. 983
Fare increase sought. 251, 478
Franchise relief proposal submitted by city. 1160
Jay walker cartoon •157
Jitneys restrained by court. n 1169
Labor shortage. 155
New round trip rates filed with commission. n 1169
One-man cars in operation. 437; Better service with less equipment. •576
Ordered to complete paving. n 1032
Relief sought from franchise burden. 1105
Service curtailment protested. 61.
Tax offer made to city. 292; Rejected n 387; Question before court. n 678; Hearing. n 824. n 874
Ticket and gross earnings litigation before the court. 590
Traffic problems explained. 879
Value of courtesy [Hamilton]. 1191
Wage offer rejected. 872
Waterway suit dismissed. n 630
Women conductors. Employment not allowed by commission. 202
——Seattle Municipal Ry.:
Extension bills approved. n 291
Extension to Ballard completed. 245; Open. n 335
Fares to be reduced. n 436
Freight rate increase requested. n 1168
Operation at a loss. n 337
Safety siding saves nine lives. •1242
Statement of earnings. n 387
——Seattle & Rainier Valley Ry.:
Investigation toward relief. n 1032
One-man car operation desired. n 298
Relief from franchise burdens sought. n 1108
Skip stops sought. n 938
——Seattle Renton & Southern Ry.:
Receiver asked n 201
——Traffic situation serious. 203
——Transportation service to shipyards improved. 638
Selma, Ala.:
——Selma Street & Suburban Ry.:
Foreclosure sale founds new company as Selma Traction Co. 677
Sold under foreclosure. n 386
Seneca Falls, N. Y.:
Fare increase hearing. 990
Service and tower wagons:
——Auto tower truck. San Francisco [Foster]. •281
Service and tower wagons: (Continued)
——Auto tower versus horse-drawn tower. United Railroads [Foster]. 143
——Pole painters' tower wagon with three platforms [Foster]. •815
——Power lifts on tower cars [Harte]. •494
——Tower car. Special features. San Francisco [Foster]. •1129
Shamokin & Mt. Carmel Transit Co. (see Mt. Carmel, Pa.)
Shawnee, Okla.:
——Shawnee-Terminal Tr. Co.:
Fare increase. n 158
Sheboyan, Wis.:
——Eastern Wisconsin Electric Co.:
Emergency rates granted. 343
Fare increase granted. n 1117; Sought. n 1256
Reduced rate tickets eliminated. n 729
Shore Line Electric Ry. (see Norwich, Conn.)
Signals:
——Automatic installation on Schenectady Ry., •1020
——Fuse and torpedo holder for interurban cars. •1148
——High speed operation [Nachod]. 136
——Telephone and telegraph system of New York Connecting R. R., • 1043
——Track impedance bonds for signal circuits (Union Switch & Signal Co.). •579
——Winking highway signal on Union Traction Co. of Indiana line. •1101
Signs:
——Danger signs at Rochester, N. Y., •240
Single-phase railways:
——Pennsylvania R. R. electrification extended to Chestnut Hill. •799; Comment. 795
——Reminiscences of early development [Murray]. 1155
Sioux City, Ia.:
——Sioux City, Crystal Lake & Home Elec. Ry.:
Abandonment permission sought. n 678
Operation of line discontinued. n 1205
——Sioux City Service Co.:
Wage increase. n 538
Sioux Falls, S. D.:
——Sioux Falls Tr. System:
Fare increase sought. n 1032; Granted by city election. 1113
Sistersville, W. Va.:
——Union Traction Co.:
Fare increase. n 992
Skip-stop (see Stopping of cars)
Snow-fighting line trucks at St. Louis. •579
Snowplows (see Work and wrecking cars.)
South Bend, Ind.:
——Chicago, South Bend & Northern Indiana Ry:
Fare increase on interurban line sought. 1071
South Covington & Cincinnati Street Ry. (see Covington, Ky.)
Southern New York Pr. & Ry. Corp. (see Cooperstown, N. Y.)
Southern Pacific Co. (see San Francisco, Cal.)
Southern Pennsylvania Tr. Co. (see Chester, Pa.)
Southern Public Utilities Co. (see Charlotte, N. C.)
Southern Traction Co. (see Bowling Green, Ky.)
Southwestern Electrical & Gas Association:
——Annual convention. 813
Southwestern Tr. & Pr. Co. (see New Iberia, Ibera, La.)
Special Work:
——Cost data on construction, Brooklyn, N. Y. [Bernard]. •195
——Designed to give longer life [Whitlock] •527
——Developments at Brooklyn, N. Y. [Bernard]. •863
——Difficult construction work at Washington, D. C. [Huntling]. •1140
——Manganese crossings articulated for longer life (Barkwill Manganese Crossing Co.). •192
——Outside switch used in England. •1061
——Replacing special work at Denver. [Whitlock]. •375
——Shop facilities for maintenance. [Cram]. •1137
——Standardization of track spirals. Comment 945
——Track spiral standardization [Bernard]. 1017; [Dunham]. 1017; Opportunity now to stimulate [McMath]. 1155; Simplicity is desirable [Weston]. •1156
Spokane, Wash.:
——Merger of local companies progressing. 875
——Spokane & Inland Empire R. R
Fare increase schedule filed. 156
Financial statement. 825
Valuation. Report. n 201; Hearing. 584, 985; Brief filed. n 1027
Wage scale revised. n 721
——Spokane Traction Co.:
Fare increase. 251
P. A. Y. E. operation inaugurated. n 1032
Uniform door and step operation adopted. n 1074
Wage increase. 1247
——Washington Water Pr. Co.:
Brake levers made in wheel press. •379
Employment of women in railway work [Ashton]. 1193
Fare increase schedule filed 156; Granted. 251; Increase sought. n 1256
Line car has air-operated tower. •51
Valuation. Report. n 201; Hearing. 584, 985; Brief filed. n 1027
Wage increase. n 1202
Springfield, Ill.:
——Bus line application denied. n 781
——Springfield Consolidated Ry.:
Tax case won. n 433
Springfield, Mass.:
——Springfield Street Ry.:
Car recommendations of commission. 878
Sand storage for car service. •774
Surface-bent rails. A cure for [Sullivan]. •528
Wage increase. n 1212
Zone system approved by commission. 663, 882
Springfield, Mo.:
——Springfield Traction Co.:
Fare increase sought. n 1256
Wheel grinder made from scrap material [Copley]. •976
Springfield, Ohio:
——Ohio Electric Ry.:
Air cut-off mechanism for existing equipment. •378
Brake action insured on double truck cars. [Foote.] •282
Car heaters. Circulating water in. 239
Condensate. Automatic return from heating pipes to boiler [Foote]. •765
Fare increase sought. n 206, 252; Denied in Indiana. n 789
Freight handling possibilities [Cole]. •893
Series motor used for emergency constant speed work [Foote]. •1197
Strike. n 1203
Turning steel wheels. 145
Wage increase for interurban men. n 383, n 583
Springfield, Vt.:
——Springfield Electric Ry.:
Receiver appointed. n 1110
Standard Gas & Electric Co. (see Chicago, Ill.)
Standardization:
——Lack increases cost of suplies [Harte]. •492
——Track spirals. Greater uniformity will conduce to economy [Ryder]. •649; Comment. 645; Comment. 915; [Bernard]. 1017; [Dunham]. 1017
Stark Electric R. R. (see Alliance, O.)
Statistics:
——(See also Financial)
——Applying engineering and selling principles to electric railway transportation [Layng]. •8
——Companies should give out their financial statements freely. Comment 739
——Electric railway car and mileage statistics. 41
——Encouragement and discouragement in 1917 statistics. Comment. 70
——Financial wrecks of 1917. 39
——Freight handling possibilities of the electric railways of the United States [Cole]. •893
——Japan government railways. 724
——New electric rolling stock for 1917. 34
——Price levels for a century [Hagenah]. •970
——Railway statistics of the United States New publication. 784
——Repair shop profits. 768
——Specialized research should supplement association committees. Comment 890
——Track rebuilt and new track placed in service in 1917. 36
Sterling, Dixon & Eastern Ry. (see Dixon, Ill.)
Steubenville, East Liverpool & Beaver Valley Tr. Co. (see East Liverpool, O.)
Steubenville & Wheeling Traction Co. (see Wheeling, W. Va.)
Stockton, Cal.:
——Tidewater Southern Ry.:
Operated by the Western Pacific R. R., 877
——Stockton Electric R. R.:
Fare increase sought. n 1168
Stokers (see Boilers and equipment.)
Stone & Webster (see Boston, Mass.)
Stopping of cars:
——Cincinnati abolishes double stop n 155
——Cleveland desires near-side stop n 109
——Loading surface cars at 400 passengers per minute in Detroit [Cann]. •88
——Skip stops:
Baltimore, Md., 882, 1207
Boston, Mass., 1029
Careful preparation necessary before introduction. Comment. 889
Charleston, S. C., n 993
Chicago, Ill., n 1032
Cincinnati, O., Plans revised. n 789
Dallas, Tex., n 546, n 992
Dayton, O., n 206
Des Moines, Ia., n 591
Estimated savings in consumption of fuel. 1102
Essentials to success. Comment. 215
Explanation of meaning. 786
Fort Wayne, Ind., n 482
Fuel administration issues skip-stop bulletin. 340
Harrisburg, Pa., n 437
Indianapolis, Ind., n 546, n 789
Kansas City, Mo., Considered favorably. n 1117
Louisville Ky., n 1255
Massachusetts railways adopts for conservation. 988
Nationwide adoption possible. 428
Newark, N. J., n 681
New Jersey. Adoption lies with company. n 638
Oakland, Cal., 728
Offers opportunity to better service with existing equipment. Comment. 1081
Pittsburgh, Pa., 830
San Diego, Cal., n 1169
Scottsburg, Ind., n 591
Should be adopted by every city to save coal. Comment. 1123

Stopping of cars:
——Skip stops: (Continued)
Small cars stave off jitney competition, Comment, 1178
Syracuse, N. Y., n 391
Trenton, N. J., n 437
Washington, D. C., Adds 15 per cent to service by institution, •849, 830; [Beeler], 925
Storage yards for cars (see carhouses and storage yards)
Storage yards for materials:
——Asphalt plant used also for sand drying, Kansas City Rys. [Harvey], •46
Strikes and Arbitrations:
——Alton, Ill., 381
——Atlantic City, N. J., 1063; Settled, 1106
——Bay State Street Ry. agreement, 246
——Bonner Springs, Kan., n 873
——Boston Elevated Railway situation critical, 429
——Chattanooga, Tenn., n 335
——Cleveland, O., Arbitration of wage demand, 871
——Dallas, Tex., Settled, n 722
——Dayton, O., n 1203, n 1246
——Des Moines, Ia., n 630
——Detroit, Mich., Arbitration of wage request, 823; Settlement basis, 928
——Dubuque, Ia., Arbitration of wage request, n 824
——East St. Louis, Ill., 1159, 1245
——Federal strike board appointed, 381
——Hamilton, Can., Wage increase recommended, n 874
——Kansas City, Kan., 927
——Kansas City, Mo., Settled, 674
——Kenosha, Wis., Women employees, n 1066
——Leetonia, O., n 1159
——Minneapolis, Minn. Arbitration report, 382; Strikers demand reinstatement, 430; Labor finding, n 538
——Monroe, La., 245
——Newark, N. J., 1107; Settled, 1158
——New York City, n 1158, n 1160; Settled, n 1203
——Philadelphia, Pa., 1023
——Pittsburg, Kan., n 384, n 583; Ended, 720
——Pittsburgh, Pa., Agreement reached, 928
——Reading, Pa., 1065
——Rochester, N. Y., 981
——St. Louis, Mo., 291; Settled, 333; Union presents wage demands, 429
——Salt Lake, Utah, 873
——Schenectady, N. Y., 1107; Settled, n 1201
——Scranton, Pa., n 1066; Arbitration under way, 1107
——Springfield, O., n 1203
——Toledo, O., 197
——Union leaders should prevent sympathetic strikes, Comment, 689
——Waco, Tex., n 583, n 929
——Wheeling, W. Va., n 984
——Wilmington, Del., n 1107
——Wilmington, N. C., n 56
——Winnipeg, Can., n 1066, 1246
Strong City, Kan.:
——Consolidated Street Ry.:
Electricity replaces horse-car, n 247
Stroudsburg, Pa.:
——Stroudsburg Passenger Ry.:
Motorman makes a traveling record, n 592
Substations and equipment:
——(See also Switchboard equipment)
——Automatic type:
High time for more extensive installation, Comment, 689
Ohio Electric Ry., New type [Wensley], •707
Savings effected by [Davis], •692
Saving in material and labor [Lloyd], •705
The automatic substation [Harte], •495
——Chicago, Milwaukee & St. Paul, New electrification, 1198
——Design and operation for maximum efficiency, Cleveland, O., •700
——Montreal Tramways power rehabilitation, •72; Comment, 71, •499; Comment, 446
——Operators, Suggestions for wartime employment, Comment, 1124
——Remote control of heavy current switches, 534
Switchboard equipment:
——Calibration of switchboard watt-hour meters [Smith], 716
——Combined disconnecting switch and fuse for outdoor use [General Electric Co.], •864
——Low tension dead front switch panel, •1241
Switzerland:
——Electrification of Swiss Federal Railways, n 188
Syracuse, N. Y.:
——Allen & Peck, Inc.:
Reorganization, 1110
——Auburn & Syracuse Elec. R.R.:
Interchangeable fares canceled, n 109
——Empire State R.R. Corp.:
Angle iron posts for car painters' platform, •1197
Fare increase denied, n 1255
Interurban car axles, Experiences with [Metcalfe], •94
Shop notes, •93
——New York State Rys.:
Automatic substations, Savings effected by [Davis], •692
Fare increase sought, Proceedings, 1072
Inspectors, Instruction of, •379
Magnetic separator for screws and filings, •377; For shop use, •772
Skip-stop extended, n 391
Storage racks for wooden car-repair parts, 49
Ticket commutation book, •90
Traffic investigation report, 728
Wage increase sought, n 847; Increase, n 1248

T

Tacoma, Wash.:
——Free bus ordinance passed, n 298
——Jitney service resumed, n 638
——Municipal ownership proposal defeated, n 722
——Pacific Traction Co.:
Investigation of service by city, n 1114
——Tacoma Municipal Ry.:
Operating results, n 1070
——Tacoma Ry. & Pr. Co.:
Co-operation from old and new employees [Winsor], 1189
Court decision denies application of company, 936
Fare increase case to determine status of franchise, 629; Before the court, 727
Franchise relief refused, 587
Investigation of service by city, n 1114
Municipal operation suggested, 471; Controversy, n 583
Tampa, Fla.:
——Tampa Electric Co.:
One-man cars placed in operation, 154
Wage increase, n 1065
Taunton, Mass.:
——Taunton & Pawtucket Street Ry.:
Fare increase voluntarily paid to save road from junk heap, 199
Part of property sold for junk may be saved, 876
Patrons committee trying to prevent abandonment, 336
Tennessee:
——Governor sees hopes of relief for public utilities, 1115
——State-wide appeal of utilities for rate increases, 1071
——Wartime utility conference with Governor, n 984
Terminal Stations and Terminals:
——Akron, O., Interurban building, •465
——Freight handling electric railways of the United States [Cole], •893
——Interurban freight terminals [McMath], 816
——Loading and unloading stations to handle large fair crowds, Columbus, O., •846
——Rhode Island Co. freight terminal, •1003
Terre Haute, Ind.:
——Jitney licensing measure upheld by Council, n 729
Terre Haute, Indianapolis & Eastern Tr. Co. (see Indianapolis, Ind.)
Tests of equipment:
——Testing organization of electric railways [Smith], •511
Texas:
——Proper methods of taxation [Blachly], 1052
——Snowstorm interrupts traffic on electric railways, n 198
Texas Electric Ry. (see Dallas, Tex.)
Third Avenue Railway (see New York City.)
Third-rail contact system:
——Cloth tapes must be used with care, •377
Tickets:
——Box-cutter for interurban lines, Ill. Traction System, •286
——Commutation book for interurban lines, •90
——Dallas, Texas uses metal tickets, n 298
——Metal tokens for St. Louis, n 1032
Tidewater Power Co. (see Wilmington, N. C.)
Tidewater Southern Ry. (see Stockton, Cal.)
Ties:
——Annual convention of American Railway Engineering Association, 565
——Mechanical ties, Advantages, (Dayton Mechanical Tie Co.), •145
——Pneumatic tamping at San Francisco, 974
——Pneumatic tampers solve labor problem, 1020
——Steel tie with advantages of wood (Standard Steel Tie Co.), •532
Titusville, Pa.:
——Titusville Traction Co.:
Fare increase sought, 342
Toledo, Bowling Green & Southern Tr. Co. (see Findlay, O.)
Toledo, O.:
——Franchise proposals, 289
——Ordinance report ready for new mayor, 53; Plan described by New York newspaper, n 56; Plans, 582
——Toledo & Indiana R. R.:
Freight handling possibilities [Cole], •893
——Toledo Rys. & Lt. Co.:
Arbitration proceedings, 197
Car delays, Cause of, 147
City Council to take up wages, 873
City wishes to abolish skip stops, n 729
Fare and wage controversy, 1021
Fare increase movement, 252; Increase, 982
Financial investigation results, 777
Labor investigator sent from Washington, n 56
Liberty Loan activities, •607
Power plant construction progressing, 580
Power station operated under flood, n 430
Safety campaign decreases accidents, 590
Wage increase investigation, n 674; Request moderated, 822; Controversy, n 929; Increase 982; Controversy, 1063
——Toledo & Western R. R.:
Freight handling possibilities [Cole], •893
Topeka, Kan.:
——Topeka Ry.:
Line abondoned, n 57
Wage increase, n 983
Toronto, Can.:
——Municipal ownership voted, n 151
——Toronto Civic Ry.:
Fare increase lost, 878
Toronto, Can.: (Continued)
——Toronto Ry.:
Arbitration on employment of women, n 1203
Basis of car order appeal, 1115
Car shortage inquiry, 333
Financial statement, 431; Outlook better, 724
Fine imposed for non-compliance of service order, n 882
Women trainmen objected to, 983
——Toronto & York Radial Ry.:
Fire destroys carhouse and equipment, n 335
Tower wagons (see Service and tower wagons)
Track construction:
——Chicago Surface Lines great street widening plan, •609
——Electric shovels at Cincinnati, •534
——Elevated railway construction under schedule traffic, New York City,•320
——Hand tools for way department, Selection and care of [Cram], •959
——Spirals:
Greater uniformity will conduce to economy [Ryder], •649; Comment, 645
Limitations to standardization [Harvey], 775
Proposed uniform standard [Angerer], •868; [Keen], 869
Standardization [Wilson], 926
Track maintenance:
——(see also Storage yards for materials)
——Annual convention American Railway Engineering Association, 565
——Built-up sections of track for diverting traffic [Whitlock], •770
——Labor-saving appliances, Respective importance of [Larned], [Harvey], [Dunham], [Steward], [Ripley], [West], 522; [Ford, Bacon & Davis], [Keen], [Hill], [Clark], 522
——Labor-saving methods in the way department [Cram], •517
——Pneumatic tie tamping cost at San Francisco, 974
——Problems of the maintenance of way department [Cram], •357
——Specialties of labor a menace, Comment, 489
——Spring duties of the way department [Cram], •740
——Stresses in railroad track, Report of A. R. E. A., Comment, 646
Traffic Investigations:
——Applying engineering and selling principles to electric railway transportation [Layng], •8
——Boston, Mass., 313; Hearings before Commission, 660
——Buffalo, N. Y., 297, 341; Recommendations accepted, 203
——Dallas, Tex., 981
——Detroit, Mich., •420, 788
——Intercommunity League of the Southwest, War convention, 1114
——Montreal, Can., Moving cars through congested intersections [Gaboury], 233
——Organization effected by shipping board investigates transportation problems, 637
——Outside expert serves important purpose, Comment, 352
——Parked automobiles steal streets, Comment, 1040
——Pay-as-you-pass car, How it was developed [Witt], •30
——Philadelphia department of city transit report, 1196
——Pittsburgh, Recommendations of transit commissioner, 148; Report, •842
——Shipyard transportation survey, 779
——Syracuse, N. Y., Report, 728
——Trenton, N. J., Report by Peter Witt, 138
——Washington, D. C.:
Fifth section of Beeler report, •613
First section of Beeler report, •223
Report, Requested in digestible quantity, Comment, 214; Acceptable, Comment, 305, 342; Considered, 542, 1030
Second section of Beeler report, 312
Staggered hour report completed, n 638; Recommendations, •655; Comment, 646; Approved by government, 787
Suggestions followed, 390
Third section of Beeler report, 405
Traffic Stimulation:
——Preparing for changed conditions in interurban passenger traffic, Comment, 352
Train Operating Practice:
——Brooklyn to operate two-car trains, 381
——Dispatching trucks and work trains [Cadle], •45
Transfers:
——Color scheme to simplify issuing, •325
——More attention should be paid to transfer problems, Comment, 600
——Patriotic use for backs, 762
——Retaining a record of transfers (Macdonald Ticket & Ticket Box Co.), •50
——Inductive interference, Report of California Commission,, 38
Transmission Lines:
——Forces which must be considered in construction [Harte], •364
——Insulation cutter for high-tension lines [Morse], •1101
——Insulators, Re-use of, 495; Applying theory and practice to design, A. I. E. E. meeting •1230
——Safety code standards [Harte], 979
——Stray power determinations [Ewing], •95; Comment, 69
Trenton, Lakewood & Seacoast Ry. (see Lakewood, N. J.)

Trenton, N. J.:
——Differences between city and railway must be settled by commission, n 482
——Garfield order, Effect on railways, 182
——New Jersey & Pennsylvania Tr. Co.:
Fare increase sought, n 437, 589; Hearing, 726, 789; Increase, n 1032
Wage increase, n 783; Sought, n 1248
——Peter Witt report, 138
——Trenton & Mercer County Tr. Corpn.:
Answer to city application filed, 388
Car house being rebuilt, •471
Chamber of Commerce urges fare increase, n 938
Equipment found in poor condition by investigators, 935
Fare increase refused, 481; Sought, 988; Hearings, 1028, n 1116, n 1117, 1207
"Going value" tax overruled, 631
Indictments argued, n 430; Quashed, n 874; Appealed, n 1248
Service hearing, n 592, n 1117; Concluded, 1168
Skip-stops inaugurated, n 437
Tax case appealed, n 102; Hearing, n 291
Traffic recommendations adopted, n 206
Transfer system revised, n 681
Wage increase demanded, n 1108; Sought 1160; Increase, n 1248
Tri-City Ry. (see Davenport, Ia.)
Trolley poles and wheels (see Current collecting devices)
Trolley wire and equipment (see Overhead contact systems)
Troy, N. Y.:
——Troy & New England Ry.:
Financial statement, 1067
Trucks:
——Heavy trucks, Effect on economical operation [Litchfield], •498
——Radial trucks for power saving, •815
——Reduced-height truck for low level cars (Taylor Elec. Truck Co.) •51.
Turbo generators and equipment:
——Large unit at Montreal, Can., •1085
——Windsor plant of West Penn. Rys., •314
Tuscaloosa, Ala.:
——Tuscaloosa Railway & Utilities Co.
Fare increase sought, n 1169
Twin City Rapid Transit Co. (see Minneapolis, Minn.)

U

Union Electric Co. (see Dubuque, Ia.)
Union Street Railway (see New Bedford, Mass.)
Union Railway Co. (see New York City)
Union Traction Co. (see Philadelphia, Pa.)
Union Traction Co. (see Sistersville, W. Va.)
Union Traction Co. of Indiana (see Anderson, Ind.)
United Engineering Society:
——Election of officers, 287
——Meeting and election to Engineering Foundation Board, n 1159
United Gas & Elec. Engng. Corp. (see New York City)
United Railroads (see San Francisco Cal.)
United Railways (see St. Louis, Mo.)
United Rys. & Electric Co. (see Baltimore, Md.)
United States Bureau of Standards:
——Digest of electrolysis bulletin, 621
United States Chamber of Commerce:
——Annual convention, Business men can help win the war, 711; Utility relief endorsed, 763
——Asks Congress to develop water power, 627
——Delegates appointed by A. E. R. A., 526
——Peak-flattening movement backed by bulletin, 659
——Resolution concerning public utilities, 737
United States Shipping Board:
——Emergency Fleet Corporation appointments, 788; Housing and service departments merged, 991
——Transportation service section organized, •853
United Traction Co. (see Albany, N. Y.)
University of California offers course on public utilities, 383
Upper Darby, Pa.:
——Philadelphia & Western Ry.:
Fare complaint withdrawn, n 681
Urbana, Ill.:
——Kankakee & Urbana Tr. Co.:
Wage increase, n 781
Utah Light & Traction Co. (see Salt Lake, Utah)
Utica, N. Y.:
——New York State Rys.:
Wage increase sought, n 874; Increase, n 1248
——Ticket commutation book, •90

V

Valuation (see Appraisal of railway property.)
Vancouver, Can.:
——British Columbia Elec. Ry.:
Advertising policy explained, 1113
Employees magazine published, 778
Financial statement, 584
Jitney regulation left with city, 879
Newspaper praise for operation, n 874
Storm causes tie-up, •232
Vancouver, Wash.:
——North Coast Pr. Co.:
One-man cars satisfactory, n 343
——Electric railways seek relief, 879
Virginia:
——Electric railways seek relief, 879
Virginia Railway & Power Co. (see Richmond, Va.)
Visalia Electric R. R. (see Exeter, Cal.)

W

Wages:
——Better salaries for technical men [Technical Man], 666
——Bonus system:
Dallas, Tex., n 983
Manila, P. I., Reduces coal consumption, [Blaisdell], •308
Richmond, Va., n 538
——Cleveland decision liberal, 927
——Credit System on Chicago Motor Bus line, •89
——Increased revenue to offset higher wages [McCarter], 1227
——Increases:
Albany, N. Y., 1107
Allentown, Pa., n 929
Alliance, O., n 1247
Anderson, Ind., n 929
Ashville, N. C., n 1247
Atlanta, Ga., n 722
Attleboro, Mass., 1202
Beaumont, Tex., n 984
Birmingham, Ala., n 1108
Birmingham, N. Y., n 983
Bloomington, Ill., n 1159
Boston, Mass., Award accepted, n 630, n 1159
Brantford, Can., n 1108
Cairo, Ill., n 984
Camden, N. J., n 1108
Charlotte, N. C., n 1024, 1066
Chickasha, Okla., n 722
Columbus, Ga., n 929
Dallas, Tex., n 383, n 428, n 675, n 983, n 1255
Davenport, Ia., n 1203
Des Moines, Ia., n 430, n 1159
Dubuque, Ia., n 984
Duluth, Minn., 722
East Liverpool, O., n 1066
Everett, Wash., n 873
Fort Wayne, Ind., n 630
Galveston, Tex., n 383, n 474, n 984
Harrisburg, Pa., n 781
Honolulu, H. I., n 824
Houston, Texas., n 474, n 984
Huntington, W. Va., n 630
Little Rock, Ark., n 1247
Louisville, Ky., n 722
Los Angeles, Cal., n 874, 1159
Medford, Mass., 1202
Milwaukee, Wis., 982
Minneapolis, Minn., n 1024
Montreal, Can., n 1247
Morristown, N. J., n 1107
Newark, N. J., n 1160
Oakland, Cal., n 1066
Omaha, Neb., n 824
Pittsburgh, Pa., 60
Philadelphia, Pa., n 874, 1106, n 1203
Port Arthur, Tex., n 984
Providence, R. I., n 1024
Pottsville, Pa., n 151
Reading, Pa., n 1024, 1107
Rochester, N. Y., 981, n 1203, n 1248
Rockford, Ill., n 983
Rockland, Me., n 1247
Sacramento, Cal., n 1065
St. Joseph, Mo., 721
St. Louis, Mo., 1106
Salt Lake, Utah, 1023
San Diego, Cal., 1065
San Francisco, Cal., n 929
Sioux City, Ia., n 538
Spokane, Wash., n 721, 1247
Springfield, Mass., 1202
Springfield, O., n 383, n 583
Syracuse, N. Y., n 1248
Tampa, Fla., n 1065
Toledo, O., 982
Topeka, Kan., n 983
Trenton, N. J., n 873, n 1248
Urbana, Ill., n 781
Utica, N. Y., n 1248
Wheaton, Ill., n 1108
Wheeling, W. Va., n 384
Wilkes-Barre, Pa., n 983
——Increases sought:
Boston, Mass., 1158; Referred to new board of trustees, n 1203
Buffalo, N. Y., n 983
Chicago, Ill., 1022, 1066; Men appeal to Washington, n 1158
Cleveland, O., 779, 821
East St. Louis, Ill., 1245
Gary, Ind., 927
Hamilton, Can., n 583
Highwood, Ill., n 1247
New York City, 721
Norwich, Conn., n 929
Peoria, Ill., n 983
Philadelphia, Pa., 981
St. Louis, Mo., 429, n 474
Salt Lake, Utah, n 824
Scranton, Pa., n 1066
Seattle, Wash., 872
Toledo, O., Investigation, n 674; Results, 777; Request moderated, 822; City Council to discuss, 873, 929; Injunction controversy, 1063
Trenton, N. J., n 1108, n 1160, n 1248
War Labor Board discussion at Chicago important. Comment, 1124
Waterloo, Ia., n 1247
Wilmington, Del., n 929
Winnipeg, Can., n 474
Worcester, Mass., n 824; Offer rejected.
——Rates must be increased to pay higher wages, War Labor Board, 1223; Comment, 1219
——Shopmen's wages not conducive to long service, Comment, 947
——War Labor Board takes Detroit and Cleveland wage situations under advisement, 1064
Waiting Stations:
——Benches for interurban shelters and parks, •241
Waiting stations: (Continued)
——Manhattan Elevated Ry. construction, New York City, •320
Walla Walla, Wash.:
——Walla Walla Valley Ry. Co.:
Fare increase sought, n 681
Walworth, Wis.:
——Chicago, Harvard & Geneva Lake Ry.:
Financial statement, n 932
Ware, Mass.:
——Ware & Brookfield Street Ry.:
Abandonment of operation, 336
Auction sale of property, 678
Property sold for junk, 827
Warehouse Point, Conn.:
——Hartford & Springfield Street Ry.:
Fare increase, 1028
War Finance Corporation (see Financial).
War Labor Board:
——Chicago meeting considers Detroit and Cleveland wages, 1064; Discussion brings out important points, Comment, 1124
——Distinct from Labor Policies Board, 1159
——Meeting at Chicago, n 1024
——Rules of procedure announced, 1022
——Report, 673
——Washington hearing will consider many cases, 1201; Rates and wages considered, 1223; Comment, 1219
Warsaw, Ind.:
——Winona Interurban Ry.:
Fare increase sought, n 681
Freight handling possibilities [Cole], •893
War-time conditions (see Electric railways).
Washington, Baltimore & Annapolis Electric R.R (see Baltimore, Md.)
Washington, D. C.:
——Beeler traffic report recommends staggered hours, •655; Comment, 646
——Capital Traction Co.:
Axle failures, Reasons for [Dalgleish], 380
Beeler traffic report acceptable, Comment, 305; Suggestions put in operation, 390
Fuel economy recommendations, 267; Comment 261
Liberty loan activities, •605
Operating difficulties, 231
Special work, Difficult construction [Hunting], •1140
——Government activities in utility problems, 428
——Government operation of local lines favored, 383
——Local companies appoint committees for close co-operation, 677
——Municipal ownership reported unfavorably, 777
——Rigid parking rules instituted, 1029
——Skip stops instituted, 830; Adds 15 per cent to service, •849; Approval, n 883
——Street car seats in 1868, 534
——Traffic investigation:
Recommendations acceptable to both city and railways, 342
Report, •223; Second edition, 312; •613
Skip-stop data [Beeler], 925
——Staggered hours report completed, n 638; Approved by government, 787
——Transportation report of commission, 1030
——Washington Ry. & Elec. Co.:
Fuel economy recommendation, 267; Comment, 261
Liberty loan activities, •604
Pneumatic door and step control, 765
Student trainmen to be employed, 1113
Traffic investigation report considered, 542
Washington State:
——Electric railway valuation cut, 1250
Washington Water Power Co. (see Spokane, Wash.)
Waterloo, Ia.:
——Waterloo, Cedar Falls & Northern Ry.:
Freight handling possibilities [Cole], •893
Wage increase, n 1247
Waverly, N. Y.:
——Waverly, Sayre & Athens Tr. Co.:
Fare increase granted, 342 n 1074
Waynesboro, Pa.:
——Chambersburg, Greencastle & Waynesboro Street Ry.:
Fare increase sought, n 546
Waycross, Ga.:
——Waycross Street & Suburban Ry.:
Property scrapped, n 105
Welding, Special methods:
——Axles welded by electric arc, Third Avenue Ry. [Parsons], •1136
——Effect of arc on metal in and around electric weld [Kenyon], 97
——Equipment kept in service, 810
——Government starts welding school, n 781
——Rail joints, Newark, N. J. [Schreiber], •190
——Wear on brake hangers taken up by spot welding, 1242
West Chester Street Ry. (see White Plains, N. Y.)
Western, N. Y. & Pa. Tr. Co. (see Olean, N. Y.)
West India Electric Co., Ltd. (see Jamaica)
West Milton, O.:
——Dayton Covington & Piqua Tr. Co.:
Fare increase, n 391
West Penn. Rys. (see Pittsburgh, Pa.)
West Penn. Traction Co. (see Pittsburgh, Pa.)
West Virginia Traction & Electric Co. (see Wheeling, W. Va.)
Wheaton, Ill.:
——Aurora, Elgin & Chicago R. R.:
Fare increase, 342; Sought, Partial relief granted, n 1165
Freight handling possibilities [Cole] •893
Wage increase, n 1108

(Abbreviations. •Illustrated. n Short news item.)

READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

Wheeling, W. Va.:
——Pan Handle Traction Co.:
Arbitration of wage demand, n 984
——Steubenville & Wheeling Tr. Co.:
Arbitration of wage demand, n 984
——West Virginia Tr. & Elec. Co.:
Arbitration of wage demand, n 984
Fare increase granted, 1114
Wheeling Park will continue operation, n 538
——Wheeling Traction Co.:
Arbitration of wage demand, n 984
Fare increase sought, n 1256
Fire destroys carhouse and equipment, n 287
Property of Steubenville, Wellsburg & Wierton Ry. leased, n 586
Wage increase, n 384
Wheels:
——Car hoists for changing wheels, Montreal [MacLeod], •142
——Grinder made from scrap material [Copley], •976
——Grinding, Quick method [Merrick], •240
——Skidding test on cast-steel wheels [Quinn], •1102
——Turning steel wheels, Springfield (O.) Ry., 145
White Plains, N. Y.:
——Westchester Street R.R.:
Fare increase granted, n 1115
Wilkes-Barre & Hazleton Ry. (see Hazleton, Pa.)
Wilkes-Barre, Pa.:
——Wilkes-Barre Ry.:
Wage increase, n 983
Williamstown, Pa.:
——Lykens Valley Ry.:
Fare increase sought, n 546
Wilmington, Del.:
——Wilmington & Philadelphia Tr. Co.:
Fare increase, n 1169
Owl service discontinued, n 206
Strike, n 1107
Wage increase sought, n 929
Wilmington, N. C.:
——Tidewater Power Co.:
Arbitration award, n 56
Fare increase sought, n 1074
Shipyard service helps win the war, 1050
Windows (see Seats and windows).
Windsor, Can.:
——Municipal ownership plan carried, n 247; Sought by Board of Municipalities, n 983
Winnipeg, Can.:
——Jitneys completely abolished, 989
——Winnipeg Electric Ry.:
Bus line extension installed, n 681
Strike, n 1066, 1246
Wage increase sought, n 474
Winona Interurban Ry. (see Warsaw, Ind.)
Wisconsin:
——Rules for employment of women, n 992
Wisconsin Electrical Association:
——Annual convention report, 624, 661; Officers elected, n 781
Wisconsin Gas & Electric Co. (see Kenosha, Wis.)
Wisconsin Ry., Lt. & Pr. Co. (see La Crosse, Wis.)
Women conductors:
——Adverse report in New York, n 939
——Baltimore, Md., n 1169
——Brooklyn Rapid Transit women meet the test, n 391; Employment a success [Williams], 416; Must stand when riding as passengers, n 482
——Croydon, Eng., 221
——Effect of employment on claim department [Ashton], 1193
——Electric railways offer attractive occupation for women, Comment, 119
——Employment as viewed from all angles, 466
——Employment is satisfactory, Comment, 1000
——Hudson & Manhattan R.R., n 158
——Kansas City, Mo., n 206, •1147
——Kenosha, Wis., Operating conditions and strike, •1147
——Labor bureau and federal investigation report on Brooklyn Rapid Transit and New York Railways, •1006
——Long Island City, N. Y., Novel uniform, n 298
——Manhattan & Queens Tr. Co., n 158
——Newark, N. J., 1147
——New York City, n 391
——Protecting legislation, 291
——Protested by unions at Brooklyn, N. Y., 253
——St. Louis, Mo., n 202
——Toronto Ry. employees object to their employment, 983; Arbitration, n 1203
Women conductors: (Continued)
——Wisconsin makes rules for employment, n 992
Woodstock & Sycamore Tr. Co. (see Genoa, Ill.)
Worcester, Mass.:
——Worcester Consolidated Street Ry.:
Fare increase sought, n 1115
New freight station, n 158
Wage increase sought, n 824; Offer rejected, n 1065; Increase, n 1202
Worcester & Warren Street Ry. (see Brookfield, Mass.)
Work and wrecking cars:
——Crane car built in Denver shops [McAloney], •772
——Line car with air-operated tower, Spokane, •51
——Motor car with turntable attachment, •766
——Snow plow equipment:
Chicago, Made from sprinklers and work cars, •285, •332
Salt Lake, Utah, •240
——Sprinkler car for washing ballast in tunnel, •774
——Tower car, Special features, San Francisco [Foster], •1129
——Twenty-ton sand car built in railway shop, New Bedford [Taber], •189

Y

Yards (see Carhouses and storage yards; Storage yards for materials)
Yazoo City, Miss.:
——Municipal line to continue operation, n 151
York, Pa.:
——York Rys.:
Fare increase sought, 1254
Financial statement, 585
Youngstown, O.:
——Mahoning & Shenango Ry. & Lt. Co.:
Car situation explained by employees, 428
Fare increase denied, 252; Sought, n 1032
Liberty loan activities, •607
Service ordered increased by city, n 254
Ticket books for employees, n 761
Youngstown & Ohio RiverR.R. (See Leetonia, O.)

Z

Zone system (see Fares)

AUTHOR INDEX

A

Angerer, V. Proposed uniform standard track spirals, •868
Armstrong, A. H. 3000-volt gearless locomotive for the St. Paul, •561
Arthur, William. Connecticut Company power-saving campaign, •412
——Tremendous demand for motormen's power-saving books, 667
Ashton, Thomas G. Employment of women in railway work, 1193

B

Beeler, John A. Further data on Washington skip stop, 925
Bernard, M. Cost data on special work construction, •195
——How various types of special work layouts have been developed in Brooklyn, •863
——Limitations in track spiral standardization, 1017
Blachly, F. F. How should utilities be taxed, 1052
Blaisdell, B. H. Bonus plan reduces coal consumption at Manila, •308
Bolus, G. H. Trolley ear length is a factor in wire-wear, •975
Boynton, B. F. Accident prevention work, 1189
Brackett, Q. A. Selecting lightning arrester types to suit requirements, •1145
Brown, James W. Decreasing governor maintenance, •93
——Removing worn controller parts, •144
Brush, M. C. Liberty loan activities at Boston, Mass., •606
Budd, Britton I. Liberty loan activities at Chicago, Ill., •606
Busby, L. A. Liberty loan activities at Chicago, Ill., •602

C

Cadle, C. L. Dispatching trucks and work trains, •45
Campbell, John M. How one company cured "jitneyitis," 233
Cann, W. E. Loading surface cars at 400 passengers per minute in Detroit, •88
Carraway, Leake. Publicity always the best policy, 280
Clark, Charles H. Respective values of labor-saving appliances in track work, 522
Coates, Frank R. Liberty loan activities at Toledo, O., •607
Coffin, H. P. How a municipality teaches safety, 1192
Cole, A. B. Electric railways are in a position to haul more freight, •793
Conway, Thomas, Jr. Commission made rates are paramount, 130
——The status of the higher fare, 1235
Cooper, H. S. Are reconstructed safety cars worth while, 1200
Copley, C. H. Efficient wheel grinder made from scrap material, •976
Cram, R. C. Early experimental study or rail wear, •168
——Keeping the track special work in repair, •1137
Cram, R. C.: (Continued)
——Labor-saving methods in the way department, •517
——Selecting and caring for hand tools used by way department, •959
——What the maintenance of way department does, •357
——What the way department finds it must do in the spring, •740
Curtis, V. S. Progress toward simpler classification for electric railway freight, 323

D

Dalgleish, R. H. Axles failures are not all due to defects in manufacture 380
Davies, H. J. Liberty loan activities at Cleveland, O., •606
Davis, H. E. Savings effected by automatic substations, •692
Dawson, Philip. R. W. Blackwell and the electric railway industry, 867
Dee, John. Reasons for axle failure, 280
Dickson, E. J. Liberty loan activities at Buffalo, N. Y., •605
Dobson, J. V. Dipping and baking railway motors will decrease troubles •1149
Doherty, Henry L. Present railway situation will prove blessing, 222
Dreier, Thomas. An old fable modernized, 704
——The asininity of trying to get blood out of a turnip, 318
Dunham, W. R., Jr. Limitations in track spiral standardization, 1017
——Respective values of labor-saving appliances in track work, 522

E

Eckart, N. A. Municipal auto bus traffic feeders at San Francisco, •327
Eddy, H. C. Fundamentals of successful transportation, 91
Eves, William 3rd. Electrical properties of vulcanized fibre, •238
Ewing, D. D. Better co-operation between railways and technical schools is desirable, 423
——Determing stray power of a transmission line, •95

F

Fenton, E. Bert. Safety campaign with new note, •234
Folwell, C. W. Scale impedes hot water circulation, 925
Foote, F. J. Automatic return for condensate from heating pipes to boiler, •765
——Insuring action of brakes on double truck cars, •282
——Using a series motor for emergency constant speed work •1197
Ford, A. H. Liberty loan activities at Portland, Me., •607
Ford, Bacon & Davis. Respective values of labor-saving appliances in track work, 522
Forse, W. H. Liberty loan activities at Anderson, Ind., •603
Foster, S. L. Auto tower truck with engine raised tower, •281
——Auto tower versus horse-drawn tower, 143
Foster, S. L.: (Continued)
——Pole painters' tower wagon with three platforms, •815
——Special features of San Francisco tower car, •1129
Fowler, E. W. Liberty loan activities at Peoria, Ill., •506

G

Gaboury, A. Moving cars through congested intersection, 233
Gadsden, P. H. Electric freight handling necessary to the war, 889
——Federal government can raise utility rates 1091
——Helping to win the war, 714
Geisse, Harold L. Prepare your commission cases thoroughly, 698
Gonzenbach, Ernest. Light cars favored, 44
Goodyear, T. D. Meeting war burden in Croydon, 220
Gould, L. E. Economy of checking devices for motormen, 1103

H

Hagenah, William J. No sudden decline in price level, •970
Hague, F. T. New flash suppressor applied on the St. Paul, 858
Hamilton, F. M. The value of courtesy, 1191
Hamilton, James F. Liberty loan activities at Rochester, N. Y., •602
——Rochester lines save coal, 270
Hammond, W. S. Heating does not account for all the winter increase, 577
Hanna, J. H. Liberty loan activities at Washington, D. C., •605
Harte, Charles R. Certain overhead department economies, •492
——Concrete poles are in the process of evolution, •1126
——Getting the right wood poles for electric railway service, •743
——The forces which act upon a transmission line, •364
——Virtues and limitations of steel supports in overhead construction, •948
Harvey, A. E. Asphalt plant used also for sand drying, •46
——Limitations in track spiral standardization, 775
——Respective values of labor-saving appliances in track work, 522
Hegeman, B. A. More publicity needed, 1239
Hellmund, R. E. Ventilated motors during a strenuous winter, •507
Hemming, R. N. Should larger axles be used on electric railway cars, 423
Hill, E. R. New 180-ton locomotives for the New Haven R. R., •556
Hill, F. H. Respective values of labor-saving appliances in track work, 522
Holst, E. W. Transportation engineers needed, 577
Huntling, H. P. An unusually difficult special work job, •1140

J

Johnson, Arthur R. Reducing car lighting costs from 36 cents to 8 cents per 1000 car-miles, •612

(Abbreviations. •Illustrated. n Short news item.)
READ THE INSTRUCTIONS AT THE BEGINNING OF THE INDEX

K

Karow, Edward. Liberty loan activities at Minneapolis, Minn., •603
Katte, E. B. New York Central well satisfied with its bi-polar motor locomotives, 564
Kaylor, W. G. Light-weight safety cars best for all concerned, 173
Kealy, Philip J. Liberty loan activities at Kansas City, Mo., •606
Keen, C. G. Proposed uniform track spirals, 869
——Respective values of labor-saving appliances in track work, 522
Kenyon, O. A. Effect of arc on metal in and around electic weld, 97

L

Lambert, M. B. Better car maintenance an urgent necessity, •524
Larned, J. M. Respective values of labor-saving appliances in track work, 522
Layng, J. F. Applying engineering and sellling principles to electric railway transportation, •8
Lee, Ivy. Publicity fermenting in the electric railway situation, 188
Lintern, William. Electric railways vs. motor trucks, 926
Litchfield, Norman Car axles, their design, manufacture and service, •235, •283 328
——Car bodies must be designed for economy as well as strength, •754
——Classifying passenger cars for given conditions, •370
——How the underframe contributes to the durability of the car body, 1142
——Savings attainable with present-day car design, •496
——Steel car body is well adapted to resist unusual stresses, •965
Lloyd, Charles F. Why the automatic substation saves materials and labor, •705

M

MacLeod, Keith. Six-motor multiple-unit trains for Montreal, •403
——Using car hoists for charging car wheels, •142
M., E. B. To zone or not to zone, 775
McAloney W. H. Crane car built in Denver shops, •772
——Reclaiming warped resistance girds, •47
McCarter, Thomas N. Immediate relief is a prime national necessity, 713
——Increased revenue to offset higher wages, 1227
McKelway, G. H. Convex versus concave bonding compressor screw terminals, 527
——Testing a line to see if it is alive, 742
McMath, Thomas B. The interburban freight terminal, 816
——There is a great opportunity now to stimulate standardization 1155
McMeen, Samuel G. Liberty loan activities at Columbus, O., •606
Merrick, J. F. Quick method of grinding wheels, •240
Metcalfe, A. B. Experiences with interburban car axles, •93
Mills, J. F. Prevention of automobile accidents, 1195
Mitchell, A. L. Relation between public and utility, 1051
Moore, W. H. Prevention of automobile accidents, 1194
Morrow, W. W. Instilling the public-relations ideas, 1051
Morse, O. P. Cutting loose insulation from overhead lines, •1101
Mullaney, T. F. Eliminating unnecessary lighting and heating in the carhouse, 668
Murray, W. S. E. H. McHenry's contribution to single-phase development, 1155

N

Nachod, Carl P. Signals operated at high speed, 136

O

O'Toole, J. L. Liberty loan activities at Newark, N. J., •605

P

Parsons, R. H. Reclaiming car axles by welding, •1136
Perkins, R. W. The zone system in practise, •86
Pettinger, C. M. Paint gun conduces to economy in the shop, •484
Potter, A. E. Liberty loan activities at Providence, R. I., •605
Potter, R. R. Gutters on cars reduce labor of cleaning and protect passengers, •978
Putnam, Frank. Selling service for a fair price, 851
——What the rail rate raise means, 1103

Q

Quinn, Howard W. Skidding test on cast-steel wheels, 1102

R

Rice, E. W. Jr. Railroad electrification and conservation of national resources 367
Ripley, J. P. Respective values of labor-saving appliances in track work, 522
Ryder, M. T. Greater uniformity in track spirals will conduce to economy, •649

S

Schloss, L. B. Liberty loan activities at Washington, D. C., •604
Schreiber, Martin. Welded rail joints, 190
Shepard, F. H. Further railroad electrification important, •4
——266-ton locomotive for the St. Paul, •559
Shonts, T. P. The cause is holy; the effort timely, 602
Slade, Walter C. Power production in war times, 567
Smith, Hartley LeH. Calibration of switchboard watt-hour meters, 716
——Electric railway power plant and its personnel, •361
——Getting more energy out of coal in the power plant, •953
——Keeping power plant oil in good condition, •1131
——Testing and treating power plant feed water, •751
——The testing organization of electric railways, •511
Squier, C. W. Betterments available in car equipment, •500
——Considerations in the choice of car equipment, •354
——Current and power curves show results to be expected of motors, •1134
Squier: (Continued)
——Proper analysis is fundamental in choosing railway motors, •956
——Service conditions determine car equipment characteristics, •718
Stevens, R. P. Liberty loan activities at Youngstown, O., •607
Stewart, H. M. Respective values of labor-saving appliances in track work 522
Storer, N. W. New flash supressor applied on the St Paul, 858
Storrs, L. S. Company section, advocated, 136
——Liberty loan activities at New Haven, Conn., •604
Sullivan, H K. A cure for surface-bent rails, •528

T

Taber, George C. New twenty-ton sand car built in railway shop, 189
Townley, Calvert. Economics of hydroelectric power development, 177
Treat, Dean. Metal electrode welding, 655
Treat, G. B. War needs of electric railways, 1053
Turpin, M. C. Malleable iron overhead fittings, 666

V

Van Driesen, A. C. The work of the Accountants' Association of the C. E. R. A., 419

W

Wade, A. One-man cars of economical design, •769
Wagner, R. T. Protecting car equipment effectively against lightning, •758
Way, A. P. Insulated negative return feeder system satisfactory at Lynchburg, Va., •861
Weatherwax, H. B., Higher fares essential 1234
——Liberty loan activities at Albany, N. Y., •604
Wefel, W. C. Reducing lighting maintenance costs, 978
Wensley, R. J. Automatic substation of new type on Ohio Electric, •707
West, E. A. Respective values of labor-saving appliances in track work, 522
Weston, George. Simplicity in track spiral standards is desirable, •1156
Wheelwright, Thomas. Liberty loan activities at Richmond, Va., •604
Whitlock, W. L. Built-up sections of track for diverting traffic, •770
——Replacing downtown special work, •375
——Special work designed to give longer life, •527
Wilcoxon, C. N. Radical readjustment necessary, 454
Williams, T. S. Make the liberty loan your business, 603
——Women successful as conductors, 416
Wilson, George L. Track spiral standardization, 926
Wilson, J. A. Light interburban car for Montreal & Southern Counties Railway, •331
Winsor, H. G. Old and new employees, 1189
Witt, Peter. How the pay-as-you-pass car was developed, •30
——Use auto trucks with flanged wheels and demountable rubber tires for freight delivery, 1200
Wood, George E. Struggling with poor coal, 573
Woods, G. M. Freight motive power equipment, •1055
Wynne, F. E. Railroad electrification as a war measure, 81

PERSONAL

A

Abell, Horace A., 1075
Ackerson, D. Hayward, 1118
Ahrens, Howard E., 790
Alexander, Harry W., 593
Alexander, Joseph H., 682
Andrews, J. W., 439
Armistead, Lewis A., 833
Arthur, F. W., 993
Atherton, Henry F., •344
Atwood, W. B., 1213
Austin, W. C., 393
Aylesworth, M. H., 299

B

Babcock, C. A., 548
Babcock, Darton L., 1171
Baecher, Joseph S., 160
Bailey, W. T., 483
Baker, George, 299
Baker, George E., 63
Baker, Richard Ward, 731
Baker, William, 594
Ballantine, Arthur A., 393
Ballentyne, C. G., 62
Ballou, Roy, 255
Barnhart, J. D., 299
Bauer, John, 940
Beaverbrook, Lord, 547
Bellmer, William F., 393
Bennett, C. E., 346
Bennett, W. H., 682
Bergen, George T., 346
Bird, W. M., 62
Birkett, M. W., 1257
Bissell, William, 940
Black, Charles N., 160
Blackwell, R. W., 731
Blaikie, G. H., 730
Blain, H. E., 730
Boardman, Ralph, 439
Booken, Fred., •63
Bonfils, Joseph E., Jr., 940
Bowers, John M., 548
Bowles, J. D., 594
Brazel, C., 910
Brewster, Floyd L., •593
Brill, John F., 159
Brooks, Henry N., 791
Brown, F. L., 207
Brown, Harry L., 256, 392
Brown, J. W., •884
Brownell, Frederick G., 940
Bruce, David, 344
Brush, G. Sabin, 392
Brush, M. C., •1170
Buckland, Edward G., 1258
Buffe, F. G., 730
Bullock, Harry A., 1118
Burke, Thomas P., 110, 159
Burkholder, J. L., 1118
Burrowes, Edward T., 1034
Bush, A. J., Jr., 255
Butler, F. L., 993
Byllesby, H. M., 640

C

Campbell, L. L., 1171
Campbell, W. L., 593
Canfield, J. F., 1034
Carnahan, W. H., 1118
Carpender, William, 439
Carr, James O., 255
Carson, A. G., 833
Carson, W. A., •640
Chase, N. L., 392
Cheney, Walter L., 790
Cherry, T. C., 593
Chestnut, P. C., 730
Chubbuck, O. P., 299
Clarke, Eugene C., 345
Clarke, H. A., 483
Coates, Frank R., 593
Coblentz, Emory L., 207
Coen, F. W., •483
Coffin, Charles A., 1034
Colby, A. C., 639
Couger, K. B., 1213
Connell, James A., 299
Connette, Thomas W., 207
Cosgrove, H. J., 547
Coulthard, C. C., 1213
Cowgill, H. A., 207
Cowles, Luzerne S., 255
Cox, C. E., 730
Cox, Charles E., 833
Coy, Edward, 110
Crandall, Roy, 299
Culkins, W. C., 110
Cummings, John J., 940
Cummings, Walter J., 1034
Cunningham, A. L., •111
Curtis, C. C., 255
Curtis, Frank, 346

D

Daniels, Winthrop M., 682
Daries, J. C., 207
Davidson, W. C., 207
Davies, A. J., 993
Davis, E. J., 207
Davis, W. L., 682
Davis, William Howard, 207
Davis, William R., 440
Day, T. J., •314
Deal, E. C., 640
De France, M. E., 439
De Haseth, G. A., 255
Dement, William F., 1213
Dempsey, John J., 207
de Trenaltes, Fernand, 300
Detrick, Charles R., 833
Dillon, W. F., 393
Doerr, Charles T., 1171
Dolezal, George, 639
Donges, Ralph W. E., 993
Douse, Walter C., 110
Dow, S. T., 547
Duffy, C. Nesbitt, 594, 833
Duffy, Gilbert, 593

E

Earle, William, 207
Earley, J. L., 1258
Elder, W. H., 1075
Elliott, E. C., 1213
Elward, Joseph F., 682
Emery, Rufus Franklin, 834
Emmett, William Temple, 300
Evans, Archie, 1075
Evans, W. H., 790

F

Faber, E. C., •256, 483
Fabian, V. F., 392
Fahrney, C. E., •1118
Falconer, D. P., 683
Favor, James, 344

Fennell, D. L., 1257
Fennell, Thomas F., 299
Fernald, George A., 344
Field, J. Lawrence, 1258
Fifer, C. J., 730
Finger, Charles J., 1075
Fisher, A. M., 1258
Fisken, J. B. 1257
Fitzgerald, Edward, 299
Fletcher, F. E., 547
Flickinger, W. J., *255
Foley, M. E., 682
Folk, Joseph W., 299
Frank, M. H., 1118
Fratessa, Paul C., 439
Freelund, J. C., 547
Freeman, Charles, 1171
Fuller, H. W., 439
Funk, John Thomas, 731
Funk, Neal, 682

G

Gaboury, Arthur, 483
Gallagher, Bernard, 834
Gerhardt, P. W., 682
Gilchrest, O. J., *111
Glidden, P. T., 1258
Goble, William H., 63
Goodsell, C. B., *111
Gould, J. W., 547
Graston, M. E., 1034
Grauten, S. H., 1075
Gray, Ainslee A., 833
Green, George Alan, 833
Greenland, Sam W., 683
Greenleaf, E. F., 1118
Greisser, V. H., 1257
Grey, Norman, 547
Griffith, Fay, 1034
Griffith, Franklin T., 299
Grooms, B. L., 940
Gross, Isaac W., 1171
Gulliver, Albert E. 1075
Gwynn, F. J., 547

H

Hadden, Robert A., 111
Haggenmiller, A. C., 1257
Hain, F. D., 159
Hall, C. A., 1213
Hamilton, J. F., *345
Hanley, V. J., 940
Hannaford, Foster, 62, *111
Haquette, E. P., 483
Harcus, D. B., 159
Hargis, George F., 484
Harkness, Le Roy T., 940
Harmon, James, 299
Harris, Lloyd, 547
Harris, Walter, 833
Harvey, C. R., 593
Harvey, Julian H., *483
Harvie, W. J., 593
Hatch, G. W., 440
Hatch, P. M., 255
Hawthorne, V. R., 1075
Hayden, C. F., 547
Hayes, John H., 344
Hearn, H. B., 639
Hemming, R. N., *682
Henderson, D. F., 1257
Hester, J. E., 993
Heyworth, James O., 255
Hicks, Arthur B., 1172
Hile, Charles Harvey, 1172
Hill, Charles B., 392
Hillman, John A., 110
Hinman, F. L., 1171
Hires, B. Frank, 207
Hodell, Henry H., 393
Hoffer, Henry, 1213
Holliday, William J., 440
House, G. O., 884, *940
Howard, H. C., 682
Hoyt, Allen G., 207
Hoyt, Harry, 1118
Hubbell, C. H., 256
Hubbell, Charles Bulkley, 62
Hudson, C. B., 392
Hudson, Frank P., 159
Hudson, George, 940
Hulett, Frank W., 1214
Hulme, J., 207
Humbert, S. R., 833
Humphrey, Alex P., Jr., 111

I

Insull, Samuel, 345

J

Jackson, Dugald C., 940
Jackson W. B., 594
Jaeger, Howard E., 62
James, C. N., 593
James, S. M., 1214
James, W. I., 160
Jetts, C. A., 159
Jennings, Richard L., 300
Johnson, Alba B., 1075
Johnson, H. E., 1171
Johnson, J. Frank, 682
Johnson, Robert Tillman, 299
Jones, R. Frank, 593
Jordan, Alfred C., *392

K

Kaerschner, H. C., 110
Kealy, Philip J., 160
Kearny, P. J., 159
Keesler, Rollo, 833
Keever C. S. 439
Kelly, R. E., 62
Kennedy E. R., 593
Kennedy, W. R., 344
Kieser, James F., 439
Killeen, Henry W., 439
King, Clarence P., *639
Kittredge, Gorge Alvah, 111
Kountze, Luther, 834
Kracke, F. J. H., 62
Kuhns, George, 207

L

Lauter, H. G., *730
Lawless, J. E., 682
Lawrence, H. G., 547
Leidenger, Peter, 111
Lightstone, Alexander, 207
Linn, A. M., 392
Litchfield, Norman, *547
Longfellow, N. R., 110
Losey, George H., 299
Lowe, J. R., 594
Lowrie, J. W., 392
Ludwig, A. M., 439
Lyon, W. R., 392
Lyons, H. H., 1213

M

McAloney, W. H., 207
McCarthy, Thomas E., 547
McClung, Emmt, 547
McComb, George R., 1171
McCray, L. H., 547
McDonel, James D., 346
McGee, Arthur, 833
McKinley, W. L., 392
McKinney, J. P. 392
McMahon, C. R., 1171
Macbeth, Norman, 392
MacCalla, C. S., *884
Mahoney, J. J., 344
Mann, L. G., 1171
Marcum, J. O., 1034
Marlowe, R. M., 547
Meade, Richard W., 730
Meier, Edward C., 1075
Merriam, George, 392
Merrill, B. M., 1257
Merrill, E. A., 62
Metcalfe, A. B.
Meyer, B. H., 62
Miers, M., 1034
Miller, Alfred R., 1171
Miller, C. W. D., 1172
Miller, J. G., 790
Millican, G. R., *640
Milliken, E. L., 255
Mills, George A., 63
Mills, W. M., 392
Mims, L. C., 159
Minard, W. O., 63
Moore, J. C., 1213
Morris, L. V., 299
Morrissey, F. T., 1034
Morton, J. P., 207
Mousseau, Frank M., 63
Mullaney, Thomas F., 110, *160
Munton, C. J., 255
Murphine, Thomas F., 730
Murphy, H. S., 833
Murphy, J. S., 299
Musgrave, William, 159

N

Neal, W. V., 207
Neary, Edward J., 207
Nevans, H. A., 344
Newton, H. S., 344, *393
Nielson, T. C., 593
Norton, Porter, 393

O

O'Callaghan, Edmond, 255
Oellig, H. H., 1257
Ong, J. R., 594
Owens, J. F., 940

P

Parker, Fred S., 790
Parker, W. J., 392
Parsons, D. E., *1257
Parsons, Murray, 344
Parsons, R. H., 547
Paterman, E. E., 392
Patterson, A., 344
Patterson, Stuart H., 63
Paul, Lesley C., 731
Perkins, Robert W., *639
Perrin, M. J., 111
Persons, Niles, 110
Pettit, L. A., Jr., 393
Pfenning, E. C., 833
Philips, P. T., 392
Piper, A. R., 833
Post, George A., 833
Potts, Milton G., 344
Powell, George D., 833
Power, W. P., 345
Prather, H. Clark, 484
Preger, Arthur, 682
Price, Theodore H., 1258
Price, William T., 884
Priest, William, 593

R

Rauch, T. D., 1034
Reardon, F. L., 639
Reid, Harry, 547
Reigel, Harry H., 682
Remelius, Charles, 62
Rew, Morse W., 833
Rexford, Chester P., 1075
Reynolds, A. E., *345
Reynolds, Ray W., 344
Rice, E. W., Jr., 344
Richardson, G. A., 255
Richmond, O. J., 547
Rickert, Van Dusen, 62
Ritchie, John A., 730
Robinson, Thomas T., 160
Rockwell, J. C., 730
Roemer, John H., 884
Rose, Percy Allen, 1034
Rounsavell, W. B., 1257
Royce, Allan H., 993
Ruhling, T. C., *790
Ruhlman, John H., 346
Ryan, John M., 1075

S

Savage, J. R., 299
Schaeffer, George B., 790
Schlant, Edward, 207
Schmidt, Emil G., 299
Schmidt, George W., 993
Schofield, W. B., 440
Scott, Robert F., Jr., 594
Seibert, William, 62
Seitz, Edwin P., 834
Session, Charles H., 833
Sever, George F., 730
Sewall, H. B., 159
Shapiro, D. H., 1171
Shaw, S. G., 392
Shinkle, V. G., 1257
Shonts, Theodore P., 593
Simms, Richard D., 256
Simons, Edmund G., 833
Sisson, E. B., 594
Skouden, M., 682
Slater, Harry M., 344
Small, T. L., 593
Smallman, Thomas H., 940
Smith, A. F., 299
Smith, Chester, 547
Smith, E. B., 1075
Smith, E. J., 485
Smith, E. T., 547
Smith, Fred M., 344
Smith, John Hayes, 110
Smith, O. A., 160, *344
Smith, N. W., 345
Smith, R. Home, 884
Smith, Samuel E., 160
Soren Townsend, H., 884
Southard, W. P., 683
Speidel, Joseph, 940
Spofford R. W., 730
Spring, Dana L., 255
Squier, C. W., 790
Staats, Henry N., 110
Stanley, J. J., 1213
Steel, A. F. S., 1257
Steiner, S. J., 593
Stevenson, L. M., 344
Stewart, J. B., Jr., *63
Stine, Henry M., 160
Stockman, W. C., 993
Stone, John C., 344
Strack, George W., Jr., 299
Strain, G. A., 439
Straus, Oscar S., 593, 1171
Sturzinger, O. R., 160
Sullivan, Thomas F., 640
Sutherland, Leslie, *1213
Swanson, Eric, 392
Swartz, A., 392
Swartz, Carrie A., 110
Sweeney, Alfred, 940
Swift, Harley L., 392
Swisher, W. C., *299

T

Tassie, R. W., 299
Taylor, A. M., *683
Taylor, Clyde, 159
Tegtmeier, August K., 439
Thames, J. J., Jr., 593
Thelen, Max, 159, 1258
Thirlwall, J. C., 790
Thomas, E. H., 682
Thompson, Robert, Jr., 439
Thornton, Henry Worth, 1075
Thorsson, Nils M., 1171
Throop, A. T., 547
Titus, W. E., 299
Tomkins, Robert S., 594
Treat, G. B., 344
Tripp, George R., 160
Tripp, Guy E., *159, 207
Tupton, M. A., 1118
Twomey, W. C., 682

U

Uhden, C. F., 1257

V

Van Bruns, P. H., *1257
Van Dierse, A. T., 1258
Van Hooven, Carl H., 110, *593
Van Santvoord, Seymour, 299
Vokes H. F., 299
von Seimens, Arnold, 940
Voshall, R. D., 344
Voth, W. B., 731

W

Waggener, B. P., 940
Walborn, I. G., 993
Wales, Bert H., 255
Wallace, William D., 790
Walmer, Charles E., 159
Ward, F. D., 1075
Ward, I. L., *345
Warner, Arthur W., 1213
Warwick, C. E., 1118
Wason, Charles W., 791
Waters, S. E., 1257
Waters, W. T., 62
Webb, G. A., 62
Wells, Lee J., 682
Welsh, J. W., *731
Weston, W. L., 255
Waters, S. E., 1257
Weston, Weldon F., 299
Whelan, John Brown, 790
White, G. S., 593
White, Y. M., 1257
Whitney, Walter D., *790
Wight, Charles L., 834
Williams, F. H., 1118, 1213
Williamson, John W., 1034
Withington, Sidney, 159
Woehler, A. G., 207
Wood, J. W., 593
Woolley, Roy B., 593
Wright, Augustine W., 393
Wright, Sydney L., 299
Wright, W. H., *439

Y

Young, H. C., 1118

*Illustrated

Electric Railway Journal

McGRAW-HILL COMPANY, INC.

JAMES H. McGRAW
President

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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H. H. Norris L. E. Stibbe
R. R. Bruster L. C. Paul
H. L. Brown H. S. Knowlton
G. J. McMurray N. A. Bowers
S. B. Williams

Volume 51 New York, Saturday, January 5, 1918 *Number 1*

Some Changes in the Make-Up of the "Journal"

READERS of this paper will notice a number of changes in typographical appearance in this issue, notably in the type used in the captions of articles and in the three-column arrangement in the news department. The fundamental purpose of the former is to utilize the best in the printer's art to "play up" the important facts so that they will appeal to the readers with a force proportionate to their import. Another purpose is to bring in the element of novelty. Just as it is refreshing to shift the furniture and pictures in a room, so in a periodical an occasional change in type face or headings makes a pleasing impression. Three columns have been adopted as standard in the news pages, instead of two, partly because we believe the narrower column will be more easily read, with the size of type used, and partly because of the greater variety of caption sizes thereby made possible. Another change is in the title of the "Equipment and Maintenance" department, to be known hereafter as "Construction, Maintenance and Equipment." This department begins its fifth year with this volume. Since the war began it has proved useful in segregating short articles of a practical character. The new name suggests what has actually come to be the scope of the department. The plan is gradually to enlarge it under the new name to provide full opportunity for the discussion of all live topics of the shop, the track, the line, the power house, etc. Such an opportunity is especially needed now that the war has caused a temporary cessation of the Engineering Association committee work and meetings.

A Review and a Prophecy

WITH the turn of the year comes the time for self-analysis. Our successes will take care of themselves. Our mistakes will persist in calling for correction.

Our industry—and by that we include the financiers, the managements, the Association and the "Electric Railway Journal"—has made mistakes. And the greatest of these mistakes has been the failure to carry out as an industry that policy of full, free and frank publicity which the Association, on the recommendation of its committee on public relations, formally adopted in 1914. Had that policy been put in operation, the railways of this second generation would not be suffering so alarmingly because of the sins of the fathers.

The electric railways have done a great work for this country; and there is still great work for them to do. No greater catastrophe, short of food, fuel and water shortage, can come to the modern community than to have its electric railway facilities crippled or wiped out. What have we done as an industry to bring this fact home to the people?

Like Elijah of old we have been living too long in the cave of pessimism, of fear, of inertia. We have failed to accept the mandate of the Lord to "Go forth and stand upon the mount" to see the world.

And now the time has come when this pessimism, this fear, this inertia must go. We must leave the cave and go out on the mountain in the light and before the people.

Let us first look into ourselves to see what we can do to give good service. Then come frankly forward and tell the people and their regulatory officials what they should do to help, and if the giving of good service really is accompanied by full, free and frank telling of our problems and burdens, the great fair-minded people of this country will give the electric railways the right to charge whatever fare is necessary to keep the railways going, growing, prosperous concerns.

Will the Government Be Able to Give Us More Coal?

NO radical and immediate change in the coal-supply situation is to be expected under the new management of the steam railroads of the country for reasons entirely beyond the control of government, however efficient. Efforts in the line of economy should not, therefore, be relaxed; in fact, they should be pushed to the limit. An excellent start has been made in enlisting the co-operation of employees, which will be urgently needed even if the federal authorities are as successful in improving distribution as we all hope they may be. The stubborn fact is that there is not enough coal to go around. From the reports of the Bureau of Mines and the Geological Survey it is clear that while the coal-mine output has been greatly augmented, the demands are more than proportionately increased, while the quality is quite inferior. The Railroads' War Board, now defunct, which formed a voluntary committee to accomplish the same purpose as that underlying the government's move, claimed that the coal shortage is largely due to poor distribution. That is, coal is purchased at unnecessarily remote points, involving more ton-mileage than is justified by present conditions. This situation can be remedied, at least in part, under the new management. Nevertheless, it must be remembered that the government possesses no magic wand by which coal can be mined without labor, transported without cars, or moved long distances in infinitesimal time. Hence while some hope for relief may be justified, the surest relief is that to be secured through economy. If 25,000 tons of coal annually can be saved by the electric railways in Washington, D. C., as the Electric Railway War Board's conservation committee says can be done, then the possible total for the country is something worth while.

Help, Don't Hinder, the Electric Railways

IF THERE ever was a time when all of us—railways, public and regulators—should pull together, it is now. We are in a period of high prices and scarcity of labor brought on by the war, and electric railway operating expenses have been mounting by leaps and bounds. At the same time the needs of the country for good transportation are greater than ever before. At a period when every productive agency in the country is working at full pressure, it is most important that the urban and interurban transportation systems of the nation, which are an integral part of its industrial life, should maintain their efficiency at its maximum point. No community has the right at this time to oppose any plan which will allow the railways to give better service to the public or will make the demands of the railways upon fuel and labor less.

The nation has awakened to the necessity of obtaining maximum efficiency from the steam railroads. It must be equally ready to remove the hindrances to good service by the electric railways. Of what good is it to transport raw materials to a city factory if thousands of workers cannot enjoy the best possible facilities in going to and from their work that the local railway can give them? A higher fare is necessary to meet the increased expenses of operation, but there are other obstacles which exist as well to efficient electric railway operation. Some of them arise from antique municipal ordinances or popular prejudices, such as objections to the skip stop and to changes in routing, others from the opposition of the labor element to improvements which might tend to reduce the man-power required per car, and still others from financial inability to purchase modern equipment. Now is the time to get these hindrances removed. There are several reasons why this is so.

Two years ago the jitney was looming up as a serious competitor of the electric railway. The jitney was largely the production of unemployment and flourished for a while, but with the present period of high wages, labor scarcity and work for all who wish it, the jitney has largely disappeared. But it may come back to the injury of both the railways and the communities which they serve unless the companies improve this interval to make their properties capable of giving such good service that no one will want to patronize the jitney, if it is here.

A second reason why the present is a most appropriate time for analytically studying scientific operation is that municipal bodies and the public as a whole are taking a fairer and more considerate view of railway matters than formerly. This may be because they are coming to realize the present arduous conditions under which electric railways operate. The discontinuance of several electric railways and the sale of their equipment as scrap have shown that electric roads cannot continue operation indefinitely at a loss. Greater publicity also has helped the people at large to understand somewhat better the problems of the railways and the dependence of the public on good transportation.

Finally, the recent action of several commissions indicates a growing willingness on their part to grant a rate of fare which will enable the companies to earn a fair return on the money invested in the property in public use. If the railways in general have this return, they will be able to do some rehabilitation on a scientific basis. At present and for the past few years about all that most companies could hope to do was to escape the call of the sheriff and the junk man. To earn interest on the investment in the property was beyond them and old equipment had to be used because no other could be bought.

All these improvements could not be made at once, even if the railways had the funds to spend on the new equipment, trackage, etc., necessary. The state of the industrial market would prevent that. But at least each company should know its objective. It is to help the railways to do this that Mr. Layng has written the article on economical operation which constitutes the feature of our reading pages this week. This article is based on a study extending over years of electric railway properties in all parts of the country. Many, if not most of the principles mentioned are not new, but they are mentioned in a new way and data are given to substantiate them. With an awakened sense of responsibility in this country to the necessity of good transportation, we hope that this coming year will bring better times to the electric railways of the country and a broader understanding of their burdens.

Should the article by Mr. Layng on the fundamental principles of electric railway operation help in this direction, the aims of the author and the publisher will be attained.

Making Both Ends Meet Has Been a Real Job

THE high-cost-of-living problem during the past year has been a tough one for electric railway managers to handle. The financial stability of the industry—that characteristic upon which investors have placed so much confidence—has decreased to such an extent that many a company has had marked difficulty in making its net meet its fixed charges. Many railways have found the burden unbearable, and their end has been bankruptcy and foreclosure, as shown in the extended lists published on another page. Still others have been forced farther into suspension of service or actual dismantlement.

Why have utilities offering so essential a service fallen into such a sorry plight that even the hope of successful operation under readjusted conditions after foreclosure has in some cases failed? To look at the industry from a financial point of view, the revenue-producing power, which stood up so well in the face of the jitney onslaught, is in the main unimpaired, and the revenues during 1917 have shown a fair rate of growth. But the cost of operation has increased faster. The rising costs of materials and supplies, together with heavy increases in wages and taxes, have caused a dangerous stringency in income available for a return on the investment.

Complete data are not yet available for the whole calendar year, but those already collated bear out this point. For the first half of 1917, as compared to a similar period in the year previous, electric railways with 8388 miles of line gained 3.14 per cent in operating revenues but suffered an increase of 7.67 per cent in operating expenses and a loss of 4.70 in net revenues.

The operating ratio rose from 63.40 in 1916 to 66.18 in 1917. The showing was perhaps a little better for the first nine months of 1917, when the increase of 5.87 per cent in operating revenues for only 7450 miles of line was so far offset by the 11.02 per cent rise in operating expenses that the net fell off 2.17 per cent, the operating ratio rising from 60.96 per cent to 63.93 per cent. Perhaps, with the increasingly ameliorating influence of fare increases, cantonment and other war travel and the wider development of freight and express facilities, the operating gross during the last quarter will show an even more substantial advance. It is very unlikely, however, that the net for the year will fail to reflect to a marked degree the burdensome influence of increasing costs of operation.

The railways have endeavored to meet the situation in 1917 by the institution of more economical methods, to cut down costs, and by applications for higher fares to increase revenues. In both cases traditions have been handicaps, but, on the one hand, the opposition of unprogressive managers and, on the other, the distrust of rate-making bodies, have become appreciably lessened. In regard to fare increases (we speak of the other matter in detail elsewhere), the year has been encouraging. Recent years had been so full of attempts to cut rate schedules in every conceivable way that the work of seeking general relief seemed to many almost a herculean task, but it has not been so difficult. About fifty fare increases have already been granted, and the full returns for the year's campaign have not yet been received. The commissions have as a rule met the situation with painstaking fairness, with a clear-cut recognition of their paramount rate-making powers under legislative sanction and with a frank acceptance of their share of the responsibility for preserving electric railway service. And the public, when it has been greeted with the best possible service and honest publicity, has not fought legitimate rate increases. We wonder whether the industry ought really to be proud of the fact that only its diminishing coffers finally drove it to an active public-relations campaign! To some men nothing succeeds like success; at any rate, we hope the value of intelligent public-relations work will now be denied by none.

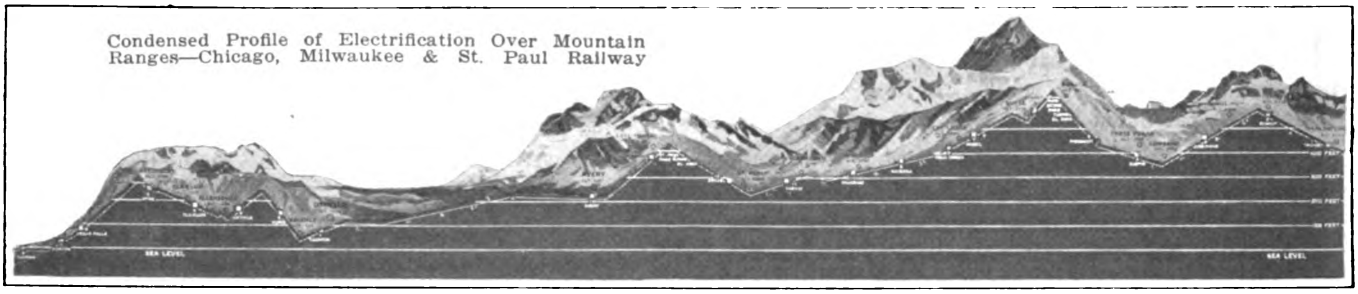
Many more fare increases are needed, of course, but even when these are obtained it is not certain that the electric railway industry will have all the financial relief needed. It must have some direct relief from inflated costs, but this will probably come to some extent through government price control. Moreover, with more than $126,817,000 of securities maturing in 1918 (and issues below $200,000 are not included), and with improved service being demanded for car patrons, the industry needs new capital. It can hardly afford to compete with the government, however, either in borrowing money or in buying new facilities. The war, in short, dominates the whole situation, and the course for the next few months or perhaps years must be planned with this in mind. What does the industry need for its preservation and for the successful prosecution of the war? and how are these requirements to be most economically met?—these are the vital questions of the new year. They can be satisfactorily answered. The past year has shown how constructive co-operation and foresight on the part of railways, commissions and the public bring beneficial results in such work.

The War Should Stimulate Steam Railroad Electrification

WHEN a few days ago the government took over the steam railroads with the stroke of a pen, things that before were remote possibilities came immediately within the range of almost immediate practicability. It requires neither a prophet nor the son of a prophet to predict that if the government continues to control the railroads for a few years extensive electrification must form part of the program. This follows because, if electrified, many roads could be operated with far less coal, and sections near water power would require no coal at all. The experience through which we are now going, with manufactories and utilities handicapped and with a large part of the population suffering or fearful of approaching suffering, has made the words "save coal" an expression to conjure with. And of equal significance is the phrase "save labor." This experience will have great weight with Congress and with individuals and committees controlling public expenditure. Feasible electrification plans will command a ready hearing, even if they involve large capital expenditure, if only ability to save fuel and labor be demonstrated. Under government operation these plans could be carried out promptly, as war measures, leaving the affected roads in much better condition when returned to their owners after the war.

While railroad conditions abroad are not altogether comparable with those in this country it is true that the Swedish, Italian, Swiss and French governments have gone into electrification of the federal railways on a comprehensive scale. The Savona-Ceva electrification, described in last week's issue of this paper, is an example of what was going on in Europe until the war called a halt. Even little Belgium is considering extensive electrification when the Huns have been forced to evacuate her territory and pay her at least in part for the ruin wrought. A London dispatch, dated Dec. 27, states that the Coal Economy Committee of Great Britain has proposed, and the Minister of Reconstruction has announced, a plan for an extensive electrification, including, of course, the railroads. An annual coal saving of a half billion dollars is expected.

The case for electrification is stated clearly by Frank H. Shepard in the first article in the body of the Journal this week. Everything that he says can be demonstrated in railroad practice in this country today. If the Government wants to go ahead the manufacturers can, with Government backing, "deliver the goods." What they can do is being demonstrated in the Milwaukee electrification extension to be practically completed this year. The places to begin are those where heavy freight traffic must be carried over mountain ranges, at which points in general water power is available. Next or simultaneously come congested sections of line which throttle traffic. This will probably be enough for wartime. Fortunately we have enough successfully electrified railroad mileage to prevent any fear of operating failure from entering into consideration. Of course, electric locomotive design is not yet standardized but for that matter neither is that of steam locomotives. With competition eliminated for the time railroad men and electrical engineers might well combine forces at this juncture to show the Government what could and should be done to increase the over all efficiency of our railroads by judicious electrification.



Condensed Profile of Electrification Over Mountain Ranges—Chicago, Milwaukee & St. Paul Railway

Further Railroad Electrification Important

Electrical Equipment Presents a Most Effective Way of Increasing Transportation Capacity—Considerations Why This Is Now a Timely Subject

By F. H. SHEPARD

Director of Heavy Traction, Westinghouse Electric & Manufacturing Company

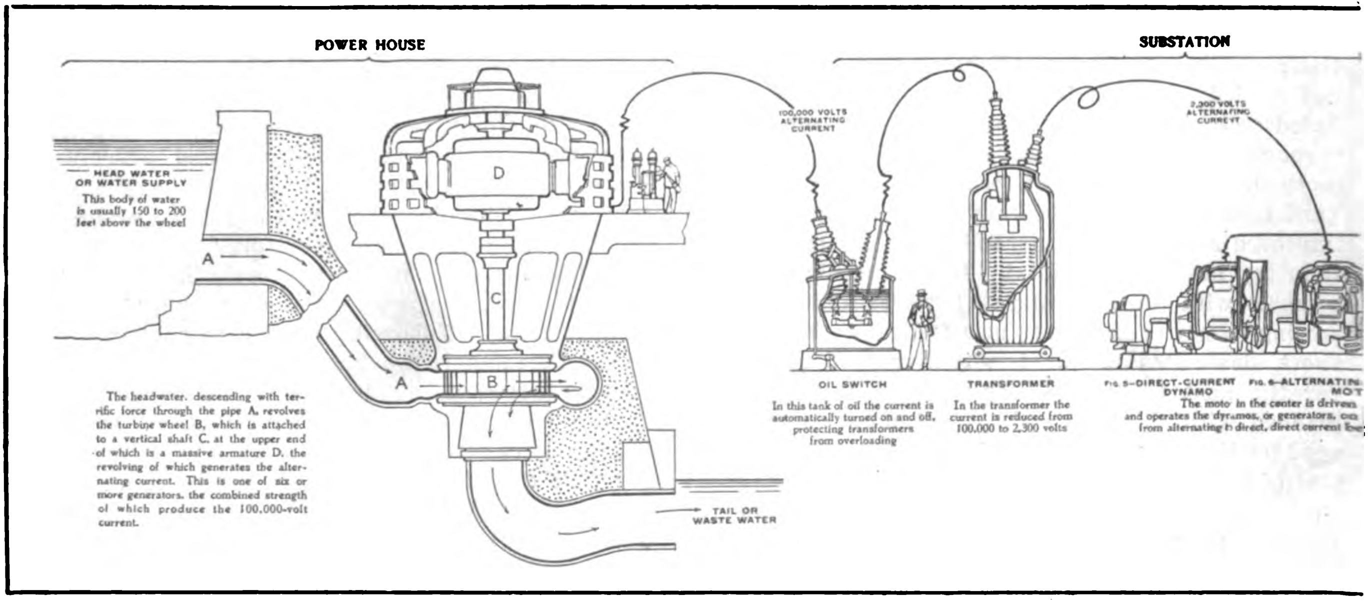
IN NO other period of our history has the necessity of adequate means of transportation been more evident. We are now at war, and one of our most important duties is to transport a vast amount of goods over long distances. Even under ideal conditions this would be a herculean task, but unfortunately for the last five years or more the railroads have been obliged, mainly because of adverse legislation, to follow a halting program of development and this condition is proving a most serious handicap to the prosecution of the war. Had there been in Public Opinion, which after all governs our legislation, a better comprehension of the requirements of our steam railroads, the present burden on the nation and on each individual would be materially less. But at least we are now fully alive to our lack of foresight, and we should be prompt to correct this ominous situation.

The need for increased transportation facilities has long been apparent to those well informed in such matters. Experience has shown that the traffic on our railroads about doubles every twelve years and that an annual capital expenditure of $1,000,000,000, at normal price levels, is needed to keep pace with this expansion. Since, for the last few years so much less than this has been invested, the sum now necessary to bring our railroads up to the point where they will be adequate to the needs of the nation is literally enormous. No such capital being now available, normal methods can no longer be followed, and therefore in the present emergency any and every means to utilize our existing railroad plant to its fullest efficiency should be carefully considered.

The Railroad War Board, despite legislative handicap, has already made phenomenal progress toward unifying the railroads' facilities, and if these handicaps were removed, it could practically eliminate all duplication of service by the common use of terminals, tracks, and equipment and by a thorough revision of traffic routing.

When all this is accomplished, however, a further improvement in the transportation situation can be secured by means of electrification.

Electrification can help the railroads and the nation in three ways:


POWER HOUSE
SUBSTATION
HEAD WATER OR WATER SUPPLY
This body of water is usually 150 to 200 feet above the wheel
A
A
B
C
D
The headwater, descending with terrific force through the pipe A, revolves the turbine wheel B, which is attached to a vertical shaft C, at the upper end of which is a massive armature D, the revolving of which generates the alternating current. This is one of six or more generators, the combined strength of which produce the 100,000-volt current.
TAIL OR WASTE WATER
100,000 VOLTS ALTERNATING CURRENT
2,300 VOLTS ALTERNATING CURRENT
OIL SWITCH
In this tank of oil the current is automatically turned on and off, protecting transformers from overloading
TRANSFORMER
In the transformer the current is reduced from 100,000 to 2,300 volts
FIG. 5—DIRECT-CURRENT DYNAMO
FIG. 6—ALTERNATING MOT
The moto in the center is driven and operates the dynamos, or generators, con from alternating to direct, direct current

PICTORIAL REPRESENTATION OF USE OF HYDROELECTRIC POWER FOR RAILROAD

1—By increasing the capacity of existing track and terminal facilities.

2—By decreasing the consumption of fuel, and

3—By conserving the labor necessary for operation and maintenance.

INCREASING TRACK CAPACITY

Any method by which the capacity of our steam railroads can be increased would be of paramount importance at this time. Electricity can accomplish this by permitting the use of locomotives of larger power, higher speed and greater mobility than is possible with steam operation. The largest type of electric freight locomotive built by the Pennsylvania Railroad is capable of developing 7000 hp. for brief intervals and 4000 hp. continuously, regardless of weather and other conditions that reduce the capacity of a steam locomotive. This is nearly the limit in power for a single road locomotive with the drawbar strength of the freight equipment now in general use. With all-steel equipment, heavier trains can be run, and under special conditions it is entirely practicable to operate trains requiring an input of 20,000 hp., including both road locomotive and helper. Such a concentration of power as this will obviously expand enormously the traffic possibilities of existing track facilities and will make additional tracks unnecessary.

The efficiency of electric operation in the most exacting service has already been demonstrated. On the Norfolk & Western Railroad, electric locomotives have replaced high-powered steam locomotives of the most efficient type, and have eliminated all congestion on the grades and, it is estimated, have doubled the capacity of this system at an expense that is considerably less than the cost of a corresponding increase in the number of tracks. In this instance, the power input for single trains is about 11,000 hp. for starting and 8000 hp. for continuous operation.

Furthermore, the electric locomotive is ready to start at any time, needs no fuel or water supply, can run in either direction, accelerates very rapidly, and has great overload capacity. All of these features simplify and expedite yard movements and train dispatching and thus increase the capacity of existing terminals for traffic movement.

THE CONSERVATION OF FUEL

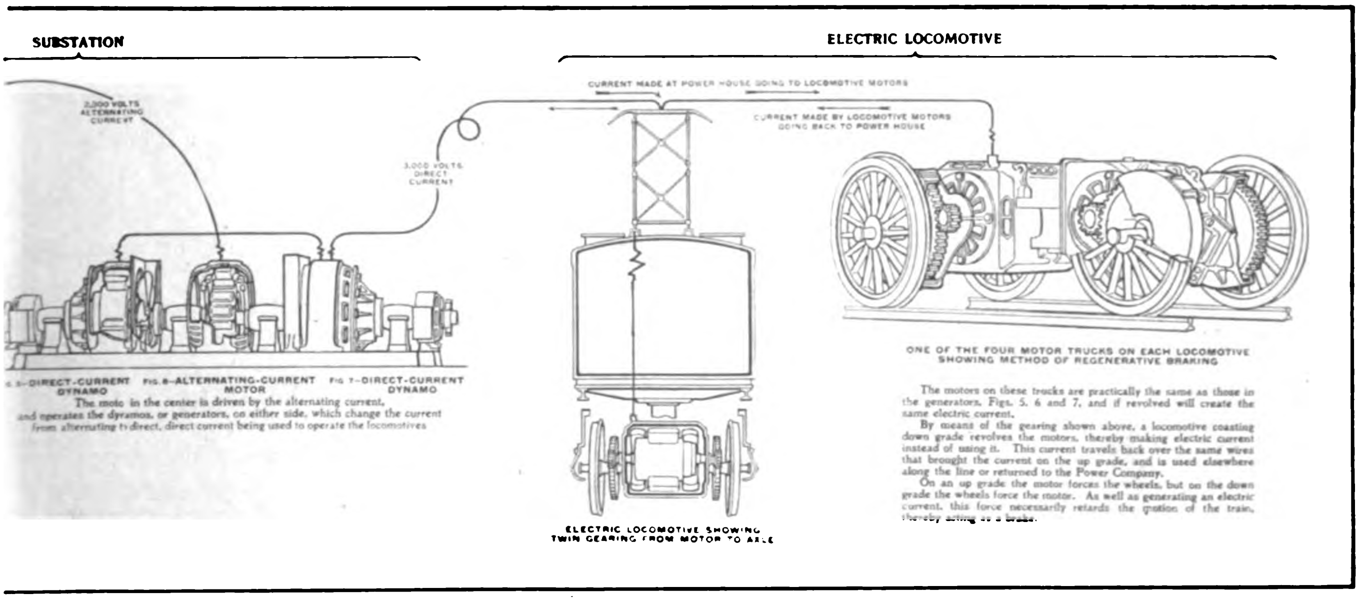
The aggregate power generated in our steam locomotive boilers is about 50,000,000 hp., and to produce this one-quarter of all the coal mined in the United States is consumed. By a somewhat curious coincidence this total horsepower is just about equal to the amount of water power that is going to waste in this country. Hence, it is apparent that if our hydroelectric power was used for railroad operation, 150,000,000 tons of coal would be saved annually, and the cars and crews needed to haul this coal would be released for other purposes. Actually the case is far stronger than this, for owing to the fact that the load factor of the individual locomotive is less than 25 per cent, power stations having a combined capacity of 12,000,000 hp. would suffice to operate our entire system of railroads, thus still leaving 35,000,000 hp. of water power available for other purposes.

For geographical reasons it is of course impossible to generate all railroad power hydraulically, and steam stations must in any event be relied upon to supply part of it. But 1 lb. of coal will produce as much power at the locomotive in a modern electric power plant and transmission system as 2 lb. or more under a locomotive boiler. Hence when this economy is combined with the reduction in the total capacity required, due to the low load factor of the locomotive, it is evident that enormous savings in fuel are possible even when steam stations are used. Irrespective of considerations of economy, our right to deplete our fuel resources in the face of this vast waste of water power is decidedly questionable.

HOW ELECTRICITY SAVES MAN POWER

The third important result secured through the electrification of the railroads is the conservation of labor. This is accomplished in several ways.

In the first place, by effecting a great saving in coal consumption, electrification releases an army of mine and railroad workers for other purposes. Re-


SUBSTATION
ELECTRIC LOCOMOTIVE
2,200 VOLTS ALTERNATING CURRENT
3,000 VOLTS DIRECT CURRENT
CURRENT MADE AT POWER HOUSE GOING TO LOCOMOTIVE MOTORS
CURRENT MADE BY LOCOMOTIVE MOTORS GOING BACK TO POWER HOUSE
…5—DIRECT-CURRENT DYNAMO
FIG. 6—ALTERNATING-CURRENT MOTOR
FIG. 7—DIRECT-CURRENT DYNAMO

The moto in the center is driven by the alternating current, and operates the dyramos, or generators, on either side, which change the current from alternating to direct, direct current being used to operate the locomotives

ELECTRIC LOCOMOTIVE SHOWING TWIN GEARING FROM MOTOR TO AXLE

ONE OF THE FOUR MOTOR TRUCKS ON EACH LOCOMOTIVE SHOWING METHOD OF REGENERATIVE BRAKING

The motors on these trucks are practically the same as those in the generators, Figs. 5, 6 and 7, and if revolved will create the same electric current.

By means of the gearing shown above, a locomotive coasting down grade revolves the motors, thereby making electric current instead of using it. This current travels back over the same wires that brought the current on the up grade, and is used elsewhere along the line or returned to the Power Company.

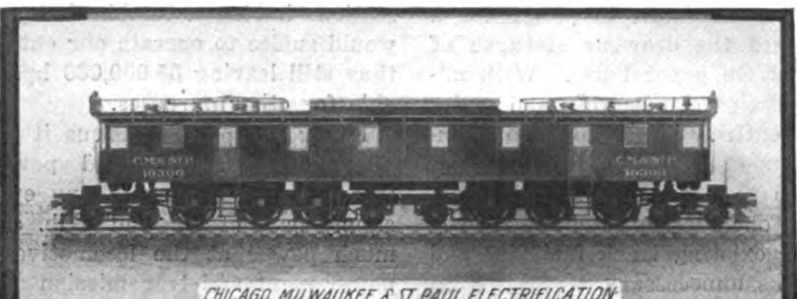
On an up grade the motor forces the wheels, but on the down grade the wheels force the motor. As well as generating an electric current, this force necessarily retards the motion of the train, thereby acting as a brake.

ELECTRIFICATION (COURTESY OF CHICAGO, MILWAUKEE & ST. PAUL RAILWAY) lief of this kind would be especially beneficial at this time, as well as of great economic importance after the war.

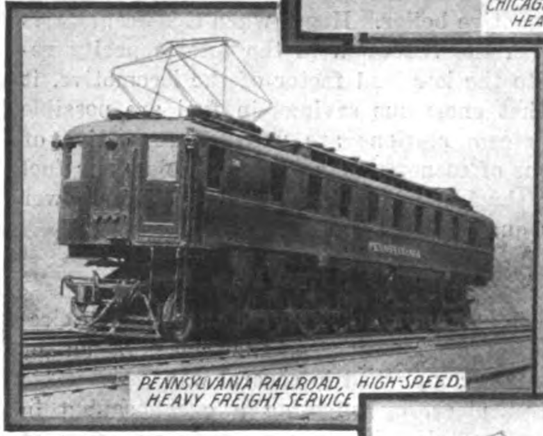
Secondly, since the use of electricity increases the amount of power that can be concentrated in a single locomotive and permits the operation of longer trains at higher speeds, a given number of men can handle a much greater volume of traffic on an electrified road than they can on a steam road.

Again, electric locomotives require much less labor for maintenance than steam locomotives. On the Chicago, Milwaukee & St. Paul Railroad the electric locomotives run 500 miles before receiving terminal attention, whereas steam locomotives are ordinarily taken to the roundhouse after runs of 100 miles. On the Norfolk & Western, twelve electric locomotives have replaced thirty-four Mallet steam locomotives, so that between the greater capacity of the electrics and their greater time in service, the reduction in the amount of labor necessary to operate and maintain them is most marked. Moreover, because of the simple construction of electric locomotives, even major repairs, such as the replacement of a motor, can be accomplished in a few hours, in striking contrast to the length of time required for important repairs to steam locomotives.

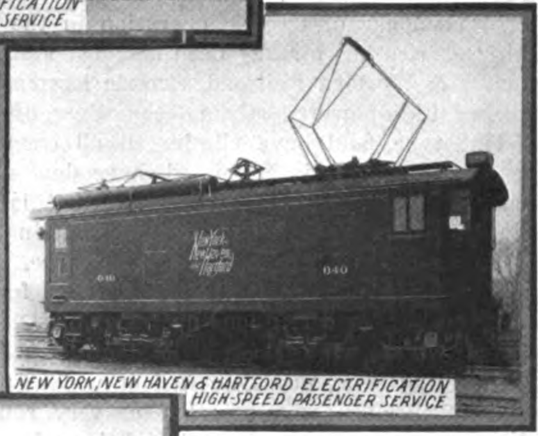
DISTINCTIVE TYPES OF ELECTRIC LOCOMOTIVES



CHICAGO, MILWAUKEE & ST. PAUL ELECTRIFICATION HEAVY TRANSCONTINENTAL PASSENGER SERVICE



PENNSYLVANIA RAILROAD, HIGH-SPEED, HEAVY FREIGHT SERVICE



NEW YORK, NEW HAVEN & HARTFORD ELECTRIFICATION HIGH-SPEED PASSENGER SERVICE

NORFOLK & WESTERN ELECTRIFICATION HEAVY-TONNAGE, MOUNTAIN-GRADE HAULAGE

Finally, because electric locomotives are independent of fires, steam pressure, fuel and water, electric operation secures an economy of yard and terminal labor.

A number of factors are directing constructive thinking in many quarters toward electrification at the present time, and of these the following are most important:

1. The present scarcity of labor, which will undoubtedly continue after the war.

2. The scarcity and high cost of fuel. While present prices are not likely to obtain in the future, it is the general belief that they will never drop to their former level.

3. The inevitable growth of traffic in the United States which will necessitate increased traffic capacity. Electrification in many cases provides the cheapest means of increasing capacity, especially in settled communities and in mountain sections where increasing the width of the right-of-way for additional tracks would be either enormously expensive or practically impossible.

4. The increasing capacity and efficiency of hydroelectric and steam generating plants, which are constantly tending to augment the relative economy of the electric locomotive as compared with the steam locomotive.

5. The increase in the size of transmission systems throughout the country not only makes electric power more readily available to the railroads but increases the facility and ease with which the fluctuating railroad loads can be carried.

6. The improvements in trolley design and construction, which are constantly reducing costs per track-

PHILADELPHIA PASSENGER TERMINAL
BROAD ST. — PENNSYLVANIA R.R.
NEW YORK FREIGHT TERMINAL
N.Y., N.H. & H.R.R

ELECTRIFICATION HAS PROVED THE MOST ECONOMICAL MEANS FOR CARING FOR TRAFFIC AT TERMINALS LIKE THESE

mile. Because of the number of track-miles involved, this reduction of the cost of overhead construction will have an important influence on railroad electrification.

7. Improvements in the standards for freight car equipment which will permit trains of greater tonnage to be hauled in the future. The power capacity of electric locomotives being practically unlimited, these heavier trains can be hauled electrically over existing grades, but to handle them with steam would require most extensive grade revisions.

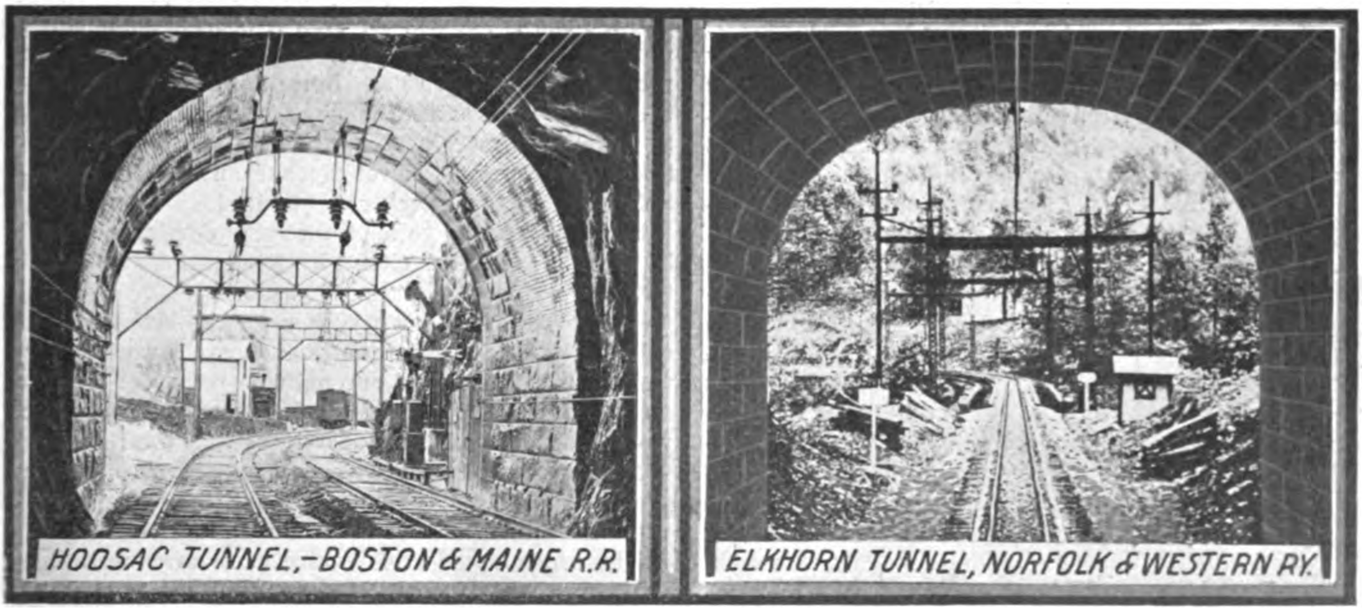
8. Greater regularity and reliability of operation. One of the important results of every electrification has been improvement in service. The New York Terminal locomotives of the Pennsylvania Railroad have, for example, a record over a term of years of 100,000 locomotive-miles for each case of detention. Such accomplishment in maintenance of schedules directly increases capacity.

THE IMMEDIATE OUTLOOK

With the unification of the direction of the railroads by the action of the President it is expected that capital expenditures during the war will be governed by broad consideration of traffic necessities, conservation of fuel and conservation of man power. In those situations where traffic congestion is most acute relief will be available in some cases through the utilization of existing electric generating stations, so that the construction involved would be limited to that of locomotives, substations and trolley installation, and would therefore involve a minimum diversion of effort.

The means by which this can be accomplished remains to be developed. If the improvements are for the benefit of the nation and the property concerned, the financial means will be forthcoming.

A hopeful view of the situation is that full opportunity for the continuance of individual incentive and ability will prevail, so that the splendid achievement, so characteristic of past American railroad history, will obtain in the future. The further upbuilding and improvement of the transportation facilities for the country should unquestionably be the dominating part of our activity after the war, so that certain electrification, desirable but deferred, should now be planned for, to form part of the nation's immediate constructive program as soon as opportunity affords.


HOOSAC TUNNEL,-BOSTON & MAINE R.R.
ELKHORN TUNNEL, NORFOLK & WESTERN RY.

ELECTRIC LOCOMOTIVES ALSO SAVE THE COST OF ADDITIONAL TRACKS IN CONGESTED SERVICE ON MOUNTAIN DIVISIONS

Applying Engineering and Selling Principles to Electric Railway Transportation

By J. F. LAYNG

Railway and Traction Engineering Department
General Electric Company

A Discussion of the Present Situation and Its Connection with the Conservation of the Nation's Resources; of the Electric Railway's Need for Statistical and Analytical Data; of the Economies Possible with Better Equipment and Scientific Running in Co-operation with Regulatory Bodies, and of Improved Relations with the Men

The Situation To-Day

The Need for Conservation of the National Resources in Fuel and Labor Intimately Connected with the Electric Railway's Problem of Meeting Automobile Competition and Higher Costs of Operation

THE electric railways are faced by something actually worse than the question of the price of their necessities—they are likely soon to to be told by the government that they must give an accounting for the efficient employment of every kilowatt hour of energy, of every ounce of material, and of every hour of labor that they use, no matter what prices they pay for them. The question of fuel is in the foreground now, but as the war advances this "show me" attitude may be carried over to many other items.

Many of the betterments possible on electric railways, like longer spacing between stops, the rerouting of cars, the application of anti-blockading ordinances are not up to the railways but are dependent upon the good will and intelligence of the public and its representatives. Such relief would not only go far along the road of patriotism, but prove a permanent benefit to electric railways and to the communities which they serve. Other betterments, such as improved cars, in many cases, have been beyond the means of the properties which have been forced to use the cars they had because they could not afford to purchase the latest models. The suggestions made in this article should therefore be understood as applying only to those conditions in which their introduction is practicable.

10,000,000 Possible Competitors

At the very beginning of any campaign to improve electric railway conditions we must take into account the highly wasteful competition of the automobile. It is possible that the need for conserving gasoline may lead to the prohibition of the automobile for pleasure riding. This, however, would be only a war-time measure. Then the automobile would resume its present attacks on the stability of the electric railway industry unless it could be met by thoroughgoing changes in present methods of operation.

That this competition is serious is known to most managers through individual experience. Yet how many of us realize its scope throughout the nation at large? Perhaps the following figures, furnished on Nov. 28, 1917, by the Automobile Chamber of Commerce, may prove not only enlightening, but startling.

Of 4,243,139 self-propelled vehicles in the United States in use up to July, 1917, 3,843,139 were pleasure cars and 400,000 are auto-trucks.

During 1916 the United States produced 1,617,708 passenger automobiles and 90,000 trucks; and during the fiscal year ending June 30, 1917, 1,693,994 passenger cars and 112,200 trucks. In addition to these figures, the Automobile Chamber of Commerce in New York offers such staggering data as the following:

Wholesale value of motor-driven vehicles produced last fiscal year	$917,470,938
Capital invested in automobile and motor truck plants	$736,000,000
Body parts and accessories, capital	$1,000,000,000
Capital invested by automobile and truck dealers, garages and supply houses	$920,000,000
Employees of automobile and truck companies	280,000
Employees of manufacturers of accessories and body parts	650,000
Employees of dealers, garages and supply houses	368,000

The pleasure cars alone call for an expenditure of $200 a year each, making the stupendous total of $768,627,800, which actually exceeds the present annual receipts of electric railways by more than $150,000,000! But the end is not yet, for even if 500,000 automobiles were scrapped during 1917, the net addition to the ranks would be 1,500,000. Since automobile manufacturers place the saturation limit of the United States at 10,000,000 machines, continuation of present electric railway practices would make automobile competition three times as severe as to-day!

It would be folly to hope that this development will be seriously checked either by temporary war conditions or by the exhaustion of gasoline.

In offering the following ideas for the betterment of existing electric railway practices, for the two-fold purpose of conservation of our national resources and the maintenance of electric railway service for the public, we would not have the reader infer that even if all of these ideas were to prove as good in performance as in prophecy, the need for more revenue from transportation would vanish. There are roads to-day, for example, which would still require more revenue if they got their energy for nothing.

Of all the departments, that of conducting transportation offers the greatest possibilities in the way of economies and larger receipts, largely because in the past electric railway companies have had less of a free hand in this department than in any other. Should new apparatus promise a saving of a considerable percentage in the power station, the cost of the new equipment is balanced against this proposed saving, and if a definite advantage is to be gained, the company will order the equipment. In the transportation department, however, where a new system of routing, longer spacing between stops or other improvements promise an equal saving, quick action is not so possible. The authorities, represented by the commissions or municipal authorities, have to be consulted. Moreover, the public is usually very conservative as regards changes in transportation methods, and the labor element is also very jealous of what it considers its prerogatives.

Possibilities in Transportation

Nevertheless, in the study for economy, the transportation department deserves vastly more attention than the engineering department, partly because its expenses represent such a large part of the total expenditures for operation and partly because its methods being less susceptible to mathematical laws than engineering practice, there has been less uniformity in them. In spite of this fact, railway companies are standardizing more and more on transportation methods in their effort toward economical operation in order to make the present campaign for higher fares 100 per cent perfect.

* * *

The Railway Manager Has the Biggest Job in Town

Therefore His Problem Is to Secure the Principal Community Statistics. Some Sample Graphs Are Presented, Chiefly from Chamber of Commerce Records

IN NOVEMBER, 1917, during the coal stringency the railways of Kansas City received preference to private consumers in fuel allocations while, in December, the Cleveland Railway received preference over lighting—an eloquent tribute to the primacy of the electric railway.

Knowledge Is Power

But now let us go to a more specific matter in illustrating the old saying "Knowledge is Power," namely:

Since the railway manager has the biggest job in community development, he ought to know more about the past, present and future of the town than anyone else. Otherwise how can he shape the policy of his company to conform to changed conditions or prove to the investor that his town is coming instead of going?

In a growing community a railway manager can get a great deal of helpful information from the following:

First—Graphs of the increase in population according to the shortest intervals available. Figs. 1 and 2 present such graphs for two American cities, both being reproduced to show how the ratios of increase may differ. Nor should we stop here. If at all possible, similar graphs should be made by districts, to determine where track should be put down and where track should be pulled up.

Second—Graphs of growth of employment establishments and wage earners. Fig. 3 shows that these two elements in city growth are by no means parallel. A slight increase in shops against a big increase in men discloses a greater likelihood of congestion than if the shops also had increased in the same ratio. Factory capacity is usually increased vertically or by annexes; but factory number is usually increased by new construction in another district. Some railways, in the absence of these graphs, have overlooked developments like these; or, contrariwise, have continued excess service to a rundown factory district.

Third—Graphs which indicate the financial progress of the community, such as value of products, capitalization, cost of material and wages (Fig. 4) and the bank clearings (Fig. 5). Bank deposits should also be plotted. Such graphs as these will speak in mighty convincing tones alike to the banker, the board of directors, the management and the community.

* * *

Keep Graphic Records of Railway Statistics

How the Expenditures of Each Department Can Be Checked Against Preceding Years and Their Corresponding Gross Earnings

IF IT IS important to chart community statistics, it is vital to chart company statistics. Some men are mathematical wizards who can see a picture in the mind's eye; but most of us, including the board of directors, need direct, concrete charts.

To know how the general finances are tending, most managers keep graphs of the gross earnings, operating expenses, interest charges, net earnings, taxes and the remainder necessary for paying the interest on stocks, bonds, mortgages and reserve funds. They are usually made on what is commonly known as a twelve-months' ending curve, namely, each point on the graph represents the business of the preceding lunar year, like January to December, February to January, inclusive, etc. When we plot the graph on this basis, the influence of fluctuations is decreased so that it is easier to form a direct idea of general tendencies in either the increase or decrease of the different items. This is illustrated by Fig. 6.

Other important studies are the preparation of graphs to show the gross receipts, increase in population and car-miles. On the same chart are plotted receipts per capita, car-miles per capita, etc., as in Fig. 7.

Comparisons of Departmental Expenditures

To find if the expenditure of the various departments varies in the same ratio as the gross income of the company, graphs are prepared of the gross receipts, total operating expenses and car-miles, as in Fig. 8. It is good practice to show the gross and operating expenses in total dollars, while plotting directly underneath it the receipts, operating expenses, cost of conducting transportation, power, maintenance of way and structure, maintenance of equipment and general and miscellaneous expenses in cents per car mile. With the car-mile basis, the manager can see at

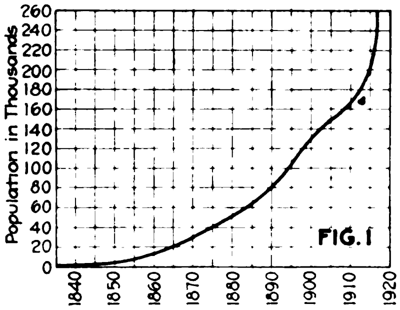


FIG. 1

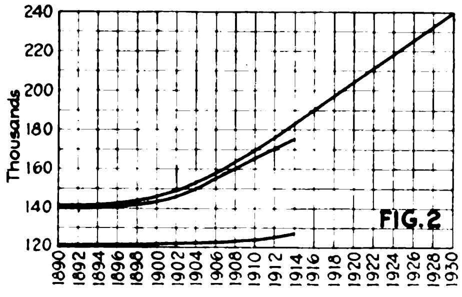


FIG. 2

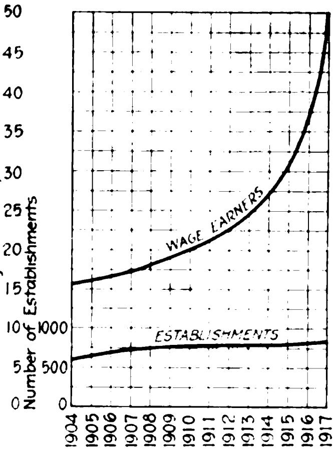


FIG. 3

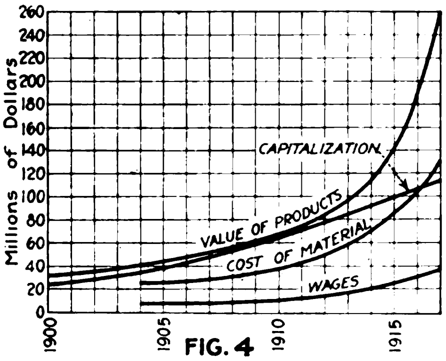


FIG. 4

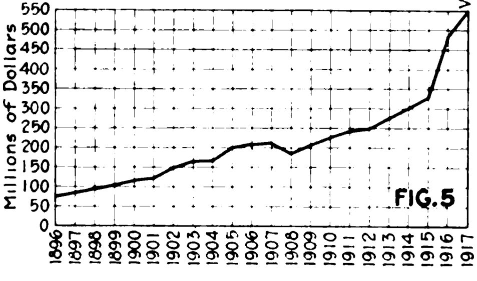


FIG. 5

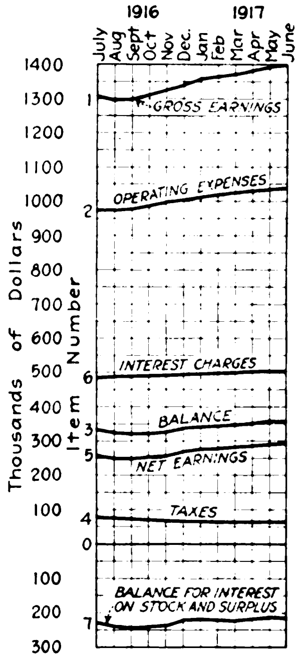


FIG. 6

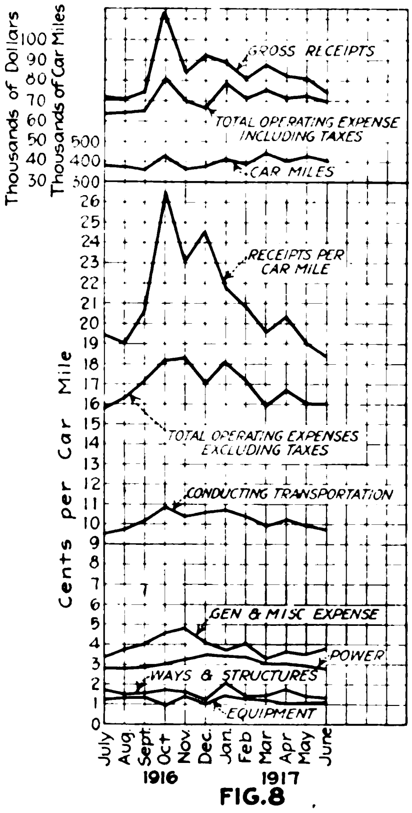


FIG. 8

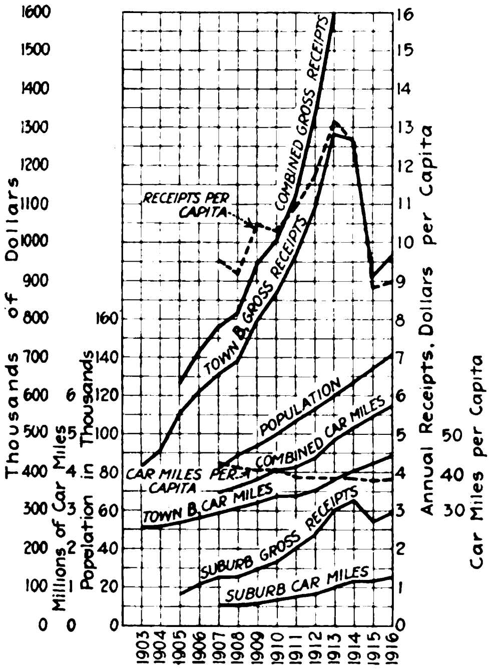


FIG. 7

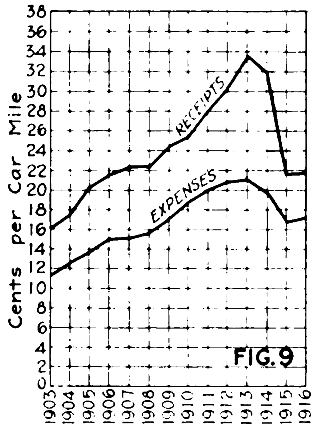


FIG. 9

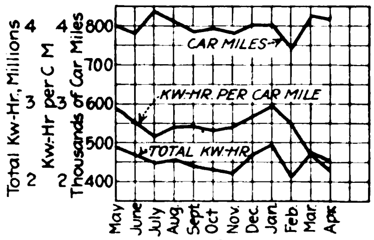


FIG. 10

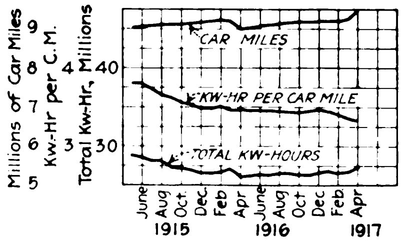


FIG. 11

GRAPHICS OF ELECTRIC RAILWAY TRANSPORTATION—PLATE I

Fig. 1—Growth in Population, Town A

Fig. 2—Growth in Population, Town B, from Top Down, Combined, City and Suburbs

Fig. 3—Relation Between Growth in Numbers of Wage Earners and Establishments

Fig. 4—Relative Increases in Value of Products, Capitalization, Cost of Material and Wages, Town A

Fig. 5—Record of Bank Clearings, Town A

Fig. 6—Company Records, Town B, Suburbs Included.

Fig. 7—Company Records, Per Capita Data, Town B, Suburbs Included

Fig. 8—Total Departmental Data, Town B, Suburbs Included

Fig. 9—Gross Receipts and Operating Expenses Per Carmile, Town B Alone

Fig. 10—Car-miles and Energy for One Year by Months

Fig. 11—Car-miles and Energy for Two Years by Months

once if departmental expenses are increasing or decreasing in proportion to the railway's gross earnings. An opportunity to compare relative total operating expenses and receipts on a cents per car-mile basis is presented in Fig. 9.

It is suggested that these graphs be made on charts of wall-map size, not only for easier reference, but for use in discussions with employees, the public and regulatory bodies.

Of course, in making comparisons of total and departmental expenditures we should be sure that apparent savings in way or equipment maintenance, power or transportation expenses are really savings. They may be merely transfer charges, as when a saving in power possibly is transferred to the cost of transportation. Therefore, each saving must be considered in the light of what effect it will have on other costs.

The importance of departmental studies like Fig. 8 is emphasized by comparisons with the statistics of the United States Census Bureau. Its 1912 report shows that of the gross income of all the electric railways of the United States, the 58.18 per cent operating ratio was divided as follows:

Maintenance of way and structures	8.17 per cent
Maintenance of equipment	7.06 per cent
Transportation	24.42 per cent
Power	9.00 per cent
General expense	9.53 per cent
Total	58.18 per cent

We all know that the recent exceptional increases in the price of labor and material will raise this percentage. Thus the figure for transportation expenses is nearer 35 and 40 per cent than 24.42 per cent.

It would seem advisable also to include the depreciation, contingency funds, taxes and terminal charges in the operating ratio to obtain a true idea of what it really costs to conduct electric railway business.

* * *

What Lines Are Making or Losing Money?

Costs and Earnings of Individual Lines Should Be Known to Give Service with Satisfaction to the Public and Profit to the Railway

THE same method of analyzing accounts applied to the system as a whole should be extended to the individual lines. Not to have such data is to be in the position of a manufacturer who has a surplus or deficit (more often a deficit), yet cannot place the responsibility for the result.

It is absolutely vital to know the earning value of each line by itself; and not the least important reason is the ability which it lends to a manager to prove his case when he is asked to make an unreasonable increase in service.

He knows, for example, that an extra stop slows down schedules and costs money but he must prove this to the satisfaction of the complainants in figures, for his say-so is no better than that of any other man.

Figs. 10 and 11 contrast the average car-mile earnings, car-hours and car-mileage of a certain city with those of its best-paying line. Going still further, Fig. 12, we get a contrast of all the lines individually (on another system) revealing the perceptible disproportion between car-miles and earnings per mile. The operating expenses of a line may seem to be reasonable when measured on a car-mile basis but be found unduly high when measured on a car-hour basis. For this reason, if a railway has the information figured on a basis of both car-miles and car-hours, it comes pretty close to knowing what parts of the system are bringing in the net income, where service should be added and where it should be taken off.

Further Segregation of Accounts Necessary

By further segregation of the standard classification of accounts, the cost of operation of individual lines can be obtained. Thus where several lines operate over one track, the expense of maintenance and operation can be distributed in proportion to the car-mileage of the individual lines.

More refined methods of determining both costs and possible economies and improvements will be found in the traffic studies presented later. These studies will take up schedule speeds, stops, length of stops, voltage, car weights, grades, number of passengers carried in different zones, etc. By giving such points due consideration, we can find directly the cost of giving additional or decreased service. To have exact facts, of course, will put an entirely different face on arguments concerning public policy, and make it quite impossible to ask impracticable things from the railway.

When the service of the individual lines is analyzed, it is well to consider the cost or appraisal value of each of the lines which we are comparing. Frequently, a large amount of money necessarily has to be invested to construct over a bridge or some costly fill—items which are not taken into consideration when operating costs only are borne in mind.

* * *

Car Turn-back Statistics, the Proof of Unnecessary Service, Are of Immediate Value

A Periodical Traffic Analysis of Each Line, Made with the Aid of the Conductors, Will Eliminate Waste Mileage by Indicating Desirable Turn-back Points

STILL another subject of profitable study for the average road is a careful analysis of the turnback situation. Indeed, a company whose needs do not require the compilation of any extended system of graphs will yet find it worth while to take up the subject of passenger loading for turn-back points and the requirements of car capacity. The savings possible in this direction, when they are tabulated and put before the local authorities, will often help a company in receiving permission to extend its system of turn-backs. The greatest gain possible from turn-back cars is to apply them, in whole or in part, for more frequent service on the heavily traveled portion of the line or to take care of increased business without buying new cars.

To determine the turn-back points for any particular line, it is necessary to analyze the passenger loads on all cars at all hours of the day. It is just as wrong to run too much mileage as too little mileage; in one case the hardship suffered by the company is reflected in its finances; in the other, the hardship borne by the public is reflected both in the decreased earnings and in the increased dissatisfaction. Only an actual survey will bring out these facts, as register turn-ins are useless for records of travel over different parts of one line.

All operators know that the heaviest passenger loads usually are found in the congested portions of the city. This load tapers off gradually as the car advances toward the outer terminals or drops sharply at certain crossings, like transfer points. A few lines may have one or more traffic centers, but this general fact holds.

Principle of Turn-back Is Sound

Despite general knowledge of the "turn-back" principle, "turn-back" service is not used as extensively as it should be. In some cases no attempt has been made to work it out; in others the public has become prejudiced against the system either because the car marker signs were not easily legible or because the question of whether the car should go on or turn back has been left to the will of the individual car crew instead of being placed in the hands of inspectors or of a central dispatcher.

A gratifying feature about the turn-back traffic survey is that except possibly in the largest cities, a company can very easily get, at very little extra expense, all of the information necessary for it to determine turn-backs pretty closely, from its own staff of conductors and inspectors who have already an intimate acquaintance with the cars and their routes.

Quite recently a traffic survey was conducted of all the lines in a city of 150,000 population. It was not necessary to call in any outside help. Eight regular employees transcribed all the information from the conductors' cards and made the graphs within six days from the time we began. Similar surveys have been made in cities up to 300,000 population.

Simultaneous Check by Conductors

With other systems of checking it is necessary to have so many men that usually only one line can be surveyed at a time. With the conductor's card system it is possible and usually advisable to make all observations on all lines at one time. A simultaneous one-day survey avoids errors due to the variations in gross receipts even on successive week days. It is not uncommon to find variations of 25 to 33⅓ per cent on individual and groups of lines; so the picking out of "typical" days with traffic survey systems other than this is extremely difficult, if not impossible.

It is not asserted that the system recommended is as complete as those of our largest engineering organizations, but it is good enough and sufficiently comprehensive so that a survey which will enable the local manager to give the best service with the least waste of mileage may be obtained. Aside from this, periodical checking of traffic for changes in turn-backs are necessary in any event.

To get these data, the superintendent or manager instructs the conductors to count the number of passengers at each point selected, as shown in the instructions on page 28.

Each conductor also receives a printed card, Fig. 13, for writing down his figures. This card carries the name of the possible "turn-back" streets, the line on which the data are taken, the date, car number, conductor's number, conductor's name, run number and trip number. It is necessary to have all these data to be certain that all cards have been turned in by the conductors and that all the facts needed for the graphs are at hand. Such a card should be about the size of a regular trip card, so that the conductor can fold and place it in his pocket.

To turn back or not to turn back should not be left to the varying judgment of platform men.

Data Helpful to the Men

When orders for the count are issued, the conductors should be informed that it has absolutely nothing to do with register readings; that the management simply wants to secure the most even distribution of passenger loads in all cars at all times, from which it naturally follows that the work of the conductors will also be more evenly distributed when the necessary changes are made.

It is realized that at certain times of the day the conductor will not have the time to make accurate notations just at the point where the count should be taken, so he should be requested to bear this in mind and do the best he can.

Ordinarily it is best to take this traffic count for two or three days, using but one day's figures for the analysis. As the men need a little time to understand exactly what is wanted it is best to discard the first day's count. When this count reaches the office, the delinquents are reinstructed, and usually the second and third days' cards are found in good shape.

Experience shows that the conductor's counts are as accurate as those taken by paid outsiders. The difficulty with outside workers is that the observer must have some training, while an experienced conductor can tell instantly and instinctively how many passengers are in his car without one-by-one counting.

Within the downtown section or in heavy traffic districts, the count should be taken about every 1200 or 1500 ft., and in the outer sections about every 2000 or 3000 ft. On a line 5 miles long the data on ten or twelve checking points will show at a glance the extent of over-loading or underloading of the cars, and consequently the changes desirable in the number and capacity of cars routed to each point. The form on pages 28 and 29 shows the distribution of data as tabulated from the cards turned in by the conductors.

Uncle Sam appreciates the need for electric railways. They are in the first ranks in the allotment of coal.

Determining the Size of Car Necessary

From the Turn-back Records It Is Possible to Get Maximum, Minimum and Average Car Loadings Hour by Hour and to Check Them Against Seating Capacity

THE data from the turn-back studies may be used for chief aid in determining another important matter: *The best size of car.*

To do this we must develop loading graphs which will show at each checking point the maximum and minimum number of passengers on all cars at hourly intervals throughout the day, the two classes of loading graph being contrasted with the straight line which represents the seating capacity and with the derived graph of average loading. It is this "average loading" which should determine the size of the car best suited for the line.

For instance, an examination of the upper graphs in Fig. 14 shows that the car should be a little larger to care for the worst condition or that more of the present type should be operated. By making similar studies for say a dozen points (as indicated in Figs. 15 and 16) we can decide definitely what is the best car for the line as a whole, while for the congested sections we can arrange shorter headways through turn-backs or trippers.

Again, we may look at the question in another way: Will the combined effects of increased rates of acceleration and braking, shorter length of stops, fewer stops per mile, etc., be of sufficient importance to give a shorter headway with the same number and size of cars now in use? We must not ignore the probability that shorter headways will bring more gross revenue.

Such studies as these should be considered in connection with the analysis of line travel by zones as detailed in the following paragraphs.

Study Traffic by Zones

Both in securing general data on a line and the making of schedules it is best to divide the line into zones. In the downtown districts the travel is congested and stops frequent, so the running time must necessarily be relatively slow. As we leave the center of the city, stops are less frequent and vehicle and pedestrian interference greatly reduced; therefore the schedule speed is much higher. When we also consider the possible turn-back points, we are ready to lay out the following data:

1—Distance

2—	Running Time	Stops	Length of Stop	Schedule Speed	Average Voltage
A.M. rush..........	......	....	......	......	......
A.M. non-rush.......	......	....	......	......	......
Noon rush...........	......	....	......	......	......
P.M. rush............	......	....	......	......	......
P.M. non-rush.......	......	....	......	......	......
Evening..............	......	....	......	......	......
Night................	......	....	......	......	......

3—Curves and grade condition

4—Special traffic conditions

When we have these data (see Fig. 17) plus the schedule possibility of each car, we know if we are getting all out of our equipment that is advisable, making due allowance against a schedule that is "too tight" to keep the men ambitious to hold the cars to time. The stops given in Fig. 17 are equivalent stops, and include slowdowns.

At any rate, we are now armed with definite information and can take up intelligently such problems as municipal traffic rules to secure the street car a right-of-way that will increase the schedule speeds so that it will not be necessary for the crew to take chances in meeting tight schedules.

Or to take a less obvious condition: Exact knowledge of the voltage in each of the zones will show if the bonding is right or if there is enough feeder in the section observed. For example, Fig. 18 shows how radically the schedule speed or mileage output of a car is affected over a range of 400 to 600 volts. What this low voltage means can therefore be calculated directly in dollars and cents so that it is easy to determine whether it will pay to buy better bonds, use automatic substations, install more feeder copper or to take any other measures that will improve the quality of service while lowering the cost of service.

Table 1—Schedule Speed Efficiency as Affected by Voltage

Stops per Mile	400-Volt Schedule		500-Volt Schedule		600-Volt Schedule	
	M.P.H.	Per Cent	M.P.H.	Per Cent	M.P.H.	Per Cent
3	12.4	79	14.2	90.5	15.7	100
5	11.0	84	12.2	93.2	13.1	100
7	9.9	86.6	10.75	94.3	11.4	100
9	9.1	91	9.6	96.0	10.0	100

Calculated on basis of tangent level track and without leeway.

From Fig. 18, just mentioned, Table I has been prepared to show the schedule possibilities with a 20-ton car at 400, 500 and 600 volts.

* * *

A Statistical and Schedule Department of Value

Statistical and Schedule Functions Should Naturally Be Placed Under a Transportation Engineer—The Service Fundamentals

WHAT has already been said about the essential records required by an electric railway indicates the need for a statistical department. Preferably this bureau should be combined with the schedule department because most of its work bears so directly upon transportation problems.

The work should be guided by an experienced transportation engineer who would have the tact to co-operate with all of the other departments and who would also have the ability to analyze every function of operation. To make a success of this department, it is also necessary to have its findings presented to the chief executive in such a way as to make its studies of practical instead of theoretical value.

This would be the department to prepare all the graphs mentioned in the different portions of this study. The chief executive of a railway may lack the time for details, but it is his duty thoroughly to review all of the phases of the work of this department, to keep in touch with the transportation engineer and to

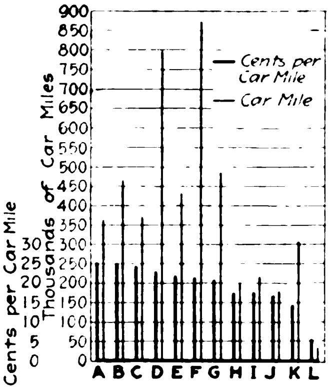
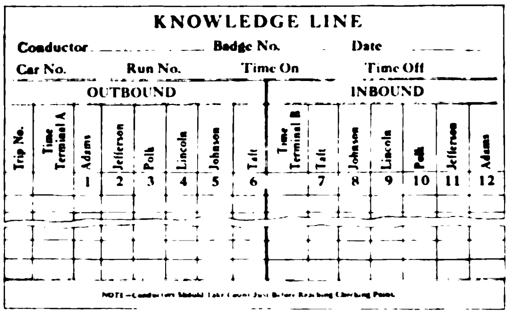


FIG. 12



KNOWLEDGE LINE

Conductor ________ Badge No. ________ Date ________

Car No. ________ Run No. ________ Time On ________ Time Off ________

OUTBOUND								INBOUND						
Trip No.	Time Terminal A	Adams	Jefferson	Polk	Lincoln	Johnson	Taft	Time Terminal B	Taft	Johnson	Lincoln	Polk	Jefferson	Adams
		1	2	3	4	5	6		7	8	9	10	11	12

NOTE—Conductors Should Take Count Just Before Reaching Checking Point.

FIG. 13

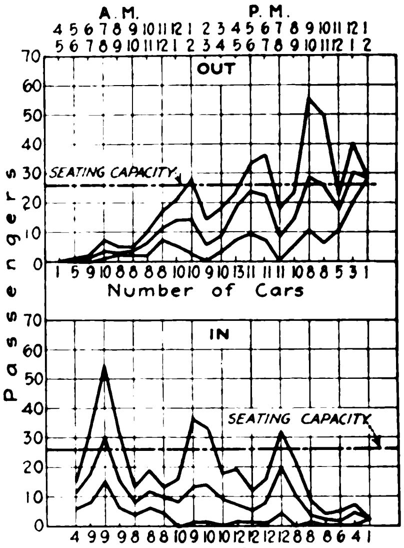


FIG. 15

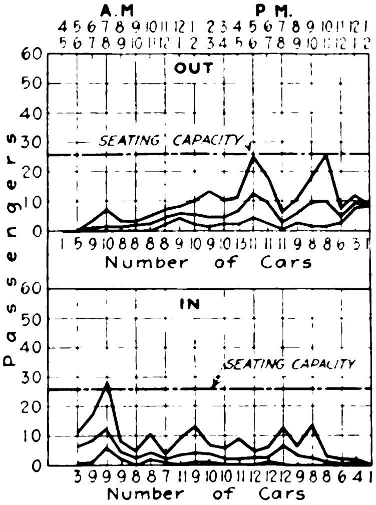


FIG. 16

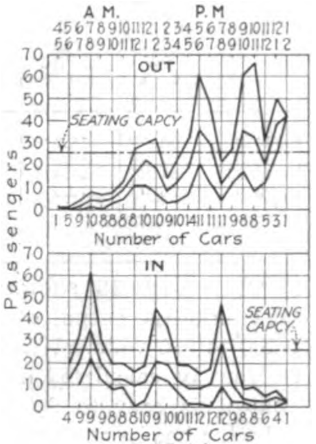
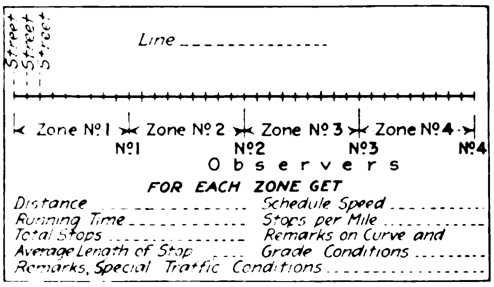


FIG. 14



Line ________

FOR EACH ZONE GET

Distance ________ Schedule Speed ________

Running Time ________ Stops per Mile ________

Total Stops ________ Remarks on Curve and

Average Length of Stop ________ Grade Conditions ________

Remarks, Special Traffic Conditions ________

FIG. 17

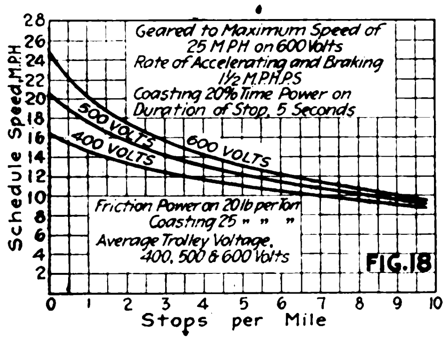


FIG. 18

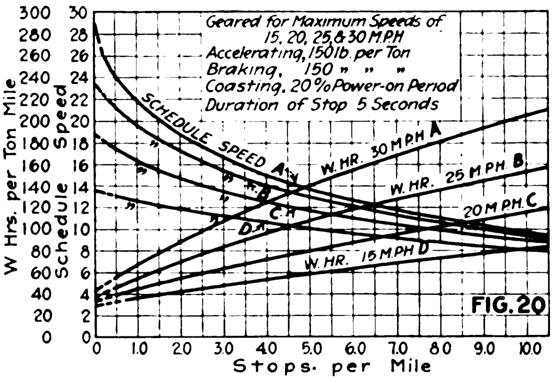


FIG. 20

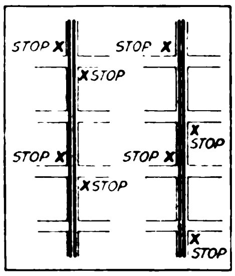


FIG. 23

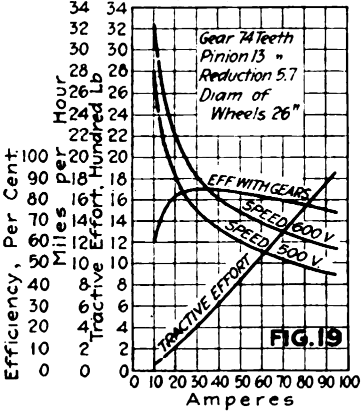


FIG. 19

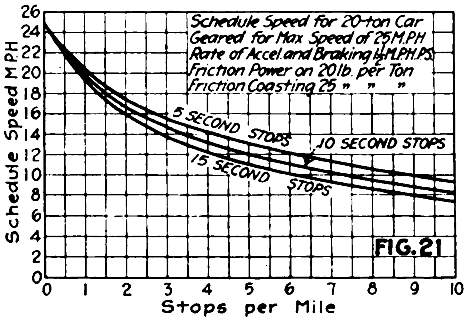


FIG. 21

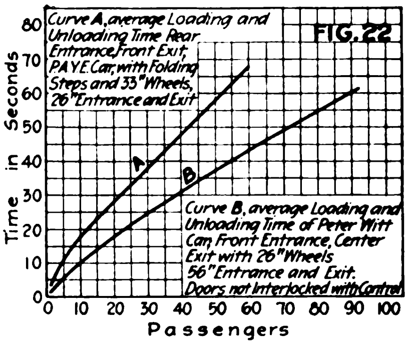


FIG. 22

GRAPHICS OF ELECTRIC RAILWAY TRANSPORTATION—PLATE II

Fig. 12—Gross Earnings Per Car-mile

Fig. 13—Blank Form for Traffic Count

Fig. 14—Determining Car Loading

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Fig. 23—Comparison of Skip Stop (Left) and Stagger Stop (Right)

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A truly scientific schedule department will solve many problems that cannot well be handled directly by the operating department. For example, there is the problem of determining whether it is desirable to have four different running speeds a day; and if so, what are the most economical figures, the question of balancing platform cost against power voltage, and others.

Or if it is a problem of removing an obstacle not within the control of the railway, such as vehicular and automobile congestion, better results will be obtained by publishing charts of surveys and detail reports of the delays so caused to the riding public than any amount of recrimination without evidence. If parking and safety zone ordinances are wanted, let this department prove the necessity for them.

In the past it has been too often the practice to lay out schedules on what might be termed the "cut and try" method. By this is meant that a trial car is operated over the line, usually under the supervision of some competent man, and the running time so made generally determines the future schedule.

On the other hand, every individual type of car has a certain schedule possibility which is almost entirely determined by the free running speed of the equipment, the arrangement of passenger interchange and fare collection facilities. The free running speed of each car being known and the other conditions outlined in the present study being reviewed, schedules can be calculated, based on what each type of car is actually capable of performing. Schedules prepared on such a basis should prove more satisfactory than those established by guess, although they should, of course, be carefully checked by actual trial as formerly.

To facilitate the making up of schedules on this basis, two graphs, Figs. 25 and 26, will be discussed later in this study; one for a 20-ton car and one for a 7½-ton car. These graphs give the schedule speeds which are possible with an equipment geared for any free running speed within certain limits. It is appreciated that the voltage will change the free running speed. The average voltage can be obtained by observation and due allowance made in the free running speed. With but a very small commercial error, free running speeds of all cars decrease in proportion to the voltage, as outlined later.

We may now proceed to a study of the service fundamentals of Safety, Comfort, Speed, Stops, Weight and Costs.

Higher voltage means higher schedule speed.

The First Service Fundamental Is Safety

Faster Schedules Are Not Incompatible with Greater Safety as the Maximum Running Time May Be Even Lower Than Before

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* * *

The Second Service Fundamental Is Comfort

Modern Heating, Lighting, Ventilation, Smooth Acceleration and Correct Seating Are All Factors in Comfort

THE comfort of the passenger is second only to his safety. Bare lamp lighting, non-regulated heating and monitor-sash entrances for drafts are giving way to the non-glaring fixture, the thermostat and the mechanical ventilator. What is most satisfactory, too, is that modernizing all of these features saves money in lamp renewals, energy consumption and car construction even if it should fail to add one extra fare to the revenues of the railway.

Still another factor in car comfort as well as accident prevention is that of smooth acceleration. It is not the rate of acceleration that makes for discomfort as much as it is the layout of resistor steps and the ignorance of the motorman. If the steps are correctly reset, half of the car troubles are over; and if automatic acceleration is adopted, all of these troubles are over.

* * *

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This is directly affected by the free running speed of the car, namely, the speed which a car will ultimately attain if the controller is at full "on" position and the car is running on tangent level track.

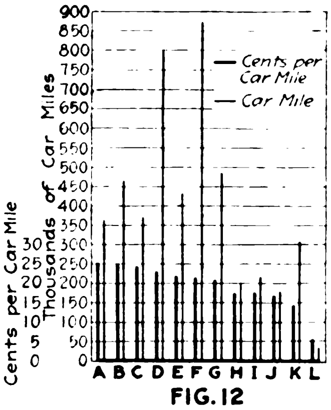
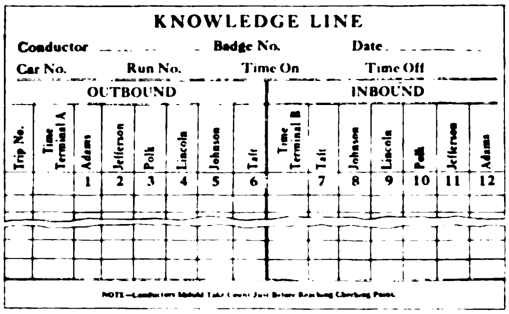


FIG. 12



KNOWLEDGE LINE

Conductor ________ Badge No. ______ Date ________

Car No. ______ Run No. ______ Time On ______ Time Off ______

OUTBOUND								INBOUND						
Trip No.	Time Terminal A	Adams	Jefferson	Polk	Lincoln	Johnson	Taft	Time Terminal B	Taft	Johnson	Lincoln	Polk	Jefferson	Adams
		1	2	3	4	5	6		7	8	9	10	11	12

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FIG. 13

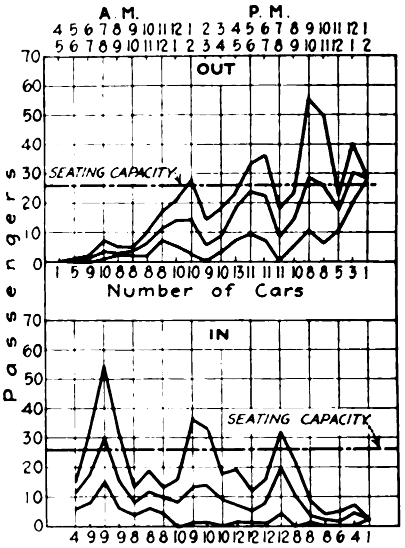


FIG. 15

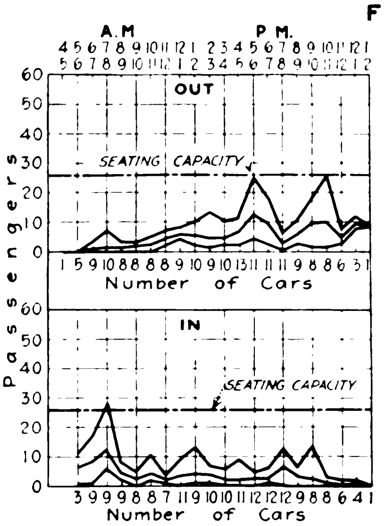


FIG. 16

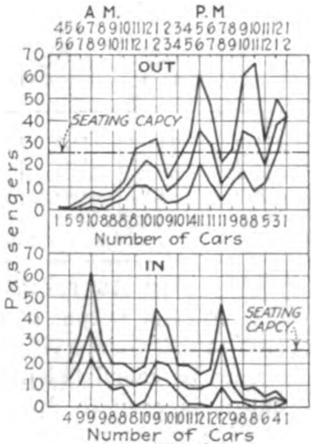
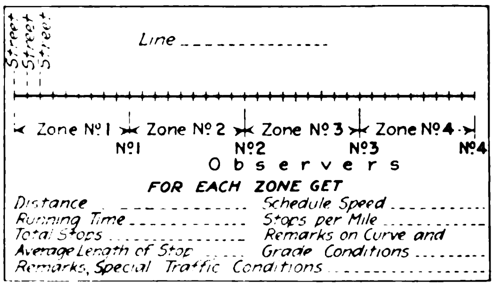


FIG. 14


Street
Street
Street
Line ______________
Zone Nº 1 Zone Nº 2 Zone Nº 3 Zone Nº 4
Nº1 Nº2 Nº3 Nº4
Observers

FOR EACH ZONE GET

Distance ________ Schedule Speed ________
Running Time ________ Stops per Mile ________
Total Stops ________ Remarks on Curve and
Average Length of Stop ________ Grade Conditions ________
Remarks, Special Traffic Conditions ________

FIG. 17

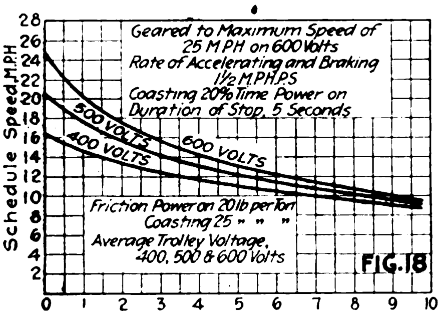


FIG. 18

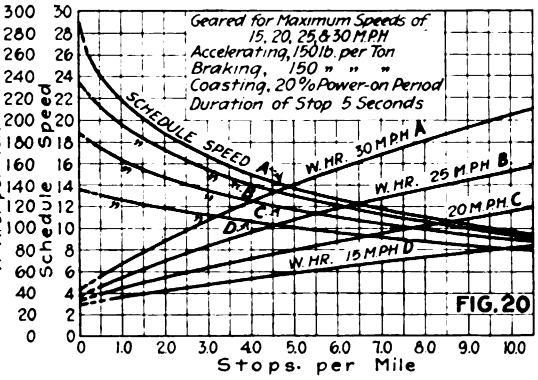
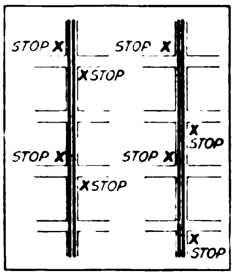


FIG. 20


STOP X
STOP X
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STOP X
STOP X
X STOP
X STOP
X STOP
X STOP

FIG. 23

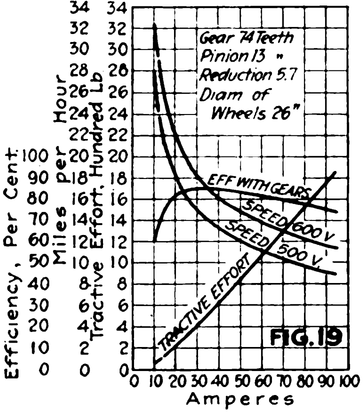


FIG. 19

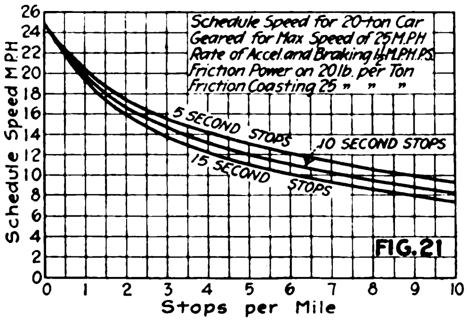
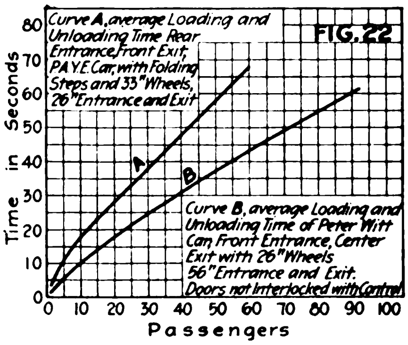


FIG. 21



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This speed can be raised or lowered by changing the gear ratio. This change affects directly the amount of energy used and so has certain practical limitations set by the horse-power capacity of the equipment. It is always safe to lower the free running speed of the car, assuming this to be advisable, but when the speed is raised it is well to consult the equipment manufacturer and give him all the operating conditions before making a change.

We will assume that we desire to find the full running speed of a car weighing 34,000 lb. complete with all equipment ready to roll. We will also assume the car has 6000 lb. of passengers, which gives a total load of 40,000 lb. We will also assume that this car is equipped with four 25-hp. motors having 74-tooth gear, 13-tooth pinion and 24-in. wheels, and that the average potential is 500 volts.

To determine the free running speed we first must take the complete weight (including the live load) and get the weight in tons per motor. Since the car weighs 40,000 lb., or 20 tons, and there are four motors, we have 5 tons per motor.

The resistance to the keeping of the car in motion is expressed in pounds torque or drawbar pull. It is generally accepted that for city cars this resistance amounts to 20 lb. per ton. This figure includes the rolling friction, windage and force necessary to keep the rotating parts in motion.

Since the car has a weight of 5 tons per motor, this total resistance per motor is 100 lb. By referring to the characteristic curve of the motor shown in Fig. 19 we first find 100 lb. on the torque curve, and then by reading up to the speed curve we find the car speed at 500 volts is 24 m.p.h. and at 600 volts 29 m.p.h. ,

It will be noted that the speed is increased in almost direct proportion to the increase or decrease in voltage. Theoretically there is some difference, but for practical purposes this difference can be neglected on the light motor loads which are obtained with free running speeds.

Stops Affect Schedule Speed

One of the basic factors in the railway business is the number of stops the car has to make. This factor directly affects the line capacity, numbers of cars for a given service, car-hours, power, maintenance of equipment, size of motors, etc. How many operators know the number of stops that are made on their different lines? How many of them are trying to reduce the number of stops to a minimum? This is one of the largest fields for saving that can be made in car operation to-day.

To know how many stops a car makes per mile is not an abstract engineering question of no vital importance to the operation of the property. Of course, a certain number of cars have to be on a line, but it is possible merely by a change in stops to make fewer cars give the same number of seat-miles. If there are but four cars on a line, the displacement of one car would demand a 25 per cent improvement in operation, which would hardly be attainable if the line is within striking distance of proper operation; but if there are six cars on the line, it is often possible either to give more service with the same number of cars or to give the same service with less cars by a better arrangement of stops and shorter length of stops. Of course, the same percentage of saving would apply to lines with a larger number of cars.

If the service is such that there are nine stops per mile with an average length of stops of five seconds each, the values would be as given in Table II.

Table II—Relation of Free Running Speed to Power Cost, Nine Stops per Mile

M.P.H. Free Running Speed	Schedule Speed	Kilowatt-Hours per Car-Mile at the Car	Power Cost for 40,000 Lb. Car-Miles, 1½ Cents per Kilowatt-Hour at the Car	Per Cent
15	8.3	1.52	$912.00	100
20	9.5	2.16	1,296.00	142
25	9.9	3.00	1,800.00	197
30	10.2	3.84	2,304.00	253

Stops Also Influence Costs

Cars in city service run 30,000 to 50,000 miles per annum. Therefore, 40,000 car-miles per annum is a fair average. To get an idea of what number of stops per mile means on a car geared for 25 m. p. h., free running speed, we can study Table III with considerable profit:

Table III—Relation Of Number Of Stops To Schedule Speed and Platform Wages

Stops per Mile	Length of Stop, Seconds	Schedule Speed, M.P.H.	Car-Hours	Platform Wages at 60 Cents per Hour	Per Cent
5	5	13.1	3053	$2,014.98	100
7	5	11.4	3508	2,315.28	115
9	5	9.9	4040	2,666.40	132

Table III especially emphasizes the advantage of eliminating stops. It also brings out the effect on schedule speed of an increased number of stops and the consequent reduction in speed. The savings of the car-hours and power, the most definite figures which we have, are but part of the savings influenced by raising schedule speeds. For instance, if a car operates at an increased schedule speed, the carrying capacity and service of the line are increased in proportion thereto; or the surplus cars are available for use elsewhere.

A further analysis of these figures brings out some very interesting facts. Assuming that a car is geared for 25 m. p. h. free running speed and is in a service with five stops per mile, the car would then be capable of making a schedule speed of 13.1 m.p.h. If the stops are increased to seven per mile, this figure would be decreased to 11.4 m.p.h. If the stops are increased to nine per mile, the schedule speed will be further decreased to 9.9 m.p.h.

It will be noted that there is 10 per cent leeway in the item for platform wages. This 10 per cent will be carried through on all items where wages are specified hereafter. The reason for this is that the schedules which are specified in every place in this discussion are theoretical schedules. To make them practical it is necessary to add 10 per cent for interruptions in traffic, grades, curves and necessary layovers at the end of the line.

Shorter Stops Mean Lower Costs

The length of stop can also be decreased if passengers are urged both by posters and by word of mouth to board and leave the car as expeditiously as possible, while the conductor should be urged to be prompt in giving signals to the motorman through push-buttons or otherwise. The value of decreasing the length of stop is strongly brought out by the following Table IV and Fig. 21:

Table IV—Effect of Length of Stop on Schedule Speed

Stops per Mile	Length of Stop	Schedule Speed	Car-Hours	Platform Wages	Per Cent
5	15	11.1	3603	$2,377.98	118
5	10	12.0	3333	2,199.78	109
5	5	13.1	3053	2,014.98	100
7	15	9.35	4278	2,823.48	140
7	10	10.3	3883	2,562.78	127
7	5	11.4	3508	2,315.28	115
9	15	8.0	5000	3,300.00	164
9	10	8.85	4519	2,982.54	148
9	5	10.0	4000	2,640.00	131

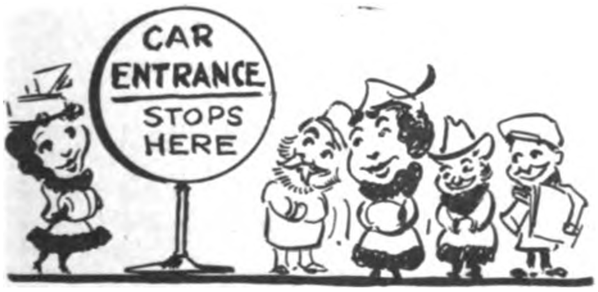
The car on which these figures are based is geared for 25 m.p.h. free running speed. Further, to analyze just what this table means, it might be well to consider a car with fifty passengers. Of course, the entire fifty passengers would not get on the car at the outer terminal of the line, but would be taken on at different points along the route. However, it is fair to assume that out of the fifty passengers twenty-five would be the equivalent number which would be carried over the entire distance.

We will assume that we can reduce the average length of stop from nine seconds to five seconds, saving four seconds per stop. We will also assume the following schedule conditions:

Sixty minutes running time
9 m.p.h schedule speed
Eight and five-tenths stops per mile

It will then be understood that we will have a total of seventy-six stops, and since the time which is saved is four seconds each we shall save 304 seconds or approximately five minutes for the entire run. Since there is an average of twenty-five people and the total time saved on the run is five minutes, the total time saved for all of the passengers will be five times twenty-five or 125 minutes.

It may seem to some that this is figuring down to a rather small point—merely the saving of five minutes on a single run, but as we follow along the argument we can readily appreciate what five minutes means to the entire community.



When you have signs like this or its equivalent, the position of the entrance on the car is a minor matter.

Saving the Rider's Time, Too

Previously we took the average mileage of city cars at approximately 40,000 car-miles per annum. For the sake of argument, we will assume that this car is in a service which averages eight stops per mile. We will also assume that we reduce the length of stop four seconds. This would give a total saving for the year of 1,280,000 seconds or 355½ hours. When we consider that the average passenger load of the car would be approximately twenty-five, it is realized that the accumulated time saved for these passengers represents 8887½ hours.

These arguments illustrate directly the value of a small thing in car transportation. By looking at Table IV—which shows the difference between making nine ten-second stops per mile with seven five-second stops per mile—we see that to operate 40,000 car-miles a car must necessarily be in service 4519 car-hours. This will give a total number of 112,975 accumulated passenger car-hours, while with seven stops per mile and five-second stops, the accumulated passenger-hours would be 87,700. The difference between these two values would be 25,275 passenger-hours. This would be the accumulated time saved by the passengers on each car. If the system operates 200 to 300 cars or more, one can easily realize how this saving for the community is a valuable public service aside from any saving to the railway.

Use Stop Signs Freely

To reduce the length of stop to a minimum, it is advisable to mark all car stops plainly so that both the passengers and train crew will know exactly where the car doors will open. A misunderstanding means the loss of one or two seconds per stop while the passengers are walking up to the car entrance. It is these seconds per stop that in the aggregate are so valuable to the community and to the railway.

If a city car averages 40,000 miles annually and makes six stops per mile, it will make 240,000 stops annually. The average length of stop in city service is seven seconds. If we arrange markings at corners so that passengers will know the exact point at which the car *entrance* will stop and if both train crews and passengers exercise care in the amount of time the car is stopped, we could shorten the average length of stop to five seconds, which is equivalent to a saving of two seconds per stop. For a single car this means a saving in car time of 480,000 seconds annually, or more than 133 1/3 hours.

If the average number of passengers on a car is twenty-five, the annual saving for the passengers in each car would be 3333¼ hours, or, assuming that the average active portion of the day of each person is sixteen hours, this figure would then be equivalent to 208 1/3 days. If figured on a ten-hour day, this amounts to 333 1/3 days for the passengers on a car.

Fifty-three Weeks to the Year!

We have just seen how important decreased stopping time is to both the public and to the railway. The next step is to see how they can co-operate to get the benefit of a smaller number of stops.

When railway officials contemplate inaugurating such service, the number of possible stops and existing stops, including the distances between them, should be tabulated and analyzed. The distance between the new, possible stops should approximate 600 ft.

The first question that will arise will be not the gain of 10 to 12 per cent in schedule speed, but what will the change do for the individual rider? What does five minutes saved per half trip mean to him? Now this amounts to ten minutes a day, and if we allow 300 working days, the total will be 3000 minutes or 50 hours or 6¼ business days of eight hours each—practically a fifty-third week to the year.

As it is not unreasonable to assume that the time of the average car rider is worth 20 cents an hour, the fifty hours saved by cutting the number of stops would have a commercial value of $10 per annum, the equivalent of 200 five-cent rides! In other words, the time saved for the passenger may be greater in value than the receipts per annum per capita! On the basis of 30,000,000 car-miles per annum, one railway is saving $200,000 a year.

As with any other innovation, the public and the regulatory officials should be fully apprised of the railway's plans and purposes, for the success of the fewer-stop service will depend largely upon how it is introduced. To begin with, it is generally recognized that this service should be operated only in the outer district beyond the normal walking zone, and that in the downtown section and at transfer points the cars should make all stops. The near-side stop should be made standard, as this is a great time saver.

Further, the new plan should be introduced in the spring or summer months so that the riders will have learned to appreciate its advantages in the saving of time and the increasing of comfort in riding before the few days of severe snowy weather show them the change in its one unfavorable light. The matter should be thoroughly explained beforehand to the public also, so that the people will understand that they are to be the beneficiaries as well as the railway companies.

Play-Fair or Stagger Skip Stop

One way of operating fewer-stop service is to stop on alternate corners; the other is to have outbound cars stop at one series of corners while inbound cars stop at the other series of corners. The latter method, or "stagger" stop, illustrated in Fig. 23, has the advantage of equalizing the walking done by all passengers, since the passenger who walks an extra block in the morning does not have to do so at night—and vice versa. The stagger stop has been successfully introduced at Cleveland, Detroit, Buffalo, Kansas City and Toledo, and is now being tried at Baltimore, Dallas, Cincinnati and Columbus.

To show that the stagger stop plus walking is quicker for the patron than haphazard stopping, Fig. 24 has been prepared. This shows the time required to walk distances up to 1000 ft. Of course, the distance between stops does not have to be traversed by every individual car user. The greatest distance which he will have to walk will be one-half of the distance between the possible car stops.

It is to be expected that when some stops are eliminated, a few people will appear before regulatory bodies to contend that it is a personal inconvenience for them to walk an additional square. Not only do such complainants fail to consider the benefit to the community in general, but they also fail to appreciate their personal gain and convenience. As for the storekeeper who wants every car to stop in front of his emporium, the rule of the greatest good to the greatest number should be rigidly applied.

It may be interesting to add that in European cities, the spacing between stops ranges from 250 meters (820 ft.) up* and that the stop signs are placed regardless of crossings—a practice which is safer and more equitable than the use of corners.

Save Time in Passenger Interchange

One of the most important studies, especially on city railways, is the proper design of car entrances and exits. These studies should be made in conjunction with different systems of fare collection. To be sure, the height of step, width of entrance and means of signaling from the conductor to the motorman are features which have long been studied. Nevertheless, the variations in the designs of cars purchased by different railways plainly show that the underlying principles of correct design have not yet been properly outlined and universally accepted.

To make the conductor reach up or out to some remote point to pull a bell rope instead of pushing a button on a fare box pedestal seems a trifle; but for the combined stops on a run it surely involves the loss of enough fractions of a second to be exceedingly important. Very profitably could we enter into studies such as those outlined in Frank B. Gilbreth's book on "Motion Study." The number of useless motions that are made by the passenger and also by the conductor should receive careful study. Until this study is made and followed to a conclusion, we shall never have a car which is properly arranged.

In all probability, the ultimate city car will be so arranged that the natural inclination of the passenger will be to follow a series of movements that will result in reducing the length of stops to a minimum. Every railway should study each type of car which it is now operating to ascertain the number of passengers which can be loaded and unloaded within a given time. These graphs of passenger interchange will plainly show the time effect of the different heights of steps, different widths of entrances and different methods of fare collection. If investigations of this kind are carried out we can rest assured that a number of operating com-

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*See Blake & Jackson's "Electric Railway Transportation," page 84.

Table V—Effect of Two Rates of Acceleration and Braking and Different Number of Stops on Power Costs and Platform Wages While Maintaining the Same Schedule Speed

Stops per Mile	Acceleration and Braking Rate	Schedule Speed	Power, Kilowatt-Hour per Car-Mile	Car-Hours for 40,000 Car-mile Operation	Platform Wages per Hour Plus 10 per Cent	Power Cost at 1½ Cents per Kilowatt-Hour at the Car, 40,000 Car-Mile Operation	Total Cost	Per Cent
3	**1½**	15.6	1.84	2564	$1692.24	$1104.00	**$2796.24**	106
3	**2**	15.6	1.56	2564	1692.24	936.00	**2628.24**	100
5	**1½**	13.1	2.28	3053	2014.98	1368.00	**3382.98**	128
5	**2**	13.1	1.90	3053	2014.98	1140.00	**3154.98**	120
7	**1½**	11.4	2.66	3508	2315.28	1596.00	**3911.28**	148
7	**2**	11.4	2.18	3508	2315.28	1308.00	**3623.28**	138
9	**1½**	9.9	3.00	4040	2666.40	1800.00	**4466.40**	170
9	**2**	9.9	2.36	4040	2666.40	1416.00	**4082.40**	155

panies would either dispose of some present equipment or change the entrance, exit and step arrangements to such advantage that a very handsome interest would be returned on the expenditure.

The great importance of the system of fare collection on loading time is shown in Fig. 22, which brings out the greater passenger-interchange speed of the pay-as-you-pass car over a prepayment car in exactly the same service. Thus the pay-as-you-pass car interchanged sixty on or off passengers in forty-three seconds, while the other car required sixty-eight seconds, or twenty-five seconds more!

Accelerate Quickly Brake Quickly

For a long time we have realized that by accelerating and braking at relatively rapid rates we could make faster schedule speeds. To what extent this would affect the schedule speed has not, in so far as the writer knows, been previously worked out. The Twin City Rapid Transit Company has for years been accelerating its cars at a rate of 2 m.p.h.p.s. and also braking at rates which were as fast as was consistent with good practice. Within the last few years the Chicago Surface Lines have done likewise.

To show definitely what can be secured from schedules with different rates of acceleration and braking, three sets of graphs have been made up. Fig. 25 shows a 40,000-lb. car complete with load and geared for a free running speed of 25 m.p.h., assuming a definite length of stop of five seconds. The calculations are made on the basis of accelerating and braking at 1, 1½, 2 and 2½ m.p.h.p.s. With an equipment on cars of this weight the best rate of acceleration which we have been able to obtain commercially is 2 m.p.h.p.s. However, since the future may give us an equipment and car construction which will enable us to accelerate at 2½ m.p.h.p.s. we have included this figure.

On the automatic safety car, Fig. 26, data have been prepared for a car which will weigh complete with live load 7½ tons or 15,000 lb. The rates of acceleration and braking specified for this car are 1½, 2 and 2½ m.p.h.p.s. This car is also geared for 25 m.p.h. free running speed, and we are assuming that the stops are of the same length as for the larger car, that is five seconds. On these two graphs we have taken the example of a car accelerating and braking at different rates and have taken full advantage of all the schedule possibilities of the equipment when accelerating and braking at 1½ m.p.h.p.s. It will be noticed that the power increases with the more rapid rate of acceleration, but that we secure a greater schedule speed.

Another condition which we can consider is that illustrated in Fig. 27. This graph shows the maximum speed which can be obtained by accelerating and braking at 1½ m.p.h.p.s. The power when this acceleration is in use is shown in the upper graph.

We all know that by accelerating and braking at 2 m.p.h.p.s. rather than 1½ m.p.h.p.s. there is a considerable saving in energy consumption, providing the same schedule is maintained in both cases. This fact is brought out by Figs. 28 and 29, which show the power saving which can be made by accelerating and braking at different rates, while maintaining the same schedule. These two graphs are made for cars operating in runs of 1000 ft. each.

Fig. 27 shows the saving which can be made in energy by operating a maximum schedule with 1½ m.p.h.p.s. acceleration and braking; and also the energy which will be used providing this acceleration and braking are changed to 2 m.p.h.p.s. With this latter condition we will still maintain the maximum schedule possible with the lower rate of acceleration and braking.

Higher Speeds Save

In order that we may analyze more thoroughly just what different rates of acceleration and braking mean, Table V has been prepared from Fig. 27, showing the effect of accelerating at 1½ and 2 m.p.h.p.s. for 40,000 car-miles. In this table we have merely considered the cost of power and platform wages. It will be noticed that we have taken three stops per mile with 2 m.p.h.p.s. accelerating and braking as a basis of comparison, using this figure as 100 per cent. By accelerating and braking at 1½ m.p.h.p.s. with three stops per mile we notice that the percentage expense for energy and wages alone has increased to 106 per cent. With seven stops per mile this is increased from 138 to 148 per cent and with nine stops per mile from 155 to 170 per cent.

In Fig. 25 we considered the 40,000-lb. car in service of three, five, seven and nine stops per mile and used rates of acceleration and braking of 1, 1½, 2 and 2½ m.p.h.p.s. We also took three stops per mile with 2½ m.p.h.p.s. acceleration and braking as 100 per cent. It will be noticed from Table VI that with three stops per mile the total cost of platform wages and power has advanced with 2, 1½ and 1 m.p.h.p.s. from 100 up to 102, 103 and 108 per cent respectively. With seven stops per mile the percentage is increased from 139 up to 155 per cent, and with nine stops per mile from 155 up to 174 per cent.

Table VI—Effect of Three Rates of Acceleration and Braking and Different Number of Stops on Power Costs, Platform Wages and Schedule Speeds, 40,000-Lb. Car

Stops per Mile	Acceleration and Braking Rate	Schedule Speed	Power, Kilowatt-Hour per Car-Mile	Car-Hours for 40,000 Car-Mile Operation	Platform Wages 60 Cents per Hour plus 10 per Cent	Power Cost at 1½ Cents Kilowatt-Hour at the Car, 40,000 Car-Mile Operation	Total Cost	Per Cent
3	1	14.3	1.80	2797	$1827.54	$1080.00	**$2907.54**	108
3	1½	15.6	1.84	2564	1692.24	1104.00	**2796.24**	103
3	2	16.4	1.86	2439	1609.74	1116.00	**2725.74**	102
3	2½	16.9	1.89	2366	1561.56	1134.00	**2695.56**	100
5	1	11.6	2.20	3448	2275.68	1320.00	**3595.68**	133
5	1½	13.1	2.28	3053	2014.98	1368.00	**3382.98**	126
5	2	13.9	2.34	2877	1898.82	1404.00	**3302.82**	123
5	2½	14.4	2.38	2777	1832.82	1438.00	**3270.82**	122
7	1	9.95	2.52	4020	2653.20	1512.00	**4165.20**	155
7	1½	11.4	2.66	3508	2315.28	1596.00	**3911.28**	145
7	2	12.2	2.75	3278	2163.48	1650.00	**3813.48**	141
7	2½	12.8	2.80	3123	2061.18	1680.00	**3741.18**	139
9	1	8.75	2.80	4571	3016.86	1680.00	**4696.86**	174
9	1½	9.9	3.00	4040	2666.40	1800.00	**4466.40**	166
9	2	10.9	3.10	3669	2421.54	1860.00	**4281.54**	159
9	2½	11.6	3.18	3448	2275.68	1908.00	**4183.68**	155

In like manner Table VII shows what can be done with a lightweight safety car at three different rates of acceleration and braking and four different numbers of stops.

The annual cost is estimated to be $832.44, or 62 per cent, more at 2½ m.p.h.p.s. and three stops per mile than at 1½ m.p.h.p.s. and nine stops per mile.

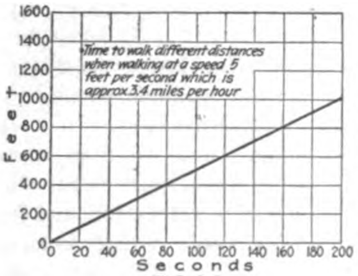


FIG. 24

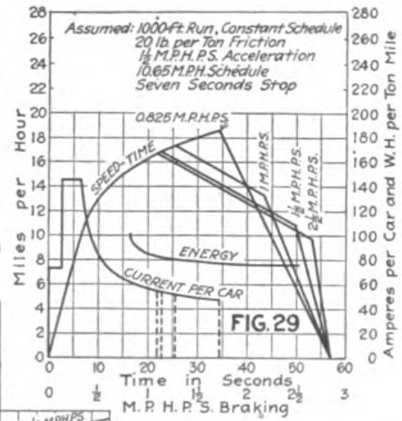


FIG. 29

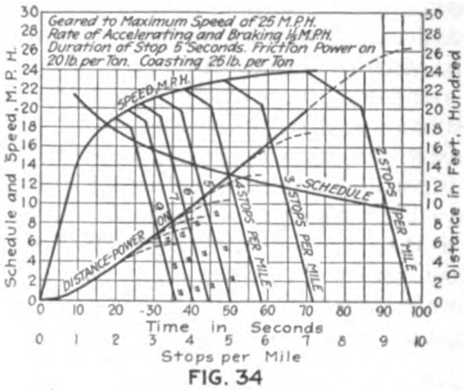


FIG. 34

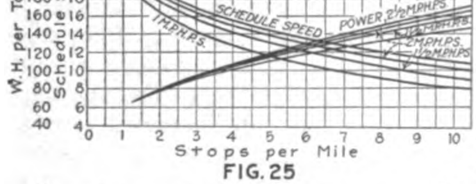
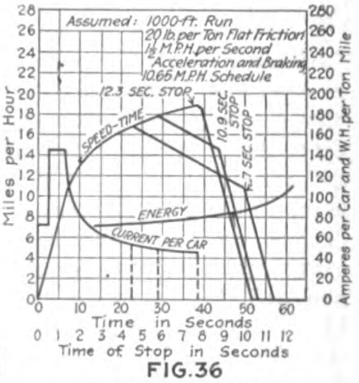


FIG. 25



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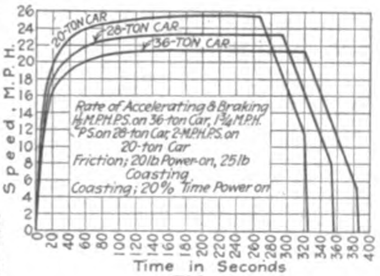


FIG. 30

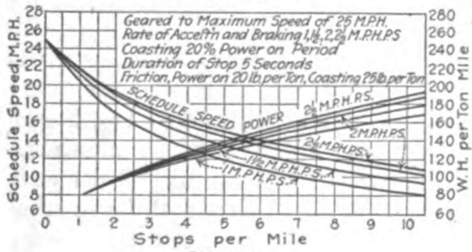
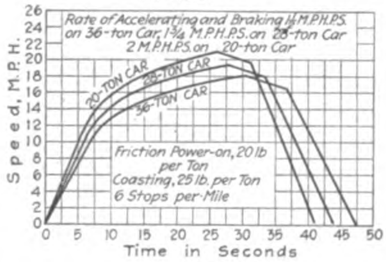


FIG. 26



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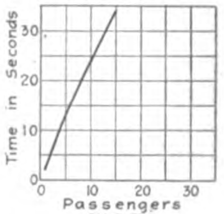


FIG. 37

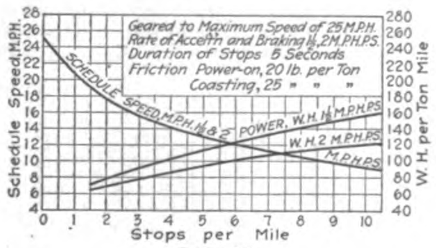


FIG. 27

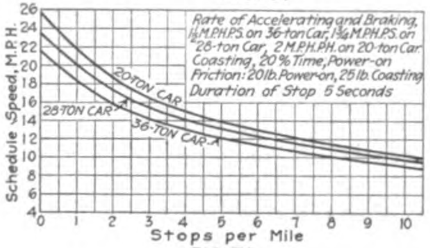


FIG. 32

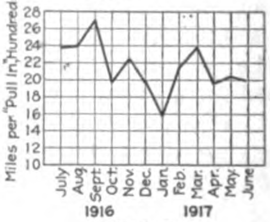


FIG. 38

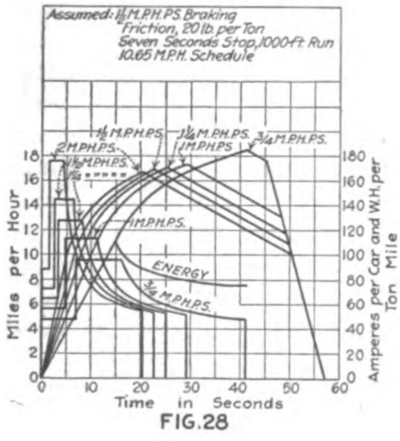


FIG. 28

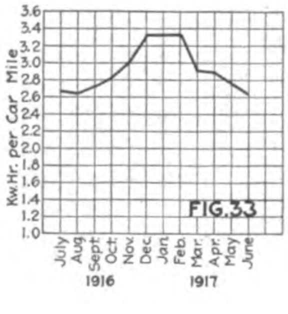


FIG. 33

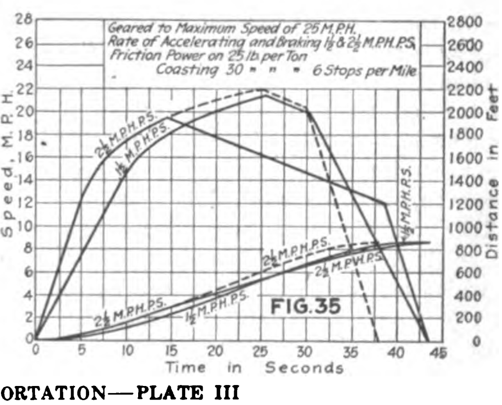


FIG. 35

GRAPHICS OF ELECTRIC RAILWAY TRANSPORTATION—PLATE III

Fig. 24—Relation of Walking Distance and Time
Fig. 25—Schedule Speed and Energy Consumption Curves for 20-ton Car
Fig. 26—Schedule Speed and Energy Consumption Curves for 7½-ton Car
Fig. 27—Schedule Speed and Energy Consumption Curves for 20-ton Car
Fig. 28—Chart Showing Decrease in Energy as Rate of Acceleration is Increased
Fig. 29—Chart Showing Decrease in Energy as Rate of Braking is Increased
Fig. 30—Speed-Time Graphs for 20-ton, 28-ton and 36-ton Cars
Fig. 31—Speed-Time Graphs for 20-ton, 28-ton and 36-ton Cars
Fig. 32—Schedule Speed Curves for 20-ton, 28-ton and 36-ton Cars
Fig. 33—Graph Showing Effect of Heating on Energy Consumption
Fig. 34—Speed, Schedule Speed and Distance Graphs for 20-ton Car
Fig. 35—Speed and Distance Graphs for 7½-ton Car
Fig. 36—Chart Showing Increase in Energy Consumption as Duration of Drop Is Increased
Fig. 37—Loading Time of Fort Worth Safety Car
Fig. 38—Graph of Miles per "Pull In" (Total "Pull Ins")

Table VII—Effect of Three Rates of Acceleration and Different Number of Stops on Power Costs, Platform Wages and Schedule Speeds, 15,000-Lb. Safety Car

Stops per Mile	Rate of Acceleration	Schedule Speed	Power Consumption per Car-Mile	Car-Hours for 40,000 Car-Mile Operation	Platform Wages at 36 Cents per Hour Plus 10 per Cent	Power Cost 40,000 Car-Mile Operation	Total	Per Cent
3	1½	15.4	.825	2597	$934.92	$495.00	$1429.92	107
3	2	17	.84	2353	847.08	504.00	1351.08	101
3	2½	17.45	.85	2292	825.12	510.00	1335.12	100
5	1½	13.45	.915	2974	1070.64	549.00	1619.64	121
5	2	14.4	.945	2777	999.72	567.00	1566.72	117
5	2½	15	.96	2666	959.76	576.00	1535.76	115
7	1½	11.6	1.08	3448	1241.28	648.00	1889.28	141
7	2	12.65	1.18	3161	1138.96	708.00	1846.96	139
7	2½	13.2	1.23	3030	1090.80	748.00	1838.80	138
9	1½	10.2	1.26	3921	1411.56	756.00	2167.56	162
9	2	11.2	1.32	3571	1285.56	792.00	2077.56	155
9	2½	11.8	1.35	3389	1220.04	810.00	2030.04	152

These savings, of course, cannot be obtained in their entirety. We all know that there are certain operating conditions which have to be considered in connection with any calculated savings. However, it is fair to assume that by explaining these different features to all of the men, we can secure under favorable conditions at least half of these savings.

To determine what is the maximum rate at which a car can be accelerated, it is necessary to have the following data:

Weight of car complete with live load.
Number of motors per car.
Size of motor, that is, hourly rating.
Motor gearing.
Size of wheel.
Characteristic curve of the motor arranged for the proper size of wheel and gearing.

From these data it is possible to secure the amount of current which the equipment will require for different rates of acceleration. We will assume we have a car weighing 40,000 lb. and that the car is equipped with four 25-hp. motors having 74-tooth gear and 13-tooth pinion and that the wheel diameter is 26 in. To calculate this, proceed as follows:

Since the car weighs 40,000 lb. or 20 tons complete with live load this will be equivalent to 5 tons per motor. Let us assume that we are desirous of knowing if the car can be accelerated at 2 m.p.h.p.s. To accelerate 1 ton at 1 m.p.h.p.s. 91.2 lb. tractive effort or drawbar pull is required. It is also customary to add approximately 7 per cent for the rotary effect of wheels, gears, axles and armatures, which will give a total of 98 lb. per ton. Therefore, to accelerate this mass at 2 m.p.h.p.s. this figure will have to be doubled, by which we obtain a figure of 196 lb. per ton merely to accelerate the mass. To this figure for tangent level track it will be necessary to add 20 lb. per ton friction, which is the figure ordinarily used for rolling friction, energy, etc. Hence we would have a cumulative value of 196 plus 20, or 216 lb. per ton. Multiplying this by five tons we find that we have a total of 1080 lb., or by referring to the characteristic curve, Fig. 19, we find that 61 amp. will be required to produce the desired torque which gives the desired rate of acceleration. The hourly commercial rating of this motor is 37 amp., and it will be noted that the 61 amp. represents a value of 165 per cent of the hourly rating. With this particular motor it will be satisfactory with the weight given to accelerate with the currents specified. In the old non-commutating pole motors it is always safe to use accelerating currents up to the full one-hour rating of the motor, and on certain non-commutating motors we can use accelerating currents as high as with the newer type commutating pole motors where it is safe to accelerate up to 150 per cent of the hourly current rating. However, it is always best to consult with the motor manufacturer before accelerating with currents which are in excess of the hourly rating.

That the motorman may know positively what maximum rates of braking and acceleration are permissible, it is advisable to have a sign placed above the controller, which sign should state distinctly the time in seconds in which it is safe to accelerate up to full series and full parallel when operating on level track.

Before the inauguration of a campaign for the maximum rates of acceleration and braking, it is necessary to have the mechanical department set up the circuit-breakers to a point which will allow them to open only when actual overloads occur. If this is not done, the circuit-breaker may be set so low that it will blow continually during the normal operation of the car. The controllers and motors should also be overhauled and cleaned up. It is also important that the piston travel be of the proper length to secure the maximum braking effect.

After we have reviewed the tables which show the effect of different stops per mile with different rates of acceleration and different length of stop, we are bound to feel that we should do everything we can to eliminate all possible stops. We should not simply refer to the stops as "useless," but consider how they tend greatly to increase or decrease the schedule speeds.

Public Puts Speed Before Comfort

An example of what can be accomplished and how popular is bound to be a reduction in the number of stops is strikingly illustrated in the service which is given in the New York subway between Forty-second Street and Fourteenth Street. At these two points there are island platforms from which it is possible to take either express or local trains; the express train having a running time between express stations of approximately two minutes less than the local. Passengers almost invariably use the express train between these two points regardless of whether there is ample seating room on the local train. Here is a case absolutely free from coercion which proves that passengers are willing to sacrifice a seat to avoid four stops, in order to save two minutes and enjoy the exhilaration of riding in a vehicle which is not continually accelerating and braking.

This is a point which we should study and try to follow through to a conclusion. If we do this we shall be in better position to guide our public relations. This illustration of the use of the express train leads us directly to the conclusion that fast schedules and fewer stops build up business.

Proper Gear Ratio Important

If we assume that the railway has been permitted to put into effect the speed-raising improvements discussed, it can go a step further—provided it can get the money—namely, rearrange its gear ratios. An idea of the schedule speeds which can be made with cars geared for different free running speeds may be obtained from Table II and Fig. 20. We have assumed that the car weight complete with all equipment and live load will total 40,000 lb. and that by substituting different gearing we can arrange the car to have free running speeds of 15, 20, 25 or 30 m.p.h. This car would then be capable of making the schedule speeds shown in Table VIII when operating in a service of seven stops per mile with an average of five seconds per stop:

Table VIII—Relation of Free Running Speed to Power Cost, Seven Stops per Mile

M.P.H. Free Running Speed	Schedule Speed*	Kilowatt-Hours per Car-Miles at the Car	Power Cost for 40,000-Lb. Car-Miles—1½ Cents per Kilowatt-Hours at the Car	Per Cent
15	9.2	1.36	**$816.00**	100
20	10.3	1.84	**1104.00**	154
25	11.4	2.66	**1596.00**	223
30	11.7	3.32	**1992.00**	278

*Schedule speed in all tables are understood to be the maximum speeds obtainable, no allowance being made for curves, grades and traffic interruptions. Actual schedule speeds will be 10 per cent lower.

* * *

The Fourth Service Fundamental Is Weight

The Advance Made by the Car Builder in Weight Reduction Is But One Item; the Operation of Smaller But Faster Cars Is Still More Important

THE service fundamental of weight embraces the size of car or seating capacity and the design and structure of a comfortable vehicle capable of operating at a speed which will satisfactorily meet the conditions of traffic.

We need not enter here into the province of the car builder except to note how the evolution from rule-of-thumb methods to the days of stress diagrams has brought down the weight per seated passenger from 1500 lb. to 500 lb. or less, as in the safety car, thus making an enormous saving in the cost of the weight propelled. Recently, detailed investigation was made on a prosperous, well-managed property which had inherited certain equipments. It has in city service a number of cars which weigh approximately 60,000 lb. each. These cars seat forty-eight passengers (1250 lb. per seated passenger) and are geared for a speed which is higher than necessary. A new car, weighing only 40,000 lb. and seating fifty-eight (687 lb. per seated passenger) was purchased to give even better service than the present equipments at an annual power saving of more than $1,500 per car.

Even before a railway decides upon new equipment, it will do well to review all the weights of existing types so as to select the extra heavy cars for trippers and exclude them, wherever possible, from any runs on which the maximum mileage is operated.

The following Table IX shows the comparative power costs for 15,000-lb., 40,000-lb. and 60,000-lb. cars, assuming schedule conditions to be alike, length of stop five seconds, rate of acceleration 1½ m.p.h.p.s. and the cost of energy 1½ cents per kilowatt-hour at the car.

But the problem is far broader than is expressed by those savings in weight which are due to the advances in car building, because we can make still greater savings in the ton-miles propelled by using smaller but faster cars. In other words, the capacity of the cars should be considered on the basis of how many people they can carry per hour and not on how many they can carry per trip.

Table IX—Power Consumption and Power Costs for 15,000 Lb., 40,000-Lb. and 60,000-Lb. Cars with Power Costs of 1½ Cents per Kilowatt-Hour at the Car

Stops per Mile	15,000-Lb. Car Power, Kw.-hr. per Car-Mile at Car	40,000-Lb. Car. Power, Kw.-hr. per Car-Mile at Car	60,000-Lb. Car. Power, Kw.-hr. per Car-Mile at Car	Power Cost for 15,000-Lb. Birney Car, 40,000-Car-Mile Operation	Power Cost, 40,000-Lb. Car, 40,000-Car-Mile Operation	Power Cost 60,000-Lb. Car, 40,000-Car-Mile Operation
3	.825	1.84	2.76	$495.00	$1,104.00	**$1,656.00**
5	.915	2.28	3.42	549.00	1,368.00	**2,052.00**
7	1.08	2.66	3.99	648.00	1,596.00	**2,394.00**
9	1.26	3.00	4.50	756.00	1,800.00	**2,700.00**

The but recent realization of the principle that schedule speed is a vital factor of car capacity accounts largely for the popularity of the big pay-as-you-pass car and the small safety car.

One beauty of the small car is the fact that it is the car with the least idle or excess weight during the light hours of the day.

To help us review the influence of weight propelled on a particular motor on which the same gearing is used, graphs have been prepared to show the free running speed which determines the schedule possibilities with cars having a total weight of 20, 28 and 36 tons respectively.

Fig. 30 shows that the free running speed with the three different classes of equipment will be

20-ton car—25.6 m.p.h. free running speed
28-ton car—23.4 m.p.h. free running speed
36-ton car—21.4 m.p.h. free running speed

It will be noted that this graph has been made up to show three different runs which are of the same distance. However, the time of making the run varies with the different weights of cars.

By referring to Fig. 31 we see that the highest speeds which are attained when the car is making six stops per mile are as follows:

20-ton car—21.0 m.p.h. max running speed
28-ton car—19.4 m.p.h. max. running speed
26-ton car—18.1 m.p.h. max. running speed

The time required for each cycle of operation will be as follows:

20-ton—41.00 seconds
28-ton—44.00 seconds
36-ton—47.25 seconds

By referring to Fig. 32 on page 20 we find that the schedule speeds which can be operated without leeway are as follows:

Stops per mile.....	3	5	7	9
20-ton car..........	16.5	13.9	12.25	10.9
28-ton car..........	15.4	13.2	11.65	10.4
36-ton car..........	14.6	12.2	10.8	9.65

This is but one phase of the study of what weight means. Another phase is that every time excess weight is moved it is paid for in power. So we should keep weights down to the possible minimum and still retain safety and reasonable maintenance. If we desire to know the influence of weights of all different cars on the system which are in service, we can ascertain from characteristic curves what is the free running speed of each car which is in service. We can also follow up the service conditions as they actually are and obtain the number of stops per mile with which the cars are operating. From these data, and also from the data which are given on the graphs of power consumption and schedule speed possibilities, we can determine to a surprising degree of accuracy the amount of power taken by the different cars on the system. Due allowance can be made for transmission, substations and line losses, and so we can figure out the total amount of power used by any combination of equipments.

Where the mileage operated by each car and also the service in which it is operated are given, relative comparisons can be made as to what different cars cost for power consumption. Our estimates for wear and tear on track by equipments of different weight are not definite, but approximate figures can be taken to enable the operator practically to determine just what heavy cars cost. By making a comparison of this kind, the operating department will learn what cars should be run for the maximum mileage and what cars should only be used as trippers.

* * *

The Fifth Service Fundamental Is Cost

The Elements of Both Time and Weight Enter, Aside From Which Energy Savings Are Possible Through Anti-Friction Equipment and Scientific Operation with Maximum Coasting

A NUMBER of factors which affect cost of power, such as number and time of stops, gear ratios, weights, etc., have already been discussed. The time elements, of course, also have considerable effect on platform costs.

Undoubtedly there is a great deal of loss through wasteful operation of electric heaters and motor-driven hot-air heaters. If thermostats and automatic switches were used, the car-heating peak shown in Fig. 33 would be reduced 25 to 33⅓ per cent. At the same time, the riders would be more comfortable, because of the more uniform temperature attained. Thirty per cent of the electric heaters ordered last year from one maker included thermostats.

Among the minor power losses are those due to dragging brakeshoes—a condition that can be eliminated partly by the use of air brakes, automatic slack adjusters and more coasting. The installation of these devices will require new capital, which the operating company may or may not be able to secure at a reasonable rate of interest.

Coasting Extremely Important

In addition to these factors is the overwhelmingly important one of the motorman's handling of the car operating cycle, namely acceleration, coasting, braking. Here are important opportunities if we first learn how to analyze the possibilities for ourselves and then instruct the motormen with the aid of car checking instruments to operate exactly as they should.

Therefore, it will be of decided advantage to know just how many seconds are required for each particular part of the cycle of car operation. In order to facilitate our study Figs. 34 and 35 have been made up for the big and small cars respectively. Fig. 34 illustrates a car weighing 20 tons, which is geared for a maximum free running speed of 25 m.p.h., when accelerating and braking at 1½ m.p.h.p.s. using 20 lb. per ton friction during the power-on period and 25 lb. per ton friction during the coasting period. Let us assume that this car is operating in a service with six stops per mile. Then the car will require 26.3 seconds to reach the point where the current is cut off and will have to traverse a distance of 580 ft. The time required to the end of the coasting will be 31.7 seconds and the distance will be 700 ft. The time required to the end of the braking, namely, when the car comes to a complete stop, will be 44.5 seconds and the distance traveled will be 880 ft. On the lower ordinate it will be noted that time and stops per mile are specified. The stops per mile refer to the schedule speed graph which is shown above and should not be confused with the distance graph or with the graphs which illustrate the actual car speed, coasting and braking.

Since the energy that can be saved during the run cycle depends largely upon the time available for coasting, it is not only desirable to use high rates of acceleration and braking, but also to shorten the length of stop. By referring to the graphs, Fig. 36, we see that by making a seven-second stop the coasting will amount to 120 per cent of the power-on period, while by extending the length of stop to 10.9 seconds, this figure is further reduced to 47.8 per cent; by further increasing the length of stop to 12.3 seconds, the coasting period is reduced to 2.63 per cent. It will therefore be readily appreciated that if we are operating a car at a given schedule, the length of stop is a big factor in the amount of coasting possible. We should, therefore, help the crews all we possibly can to take advantage of this phase of operation in addition to obtaining the permissible maximum rates of acceleration and braking.

The use of anti-friction bearings, particularly for the journals, naturally will extend the coasting period.

It may be added here that even on lines of three or four cars, where the larger economies (like saving a car) are impracticable it is at least possible to get more coasting, which means power savings.

* * *

The Cars of To-day

Why the Light-Weight One-Man Safety Car and the Pay-as-You-Pass Car Loom Up So Largely on the Electric Railway Horizon

FROM the car-loading graphs presented earlier in this article, we have seen how readily a small car meets the average car loading. When we give this small car 15 per cent greater schedule speed, or mobility, through the use of higher accelerating and braking rates and fewer stops, and then economically give a 25 to 50 per cent shorter headway, we shall find that the safety car can be run to good advantage on a large number of lines.

Table X has been prepared to show just what the safety car does under stated conditions for say a year's operation of 30,000 or 40,000 miles. By the use of this car with the fair average of seven stops per mile and five seconds per stop the cost of platform wages and power for 40,000 car-miles is estimated to be $1,964.90. This figure is but 41½ per cent of the $4,727.70 cost of

Table X—Possibilities of the Safety One-Man Car

40,000 CAR-MILES OPERATION

Stops per Mile	Length of Stop	Schedule Speed with 2 m.p.h. p.s. Acceleration and Braking	Kilowatt-Hours per Car-Mile 2 m.p.h.p.s. Acceleration and Braking	Car-Hours, 40,000 Car-Mile	Power Costs 1.5 Cents per Kilowatt-Hour at the Car	Platform Wages 36 Cents per Hour plus 10 per Cent	Total Wage and Power
3	5	17	.84	2353	$504.00	$931.78	$1435.78
5	5	14.4	1.02	2777	612.00	1099.69	1711.69
7	5	12.6	1.18	3174	708.00	1256.90	1964.90
9	5	11.2	1.32	3571	792.00	1414.11	2206.11

30,000 CAR-MILES OPERATION

Stops per Mile	Length of Stop	Schedule Speed with 2 m.p.h. p.s. Acceleration and Braking	Kilowatt-Hours per Car-Mile 2 m.p.h.p.s. Acceleration and Braking	Car-Hours, 40,000 Car-Mile	Power Costs 1.5 Cents per Kilowatt-Hour at the Car	Platform Wages 36 Cents per Hour plus 10 per Cent	Total Wage and Power
3	5	17	.84	1764	378.00	698.54	1076.54
5	5	14.4	1.02	2083	459.00	794.86	1253.86
7	5	12.6	1.18	2381	531.00	942.87	1473.87
9	5	11.2	1.32	2878	594.00	1060.48	1654.48

a large two-man car in a service of nine stops per mile with ten seconds per stop.

Car Sizes Contrasted

From the traffic checks previously described, we can find the total number of passengers for cars for each hour of the day; also the total number of cars passing the checking point. With these data we can readily calculate what the seating capacity and size of car should be. We can also see just what will be the effect of putting on a lesser number of large cars or a greater number of small cars.

Now the only limitation of the small car is the number of units that can be run through the congested portion of the city. The studies of B. J. Arnold in Chicago indicate that the least permissible time between following cars is approximately twenty seconds. But looking at the subject in a broader way, we can well afford to consider what other possible parallel avenues of travel could be utilized if necessary to give adequate service with economy.

This is the originator of the safety car

Another fact to be considered is that in accordance with old-time viewpoints railways frequently have operated cars over certain streets and to special points because they feared to offend public opinion. To put this in another way: a few prominent citizens, to serve their own selfish mercantile interests, wisely or unwisely have dictated to the railway where cars should be operated. Their will prevailed, not because the greatest number of citizens were properly accommodated thereby but because these few citizens who thought they had something big at stake, possessed the largest, loudest and most persistent voice as regards the accommodations which the railways should provide for the public.

Recent events and conditions have accelerated the spread of the modern idea that all service, public and private, must be operated on the basis of the greatest economy consistent with public policy. In short, we must consider first the good of the largest number.

For the purposes of comparison in costs, we have taken a 40,000-lb. car complete with load and 15,000-lb. car with load, as shown in Table XI. Let us first review the cost of platform wages and power of the large car on a line with ten-minute non-rush and 6.6-minute rush service. By putting on the small car with higher schedule speed we can give twice the service at an estimated operating saving of $3,674.60 per annum. In many cases this increase in service will produce 30 to 40 per cent more gross.

Table XI—The Superiority of the Safety Car for a Given Service

	40,000-Lb. Car Seating Fifty-four	15,000-Lb. Car Seating Twenty-eight	15,000-Lb. Car Seating Twenty-eight
Length of line, miles	10.5	10.5	10.5
Interval between cars, non-rush, minutes	10	5	10
Interval between cars, rush, minutes	6.6	3.3	3.3
Cars required, non-rush	6	10	5
Cars required, rush	9	15	15
Stops per mile, non-rush	5	4	5
Stops per mile, rush	6	5	5
Average length of stop, seconds, non-rush	5	5	5
Average length of stop, seconds, rush	5	5	5
Running time, minutes, non-rush	57.5	45	48.5
Running time, minutes, rush	60	50	48.5
Schedule speed, miles per hour, non-rush	11	14	12.9
Schedule speed, miles per hour, rush	10.5	12.9	12.9
Rate of acceleration and braking, miles per hour per second	1½	2	2
Layover in minutes, non-rush	2½	5	1½
Layover in minutes, rush	0	1½	1½
Seats per hour, non-rush	324	336	168
Seats per hour, rush	486	504	504
Car-miles per day	1260	2510	1677
Car-hours per day with four hours, rush service	120	200	130
Crew wages per hour, cents	60	36	36
Total platform wages with four hours' rush service	$72.00	$72.00	$46.80
Power cost per day	47.19	35.57	27.17
Combined wages and power per day	119.19	107.57	73.97
Combined wages and power per year, 330 days	$39,172.70	$35,498.10	$24,310.10

In each case studies should be made of the riding habits of possible customers to determine how many ride in automobiles, and we should also consider the class of people along the line to get an idea of what increased service is likely to do in changing the shopping habits of the community and other habits which are affected by transportation facilities.

Of course, our small units will operate more car-miles, but the cost of maintenance per unit is sufficiently low to make one grade of service cost practically about as much as the other.

The field of the small car yet remains to be determined, but on routes of light or moderate traffic where the rush-hour requirements are not so greatly in excess of those during the rest of the day as to impose an excessive penalty in the form of numerous tripper cars, the electric railway manager can well consider the possibility of this type of car.

Analyze car loading by hours and zones to decide the size of car

Make Every Car Make Good

Car-Mile Records Should Be Kept of All Equipment Defects and Their Influence on Service Analyzed. Every Railway Should Also Know the Use Factor of Its Equipment

THE number of cars taken from service every day because of equipment defects directly pictures the physical condition of the apparatus and, broadly speaking, usually represents the amount of money which is spent for equipment maintenance. Where there are a large number of failures the cost of maintenance is in proportion.

Records should be made of all crippled cars turned in by the transportation department; and it is advisable to transcribe this information into classified graphs which will show on the basis of car-miles per failure, the failures to motors, electrical equipment, car trucks, bodies and brakes respectively. On large, well-operated systems mileage per failure varies from 2800 to 4400 car-miles. By the proper segregation of these failures the mechanical department knows exactly what portion of the equipment is causing the largest number of troubles and can use its energies intelligently to care for each trouble as it comes along.

It is even more important to know just how many minutes delay certain defects caused in service on the line. With such a comparison, added to the mechanical analysis, it will not take long to learn what equipments are unprofitable and unsatisfactory.

What's Your Use Factor of Cars?

Perhaps the first thing to do is to determine the use factor of the cars, namely, the actual daily car-hours against the ideal car-hours obtained by multiplying the number of cars by twenty-four. At the very least, this will be good material for publicity; but going deeper, we see how this ratio is affected by the proportion of cars unsuitable for the season or just out of a job, the proportion in for inspection, for repairs and for painting. Take the last-named item for example. If a car is painted once a year, a week saved by quick-painting methods corresponds to 2 per cent of its working time.

The use factor, which varies between 30 per cent and 40 per cent, gives a definite idea of the number and consequent value of the extra cars required to give adequate rush-hour service. Interest, depreciation and upkeep of this extra equipment are parts of the cost of giving rush-hour service.

Car Failure Analysis

The superintendent of equipment should classify all failures of equipment for each class of cars carefully. The following list of headings will be found convenient in this connection:

Car Bodies

Car-body parts
Sash or glass
Ventilators
Registers
Gong signals
Sand box
Drawbars
Fenders
Trapdoors
Seats
Doors and operating mechanism
Signs
Heaters
Headlights
Light circuits
Window shades

Trucks

Wheels
Axles
Journal bearings
Truck frame
Brakeheads and shoes
Brake rods
Brake levers
Bolster springs
Loose brakes
Tight brakes

Electrical Equipment of Cars

Trolley base
Trolley pole or wheel
Wiring
Fuse box
Circuit-breaker
Controller
Grid resistance

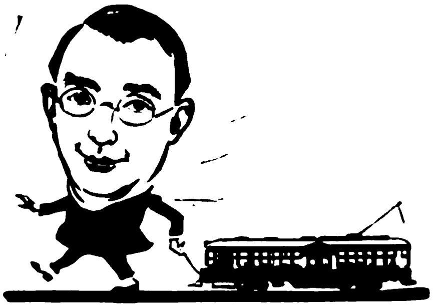
Motors

Field coils
Low bearings
Armatures
Brush-holders
Pinions
Gears
Gear case
Motor frame
Motor leads

Air Brakes

Compressor
Motor
Governor
Air-brake parts frozen
Engineers valve
Reservoir
Piping or brake cylinder

If this classification is followed for each series of cars, we can ascertain what particular cars and kinds of failures recur again and again. Under each of the five general headings, it is advisable to chart the car-miles per pull-in. Of course, there should always be graphs showing the effect of the total pull-ins. A glance at these charts, such as Figs. 38, 39 and 40, will show whether or not the mechanical department is maintaining the proper relations between failures and pull-ins.



We are indebted to this man for the pay-as-you-pass car

Equipment failures are very expensive and unsatisfactory. Each car taken from service makes for serious public inconvenience and costs the railway much more in transportation losses and interruptions to service than for repairs to the car alone. Thus the book costs of replacing a defective coil may be only $9 or $10; but this takes no account of the cost of moving the dead car to and from the shops nor of the losses in revenue and payment for idle platform time on all of the cars delayed —not to mention the inconvenience to the public.

What we have said about the value of high rates of acceleration and braking will help to give a true appreciation of what it means to have equipments capable of meeting fully the requirements of an efficient transportation department. The maintenance cost of the equipment is but a small portion of the other expenses which may be incurred due to the failure of obsolete equipment to measure up to modern standards. It behooves the manager to investigate with particular care the merits of the higher acceleration four-motor equipment as compared with two-motor equipment. In fact, now that we understand better the dollars and cents value of higher rates of acceleration, we may expect the old controversy of four-motor versus two-motor equipment to be decided soon in favor of the former.

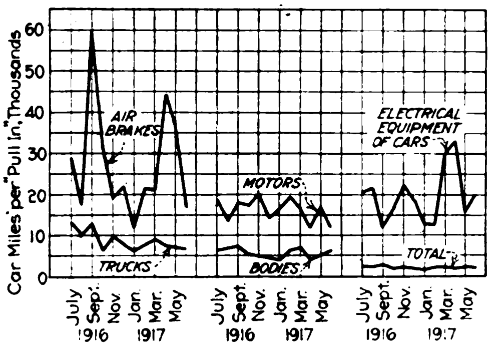


FIG. 39

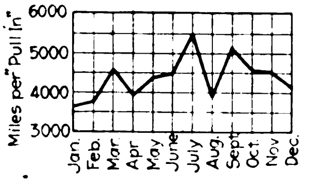


FIG. 40

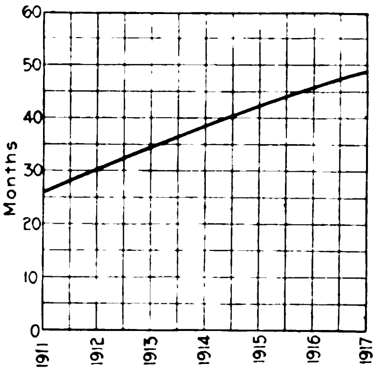


FIG 41

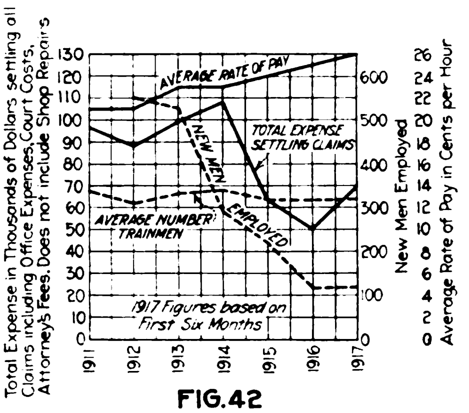


FIG. 42

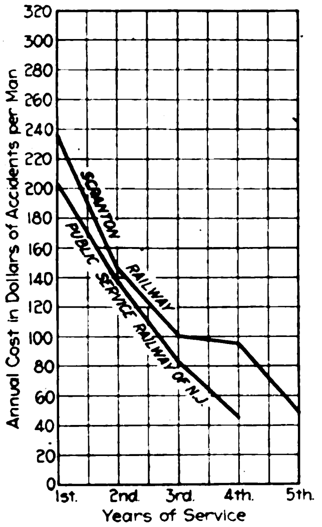


FIG. 43

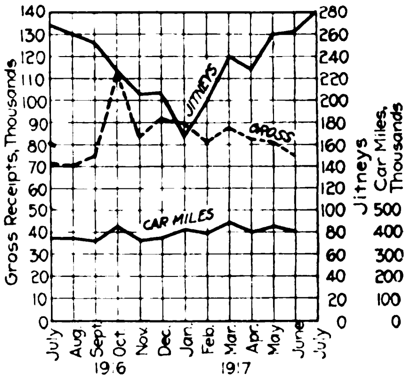


FIG. 44

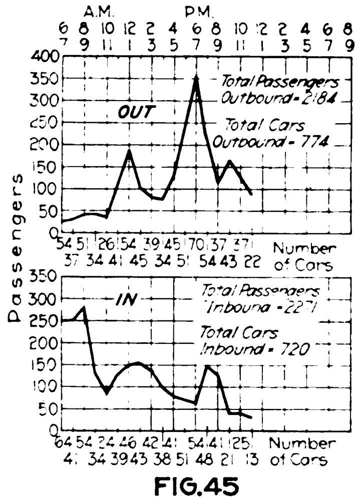


FIG. 45

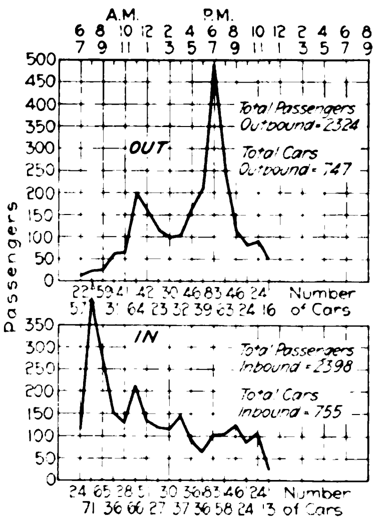


FIG. 46

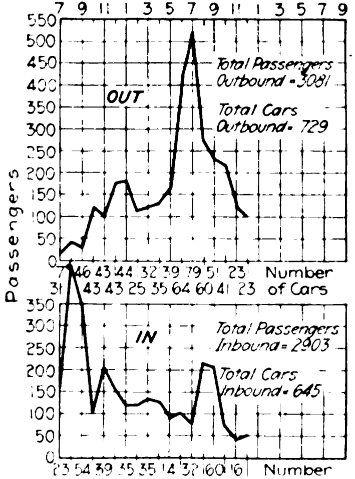


FIG. 47

GRAPHICS OF ELECTRIC RAILWAY TRANSPORTATION—PLATE IV

Fig. 39—Car-miles per "Pull In," i.e., Cars Removed from Service Due to Car Defects

Fig. 40—Car-miles per "Pull In"

Fig. 41—Average Duration of Service of Trainmen, Dallas

Fig. 42—Relation of New Men Employed and Cost of Settling Claims

Fig. 43—Graphs Showing How Platform Experience Cuts Platform Cost

Fig. 44—Graphs Showing Irregularity of Jitney Service and Regularity of Street Car Service, Town B, Excluding Suburbs

Fig. 45—Jitney Check in Town B, on C Street at Corner of First Street

Fig. 46—Jitney Check in Town B, on E Street at Corner of Tenth Street

Fig. 47—Jitney Check in Town B, F Street, corner Fifth Street

Fare Boxes Will Get More Money

It's Not Only Good Policy to Waste Less But Also to Get Every Fare Possible

IN A REVIEW of the operations of a company recently it was found that the cars were operated without fare boxes. After investigation the management concluded if fare boxes were installed, there would be an increase of 5 per cent or $100,000 in the gross receipts of the company, because with the present system of fare collection a large number of fares are lost either through indifference or dishonesty of passengers and conductors.

The psychological effect of having a fare box which every passenger must pass seems to be the one best way to get all the money due. The fact that a person passes the fare box means to both the person and the conductor that some fare must be put into it. If the fare is not deposited, not only the riders who try to slip by the box but others within earshot and eyeview are likely to have that fact called to their attention—a factor that helps greatly to deter theft.

Aside from its direct fare-collection value, the fare box also keeps the conductor in the proper place to give signals promptly and safely. Therefore the fare box is a logical part of our "safe speed" campaign for producing additional business. Since the conductor is at the door, he can supervise the entrance and exit of all passengers regardless of whether or not the car is empty or full. With hand-to-hand collection it is necessary for the conductor to go up in the car and depend at these times upon the passengers to inform him if the starting signal should be given or not. This is not only an element of delay but of danger also, because the passengers have not got the skill nor should they be given the responsibility to observe whether it is safe for the car to be started.

* * *

How Can We Keep Satisfactory Men Satisfied?

Real Instruction, Complete Publicity As to Costs and Earnings, Agreeable Working Conditions on the Car and Recognition of Efficiency and Experience Are Among the Ways to Do It

WHEN we have dug out every technical and analytical resource that can be applied within the organization, we still have the great, big human problem of relations with the employees who are expected to apply those resources. In short, the personal equation of management remains the greatest single factor.

We ought to leave nothing undone to get the right kind of men; to instruct them in the right way without any concealment of motives; to make their jobs as pleasant as possible so they will feel like really enthusiastic salesmen; to use open inspection by "big brother" veterans who will say: "Haven't you *overlooked* a couple of fares, Jim?" and finally to make wages and bonuses rewards for honest service. Splendid results are being secured where the man at the top is in it heart and soul.

It is very important that the trainmen have the privilege of receiving correct instruction in every branch of their duty. More can be accomplished for public relations by showing the employees how to handle the public than by any other means.

Technical Knowledge Necessary

To begin right, the instruction rooms should be well-lighted, well-ventilated and quiet, the newcomers being treated as guests. Great care should be taken in selecting an instructor. He should be a man who is thoroughly in sympathy with the management and who understands the fundamentals of the operation and running of equipment, having gathered his technical knowledge through experience and study. It should be his duty to inform the men how every portion of the equipment is made, and to confer with the mechanical and power departments at regular intervals to know what car-operating defects and wastage, respectively, are most frequent. He should be able to explain the benefits of proper rates of acceleration and braking, proper amounts of coasting, advantages of short length of stop, etc. Complete rule books should not only describe the apparatus used on the cars, but should also include a general description of what power and schedule savings mean to the company. If properly handled such instructions will greatly assist the management in the general campaigns of economy now so necessary.

A trainman instructor ought to know a speed-time curve and how to talk about it.

Give the Men All the Facts

As to the general policy of the railway, if we do not convince our own employees that what we are doing is right, we certainly never can expect to convince the public. Inasmuch as each one of our employees is a salesman for the company, it will be necessary to have him thoroughly believe the doctrines which we preach. It will be necessary to make known to all the men all of the expenditures of the company in the simplest form so as to be readily understandable. If the company is losing money, the employees should know it so that they can make every effort to keep the company on a sound financial basis. If the company is making money they are equally entitled to the information. In these days when full financial reports are required by the authorities there would be little possibility of a company concealing information about its financial status, even if it desired to do so.

Experience Costs Less Than Accidents

The influence of rates of pay and considerate treatment of platform employees is strongly brought out by a study of the Dallas Railway under Richard Meriwether, now general manager. The attached graphs, Figs. 41 and 42, show how a voluntary increase in the average rate of pay from 21 cents to 26 cents an hour over a period of six years held the men.

Distribution of Conductors' Figures Obtained in Traffi

Run Number		4-5		5-6		6-7		7-8		8-9		9-10		10-11		11-12		12-1		1-2		2-3	
		Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In
Point No. 1	18																						
	5			2			8	5		1	10		0	2			2	9	4				
	17																					5	
	10																						23
	15																						
	12																						
	14																			13		2	8
	11																			5			9
	4			0	5	7		6	8		7	7		5	1		9	9		1	1		0
	24																						
	21			4		1	29		10														
	17			14	0																		
	20	11			14	71			8														
	1				20	31			1	6	1	13			4	4	8	14			6	5	
	15			29			48	10	15	0			22	4	1	7			6	6	5		
	7			2		3	14		7	1		2	4		2	2		2	2		17		
	6						11	3		3	11		10	5		5	6		6	6		5	7
	13																						
	3					40	12	0			8	2	11	5			1	5	6	6			8
	2				7	70	30	6			19	3	12	10			3	3	14				
	25																						
	19	13		100	6		23	61			6												
	9				24	18		9	14		2	6		4	10		0	5		3	2		5
	16																					5	
Total		24		151	76	241	175	100	63	11	64	33	59	35	18	18	29	47	38	40	24	22	60
Number of cars		2		7	7	8	8	8	7	5	8	6	6	7	5	4	7	7	6	7	5	5	7
Average		12		21.5	10.85	30.2	21.9	12.5	9	2.2	8	5.5	9.8	5	3.6	4.5	4.1	6.7	6.3	5.7	4.8	4.4	8.5
Maximum		13		29	24	70	48	61	15	6	19	13	22	10	10	7	9	14	14	13	10	5	23
Minimum		11		0	0	1	8	0	1	0	1	2	0	2	1	2	0	2	2	1	1	2	0

In 1911 the average length of service of a trainman was twenty-six months, while in the first half of 1917 the average length of service had increased to forty-nine months.

The influence which the retention of the men in the service has to accidents is very striking. It will be noted that the total expense in settling claims for this property was reduced from approximately $97,000 in 1911 down to aproximately $50,000 in 1916. The costs in each case are exclusive of the shop repairs and mileage losses due to shopping time.

Aside from the decreased cost of accidents we must consider the saving in instruction cost and apprenticeship periods.

Fig. 43, derived from Blake & Jackson's "Electric Railway Transportation," presents these figures on a year-by-year basis.

* * *

How About Automobile Competition?

The Sporadic Competition of the Jitney and the Continuous Competition of the Private Automobile Have Forced Us to Find Out Why People Do Ride or Don't Ride—Short-Headway, Fast Service, Accurate Time-Points the Only Solution.

AT THE very opening of this article it was said that the automobile manufacturers expected to get in use at one time 10,000,000 machines, or thrice the present number, before the saturation limit was reached—dour warning that unless electric railways revolutionize their ways in the right direction "the worst is yet to come."

In this journal it is unnecessary to rehearse the all-too-recent jitney history. Only one example of the effect of this competition will be quoted to show what records were kept as a basis for discovering the habits of the intruder, for determining the extent of the losses and for finding a remedy.

Although the jitney appeared in this particular city in 1914, there were still 268 jitneys in July, 1916, and by July, 1917, the number actually rose to 282. In the intervening months, however, as Fig. 44 shows, the number declined with the severity of the weather—only 167 being run in January. Now compare this ground and lofty tumbling with the almost uniform record of electric car-miles throughout the twelve months.

Isn't this a splendid exhibit of the dependability of electric railway service?

BULLETIN No. 300

NOTICE TO CONDUCTORS

February 14, 1917.

The company desires to make as close a traffic check as is possible. The object of this check is to ascertain the number of passengers in cars at definite fixed points on all lines. This information will assist us to determine if any improvement can be made in the service.

Each conductor will be furnished with a blank on which he is to note the number of passengers on his car at the different check points. Above each of the numbers a space has been left which can be filled in by the conductor to show the definite point at which the count is taken.

The following points on the different lines have been selected and numbered as the best points for the counts. We desire this count on all lines, both inbound and outbound.

Main Line—
1—Car house
2—3rd and Jones
3—5th, 6th and Williams
4—Union Depot
5—Cross Street

Spall Line—
1—8th and April
2—22nd Street
3—33rd and Washington

Waverly Line—
1—10th and Wood
2—24th and Waverly
3—26th and Abner

It is appreciated that there are certain times when it will be practically impossible for conductors to make an actual count of the passengers. At these times it is requested that the conductor use his own best judgment as to the number of passengers that are on the car, regardless of what the register reading is. It is the intention to have the figures as near right as is possible. Your cordial co-operation toward this end is requested.

Asst. Supt. Transportation

FORM OF ORDER FOR SURVEY

arvey at a Given Point—Baskerville Line, June 15, 1917

3-4		4-5		5-6		6-7		7-8		8-9		9-10		10-11		11-12		12-1		1-2		2-3		3-4		Car Number	Seating Capacity
Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In		
S			14	13			10	2	2	3		1	2		0												
	13	21	11	5			3	6		4	4		1	6	2	4			0							625	42
2	79	0			39		8	34			0	34	1	32			1									628	"
0			20	25		6	2		5	2		4	1		0	1	1									621	"
	18	21			26	9		4	6		5	4		2	5		1	3								626	"
	3	9		15	3		0	3			0															623	"
1	3	15			14	4	4	4			0															625	"
				1			1																			647	"
		23			17																					624	"
		40			35																					579	"
																										507-660	"
		130	63	80			1																			630	"
																										577-597	"
																										621	"
																										628	"
	3																									627	"
10		15	9		11	3			11	4	1	6		5	0		0									626	"
																										624	"
																										623	"
							0																			622	.
				11	2																					634	"
7																										582-655	"
2	2		13	8			4	3		5		6	1		0	3			0							629	"
																										627	"
70	121	304	130	225	147	22	33	56	25	18	10	55	6	45	7	8	3	3	0								
7	7	9	6	9	8	4	10	7	5	5	6	6	5	4	6	3	4	1	2								
10	17.3	33.5	21.7	25	17.1	5.5	3.3	8	5	3.6	1.6	9.1	1.2	11.2	1.1	2.6	.75	3	0								
12	79	130	63	80	39	9	10	34	11	5	5	34	2	32	5	4	1	3	0								
7	2	9	9	1	2	3	0	2	1	2	0	1	1	2	0	1	0	3	0								

The small initial investment in a jitney and the usual absence of all service obligations make it easy to withdraw individual machines from service; the large collective investment and fixed charges in an electric railway and the franchise requirements compel a large measure of service. Interest necessarily has to be paid on the investment, and every intelligent effort possible must be made to conserve that investment so that new capital may be obtained for new work.

Of course, those companies which tried to answer jitney competition by cutting down their own service made a tactical error. It was not necessary, however, to go to the other extreme of increasing the service at all hours of the day. If the jitney traffic had been plotted by hours, as in Figs. 45, 46 and 47, the extra service could have been put on only when it served the purpose of making competition unprofitable.

That the electric railway can win on this basis by the use of small, fast, one-man cars on short headways is now certain. The safety car in particular has proved that fact in a host of places. Electric railway men now know that the public isn't quite so prejudiced against them after all. What it really does is simply to take the first low-price transportation at hand—and if the street car is first, the street car gets the fare.

Private Autos Are Tractable, Too

The competition of the private automobile, naturally, is more subtle than of the jitney. Its severity also fluctuates with the weather, and it can be attacked directly only by zoning and parking restrictions. The latter are palliatives. As in the case of the jitney, the real deterrent is fast service with cars that the railway can afford to operate on short headways. Furthermore, exact operation to time-points will also help greatly—a feature which can be made effective automatically by the use of headway recorders, as at Fort Worth.

Accurately synchronized watches are a most decided factor in making time-point operation a success. Up-to-date electric railways use watch movements equivalent to steam railroad standards. New speed, headway and time-point operation often will call also for the better relocation of many switches.

Experience in several cities indicates that with such standards the private automobile returns to its old limitations as a holiday car. Why bother to open and close the garage when the trolley car will start you on your trip downtown before you can get your automobile started?

This Car Card just issued is reproduced at the end of Mr. Layng's article because it illustrates the kind of co-operation which he describes.

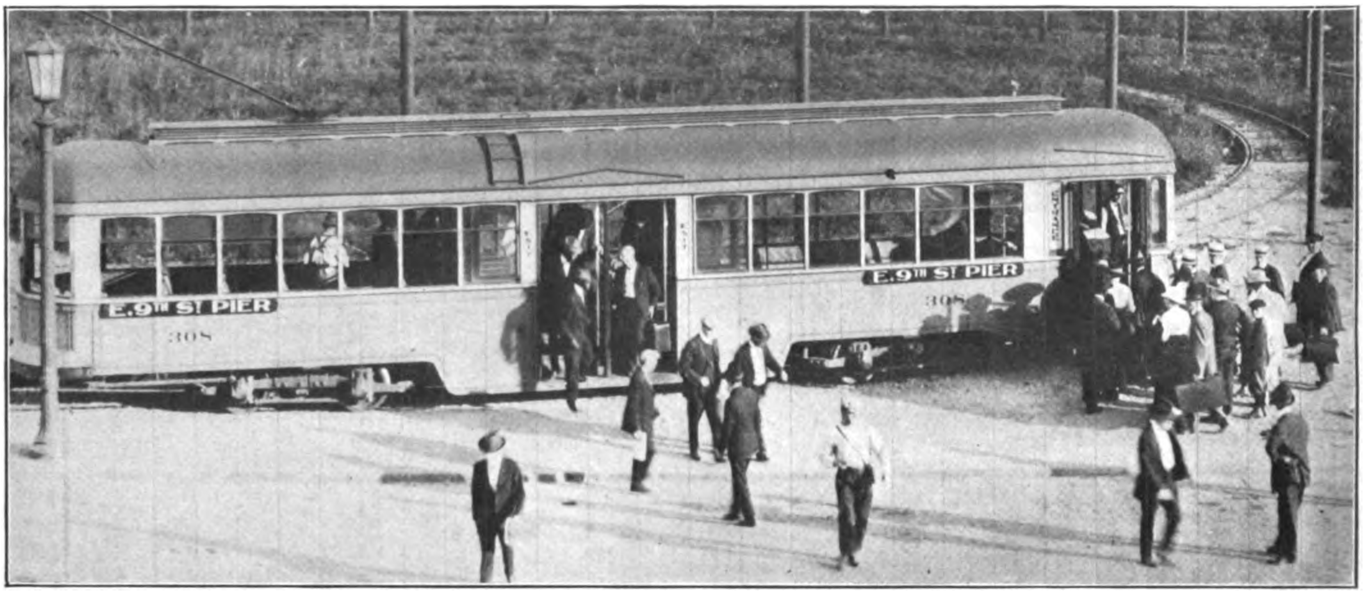
THE Motorman *and* Conductor of this car are members of the

U.S.FUEL ADMINISTRATION

and *they* are pledged to save Electricity, which means COAL

WAR BOARD AMERICAN ELECTRIC RAILWAY ASSOCIATION

The United States Fuel Administration, through the Electric Railway War Board, will furnish car cards like this to electric railways which will co-operate in the conservation movement by securing pledges from platform men to conserve energy.



PETER WITT CAR LOADING AND UNLOADING AT CLEVELAND DOCK TERMINAL OF ONE-CENT FARE LINE

How the Pay-As-You-Pass Car Was Developed

By PETER WITT

Formerly Street Railroad Commissioner of Cleveland

The Pay-As-You-Leave System, Introduced First in Cleveland, Prevented Boarding Delays, But Caused Congestion at Important Leaving Terminals—The Present Cleveland Car Cuts Down the Time of All Boarding and Alighting and Insures the Collection of All Fares—At the Same Time It Reduces the Work of the Conductor—The Peter Witt Car Is Also Well Adapted to the Zone System, Which the Author Considers the Best Solution for the Fare Problem

ON Jan. 1, 1912, by appointment, I became the city's street railroad commissioner, an office created under the ordinance then and now in effect for the operation of the property of the Cleveland Railway Company. By reason of the long drawn-out war (covering a period of ten years) the property not only was run down, but there was a lack of equipment, which produced during the rush hours a condition of crowding which can be described only by saying it was indecent. Bad as it was for the public to endure this kind of service, there was another phase not generally known to the car riders as a whole, and that was the inability of the conductors to collect all the fares due. The cars were all of the pay-enter type, and some had very large platforms. With a crowd of twenty-five or thirty riding on one of these platforms it became very easy, especially for the persons riding on the steps of the cars, to do their riding without paying fare.

Since new cars could not be ordered and delivered for many months, this condition called for the application of a speedy remedy, otherwise, the loss of fares, large as it was, would continue to grow as the news of the dishonest car riders was carried to the honest ones who were riding on the crowded platforms and still paying their fares. To give the full force of what I mean, let me quote a favored lecture of the late Albert Johnson to the conductors in his employ. He used to say:

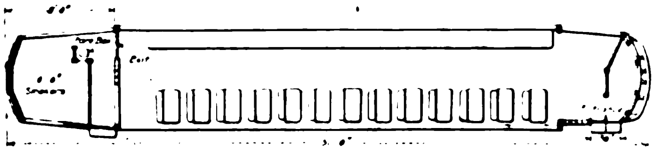
"Don't steal, for if you are caught you will be fired, but I would rather have you steal a dollar than miss one nickel. Why? Because every passenger up till the time that the conductor has failed to get his fare not only pays, but will make an effort to get the nickel to the conductor. But once you miss him and he has enjoyed the sensation of riding free he will be on the lookout to beat you ever afterward."

What was to be done? This soon gave way to, What can be done? Several weeks of earnest and hard thinking brought me to the place where I was convinced that to remedy the situation there was but one thing to do, and that was to operate the cars by reversing the time of payment, *i. e.*, changing from pay-enter to pay-leave. Not only would it be possible for the conductor to get all fares because car riders get off in ones, twos and threes, but there would be a swiftness of loading at terminals which would solve the old standing and ever-pressing problem of congestion. So in February I requested John J. Stanley, president of the Cleveland Railway, to rebuild one of the large platform cars by removing the forward bulkhead and changing from transverse to longitudinal seats on the devilstrip side. This change meant a wider aisle and the consequent reduction of the inconvenience of going through the car when the passengers entered at the front door and made their exit at the rear.

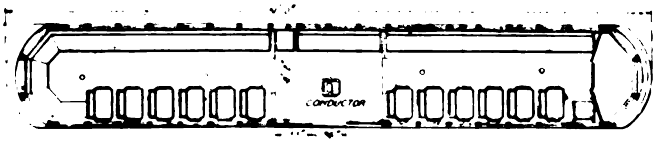
THE PAY-LEAVE PLAN WAS STARTED IN 1912.

The first car so reconstructed was put into service on April 10 following. Its success was immediate, but as it ran on a line which carried ninety pay-enter cars, in-bound cars were delayed at the downtown terminal because of the large number of fares which had to be collected there. What was gained by loading by this method of fare collection was at once offset by unloading. One day's trial resulted in the making of a combination of the two systems of fare collection. When the car was being operated to the city we adopted the pay-enter plan, with entrance at the rear door, and when the car was out-bound, the pay-leave plan, with entrance at the front door. So successful did this change prove that all the other cars of this type, 100 in number, were speedily changed to this type of seating arrangement and alternation of fare collection.

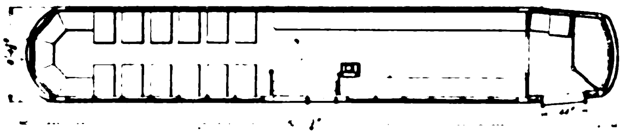
In September of the same year the first of the 100 center entrance trailers, which had been ordered in January, were delivered and ready for service. Here was still another problem; cars without a platform. How to load them became the question. To use the method employed on the pay-enter platform cars meant confusion at the fare box, keeping the car riders out in the weather and the slowing down of the schedule. In order that the reader may get the full import of this let me say that the alternate stop had already been established in Cleveland, and this means that at such stops there accumulate all the car riders who under the old scheme are distributed at all street intersecting stops.



PLAN OF ORIGINAL PAY-LEAVE CAR IN CLEVELAND, PUT IN SERVICE IN APRIL, 1912



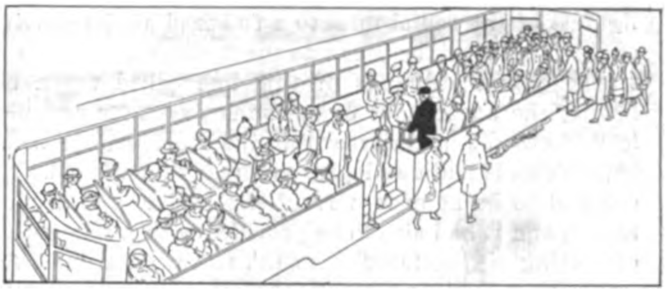
PLAN OF CENTER-ENTRANCE TRAIL CAR ON WHICH THE PAY-PASS SYSTEM WAS INTRODUCED, THE NEXT STEP IN THE DEVELOPMENT OF THE PETER WITT CAR



PLAN OF CAR DESIGNED BY PETER WITT FOR CROSSTOWN SERVICE IN CLEVELAND

The solving of this problem, however, was easy. All we did was to regard the rear half of the car a loading platform, then make all car riders as they deposited their fares proceed to the forward end of the car. When the car reached the terminal all the conductor had to do was to open both doors. Then he need pay no attention to the front end, but simply watch the tickets drop from those in the rear. It was found that the non-paid, or rear, end of the car would empty just as fast as the paid end, for the rider in the rear end, having plenty of time, would have his ticket ready long before he would reach the box. Here was speed and convenience combined.

The next step was easy, as the pay-as-you-leave system was already in operation and familiar to the car riders in Cleveland. We made all cars pay-leave when leaving the downtown loops. To all unacquainted with the street layout of Cleveland and who desire to grasp it quickly it might be likened to a three-quarter wheel, with the hub for the heart of the city and the spokes for the radiating streets. What through lines there were we cut and made the hub (the Public Square) the transfer point.



IN THIS VIEW THE ROOF HAS BEEN OMITTED TO SHOW HOW PEOPLE PAY THEIR FARES AS THEY PASS THE CONDUCTOR IN GOING FROM THE FRONT OF THE CAR TO THE REAR OR OUT AT THE EXIT

Under the former pay-enter system it was a nightly sight to see on all streets long lines of cars moving slowly toward the loop, because at the loop it used to take from two to three minutes to load a car. Under the new system these long lines disappeared, for a train now unloads and gets away in fifty seconds, in spite of the fact that a train covers more than 100 ft. of track, seats 127 passengers and has its complement of strap hangers. This method of operation was equal to doubling the terminal, which with us was impossible owing to an absence of streets.

THE PAY-PASS PRINCIPLE DEVELOPED FOR CROSSTOWN TRAFFIC

Now, in addition to the lines which radiate from the Public Square, we have five crosstown lines. The principal one of the five is the first one east of the Public Square, known as the East Fifty-fifth Line. This line, in a distance of three miles, crosses nine radial streets, over which run the cars of sixteen routes. On this line it is not unusual but ordinary for a car to discharge and take on anywhere from a score of riders from the

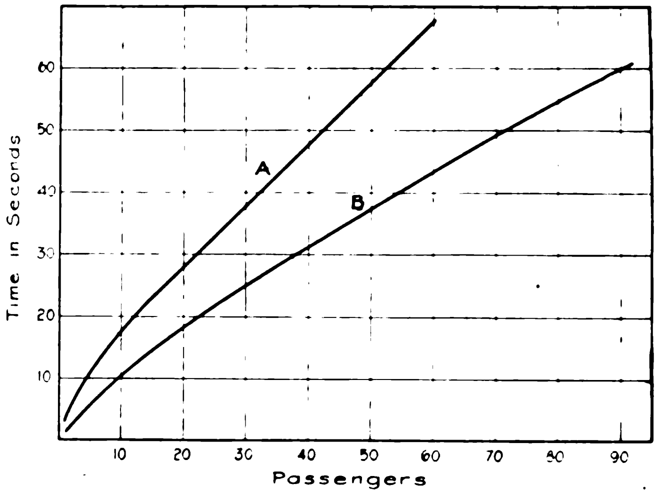


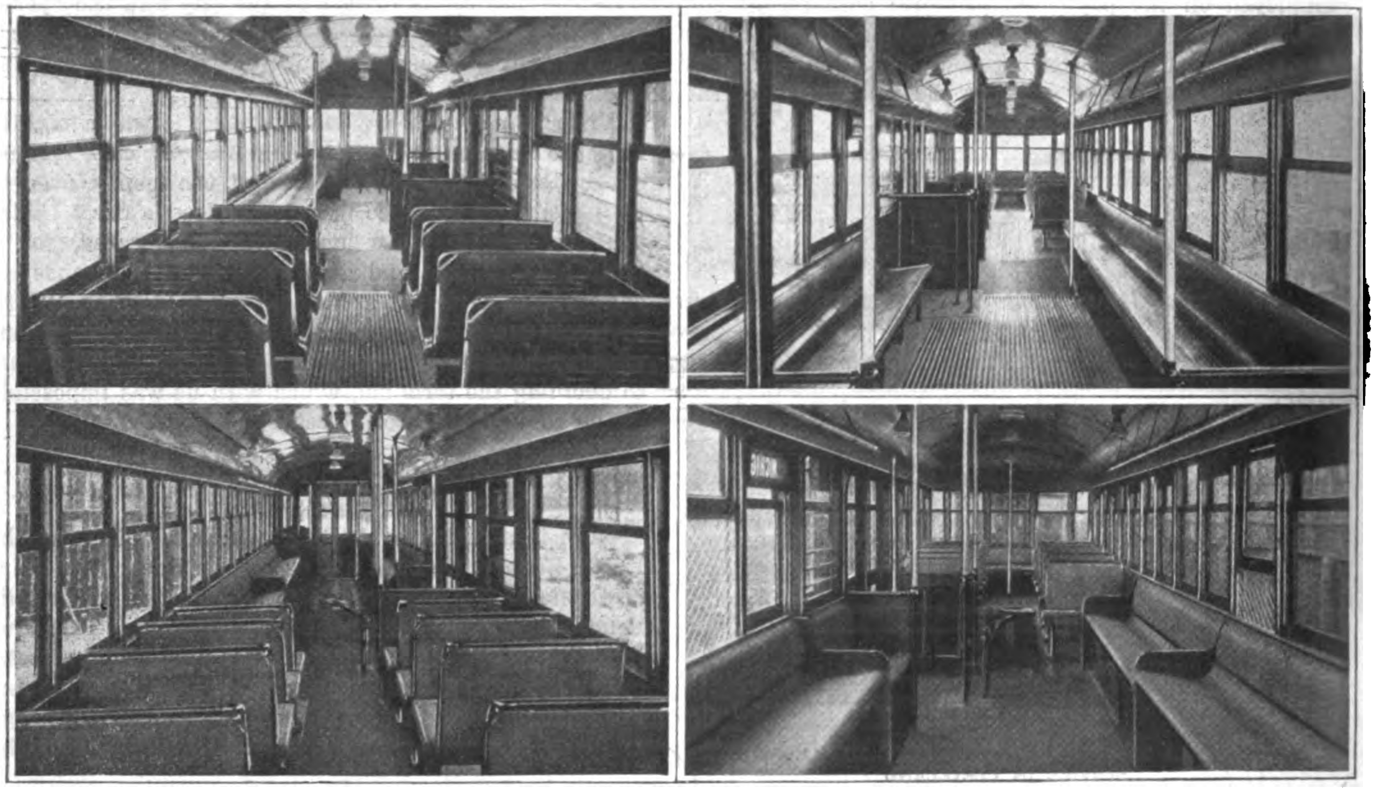
CHART OF LOADING AND UNLOADING TIME

Curve A—Average loading and unloading time of rear-entrance, front-exit, pay-as-you-enter car with folding steps, 33-in. wheels and 26-in. entrance and exit.

Curve B—Average loading and unloading time of Peter Witt car with front entrance, center exit, 26-in. wheels and 36-in. entrance and exit. Door not interlocked with control.

lightest of the radial lines to a full load at the heaviest ones. The need for a car to meet these most unusual transportation demands of this line called for a car having the advantages of both the pay-enter and pay-leave method and yet free from the shortcomings which both methods had developed, as already mentioned. The car had to be at once a front-end loader, and a quick loader, and it had also to be provided with a sure means of getting all the fares from the riders on a quick filling car. Knowledge of what was needed and the experience had with the first pay-leave car were of great help in solving this problem. The answer was the design which has since become known as the Peter Witt front-entrance center-exit car riders' car, the car with the pay-as-you-pass principle of fare collection.

As the entrance to this car is through the front door and the exit is by way of the center door, the movement within the car is all one way, with the consequent absence of the confusion which comes from a conflicting movement. The doors are very wide, permitting the car riders to enter or leave two abreast. In the forward half of the car, which is really nothing more or less than a loading platform, longitudinal seats are used. This gives a very wide aisle and makes possible that rapidity of loading for which the design is particularly noted. It becomes a very easy matter for twenty or thirty people to board this car and to have the last one on before the first one arrives at the fare box. The paying then goes on while the car is in motion.



THESE VIEWS SHOW DIFFERENT TYPES OF INTERIORS OF PETER WITT CARS, OPERATED ON THE PAY-AS-YOU-PASS SYSTEM

The rear half of the car is provided with transverse seats. As these seats are of the type which the public prefers, quite naturally they are the first to be occupied. The effect of this is to remove the car rider from the entrance, so the incoming crowd can move in without interference. There being no crush at the fare box, the collection of fares not only becomes easy but sure as well. This means that in a very short while the man conductor will go. His place will be filled by a woman, partly because man labor is scarce but also because this is a woman's job. She will perform her duties more quickly than a man and also more neatly. At the same time the order and decorum will be better. Scrapping between the payer and the receiver of fares will be but a memory.

HOW THE PETER WITT CAR CAN BE USED WITH THE ZONE SYSTEM

The biggest thing for the car is yet to come, for the present method of charging a unit fare regardless of the length of haul must give way to the zone system. The rider who covers 9 blocks ought not to be obliged to pay the fare of the one who rides 9 miles. The street railway companies must become the equalizer between the short-haul and long-distance rider. It must stop robbing the former, who now gets less than he pays for and refuses to stand for the larceny of the latter, who pays less than the service costs.

This change, which is bound to come, should receive more than serious consideration at this time, when the nickel is becoming less valuable every minute. It should be put into effect, for through it and it alone will come the remedy for the present-day transportation ills. It will even do more. It will easily prevent future ills, as come they will, to both owner and user of cars alike, for the stability of the nickel is gone. Its shrinkage hurts the former; its expansion injures the latter. Any change then needed to meet new conditions can easily be brought about by the simple and easy process of shortening or lengthening the zone. Such a plan of charging for rides is much less revolutionary than the present way of increasing the unit. The latter method kills the short and profitable haul and fails to get what is due from the long haul. The zone system will save the short-distance rider to the transportation company and at the same time make the long-distance traveler pay the full price for the service he receives.

Right here the objector to the zone system will appear and give as his reason for opposition to the change that old hackneyed and threadbare argument that the present way is the only way of preventing congestion. But does it? Of course not, and it never will. Wherever you find the haul the longest then you will find congestion the greatest.

To him who refuses to take that answer as complete, let him look about. If he can show one extension that was ever made to relieve congestion which did not raise the value of land along the route traversed by the extension, he can show something no searcher has been able to find.

In Cleveland we carry people nine miles for three cents. Experience has shown that if the fare were six cents just as many inhabitants would be living along this line, but with this difference: The land would sell for less, the decrease in the value of the lot would be measured by the increase in the fare. In other words, a high rate of fare means low land values in the suburbs, and a low rate of fare means high land values there. The owner of land at a distance from the center of a city capitalizes the industry and thrift of others. His is the game unbeatable and will remain so until the state appropriates for social purposes the social product—the unearned increment.

A PAY-AS-YOU-PASS CAR IN BUFFALO DURING THE RUSH HOUR ON A SNOWY AFTERNOON JUST BEFORE CHRISTMAS

But I am off the track. What I started out to say was that when the zone system comes the front-entrance center-exit car will be the one for such measured service. Not that some other designs cannot be used, for they can, but not with the same degree of convenience to the car rider, whose welfare should always be uppermost in the minds of every street railway operator. He must learn what up to the present he has failed to understand—the car rider is a customer. Such being the case, what is the operator? Nothing more or less than a merchant. His occupation is that of merchandising rides.

I still have not disclosed the method of determining the cost or the scheme of fare collection when the zone system prevails. So here it is, not what is going to be, but what will be when the three Peter-Witt cars now building for the Mahoning & Shenango Railway Company are put into service.

This company operates a line from Warren to Lowellville, Ohio, passing through five 5-cent zones. Passengers when they board will receive from the motorman a check showing point of origin. When the passenger gets ready to leave he will proceed to the conductor, who, from the check, will know the amount due. Simple, isn't it?

The experience in Cleveland of low fares shows conclusively that the riding habit can be stimulated, and since the greater part of every railway company's equipment is dead for twenty-two out of every twenty-four hours, everything should be done which will bring this dead equipment into use. To me the easiest way to do this is through the zone system, with fares so low that walking will become costly.

A 1-CENT LINE IS RUN AT A PROFIT

Since the doubting ones will want more than my word for what I have said, let me cite briefly the story concerning the one-cent line in Cleveland by way of illustrating the wisdom of the zone system. This 1-cent line is a mile long and runs from the Public Square, where all our lines converge, to the Municipal Docks, where land the boats from Detroit and Buffalo. These boats arrive at 6 o'clock in the morning and in the summer months come heavily loaded. To take care of the throng, cars must be on hand. About one hour after the arrival of the boats the place is dead. There is very little occasion for anybody to go to the boat landing. At night the boat passengers commence making their way to the dock after 7 o'clock, for the Buffalo boat leaves about 9, and this movement continues until 11.45, when the Detroit boat departs.

From this it will readily be seen that the line running on a five-minute headway from 7 to 12 o'clock is over-serviced. Notwithstanding this and the big mileage cost of bringing these cars from the nearest operating station, which is five miles away, immediately after this line was put into operation it earned within 2 cents per car-mile of what was earned by the whole Cleveland system. Were these cars operating through two parts of the city where people desired to travel, I have no hesitancy in saying that the 1-cent line, instead of earning within 2 cents of the average of the system, would have earned many cents above it.

Coal Production Falls Off

Supplementing the diagram and table printed on page 1120 of the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 22, the United States Geological Survey has issued a statement containing among others the following data: The average total bituminous coal mined per working day for the week ending Dec. 8 was 1,853,030 tons; for the week ending Dec. 15, 1,406,425 tons, and for the week ending Dec. 22, 1,652,858 tons. The total production for the week of Dec. 22 was 9,917,145 tons. The depression in the bituminous industry is accounted for by prolonged cold weather continued during the week of Dec. 22.

New Electric Rolling Stock for 1917

Orders Placed for New Cars and Those Built in Companies' Shops During the Last Year Total 2455, Which Is a Marked Decrease from Figures for Each of the Last Ten Years—One-Man Cars Increasingly Popular

THE new rolling stock ordered during 1917 or built in the shops of the various electric railways of the United States and Canada and roads having electrified divisions is tabulated herewith. Although reports from all the companies were not received in time for compilation, the figures represent the railways having about 96 per cent of all the electric cars operated. The total of 2455 cars marks a return to the low figure of two years ago. The number of companies which reported new equipment is 182 as compared with 250 in 1916, which is proportionately less of a decrease than in the total number of cars.

The following table indicates the new rolling stock for the years since 1907, divided into city and interurban passenger cars and freight and miscellaneous equipment. In this summary cars for subway and elevated lines have been classed as city equipment and those for suburban or both city and interurban service have been placed in the interurban column. Freight and express cars, electric locomotives and work cars of all kinds have been grouped as miscellaneous cars. As heretofore, the number of city cars predominates, the figure for 1917 having been affected by a single order for 477 subway cars for the Interborough Rapid Transit Company.

Year	City Cars	Interurban Cars	Freight and Misc. Cars	Total
1907	3,483	1,327	1,406	6.216
1908	2.208	727	176	3,111
1909	2,537	1.245	1,175	4.957
1910	3,571	990	820	5.381
1911	2,884	626	605	4.015
1912	4.531	783	687	6,001
1913	3,820	547	1,147	5.514
1914	2,147	384	479	3.010
1915	2,072	336	374	2,782
1916	3.046	374	522	3,942
1917	1,998	185	272	2,455

An increase of nearly 50 per cent in the number of one-man cars purchased as compared with 1916 figures is a noteworthy feature of these data, the number of cars listed of this type being 280, besides thirty-three which were arranged for either one or two-man operation. The number of locomotives ordered was forty-nine, showing a decided increase over the numbers for 1916 and 1915, which were thirty-one and forty-three respectively. Cars of all kinds built in railway shops total 281, four companies contributing 176 of this number. The number of home-made cars is about two-thirds of that for 1916, which was a distinct advance over previous years. The use of interurban trailers continues to diminish, only twenty-seven cars of this type having been ordered, as opposed to seventy-one of a year ago. Trailers that may be considered for city service, however, number 402, while for 1916 the corresponding figure was 128. This difference is effected in part by 140 subway trailers for the Interborough Rapid Transit Company, which were included this year in the large order already referred to. No data were secured regarding orders for auto buses and motor trucks.

In the following alphabetical list space limitations have made it necessary to condense the data as much as possible. All cars are specified as either passenger or miscellaneous, the former including also combination passenger and baggage cars and the latter consisting of freight, express, service, work cars, etc. Locomotives are entered separately. In classifying passenger cars for city or interurban service, disposition was made here also as previously explained, and no attempt was made to classify the miscellaneous equipment with respect to service.

While in a canvass of this magnitude and one which must close on a definite date it is not possible to get reports from 100 per cent of the industry, every attempt has been made to present complete and accurate data. It has been possible in most cases to check the companies' figures against reports of the various car builders, and the courtesy of all who have co-operated in supplying statistics is earnestly appreciated.

Railway	Number	Type	Overall Length	City or Interurban	Motor or Trailer	One or Two Man
Aberdeen Railroad	1	Misc.	..	..	Mot.	..
Alabama City, Gadsden & Attalla Ry	1	Psgr.	44	Int.	Mot.	Two
Alton, Granite & St. Louis Trac. Co	3	Psgr.	53½	Int.	Mot.	Two
	1	Psgr.	53½	Int.	Trail	..
Appalachian Power Co.	1	Psgr.	38½	City	Mot.	Two
Augusta-Aiken Ry. & Elec. Corpn	4	Psgr.	47½	City	Mot.	Two
Austin Street Ry	4	Psgr.	30	City	Mot.	One
Bangor Ry. & Elec. Co	3	Psgr.	30	City	Mot.	One
Beaumont Trac. Co.	7	Psgr.	30	City	Mot.	Two
Blue Ridge Lt. & Pwr. Co	4	Psgr.	25	City	Mot.	One.
Boston & Worcester St. Ry	6	Misc.	45	..	Mot.	..
Boston Elevated Ry	35	Psgr.	69	City	Mot.	Train
	1	Psgr.	28	City	Mot.	One
	7	Misc.	40½	City	Mot.	..
Bristol & Plainville Tramway Co	2	Psgr.	39	Int.	Mot.	Two
Brockton & Plymouth St. Ry	2	Psgr.	29½	City	Mot.	One
Brooklyn Rapid Transit Co	1	Misc.	47	City	Trail.	..
	2	Misc.	50	City	Mot.	..
Buffalo & Depew Ry	1	Loco	34	16 tons	..	..
Burlington County Transit Co	1	Psgr.	41	Int.	Mot.	Two
Cape Breton Elec. Co	2	Psgr.	28	City	Mot.	One.
Cedar Rapids & Marion City Ry	15	Psgr.	31	City	Mot.	Either
	10	Psgr.	37½	City	Mot.	Either
Centralia & Central City Trac. Co	2	Psgr.	28	City	Mot.	One.
Chambersburg, Greencastle & Waynesboro St. Ry	1	Misc.	24	..	Mot.	..
Charleston-Dunbar Trac. Co.	2	Psgr.	45	City	Mot.	Two
Charleston Interurban R.R.	1	Misc.	45	Int.	Mot.	..
	4	Psgr.	38	Int.	Mot.	Two
Chicago & West Towns Ry.	5	Psgr.	45	City	Mot.	Two
Chicago, Milwaukee & St. Paul Ry	2	Locos.	4½	70 tons		..
	5	Locos.	76	265 tons		..
	10	Locos.	90½	266 tons		..
Chicago, No. Shore & Milwaukee R.R.	2	Locos.	37½	50 tons		..
Chicago, So. Bend & No. Indiana Ry	5	Misc.	40	Int.	Trail.	..
Chicago Surface Lines	5	Misc.	40½	City	Mot.	..
Cincinnati & Columbus Trac. Co	1	Misc.	50	Int.	Mot.	..
Cleveland Ry	25	Psgr.	49	City	Trail.	..
	2	Misc.	28	..	Mot.	..
	51	Psgr.	49	City	Trail	..
Cleveland, Southwestern & Col. Ry	2	Psgr.	22	City	Mot.	One.
Colorado Springs & Int. Ry	11	Psgr.	28	City	Mot.	One
Columbia Ry. Gas & Elec. Co	28	Psgr.	47	City	Mot.	Two
Columbus Railroad	8	Psgr.	28	City	Mot.	One
Columbus Ry. Pwr. & Lt. Co	10	Psgr.	48	City	Mot.	Two
Conestoga Trac. Co	8	Psgr.	44	City	Mot.	Two
	2	Misc.	4	Int.	Mot.	Two
Cumberland & Westernport Elec. Ry	5	Psgr.	45	Int.	Mot.	Two
Cumberland County Pwr. & Lt. Co	8	Psgr.	44	City	Trail.	..
	2	Misc.	36	..	..	..
Danville St Ry. & Lt. Co	4	Psgr.	41	City	Mot.	Two
Dayton, Covington & Piqua Trac. Co	2	Psgr.	50	Int.	Mot.	Two.
Dayton, Springfield & Xenia Southern Ry	2	Psgr.	43½	Int.	Mot.	Two
Denver Tramway	1	Misc.	17	..	Mot.	..
	4	Misc.	40	..	Trail.	..
	2	Misc.	40	..	Mot.	..
Duluth Street Ry	8	Psgr.	46	City	Mot.	Two
	1	Misc.	..	..	Mot.	..
Durham Trac. Co	2	Psgr.	30	City	Mot.	Either
E. Liverpool Trac. & Lt. Co.	1	Misc.	40½	..	Mot.	..

Railway	Number	Type	Overall Length	City or Interurban	Motor or Trailer	One or Two Man
East St. Louis Ry	5	Psgr.	46½	City	Mot.	Two
	25	Psgr.	41	City	Mot.	Two
Eastern Pennsylvania Rys	8	Psgr.	50	Int.	Mot.	Two
	2	Misc.	28	..	Mot.	..
Eastern Wisconsin Elec. Co	1	Misc.	46	Int.	Mot.	..
El Paso Electric Ry	10	Psgr	30	City	Mot.	One
Enid City Ry	2	Psgr.	30	City	Mot.	One
Fairburn & Atlanta Ry. & Elec. Co	1	Psgr.	30	Int.	Mot.	Two
Fonda, Johnstown & Gloversville R.R.	4	Psgr.	33½	City	Mot.	Two
Fort Dodge, Des Moines & Sohn R.R.	2	Psgr.	47	Int.	Mot.	Two
Fort Dodge Street Ry	1	Psgr.	30	City	Mot.	One
Fort Wayne & Decatur Trac. Co	3	Psgr.	47	Int.	Mot.	Two
	1	Misc.	40	Int.	Mot.	..
Fort Wayne & No. Indiana Trac. Co	10	Psgr.	41	City	Mot.	Two
	2	Misc.	53	Int.	Mot.	..
Fox & Illinois Union Ry	1	Misc.	50	Int.	Mot.	Two
Gary & Interurban R.R.	4	Psgr.	44	Int.	Trail	..
	2	Psgr.	44	Int.	Mot.	Two
Georgia Ry. & Pwr. Co	10	Psgr.	40	..	..	..
Glendale & Montrose Ry	3	Psgr.	..	..	..	..
Grafton & Upton R.R.	2	Locos.	26	30 tons		..
	3	Misc.	44	Int.	Mot.	..
Gd. Rapids, Gd. Haven & Muskegon	1	Psgr.	55	Int.	Mot.	Two
Gray's Harbor Ry	6	Psgr.	..	City	Mot.	One.
	3	Psgr.	31½	City	Mot.	One
Hagerstown & Frederick Ry	3	Psgr.	48	Int.	Mot.	Two
Hammond, Whiting & E. Chicago Ry.	2	Psgr.	52	City	Mot.	Two
Harrisburg Rys.	5	Psgr.	44	City	Mot.	Two
Hocking-Sunday Creek Trac. Co	1	Psgr.	44½	Int.	Trail	..
	1	Psgr.	47½	Int.	Mot.	Two
Holyoke Street Ry	2	Misc.	40½	..	Mot.	..
	1	Misc.	28	City	Mot.	..
Honolulu Rapid Trans. & Land Co	10	Psgr.	40	City	Mot.	Two.
Hot Springs Street Ry	7	Psgr.	28	City	Mot.	One.
Illinois Traction System	6	Locos.	..	60 tons		..
Indiana Ry. & Lt. Co	2	Psgr.	39	City	Mot.	Two
Interborough Rapid Transit Co	337	Psgr.	51½	City	Mot.	Train
	140	Psgr.	51	City	Trail	..
International Ry	100	Psgr.	50	City	Mot.	Two
	4	Misc.	40	City	Mot.	..
	3	Misc.	28	..	Mot.	..
Interstate Public Service Co	2	Misc.	40	Int.	Trail.	..
	1	Misc.	60	Int.	Mot.	..
Inter Urban Ry	2	Locos.	..	60 tons		..
Johnstown Trac. Co	10	Psgr.	40	City	Mot.	Two
Kankakee & Urbana Trac. Co	1	Psgr.	51	Int.	Mot.	Two.
	1	Psgr.	42	Int.	Trail.	..
Knoxville Ry. & Lt. Co	12	Psgr.	47½	City	Mot.	Two.
Lake Shore Elec. Ry.	12	Psgr.	60	Int.	Mot.	Two
	1	Misc.	60	..	Mot.	..
Lancaster & York Furnace Lt. Ry	1	Psgr.	28	City	Mot.	One.
Lehigh Valley Transit Co	24	Psgr.	47	City	Mot.	Two
Lewiston, Augusta & W'v'le St. Ry	10	Misc.	34	..	Trail.	..
	6	Psgr.	34	City	Mot.	Two
	3	Misc.	34	..	Mot.	..
	2	Misc.	46	..	Mot.	..
	2	Misc.	36	..	Trail.	..
Linwood Street Ry	1	Psgr.	40	City	Mot.	Two
	6	Psgr.	47½	City	Mot.	Two
Little Rock Ry. & Elec. Co	5	Psgr.	33	City	Mot.	Two
London Street Ry	5	Psgr.	49	City	Mot.	Two
Lorain Street R.R.	10	Psgr.	28	City	Mot.	One
Louisville & So. Indiana Trac. Co	6	Misc.	40½	Int.	Trail.	..
Louisville Ry	6	Psgr.	41	City	Mot.	Two
Macon Ry. & Lt. Co	1	Misc.	38	..	Mot.	..
	5	Psgr.	28	City	Mot.	One
Madison Rys.	13	Psgr.	46½	City	Mot.	Two
Mahoning & Shenango Ry. & Lt. Co	3	Psgr.	49	Int.	Mot.	Two.
	5	Psgr.	31	City	Mot.	One
Mason City & Clear Lake R.R.	12	Psgr.	50	Int.	Mot.	Two
Massachusetts Northeastern St. Ry	5	Psgr.	41½	City	Mot.	Two
Michigan Ry	4	Psgr.	61	Int.	Mot.	Two
	2	Psgr.	53	Int.	Trail.	..
	3	Psgr.	46	Int.	Trail.	..
	1	Misc.	60	Int.	Mot.	..
	1	Misc.	50	....	Mot.	..
Milwaukee Electric Ry. & Lt. Co	2	Misc.	36	City	Mot.	..
	2	Misc.	40½	City	Mot.	..
	2	Misc.	36	..	Trail.	..
	2	Misc.	50	Int.	Mot.	..
Monongahela Valley	6	Psgr.	40	City	Mot.	Two
	4	Psgr.	51	Int.	Mot.	Two
	2	Psgr.	42	Int.	Mot.	Two
	1	Misc.	45	Int.	Mot.	....
	3	Misc.	40	Int.	Trail.	..
	1	Loco.	32½	40 tons		..
Montreal & So. Counties Ry	3	Psgr.	55	Int.	Mot.	Two
	3	Psgr.	55	Int.	Trail.	..
Montreal Tramways	50	Psgr.	44	City	Mot.	Trail.
	50	Psgr.	47	City	Trail.	..
Morgantown & Wheeling Ry	1	Psgr.	45	Int.	Mot.	Two
	1	Misc.	46	Int.	Mot.	..
Nashville Interurban Ry	6	Psgr.	47	City	Mot.	Two
Newport News & Hampton Ry. Gas. & Elec. Co	30	Psgr.	69½	Int.	Mot.	Train
New York Central R.R.	1	Loco.	62	145 tons.		..
New York, New Haven & Hartford R.R.	5	Locos.	69	180 tons.		..
New York State Rys. (Rochester)	2	Misc.	28	City	Mot.	..
New York State Rys. (Syracuse)	25	Psgr.	47½	City	Mot.	Two
	1	Psgr.	60½	Int.	Trail.	..
	1	Misc.	28	City	Mot.	..
New York State Rys. (Utica)	1	Misc.	50	Int.	Mot.	Two
No. Carolina Public Service Co	15	Psgr.	28	City	Mot.	..
Northern Elec. Co	2	Psgr.	28	City	Mot.	One
Northern Ohio Trac. & Lt. Co	10	Psgr.	47	City	Trail.	..
	10	Psgr.	46½	City	Mot.	Two
	25	Psgr.	41½	City	Mot.	Two
	4	Misc.	60	Int.	Mot.	..
	4	Misc.	50	Int.	Trail	..
	3	Misc.	40½	..	Mot.	..
	1	Locos.	37½	50 tons.		..
Northern Texas Trac. Co	20	Psgr.	28	City	Mot.	One
No. Kankakee Elec. Lt. & Ry	2	Psgr.	32	City	Mot.	Either
Northwestern Pennsylvania Ry	2	Misc.	36	Int.	Trail.	..
	5	Psgr.	47	Int.	Mot.	Two
	6	Psgr.	28	City	Mot.	One.
	2	Misc.	46	Int.	Mot.	Two
Ohio Electric Ry	4	Misc.	50	Int.	Mot.	..
	16	Misc.	38½	Int.	Trail.	..
	10	Misc.	40	Int.	Trail.	..
Oklahoma Ry	12	Psgr.	41	City	Mot.	Two
	4	Psgr.	49	Int.	Mot.	Two
	1	Locos.	36	30 tons		..
Omaha & Council Bluffs St. Ry	40	Psgr.	45	City	Mot.	Two
Omaha, Lincoln & Beatrice Ry	1	Psgr.	18	Int.	Mot.	One
	1	Psgr.	28	Int.	Mot.	Two.
Ottawa Electric Ry	3	Psgr.	45	City	Mot.	Two
Pacific Electric Ry	3	Misc.	40	Int.	..	..
Pacific Power & Lt. Co	2	Psgr.	28	City	Mot.	One
Pennsylvania R.R. (Elec. Div.)	1	Loco.	76	250 tons		..
Pennsylvania & Ohio Rys	1	Misc.	36	..	Mot.	..
Peoria Ry	18	Psgr.	41	City	Mot.	Two
Peoples Ry. of	10	Psgr.	44	City	Trail	..
Philadelphia & Garrettford St. Ry	1	Misc.	50	Int.	Mot.	..
Pittsburg County Ry	6	Psgr.	37	City	Mot.	One
Pittsburg, Harmony, Butler & New Castle Ry	2	Psgr.	47	..	Mot.	Two
Pittsburgh Rys.	50	Psgr.	45	City	Trail.	..
Portsmouth St. R.R. & Lt. Co	3	Psgr.	48	City	Trail	One
Princeton Power Co	1	Psgr.	34	Int.	Mot.	Two.
	1	Psgr.	25	City	Mot.	One.
Public Service Ry	100	Psgr.	51½	City	Mot.	Two
	50	Psgr.	48½	City	Mot.	Two
Puget Sound Int. Ry. & Pwr. Co	10	Psgr.	28	City	Mot.	One
Puget Sound Trac. Lt. & Pwr. Co	24	Psgr.	28	City	Mot.	One.
Quebec Ry., Lt. & Pwr. Co	2	Psgr.	41	City	Mot.	Two
Reading Transit & Lt. Co	6	Psgr.	46	Int.	Mot.	Two
	3	Psgr.	34	City	Mot.	Either
Rhode Island Co	2	Misc.	38	..	Mot.	..
Roanoke Ry. & Elec. Co	6	Psgr.	41	City	Mot.	Two
Rockford & Interurban Ry	13	Psgr.	41½	City	Mot.	..
	5	Psgr.	46	City	Trail.	..
Salt Lake, Garfield & Western Ry	6	Psgr.	56	Int.	Mot.	Train
San Antonio Public Service Co	20	Psgr.	26	City	Trail	One
	2	Psgr.	46	City	Mot.	Two
Sand Springs Ry	1	Psgr.	57	Int.	Mot.	Two
Sandwich, Windsor & Am'b'g Ry	3	Psgr.	34	City	Mot.	Two
Scioto Valley Trac. Co	6	Misc.	42½	Int.	Trail.	..
Seattle Municipal St. Ry	6	Psgr.	30	City	Mot.	One
Sherbrooke Ry. & Pwr. Co	1	Psgr.	32½	City	Mot.	Either
Shore Line Electric Ry	2	Misc.	45	Int.	Mot.	Two
Sioux City Service Co	7	Psgr.	30	City	Mot.	One
Sioux Falls Trac. System	1	Psgr.	28	City	Mot.	One
Slate Belt Elec. St. Ry	4	Psgr.	47	Int.	Mot.	Two
Southern New York Pwr. & Ry. Corpn.	1	Misc.	..	..	Mot.	..
Southwest Missouri R.R.	7	Psgr.	44	Int.	Mot.	Two
Springfield Street Ry	20	Psgr.	43½	City	Mot.	Two
	2	Misc.	40½	..	Trail	..
	1	Misc.	40½	..	Mot.	..
St. Joseph Ry., Lt., Ht. & Pwr. Co	8	Psgr.	..	City	Mot.	One
Tacoma Ry. & Pwr. Co	32	Psgr.	28	City	Mot.	One
Tampa Electric Co	23	Psgr.	28	City	Mot.	One
Tarentum, Brackenridge & Butler St. Ry	1	Psgr.	31	City	Mot.	One
Terre Haute Trac. & Lt. Co	1	Psgr.	55	Int.	Mot.	Two
	2	Misc.	38	Int.	Trail	..
	1	Misc.	43	Int.	Trail.	Two
Terre Haute, Indianapolis & Eastern Ry.	5	Misc.	40	Int.	Trail	..
Texas Electric Ry	2	Misc.	40	Int.	Trail	..
Three Rivers Trac. Co	3	Psgr.	27	City	Mot.	One
Toledo, Bowling Green & So. Trac. Co.	4	Psgr.	60	Int.	Mot.	Two
Trenton & Mercer County Trac. Corpn.	10	Psgr.	43	City	Mot.	Two
Tri-City Ry. of Iowa	3	Psgr.	42½	City	Mot.	Two
Tuscaloosa Ry. & Utilities Co	1	Loco.	30	30 tons		..
Twin City Rapid Transit Co	8	Misc.	36½	City	Mot.	..
	34	Psgr.	46½	City	Mot.	..
	1	Misc.	37	..	Mot.	..
	1	Misc.	27	City	Trail.	..
Twin State Gas & Elec. Co	3	Psgr.	31	City	Mot.	One
Union Street Ry	6	Psgr.	44	City	Mot.	Two
	1	Misc.	43	..	Mot.	..
United Rys. & Elec. Co. (Baltimore)	80	Psgr.	46½	City	Mot.	Two
	12	Misc.	40½	..	Mot.	..
United Rys. of St. Louis	40	Psgr.	45	City	Trail	..
	1	Misc.	30	..	..	..
Vicksburg Light & Trac. Co	4	Psgr.	28	City	Mot.	One
Virginia Ry. & Pwr. Co	20	Psgr.	45	City	Mot.	Two
Washington, Balt. & Annapolis Elec. R.R.	8	Locos.	58	47 tons.		..
Western New York & Penn. Trac. Co	2	Psgr.	47	Int.	Mot.	Two
Western Washington Pwr. Co	2	Psgr.	28	City	Mot.	One
Wheeling Trac. Co	14	Psgr.	49	City	Mot.	Two
	1	Misc.	..	City	Mot.	..
Wichita Falls Trac. Co	5	Psgr.	28	City	Mot.	One.
Williamsport Passenger Ry	4	Psgr.	40	City	Mot.	Two
Wilmington & Philadelphia Trac. Co	15	Psgr.	41	City	Mot.	Two
Winnipeg Elec. Ry	1	Misc.	40	..	Mot.	..
Winona Interurban Ry	2	Misc.	40	Int.	Trail.	..
	1	Misc.	50	Int.	Mot.	..
Worcester & Warren St. Ry	1	Psgr.	30	City	Mot.	One.
Worcester Consolidated St. Ry	10	Psgr.	43½	City	Mot.	Two
	4	Misc.	45	City	Mot.	..
	3	Misc.	45	City	Trail.	..
	1	Misc.	46	City	Mot.	..
York Rys	3	Psgr.	45	City	Mot.	Two

Track Rebuilt and New Track Placed in Service in the Year 1917

Electric Railways of the United States and Canada Report a Total of 442 Miles of Track Constructed or Electrified During the Year. This Is Less Than in Any Corresponding Period During the Last Ten Years—Approximately an Equal Amount of Track Was Rebuilt

THE results of a canvass of the electric railways of the United States and Canada to determine the single-track mileage of lines built or electrified and placed in operation during the year 1917, and also the amount of track reconstructed, are shown in the accompanying lists. Although reports were not received from all of the companies, the data can be considered representative of 97 per cent of the total mileage under electric operation, and this is quite satisfactory in view of the difficulties involved in conducting a canvass of such wide scope.

The following table, which was prepared from previous compilations by the ELECTRIC RAILWAY JOURNAL, shows that the additions made during the past year to the electric railway trackage were considerably less than for any year since 1907. Exclusive of electrified steam lines there were 376.7 miles of new electric railway track built, of which 71.1 miles were represented by new rapid transit lines in Greater New York and 305.6 miles by additions to various city and interurban lines. Although a comparison of the new electrified mileage placed in operation in the last two years shows a large decrease for 1917, the 1916 figure was greatly augmented by the 225-mile extension of the Chicago, Milwaukee & St. Paul electrification, and exclusive of this project the amount of new electrified line for the past year represents a slight increase.

	New Electric Railway Track Built	Electrified Steam Line	Total New Electric Mileage
1907	.....	....	1880.0
1908	1174.5	84.0	1258.5
1909	774.7	112.4	887.1
1910	1204.8	192.4	1397.2
1911	1105.0	86.5	1191.5
1912	869.4	80.8	950.2
1913	974.9	119.0	1093.9
1914	716.5	229.0	946.4
1915	596.0	448.2	1044.2
1916	356.3	388.0	744.3
1917	376.7	66.0	442.7

The 376.7 miles of new line constructed and placed in operation can be divided roughly into two-thirds city and one-third interurban track. In 1916 the interurban track represented two-thirds of the total and the city track one-third. The number of states represented in the accompanying lists is practically the same as a year ago, while the number of companies that reported new work is about 15 per cent greater.

Among the states in which new track was reported, New York leads with 82.9 miles, consisting, as already stated, principally of extensions to the rapid transit lines in Greater New York. This figure compares favorably with the 78.4 miles constructed during 1916 in the State of California, which was the largest amount of new construction done in any one state, excepting, of course, Montana, in which a large amount of steam road had been electrified. In California and Ohio about 33 miles of new track have been built during the last year, this being the second largest amount reported for any state. This, of course, does not include Oregon where the greater part of the new line indicated was an extension of the Portland electrified division of the Southern Pacific Company.

Electric railway construction in Canada suffered a decline from the good record of 1916, due, no doubt, to effects of the war. While several companies are mentioned, by far the greater proportion of work done has been in rebuilding existing track.

The total rebuilt mileage for the year was 375.4, about 85 per cent of which was city track. The Connecticut Company seems to have been most active in this regard, having rebuilt a total of 25 miles. Since corresponding data were not compiled in previous years, no figures are available to use as a basis for comparison.

	New Track, Miles	Rebuilt Mileage
ARKANSAS		
Fort Smith Light & Trac. Co	1.0	1.4
	1.0	1.4
CALIFORNIA		
Los Angeles Ry. Corporation		10.1
Municipal Ry. of San Francisco	11.7	
Northern Electric Ry	0.4	0.36
Pacific Electric Ry.—La Habra to Fullerton	5.06	
San Diego Electric Ry	2.34	0.77
Tidewater Southern Ry.—Hatch to Hilmar, 8 miles; Small to Mateca, 6 miles	14.0	
United Railroads of San Francisco		4.26
	33.50	15.49
COLORADO		
Colorado Springs & Interurban Ry	0.90	1.5
Denver & Interurban R. R.—Electrification extended 1.67 miles in Boulder	2.11	
Denver Tramway	0.67	0.54
	3.68	2.04
CONNECTICUT		
Connecticut Co.	2.57	25.06
Danbury & Bethel St. Ry		1.0
	2.57	26.06
DELAWARE		
Wilmington & Philadelphia Trac. Co		6.04
		6.04
DISTRICT OF COLUMBIA		
Washington & Maryland Ry	0.87	
Washington Ry. & Electric Co	1.35	
	2.22	
FLORIDA		
Jacksonville Traction Co	0.7	
Key West Electric Co		0.25
Miami Traction Co	1.5	
Tampa Electric Co	0.75	
	2.95	0.25
GEORGIA		
Athens Ry. & Electric Co		0.25
Columbus Railroad		2.0
Georgia Ry. & Power Co	4.0	
Macon Ry. & Light Co		1.8
Valdosta Street Ry	1.0	
	5.0	4.05
IDAHO		
Boise Valley Trac. Co	0.5	
	0.5	
ILLINOIS		
Alton, Granite & St. Louis Trac. Co		0.53
Bloomington & Normal Ry. & Light Co		1.23
Central Illinois Public Service Co	0.31	0.03
Chicago & Interurban Trac. Co		2.5
Chicago & Joliet Electric Ry		2.0
Chicago & West Towns Ry	1.0	
Chicago, North Shore & Milwaukee R. R	4.33	2.02
Chicago, Ottawa & Peoria Ry	0.28	0.38
Chicago, So. Bend & No. Indiana Ry	5.1	0.4
Danville, Urbana & Champaign Ry		3.57
Decatur Ry. & Lt. Co		0.43
East St. Louis & Suburban Ry		2.3
East St. Louis Ry		0.19
Galesburg & Kewanee Elec. Ry		0.8
Galesburg Ry., Ltg. & Pwr. Co	0.09	

ILLINOIS (Continued)	New Track, Miles	Rebuilt Mileage
Hammond, Whiting & E. Chicago Ry		2.0
Jacksonville Ry. & Light Co		1.0
Peoria Ry.		6.0
Rockford & Interurban Ry.—New track built from Rockford to Camp Grant	3.0	0.4
Rockford City Trac. Co	0.34	0.8
St. Louis, Peoria & Springfield R. R		0.25
Southern Illinois Lt. & Pwr. Co	0.37	
Tri-City Ry. of Illinois	0.19	0.91
	15.01	27.74
INDIANA		
Central Indiana Lighting Co		0.24
Indianapolis Trac. & Term. Co	1.4	2.27
Interstate Public Service Co	0.96	0.06
Madison Light & Ry. Co		0.43
Public Utilities Co	0.38	
Terre Haute, Indianapolis & Eastern Trac. Co	0.94	
Terre Haute Trac. & Light Co		0.55
Union Traction Co. of Indiana	0.87	2.5
	4.55	6.05
IOWA		
Cedar Rapids & Marion City Ry		3.6
Clinton, Davenport & Muscatine Ry	0.06	
Dubuque Elec. Co		2.0
Fort Dodge, Des Moines & Southern R. R.—Fort Dodge to Webster City and Lehigh	25.0	
Keokuk Electric Co		0.57
Mason City & Clear Lake R. R	1.5	1.5
Oskaloosa Trac. & Light Co	0.12	0.21
Sioux City Service Co		0.5
Tri-City Ry. of Iowa	2.62	1.64
	28.30	10.02
KANSAS		
Joplin & Pittsburg Ry		2.65
Kansas City, Lawrence & Topeka Elec. R. R	0.5	1.0
Southwest Missouri R. R.—Electrified between Galena, Kan., and Baxter Springs, Kan	8.0	
Topeka Ry.		0.66
Wichita R. R. & Light Co		0.9
	8.5	5.21
KENTUCKY		
Kentucky Trac. & Terminal Co		0.6
Louisville Ry.—Extension to Camp Taylor	4.0	
So. Covington & Cincinnati St. Ry		0.82
	4.0	1.42
MAINE		
Bangor Ry. & Electric Co		1.33
Cumberland County Pwr. & Lt. Co	0.28	1.87
Lewiston, Augusta & Waterville St. Ry	1.78	0.78
	2.06	3.98
MARYLAND		
Cumberland & Westernport Elec. Ry		1.32
Cumberland Electric Ry	1.0	
United Railways & Electric Co	5.03	13.3
Washington, Baltimore & Annapolis Elec. R. R.—Naval Academy Junction to Camp Meade	4.5	
	10.53	14.62
MASSACHUSETTS		
Bay State Street Ry		5.8
Berkshire Street Ry	11.0	1.2
Massachusetts Northeastern St. Ry		4.08
Norfolk & Bristol St. Ry		0.34
Plymouth & Sandwich St. Ry.—Plymouth to village of Sagamore	11.07	
Springfield Street Ry	3.17	2.2
Union Street Ry		2.68
Worcester Consolidated St. Ry	1.49	4.7
	26.73	21.00
MICHIGAN		
Detroit & Port Huron Shore Line Ry	2.03	0.73
Detroit, Jackson & Chicago Ry	0.6	
Detroit, Monroe & Toledo Short Line Ry	0.75	
Detroit United Ry	14.87	11.39
Grand Rapids Ry		3.51
Grand Trunk Ry. (St. Clair Tunnel Co.)		1.5
Menominee & Marinette Lt. & Trac. Co		0.5
Saginaw-Bay City Ry		0.51
	18.25	18.14
MINNESOTA		
Twin City Rapid Transit Co	6.79	13.52
St. Cloud Public Service Co		0.5
	6.79	14.02
MISSOURI		
Blue Valley Ry	1.5	0.5
Hannibal Ry. & Elec. Co		6.0
Kansas City Rys	10.81	5.08
United Railways of St. Louis		19.5
	12.31	31.08
NEW JERSEY		
Morris County Trac. Co		3.0
Public Service Ry	0.15	
Trenton & Mercer County Trac. Corpn		0.39
	0.15	3.39
NEW YORK		
Auburn & Syracuse Elec. R. R	0.21	
Binghamton Ry.		1.78
Brooklyn Rapid Transit Co.—New track: 19.1 miles rapid transit; 6.18 miles surface lines	25.28	6.72
Buffalo & Depew Ry		0.5
Elmira Water, Light & R. R. Co	0.83	2.14
Hornell Traction Co		0.13

NEW YORK (Continued)	New Track, Miles	Rebuilt Mileage
Hudson Valley Ry		2.0
Interborough Rapid Transit Co	52.01	
International Ry.	2.1	6.59
New York & Stamford Ry		0.28
New York Central R. R. (Elec. Div.)	0.55	
New York, Westchester & Boston Ry	0.01	
Niagara Junction Ry	0.77	
Orange County Trac. Co	0.5	0.5
Schenectady Ry.	0.2	0.51
Second Ave. Ry		0.3
Southern New York Pwr. & Ry. Corpn		1.75
Third Ave. Ry	0.34	
Westchester Street R. R	0.11	0.7
	82.91	23.85
NORTH CAROLINA		
Southern Public Utilities Co.—Between Charlotte and Camp Greene	4.75	
	4.75	
NORTH DAKOTA		
Northern States Pwr. Co		1.0
		1.0
OHIO		
Cincinnati, Milford & Loveland Trac. Co		10.0
Cincinnati Trac. Co		4.92
City Ry. of Dayton		2.25
Cleveland Ry.	10.61	15.43
Cleveland Southwestern & Col. Ry		3.0
Columbus Ry., Pwr. & Lt. Co	0.82	1.85
Dayton & Troy Elec Ry		3.0
Gallipolis & Northern Trac. Co	0.15	
Mahoning & Shenango Ry. & Lt. Co	1.72	0.91
Northern Ohio Trac. & Light Co	2.1	5.58
Portsmouth Street R. R. & Lt. Co.—Between Wheelersburg and Ironton	18.0	2.5
	33.40	49.44
OKLAHOMA		
Ardmore Ry.	0.3	0.9
Oklahoma Ry.	0.5	0.6
	0.8	1.5
OREGON		
Pacific Pwr. & Lt. Co		3.5
Portland & Oregon City Ry	1.0	
Portland Ry., Lt. & Pwr. Co	1.95	1.83
Southern Pacific Co. (Portland Div.)—Electrification between Whiteson and Corvallis	47.5	
	50.45	5.33
PENNSYLVANIA		
Altoona & Logan Valley Elec. Ry	0.85	
Ardmore & Llanerch St. Ry	0.93	
Carbon Transit Co.		0.5
Harrisburg Rys.		0.62
Mahoning & Shenango Ry. & Lt. Co	0.66	0.65
Montgomery Transit Co		1.0
Northwestern Pennsylvania Ry	3.65	1.09
Philadelphia & Garrettford St. Ry	0.31	
Philadelphia Rys.		0.5
Philadelphia Rapid Transit Co	0.71	16.33
Reading Transit & Light Co		4.17
Scranton Ry.		0.5
Wilkes-Barre Ry.		1.0
York Rys.	0.28	0.75
	7.39	27.11
RHODE ISLAND		
Rhode Island Co	1.44	5.36
	1.44	5.36
SOUTH CAROLINA		
Columbia Ry., Gas & Electric Co.—To Camp Jackson, 8 miles	10.0	
	10.0	
SOUTH DAKOTA		
Aberdeen R. R.		0.6
Sioux Falls Trac. System		1.0
		1.6
TENNESSEE		
Chattanooga Ry. & Light Co	3.0	
Jackson Ry. & Light Co		2.0
Memphis Street Ry.	0.3	0.75
Nashville Ry. & Light Co		4.56
	3.3	7.31
TEXAS		
Austin Street Ry.	1.5	
Beaumont Trac. Co.	0.15	0.66
Bryan & Central Texas Interurban Ry.—New track between Whittaker and Wilcox	2.25	1.0
Bryan & College Interurban Ry		2.5
El Paso Electric Ry		1.6
Galveston Electric Co		0.7
Jefferson County Trac. Co	0.11	
Marshall Traction Co.	4.7	
Northern Texas Trac. Co	4.2	
San Antonio Public Service Co	4.7	3.55
Southwestern Trac. Co.		1.2
Tarrant County Trac. Co	1.02	
Texas Electric Ry	1.55	
	20.18	11.21
UTAH		
Ogden, Logan & Idaho Ry		2.7
Salt Lake & Utah R. R.—Between Grangee and Magna	9.0	
	9.0	2.7

	New Track, Miles	Rebuilt Mileage
VIRGINIA		
Danville Traction & Pwr. Co	.02	
Hampton & Langley Field Ry.—Between Hampton and Government Reservation at Langley Field	3.5	
Roanoke Ry. & Elec. Co	1.0	
Virginia Ry. & Pwr. Co	2.23	0.93
	6.75	0.93
WASHINGTON		
Puget Sound Int. Ry. & Pwr. Co	0.25	
Puget Sound Trac., Lt. & Pwr. Co		0.19
Seattle & Rainier Valley Ry	1.25	2.0
Tacoma Ry. & Pwr. Co	2.0	
Yakima Valley Transportation Co	3.55	
	7.05	2.19
WEST VIRGINIA		
Monongahela Valley Trac. Co	5.5	0.8
Norfolk & Western Ry. (Elec. Div.)—Electrified between Cooper and Simmons	7.5	
Ohio Valley Electric Ry		0.87
	13.0	1.67
WISCONSIN		
Eastern Wisconsin Elec. Co		3.99
Milwaukee Electric Ry. & Lt. Co	2.19	5.84
Wisconsin Ry., Lt. & Pwr. Co		1.33
	2.19	11.16
CANADA		
Cape Breton Elec. Co., Ltd	0.15	1.0
Hull Electric Co	1.0	0.95
International Transit Co.		0.32
Janesville Trac. Co.		0.51
Levis County Ry.		0.57
London & Port Stanley Ry	0.34	
London Street Ry.		1.68
Niagara, St. Catharines & Toronto Ry	0.66	3.5
Nova Scotia Tramways & Pwr. Co., Ltd		0.17
Ottawa Electric Ry.		0.6
Port Arthur Civic Ry		1.51
Quebec Ry., Light & Pwr. Co	0.18	
Sandwich, Windsor & Amherstburg Ry		1.0
Sudbury, Copper Cliff Suburban Elec. Ry	1.0	
Toronto Civic Ry.	0.49	
	3.82	11.81
Total for all companies	442.7	375.4

California Joint Committee on Inductive Interference Completes Report*

A COMMITTEE which has, for the last five years, been investigating disturbances in communication circuits caused by induction from neighboring power circuits, under the auspices of the California Railroad Commission, has completed its work and presented its report.

A preliminary report, rendered by the committee in 1914, was printed in the Transactions of the American Institute of Electrical Engineers, Vol. 33, 1914, page 1441. The final report of the committee will be published by the commission if a sufficient number of subscriptions is received to cover the actual cost of printing and binding. This is estimated not to exceed $10. It is proposed to publish thirty of the technical reports presented in the course of the work, selected as being of general interest and applicability.

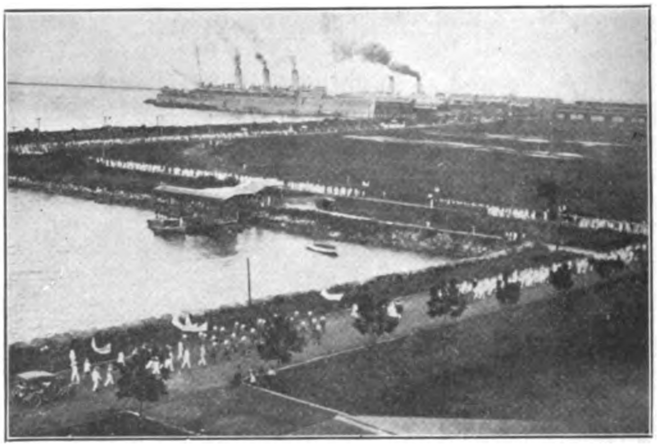
The complete report contains the following sections:

1. Historical sketch, regarding the formation, personnel, organization, investigations and finances of the committee.
2. Review of the basic principles, comprising a simple statement of the nature of the subject, a summary of the facts established or agreed upon, and a concise statement of the guiding principles for the prevention of interference.
3. Recommendations for revised rules to govern the design, construction and operation of power and communication lines and associated apparatus, to prevent or mitigate inductive interference, followed by explanatory comments. An exhibit accompanying the rules discusses the arrangement and spacing of power conductors.
4. Five appendices dealing with: (1) Interference not covered by the recommended rules, which apply to constant-potential a.c. power circuits of more than 5000 volts between wires or 2900 volts to ground and exclude telephone subscribers' loops. (2) List of technical reports prepared by the committee as a record of its investigations. (3) Comments on the 1914 report. (4) Bibliography. (5) Chart showing the organization of the committee.

Send-Off for Mr. Cairns

Officials of the Manila Electric Railway & Light Corporation Pay Respect to Associate Departing for America

A STRIKING testimonial of the popularity with which L. S. Cairns, recently assistant general manager Manila Electric Railway & Light Corporation, has been regarded during his five-year connection with that company was shown by the ceremonies at his departure from Manila on Oct. 17 to take charge of the Eastern Pennsylvania Railways of Pottsville, Pa. One function of the farewell exercises was held in the Manila Grand Opera House on the evening of Oct. 15, at which this large house was crowded. After an interlude of music and other entertainments there was an address by Mr. Santiago of the claims department, a reply by Mr. Cairns, and closing remarks by Vice-President Duffy. The following day there was a formal parade to the pier. About 1200 employees of the company participated, marching in eight divisions, representing the different departments of the company, and acting as an escort for Mr. Cairns and his family, who followed in an auto. On arrival at the pier the lines opened, giving an opportunity to the former assistant general manager to bid farewell to all as he passed through the two lines.



1200 PARTICIPATED IN PARADE FOR DEPARTING MANILA OFFICIAL

In addition, a silver tablet, inscribed with best wishes for his future success, was presented to Mr. Cairns.

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*Following are references to articles in this paper during the period covered by the report: June 8, 1912, page 963; June 15, 1912, pages 1002, 1019; Aug. 24, 1912, page 288; Aug. 31, 1912, pages 308, 336; March 15, 1913, page 512; March 22, 1913, page 531; Oct. 11, 1913, page 690; Nov. 19, 1913, page 1141; Jan. 10, 1914, page 82; Feb. 7, 1914, page 313; March 7, 1914, page 529; March 28, 1914, page 706; May 2, 1914, pages 958, 960; Sept. 12, 1914, page 485; Oct. 3, 1914, page 636. Since 1914 the matter has not had much attention in the electric railway field.

The Financial Wrecks of 1917

Electric Railway Receiverships and Foreclosure Sales, in Mileage and Capitalization Involved, Show Heavy Increase Over Those of 1916—This Due to One Large Company—Score of Small Companies Abandon Operation on Their 207 Miles of Track

THE high cost of electric railway operation during 1917 has left many a company in a disabled condition. The most striking result is the number of total wrecks. Heretofore, when electric railways have been forced into the hands of receivers because of accumulated burdens of regulation, unrestricted competition, over capitalization, or weaknesses of organization, they have almost invariably been able to effect some financial or operating readjustment so as to insure continuance of service.

The last year has seen about the usual number of companies either entering upon or completing their readjustments, but, more significant still, it has seen the passing of companies that have given up hope of any successful reorganization. A score of railway properties have suspended service and in most cases have dismantled or are planning to dismantle their lines. In many instances this action has been taken voluntarily by the management and not under court orders, and in several others the only willing purchaser at the forced sale has been the junk dealer.

Such total wrecks, it is true, have all been small properties, and some of them were probably constructed without adequate, if any, transportation studies, and have never even approached operation on a sound basis. Yet at other times they all would undoubtedly have tried to struggle along. Their collapse, in this period of inflated costs, simply shows that the industry is now passing through a stage where mere existence for its weakest members is being found impossible.

BAY STATE LINE SWELLS RECEIVERSHIP FIGURES

Owing to one large company, the Bay State Street Railway, the new receiverships in 1917 were greatly in excess of those in the preceding year, the mileage of 1,139.37 involved being, next to the record in 1915, the largest in the last nine years. The capitalization of companies placed in receiver's hands was nearly three times as large as in 1916, and the figures for outstanding stock and funded debt are well up the list for the nine years. The record for this period (adjusted in a minor point to cover a late 1916 return) follows:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909	22	558.00	$29,962,200	$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	18	1,139.37	33,497,925	33,394,400

The accompanying table gives the details of electric railway receiverships in the last calendar year. An attempt was made in all cases to take the figures from the most up-to-date and most authoritative sources, and to secure the correct data in cases of disagreement among the financial manuals, a by no means infrequent occurrence in connection with the smaller companies. These, it will be observed, constituted the great majority of the companies placed in receivership, only three having more than 30 miles of track. The 867 miles of the Bay State receivership formed more than 75 per cent of the whole sum.

Most of the receiverships were evidently caused by the decreasing margin between revenues and expenses, operation in territory of a poor character, and inherent defects of organization; but in certain cases special reasons existed. The Bay State Street Railway, for example, was confronted with unusual cash requirements and a lack of borrowing capacity, and the receivership is a "breathing spell." The Cincinnati, Milford & Loveland Traction Company has at last succumbed to the effects of the flood damages in 1915. The receivership of the Cleveland & Chagrin Falls Railway was precipitated by an award of $50,000 for injuries to a passenger, appeal on which is pending. Serious accidents also figured in the cases of the Southern Cambria Railway and the Hornell Traction Company. The Plymouth & Shelby Traction Company receivership is the result of a court decision holding the company to be a fraudulent corporation.

FORECLOSURE SALES INCREASED

The number of electric railways sold at foreclosure in 1917 was twenty-five, a substantial increase over the nineteen of the year before. The mileage of 737.69 compares with only 430.14 in 1916, and the capitalization figures are considerably larger. The miles of track sold in 1917 were greater than those in any of the preceding eight years. The following adjusted table gives all the comparative figures for the last nine years:

	Number of Companies	Miles of Track	Outstanding Stock	Outstanding Funded Debt
1909	21	488.00	$22,265,700	$21,174,000
1910	22	721.36	19,106,613	26,374,065
1911	25	660.72	91,354,800	115,092,750
1912	18	267.18	14,197,300	10,685,250
1913	17	302.28	15,243,700	19,094,500
1914	11	181.26	26,239,700	44,094,241
1915	19	308.31	30,508,817	16,759,997
1916	19	430.14	13,895,400	22,702,300
1917	25	737.69	27,131,900	27,083,045

The detailed foreclosure sales are shown in the accompanying table. As in previous years, some electric railways for which receivers had been appointed or against which foreclosure suits had been brought were able to carry out reorganization plans without the properties being offered at public sale. All the various forms of reorganization, readjustment and change in ownership without formal foreclosure sales were passed over in compiling the table.

The sale of the Mt. Vernon Railway, reported in 1916, was not confirmed, and the property was resold late this year. Furthermore, it should be noted that several properties were sold piecemeal, some parcels in certain cases remaining under the receivership. The Gary & Interurban Railroad, for example, was all sold

ELECTRIC RAILWAY RECEIVERSHIPS IN 1917

	Miles of Track	Out-standing Stock	Outstanding Funded Debt
Bay State Street Railway......	867.78	$24,531,500	$24,345,500
Beech Grove Traction Company	3.90	150,000	100,000
Cincinnati, Milford & Loveland Traction Company	37.00	1,649,425	441,000
Cleveland & Chagrin Falls Railway	12.00	300,000	251,900
Danbury & Bethel Street Railway	16.00	320,000	588,500
Eastern New York Railroad....	15.00	275,000	150,000
Grafton Light & Power Company	7.00	400,000	300,000
Hornell Traction Company.....	10.90	117,900	150,000
Manhattan & Queens Traction Corporation	22.00	†20,000	None
Minster & Loramie Railway....	3.30	34,100	20,000
Orleans-Kenner Electric Railway	11.60	250,000	250,000
Pennsylvania & Ohio Railway..	26.00	1,300,000	900,000
Pittsburgh & Butler Railway...	33.00	1,750,000	3,688,000
Plymouth & Shelby Traction Company	6.97	200,000	200,000
Richmond & Rappahannock River Railway	25.40	500,000	490,000
Southern Cambria Railway....	30.00	1,000,000	1,284,500
St. Louis, Lakewood & Grant Park Railway (*a*)..........	4.00	300,000	85,000
Trans-St. Mary's Traction Company	7.52	400,000	150,000
	1,139.37	$33,497,925	$33,394,400

†This sum represents installments paid in on subscriptions, there being no capital stock outstanding.

(*a*) Not in operation since flood of 1915.

in sections. The properties of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, the Sunbury & Susquehanna Railway and the Richmond & Rappahannock River Railway, however, were only partially sold. In such cases the capitalization figures have been prorated on a mileage basis, with full weight given to any underlying liens.

In most cases the foreclosure sales in 1917 were the forerunners to the beginning of business through a reorganized company or a new one. Some properties, however, went from the sales to the junk pile. These, with the lines whose owners voluntarily abandoned operation, are shown in the accompanying table. An effort was made to segregate actually wrecked companies into two classes, the first, or "Dismantlements," including properties actually scrapped, in process of being scrapped or having the necessary legal sanction for such treatment. The second class, or "Suspensions," includes lines where the service has been discontinued or the question of dismantlement, as far as can be learned, is still pending. No attempt was made to cover the abandonments of small sections of route by operating companies.

The 14-mile parcel of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, purchased by a committee of bondholders in December, was acquired under a court order expressly permitting abandonment if this was desired. It is reported, however, that operation has not yet been discontinued.

Although the Norwood, Canton & Sharon Street Railway was sold in November to a junk dealer, it has not been included in the compilation. The prospective purchaser forfeited his deposit rather than become involved in certain litigation regarding the company, and the property reverted to its owners. Service has not been suspended.

In closing, two instances may well be cited to show how electric railway service is better appreciated when its continuance is threatened. The Cape May, Delaware Bay & Sewell's Point Railway, a 20-mile property, was sold and became headed for dismantlement. The local

ELECTRIC RAILWAY FORECLOSURE SALES IN 1917

	Miles of Track	Out-standing Stock	Outstanding Funded Debt
Algiers Railway & Lighting Company	6.00	$430,000	$35,000
Amarillo Street Railway.......	8.20	212,000	125,000
Bluffton, Geneva & Celina Traction Company	19.00	675,000	None
Boise Railroad, Ltd...........	8.00	510,400	389,000
Bristol Traction Company.....	15.30	143,800	192,500
Cape May, Delaware Bay & Sewell's Point Railroad......	20.00	150,000	150,000
Catskill Traction Company.....	5.50	60,000	70,000
Cincinnati, Dayton & Toledo Traction Company	83.90	2,250,000	5,000,000
Cleburne Traction Company....	8.00	*15,000	None
Columbus, Delaware & Marion Railway	60.00	300,000	2,533,000
Empire United Railways, Inc. (*a*)	246.22	11,600,000	10,057,900
Gary, Hobart & Eastern Traction Company	9.00	125,000	125,000
Gary & Interurban Railroad...	85.00	4,720,850	2,537,225
Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company (*b*)	14.00	2,082,750	250,000
Minster & Loramie Railway...	3.30	34,100	20,000
Mt. Vernon (Ohio) Railway...	9.00	10,000	40,000
Nashville-Gallatin Interurban Railway	27.05	750,000	600,000
Pittsburgh & Butler Railway...	33.00	1,750,000	3,688,000
Providence & Fall River Street Railway	10.12	165,000	165,000
Richmond & Rappahannock River Railway (*c*)..........	9.10	179,000	175,420
Sacramento Valley Electric Railroad	12.30	250,000	None
Southwestern Traction Company	15.00	189,000	180,000
Sunbury & Susquehanna Railway (*d*)	6.00	400,000	560,000
Taunton & Pawtucket Street Railway (*e*)	17.50	100,000	200.000
Waycross Street & Suburban Railway	7.20	30,000	40,000
	737.69	$27,131,900	$27,083,045

*Authorized amount; outstanding amount not ascertainable.

(*a*) This entry covers the controlled Rochester, Syracuse & Eastern Railroad (as in 1915 Table of Receiverships), although this company was sold separately.

(*b*) Total trackage, 56 miles, was offered for sale on Dec. 18, but only a 14-mile section was sold.

(*c*) See 1917 Table of Receiverships. Only the Seven Pines line has been sold.

(*d*) Remaining mileage, 9 miles, still in hands of receiver. Sold portion represents property of consolidated Northumberland County Traction Company.

(*e*) Sale covered all mileage of Bristol County Street Railway under old $200,000 mortgage, held in 1915 to be valid lien assumed by successor, Taunton & Pawtucket Street Railway.

ELECTRIC RAILWAY ABANDONMENTS IN 1917

	Miles of Track	Out-standing Stock	Outstanding Funded Debt
I. DISMANTLEMENTS			
Alton & Jacksonville Railway (*a*)	21.30	$142,000	$450,000
Arkansas Northwestern Railroad	2.13	....	....
Catskill Traction Company....	5.50	60,000	70,000
City Railway, Mt. Vernon, Ill..	3.25	40,000	None
Cleburne Traction Company (*b*)	8.00	*15,000	None
Goshen, South Bend & Chicago Railway (*c*)	20.00	1,109,400	519,900
Mexico Investment & Construction Company (*d*)...........	16.00	30,000	11,550
Mt. Vernon (Ohio) Railway...	9.00	10,000	40,000
Norfolk City & Suburban Railway	4.50	50,000	50,000
Norfolk & Ocean View Railway (*e*)	10.00	62,500	625,000
St. Lawrence International Electric Railroad & Land Company	7.79	250,000	200,000
Sacramento Valley Electric Railroad	12.30	250,000	None
Waycross Street & Suburban Railway	7.20	30,000	40,000
	126.97	$2,048,900	$2,006,450
II. SUSPENSIONS			
Amarillo Street Railway.......	8.20	$212,000	$125,000
Bluffton, Geneva & Celina Traction Company (*f*)...........	19.00	675,000	None
Bristol Traction Company.....	15.30	143,800	192,500
Fort Smith-Oklahoma Light & Traction Company	1.21	30,000	None
Richmond & Chesapeake Bay Railway	14.80	2,500	1,000,000
Southern Traction Company, Inc. (*g*)	4.50	10,000	24,500
Taunton & Pawtucket Street Railway (*h*)...............	17.50	100,000	200,000
	80.51	$1,173,300	$1,542,000
	207.48	$3,222,200	$3,548,450

*Authorized amount; outstanding amount not ascertainable.

(*a*) Dismantlement order issued in December by Illinois Public Utilities Commission.

(*b*) City Council has authorized removal of physical property.

(*c*) Nineteen miles are being junked now; city of La Porte has option to purchase remaining 1 mile of track and equipment within city.

(*d*) Actual dismantlement began at end of year.

(*e*) Six miles of track were taken over by Virginia Railway & Power Company.

(*f*) Purchaser bought property to dismantle, but work is held up pending hearing before commission.

(*g*) Sold for dismantlement and work started, but city and county have asked for receiver. Suit is pending.

(*h*) Sold to wreckers for dismantlement when sale is confirmed. See note in 1917 Table of Foreclosure Sales.

public then made various efforts to secure the operation of the property, even at the hands of the steam lines in the same territory. Nothing was accomplished, however, until the United States Navy Department recently commandeered the railway for government use.

The Providence & Fall River Street Railway, actually sold for junk, was saved from the scrap heap last November. Service was suspended, and the removal of the line was imminent. Public-spirited citizens, however, secured an option and organized a successor company, which took over the property and resumed operation.

Electric Railway Statistics

Figures Are Given by States of the Miles of Track and Number of Cars Owned

THE accompanying table gives statistics of the miles of track and cars of the electric railway companies in the United States, made up from the August, 1917, Electric Railway Directory of the McGraw Hill Company. The dates of the reports in this directory average about June, 1917, so that the table may be considered to represent the statistics of the industry at about that time.

A comparison of the totals given in this table with those in a somewhat similar table, published in the issue of Jan. 6, 1917, will show for all states a total of 1029 companies instead of 1045, a decrease during the year of sixteen. The miles of track total 48,175 as compared with 47,562 in June, 1916, an increase during the year of 613, and the motor passenger cars total 81,383, as compared with 80,058 last year, an increase of 1335. The total number of cars, according to the table, increased from 100,476 to 102,359, or a total of 1883.

The decrease in the number of companies is due in most part to the abandonment of operation by companies which had not found the service financially profitable, although there were a few consolidations. There were also several cases of the splitting up of former consolidated properties by action of the court or for some other reason. Some of the cases of segregation of individual properties brought changes in the mileage credited to different states, because under the plan followed the miles of track and number of cars belonging to each company are credited to the state in which the greater part of the mileage lies. Of the total increase in mileage, more than 25 per cent is accounted for by the increase in rapid transit mileage in New York City. Part of the rest of the increase is probably due to seemingly inevitable discrepancies which occur when reports are made out by different officials each year.

A few other words of explanation are necessary. The electrified mileage of steam railroads is included, but as this is reported to the directory usually as route mileage, that figure is continued in the table, although the mileage of the city and interurban electric railway companies is figured as single track as usual. Under cars, the statistics include only the electric locomotives and the motor passenger cars of electrified steam railroads. Gasoline and storage battery cars are included as passenger motor cars.

Many electric railway companies use the expressions express cars, freight cars, and service cars as interchangeable terms. The table shows the way in which cars of these types are reported by the different companies, but what is known as a service car on one road may be called a freight car or an express car on another road. In a few cases, where a company owns a large number of freight cars compared with the number of passenger cars owned, the total number of such freight cars has been intentionally omitted from the table. The most notable instances of this are the Chicago Tunnel Company with 3000 "other cars" and the Fort Dodge, Des Moines & Southern Railroad with 2300 "other cars."

TABLE SHOWING STATISTICS OF ELECTRIC RAILWAY COMPANIES IN THE UNITED STATES

	Number of Companies	Miles of Track	Motor Passenger Cars	Trail Passenger Cars	Electric Locomotives	Express or Freight Motor Cars	Freight Cars	Service or Other Cars	Horse or Cable Cars
New England States:									
Connecticut	8	1,624	2,269	....	102	....	....	67	....
Maine	15	534	540	....	8	3	30	177	....
Massachusetts	43	3,243	7,893	357	8	27	33	1,146	....
New Hampshire	14	252	286	....	2	1	....	35	2
Rhode Island	3	439	1,056	27	....	....	....	246	....
Vermont	10	128	141	....	....	....	12	13	....
Total	93	6,220	12,185	384	115	31	75	1,684	2
Eastern States:									
Delaware	2	153	309	....	....	....	....	81	....
District of Columbia	7	412	1,074	....	....	....	....	480	....
Maryland	12	674	2,143	....	13	5	70	98	....
New Jersey	29	1,545	3,286	3	2	19	4	78	....
New York	108	5,637	16,851	1,116	151	12	35	2,000	207
Pennsylvania	124	4,579	8,732	15	2	8	75	875	2
Virginia	15	590	900	25	....	....	....	173	....
West Virginia	24	639	611	....	12	....	5	41	....
Total	321	14,229	33,906	1,159	180	44	189	3,826	209
Central States:									
Illinois	72	3,774	5,962	696	48	....	962	633	....
Indiana	43	2,378	1,920	6	3	11	....	401	....
Iowa	25	881	962	13	19	....	....	364	....
Kentucky	10	462	995	26	....	12	....	58	....
Michigan	26	1,666	2,273	8	20	105	10	472	....
Minnesota	14	722	1,329	....	8	....	....	110	....
Missouri	22	1,135	2,621	105	....	....	....	285	....
Ohio	80	4,280	5,466	68	12	16	24	1,304	....
Wisconsin	18	768	975	113	....	....	....	90	....
Total	310	16,066	22,503	1,035	110	144	996	3,717	....
Southern States:									
Alabama	15	367	444	17	....	....	2	250	....
Arkansas	10	128	231	....	....	....	....	44	....
Florida	9	183	265	7	....	....	....	53	....
Georgia	17	501	699	14	....	....	....	69	2
Louisiana	10	327	681	....	....	....	....	140	....
Mississippi	11	123	159	2	....	....	..	27	....
North Carolina	12	292	303	....	6	....	8	200	....
South Carolina	5	120	173	6	....	2	....	16	....
Tennessee	15	475	820	....	1	1	2	111	....
Total	104	2,516	3,775	46	7	3	12	910	2
Western States:									
Arizona	4	54	44	1	....	....	....	1	....
California	42	3,293	3,686	82	62	12	403	1,562	119
Colorado	13	492	463	16	5	1	143	299	2
Idaho	6	180	68	....	2	....	....	18	....
Kansas	18	553	415	3	....	....	12	106	3
Montana	9	658	128	20	42	32	....	17	....
Nebraska	6	254	538	10	1	....	....	65	....
Nevada	2	11	12	....	....	....	....	....	....
New Mexico	2	9	11	....	....	....	....	.....	....
North Dakota	6	38	72	....	....	....	....	14	....
Oklahoma	16	310	267	....	....	....	....	77	....
Oregon	10	679	749	94	25	29	449	218	....
South Dakota	3	26	34	2	....	....	....	7	....
Texas	38	1,003	1,200	84	....	11	....	223	....
Utah	5	470	276	....	7	2	....	311	....
Washington	19	1,092	1,049	23	26	16	442	929	48
Wyoming	2	22	12	7	....	....	....	3	....
Total	201	9,144	9,024	342	170	103	1,449	3,850	172
Total, all States	1,029	48,175	81,393	2,966	582	325	2,721	13,987	385

The skip-stop plan, which has been in trial use in Buffalo during the past few months, has finally been extended to include most of the routes in that city. The company states that the change has met with almost universal commendation throughout the city, for the service has been speeded up and the number of car stops has been actually reduced 50 per cent.

American Association News

Electric Railway War Board Co-operating with New York Public Service Commission for Second District

Board Issues Bulletin No. 3

New York Fuel Economy Campaign Begins

After Address by C. Loomis Allen of War Board at Conference in Albany Resolutions Are Passed Requesting Commission to Give Consideration to Adoption of Staggered Hours of Labor and Other Means of Conserving Fuel

AS THE result of a conference on Jan. 3 between officials of electric railway lines doing business within the jurisdiction of the Public Service Commission, Second District, held at the Albany offices of the commission, steps have been taken whereunder the consumption of coal by the seventy-two operating electric railways in the State of New York will be greatly diminished. The conference was called by the commission for the purpose of aiding in the nation-wide movement for the conservation of fuel. Chairman Van Santvoord opened the conference with a short address in which he dwelt upon the object of the meeting and touched upon the conditions which make it paramount that everybody should lend a helping hand in the general conservation movement.

C. Loomis Allen, director of the American Electric Railway Association's War Board at Washington, then took the floor. He voiced the warning that unless coal is saved there will be a shortage next year. "The production of coal in this country is at its absolue maximum," he said. "The output of coal during the year 1917 was the greatest in the history of the country. It cannot be increased. Yet this coming year we must add at least 50,000,000 tons to our present output. The only way in which we can provide that is not by production but by economy."

Mr. Allen went on further to state that the electric railways of this country are now annually consuming about 16,000,000 tons of coal and that of this amount they are being asked to save 1,000,000 tons. He then cited five principal methods which had been suggested in connection with an engineering study which had recently been made of the electric railway situation in Washington, D. C., and which, it is believed, will result in the annual saving of 25,790 tons of coal. These measures include the skip or stagger stops, elimination of unnecessary car mileage, reduction of heating in the cars, a gradation of the dismissal hours of employees in large plants and stores, and the operation of both traction systems in that city by means of the same power supply.

At the termination of the hearing a committee was appointed which was intrusted with the task of drafting resolutions. It was directed to make a thorough investigation into the means by which savings in coal can be effected, and to report its findings at the earliest possible date. This committee consisted of:

Charles R. Barnes, chief of the division of electric railways, member ex officio; J. P. Barnes, general manager Schenectady Railway; H. B. Weatherwax, vice-president United Traction Company, Albany; W. H. Collins, general manager Fonda, Johnstown & Gloversville Railway, and J. F. Hamilton, New York State Railways, Rochester.

The following resolutions recommending the steps to be taken by the traction companies within the jurisdiction of the commission in the matter of the saving of fuel were adopted:

Whereas, The national and state fuel administrations, through C. Loomis Allen, director of the American Electric Railway Association War Board, have directed the attention of the Public Service Commission and the electric railroads to the necessity of conserving for war purposes during the year 1918 1,000,000 tons of the annual 16,000,000 tons consumption of coal by electric railways, and

Whereas, Approximately 200,000 tons of coal are used annually by the electric railways of the State of New York under the jurisdiction of the Public Service Commission for the Second District, and

Whereas, It is the unanimous opinion of the state and federal fuel administrations, the War Board of the American Electric Railway Association, as well as of the officials and representatives of the various electric railroad companies in the Second Public Service District that one of the most effective means which can be employed in the conservation of energy as requested by the national and state fuel administrations and one which will cause the least inconvenience in proportion to the results to be obtained, is the "staggering" of hours of labor in industrial plants, the employees of which are patrons of electric railroads, and

Whereas, Under the present arrangement of working hours of these employees it is in most cases an impossibility for the companies to furnish a reasonably adequate service during the hours when they desire to travel, and

Whereas, This is so not only by reason of the limited number of cars which companies can furnish but also by reason of track limitations preventing the operation of the necessary cars, and

Whereas, With the suggested change in hours of service it might be possible to utilize one car to three times its present capacity, and

Whereas, It is believed that the increased convenience to the employees of these plants by the change in working hours would more than offset any inconvenience which might result, and

Whereas, It is further believed that practical results can best be obtained through the co-operative effort of the Second District Public Service Commission and the employers of labor, now, therefore, be it

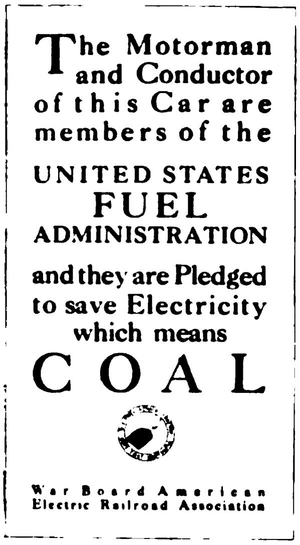
Resolved, That this conference respectfully request the Public Service Commission to give immediate consideration to the possibilities involved in the above suggestions and to take such action as in its judgment may best promise effective co-operation by industrial enterprises in the various cities within its jurisdiction where the project appears to be especially feasible. And be it

Further Resolved, That this conference assure tha Public Service Commission of the hearty co-operation of officials of electric railroad companies in the Second Public Service District in its efforts in this matter. And be it

Further Resolved, That each electric railway in the Second District of the State of New York furnish to the Public Service Commission the names of the industries and the approximate number of employees in each where the "staggered" service would be beneficial and effective.

Trainmen's Pledges Are Subject of War Board's Bulletin No. 3

On Dec. 20, 1917, Fuel Administrator H. A. Garfield addressed to the Electric Railway War Board a letter offering to furnish car cards and window posters for use in cars operated by men who have signed conservation pledges. The poster is reproduced on this page, and the car card on page 29 of the present issue. Dr. Garfield's letter forms the basis of the War Board's Bulletin 3, which the association is now distributing. The bulletin also contains the pledge card used by the United Railways & Electric Company, Baltimore, Md. This is substantially the same as the Capital Traction Company card shown on page 1121 of the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 22, 1917.



The Motorman and Conductor of this Car are members of the

UNITED STATES FUEL ADMINISTRATION

and they are Pledged to save Electricity which means

COAL

War Board American Electric Railroad Association

CAR WINDOW POSTER FURNISHED BY UNITED STATES FUEL ADMINISTRATION

Inclosed with Bulletin 3 is the following suggested form letter to car crews:

Uncle Sam Wants Us to Save Coal

The men in the power house are saving every shovelful of coal they can to help our fighters.

The men in the car houses and shops are doing their share, too.

It is up to every motorman to do his part. Every time you handle the controller wrong, or blow your breaker, or spin your wheels (or skid or flatten them), *you* waste the coal the other fellows are trying to save. Every time you keep the current on unnecessarily and then apply the brakes instead of coasting, *you* waste coal.

Be a coal saver, not a coal waster!

It's up to every conductor to back up the motorman in his efforts to save. See that heat and light are not wasted. Handle your passengers and the bell cord so as to help the motorman. This will enable him to handle controller and brakes most economically. Be careful of your passengers and the car equipment.

Encourage each other—co-operate and help.

Each one of us must fight, if we are to win. Your *fight* is to save and co-operate. *Your* enemy is carelessness and heedlessness.

Get behind our boys, "Over There."

Fare Situation Discussed at New Haven

The meeting of the Connecticut Company section, held on Dec. 20, was largely taken up with statements regarding the pending hearings before the Public Utilities Commission in the matter of higher fares. As allowed under the Connecticut law, the company some weeks ago raised the urban fares on its property to 6 cents, subject to later approval by the commission. The hearings are preparatory to action by the commission. The speakers at the section meeting explained how the data had been prepared for consideration by the commission, and some of the data were cited by way of illustration.

W. J. Flickinzer read the statement which had been presented at the hearing by President L. S. Storrs outlining the causes which had led the company to increase the flat fare to six cents rather than to secure the increase by some other method of fare modification. Mr. Flickinzer also presented to the section a résumé of the circumstances which had led to the formation of the Electric Railway War Board and explained briefly its organization.

Mr. Storrs then gave a picture of the state of the electric railway industry which, while at present discouraging in a way, is at the same time promising. He felt increasingly optimistic regarding the outlook.

The meeting, as usual, was preceded by a dinner, enlivened with orchestral music and singing. The annual election was held also, resulting in the following selections: President, W. P. Bristol, manager Hartford division; vice-president, W. R. Dunham, Jr.; engineer maintenance of way; secretary, W. E. Jones, statistician; treasurer, George M. Cresson, treasurer's office; director for three years, J. M. Hamilton, general agent New Haven division. The section decided to make a feature of the question-box plan in connection with the meeting programs. The membership committee reported a present membership of 249, including eighteen members now with the colors, a slight increase for the year in spite of difficulties incident to the war. W. E. Jones, secretary, stated that the honor roll of the company contains 214 names at present, the total number of employees being roughly 4,000.

Operating Costs Discussed in Portland

G. Sabin Brush, superintendent of the railway department, was the speaker at the meeting of the Cumberland County Power & Light Company section held on Dec. 17. Mr. Brush discussed the circumstances of the company at the present time relative to the high costs of operation. He used charts to compare present prices with those of five years ago and also to show the various items of expense. Judge William Lyons, one of the guests, responded to a request for a short talk and spoke on the war.

A notice was read at the meeting of a correspondence course in practical electricity which is being started in the power and light departments. The meeting was preceded by a dinner from 6 to 8 o'clock, and during the evening the section orchestra rendered several selections, supplemented by piano and cornet solos.

Turkey Raffle at Chicago Meeting

G. H. Pierce, of the electrical department, held the lucky number entitling him to a live 12-lb. turkey at the meeting of the Chicago Elevated Railroads' section on Dec. 18. About 100 members and guests listened to an instructive program, after which they gathered around the refreshment table where apples, doughnuts and cider were served. The service flag of the Elevated roads was displayed for the first time, showing a total of 291 men to be in government service. Recitations and a piano solo constituted the entertainment.

The serious part of the program consisted of a talk on "Accounting," by T. B. MacRae, auditor, and a brief summary of the results already obtained in the use of coasting clocks, by H. A. Johnson, superintendent of shops and equipment. Following Mr. Johnson's talk, A. H. Daus, assistant superintendent of shops and equipment, replied to the inquiry: "Could not the heat generated in motor-starting resistance be utilized for heating motor cars?" This gave rise to a brief discussion, from which it appeared that the question deserved further study.

LETTER TO THE EDITOR

Captain Gonzenbach Favors Light Cars

SOMEWHERE IN FRANCE, Dec. 15, 1917.

TO THE EDITORS:

Way over here in France I have come across copies of the ELECTRIC RAILWAY JOURNAL. I found them in the tent of one of our officers. The contents are interesting reading to me, and strange, too. It looks as if the electric railway industry in the States is hitching up its trousers and rolling up its sleeves for a new grip on itself. It seems mighty good to see "the paper" full of arguments for light cars, one-man operation and re-engineering, to one who has for years argued these points till he was blue in the face.

Some of the same engineers who are now strong for all these things did not hesitate a few years ago to brand any one a "crank" who dared to prefer the dinky light cars of our early years to the young Pullmans we so fondly and blithely ordered from the always obliging car builders; and I would mention some boards of directors who smiled tolerantly when some non-conformist manager or engineer impudently suggested dumping the juggernauts on the scrap heap and starting all over again. That would have required lots of new capital, and still does, but I suspect that the money could more easily have been raised a few years ago than under present conditions of the money market, and particularly the public-utility market. Ho-hum, the world do move!

I am sitting in a tent and can hear the guns exchanging hate as I write.

ERNEST GONZENBACH,
Captain, E. O. R. C.

Some Efforts in the Line of Conservation

Coal Shortage Is Stimulating Service Economies—Reports from Several Sections of the Country Are Given

THE conservation movement is gaining headway as indicated by the activities of railway managers in all parts of the country. A few of the most significant occurrences of the past few days are summarized below:

FUEL ECONOMY COMMITTEE APPOINTED IN INDIANA

Evans Woollen, federal fuel administrator for the State of Indiana, has appointed C. L. Henry, president Indianapolis & Cincinnati Traction Company; Robert I. Todd, president Terre Haute, Indianapolis & Eastern Traction Company; S. W. Greenland, general manager Fort Wayne & Northern Indiana Traction Company; C. N. Wilcoxon, president Chicago, Lake Shore & South Bend Railway, and F. J. Haas, general manager Evansville Public Utilities Company, as a committee on fuel economy by electric railways.

This committee held a meeting with Mr. Woollen on Dec. 28 to discuss ways and means of effecting fuel economy within the State. At a later meeting Mr. Henry was appointed chairman, and H. H. Lloyd, Terre Haute, Indianapolis & Eastern Traction Company, was named as secretary. Suggestions were made to the fuel administrator as to several questions which should be considered in fuel economy, such as the adoption of the skip stop, the elimination of all cars and trains unnecessary for public convenience, economy in the heating and lighting of cars and stations; the shutting down of the smaller, uneconomically operated power stations, current to be supplied from the larger generating stations.

OHIO INTERURBAN RAILWAYS ARE SUSPENDING "LIMITED" SERVICE

Interurban railways entering Cleveland, Ohio, are preparing to reduce passenger service by the suspension of as many limited cars as possible. It has been predicted that this will take place on all railways in the State, as the government has requested curtailment of service as a means of conserving coal. Limited cars are classed as luxuries and the government authorities expect traveling to be done on the local cars. Limited cars between Cleveland and Wooster on the Cleveland, Southwestern & Columbus were taken off on Dec. 28. The service between Cleveland and Bucyrus will not be changed for the present. On Jan. 1 all but two limited cars were taken off the Cleveland, Painesville & Eastern, five cars being taken out of service.

Several limited cars have been taken off the Lake Shore Electric also, but the important through service to Toledo and Detroit will be continued.

ECONOMIES AT ST. LOUIS AND EAST ST. LOUIS

In response to requests received by the United Railways asking that conservation measures be enforced President McCulloch stated as follows: "We are making every effort to comply with the request of the government but are not able to save much coal at present. We are trying to eliminate waste by keeping the boilers in the power houses perfectly clean, etc. The supply of coal used in the cars has not been cut down. We are also trying to refrain from buying any but necessary supplies. This part of the conservation program has been easier for us to follow and already we have made a noticeable difference in the amount of material shipped to us."

Last week D. E. Parsons, general manager East St. Louis & Suburban Railway, announced that cars would be taken off some lines and the heating of the cars would be reduced. Service will probably be reduced on the State Street and Cleveland Avenue lines. Stockyards cars will not be run over the Eads Bridge to St. Louis and the lone car of the Jones' Park line will no longer be operated. The Stockyards cars will be run to Third Street and Broadway. Transfers will be issued good on cars going over the river.

I. T. S. CONSIDERING INCREASED HEADWAY

The Illinois Traction System may annul certain trains on a number of divisions of the road. A two-hour headway at certain hours of the day instead of hourly service is under consideration. Some of the early morning cars could also be dispensed with as they are poorly patronized, especially in certain seasons of the year.

The Chicago (Ill.) Surface Lines service flag contains 542 stars. It was hung out of the window of President Busby's office on Christmas day for the first time.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

Engineers, Master Mechanics and Others Who Have Developed Economical Practices, or Who Have Worth-While Ideas Are Invited to Tell Readers of the Journal About Them in This Department

Dispatching Trucks and Work Trains

New York State Railways Have Developed a Simple but Effective Plan for Increasing Useful Mileage

By C. L. Cadle

Chief Engineer New York State Railways, Rochester Lines

THE same principles that are effective and necessary in train and power load dispatching can be applied also to the assignment of duty to truck and work train crews. The way in which this work is handled by the New York State Railways, Rochester lines, is as follows:

The writer is responsible for the proper utilization of all repair trucks and work trains on the Rochester lines, and deputizes to a special telephone operator the authority necessary for the dispatching work in detail. This operator does not devote all of his time to dispatching, but he makes this his first duty and familiarizes himself with the whereabouts of all transporting equipment for which he is responsible. The dispatcher's task is to see that supplies are delivered when and where needed, that freight is promptly removed from railroad stations or delivered thereto, that rubbish is removed from streets at the proper time, etc. This involves a general knowledge of the requirements of all departments having materials to be moved.

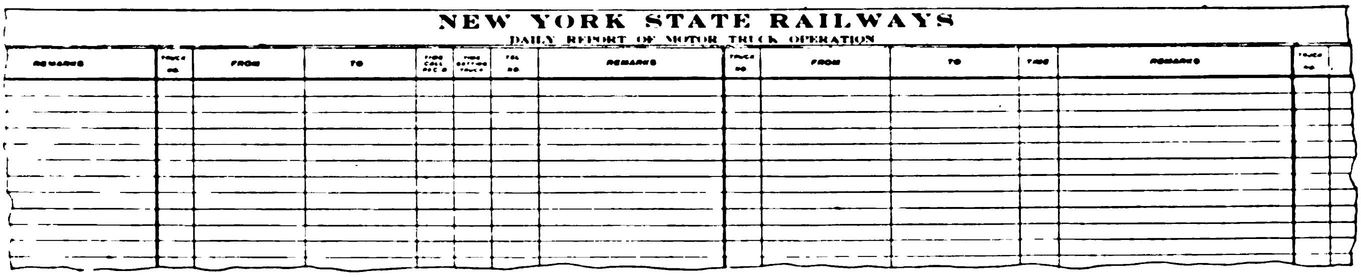
Each day the dispatcher gets from the roadmaster and the paving foreman lists of materials which will be needed, and where and when these are to be placed. The purchasing department furnishes him with the facts regarding freight at the railroad stations. The building department also specifies its requirements. With all of this information before him the dispatcher makes out a program for the day. He notifies each crew where it is to begin work and from what point he shall be called for further instructions. Each evening provision is made for moving work gangs to new jobs so that they will know where to report in the morning.

The company has four line trucks assigned regularly to cover respectively four sections of the city. These are used for routine repair work and are called upon to cover all emergency conditions, such as "trolley wires down," "cars off the track," "vehicles blocking traffic," etc. In addition, there are four service trucks engaged in the other duties mentioned above. All of these come under the dispatcher's authority, as well as two or three, and sometimes four, work trains.

For emergency operation the line trucks are called through the telephones which the company has placed at a number of important points, and we also take advantage of the friendliness of the public. When a truck goes out in the morning the crew advises the dispatcher of its prospective location. As soon as it arrives there, if there is not a company telephone in reach, the driver arranges with the proprietor of a near-by store to call him to the telephone in case the dispatcher wants him. Seldom is a merchant unwilling to accommodate us in this respect. The driver notifies the dispatcher of the merchant's telephone number. In an emergency the latter calls two trucks at once by means of those numbers, or on the company's telephones, the first one answering being sent to the seat of trouble and the other being told to continue working.

All movements of trucks and trains are recorded on a large form which is constantly spread before the dispatcher. A part of this is reproduced herewith. Thus a complete record is made almost automatically, which in itself is an important part of the scheme. This record furnishes a commentary upon the autographic mileage records made by the trucks and also furnishes data for settling disputes as to performance.

Experience at Rochester with the central control scheme has shown that it is quite possible to secure co-operation once its advantages are understood. Tact and patience are virtues required by the dispatcher, but it is easy to convince the men that their interests are being safeguarded rather than their rights invaded by the plan. The dispatcher is especially effective in sending trucks to the spot for emergency repairs, for he knows where all of them are at any moment and, in a pinch, can send to any point the first truck which he can reach regardless of its natural district boundaries.



NEW YORK STATE RAILWAYS

DAILY REPORT OF MOTOR TRUCK OPERATION

REMARKS	TRUCK NO.	FROM	TO	TIME CALL REC'D	TIME GETTING TRUCK	TEL NO.	REMARKS	TRUCK NO.	FROM	TO	TIME	REMARKS	TRUCK NO.

PART OF FORM USED IN RECORDING TRUCK AND WORK TRAIN MOVEMENTS. ACTUAL SIZE OF SHEET, 31 IN. WIDE, 12 IN. LONG. REPRODUCTION IS ABOUT TWO-FIFTHS SIZE

Asphalt Plant Used Also for Car Sand Drying to Gain All-Year Use

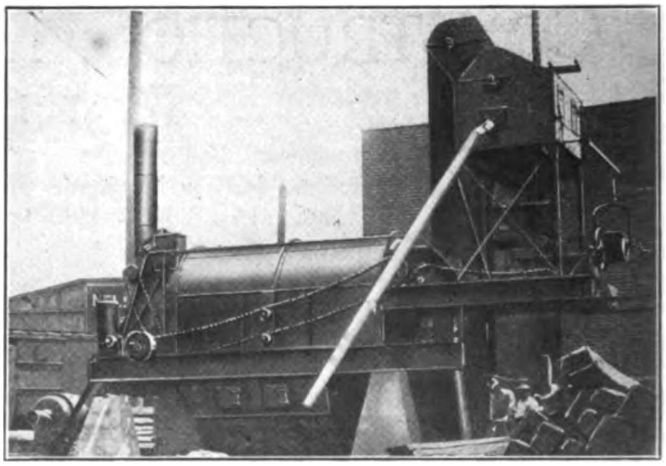
Installation of Asphalt Mixer Saves Considerable Expense on Both Asphalt and Sand Handling—Labor Saved Will Pay for Plant the First Year

By A. E. Harvey
Superintendent of Way and Structures Kansas City (Mo.) Railways

By working out a scheme for utilizing an asphalt mixer plant as a car sand dryer during the winter months and in non-construction periods in the summer, and thus keeping the investment working profitably practically all the year, we have been able to justify the expenditure for installing a Hetherington & Berner asphalt plant in our Southwest Boulevard material yard. An arrangement of the plant to allow the use of hoisting machines already in service in the storage yard in conjunction with the plant has also contributed materially to producing such savings in the provision of both sand and asphalt as practically to pay for the plant the first year. Our average requirements are about 5000 sq. yd. of asphalt per month during the summer, and 20,000 cu. yd. of sand per year for use in the cars. Where twenty-five men were formerly required to prepare our asphalt when panning it by hand we are now able to handle this work with five men. A noticeable labor saving in connection with the sand drying has also been realized, since we formerly dried the sand in stoves at the division carhouses, and some of it in the asphalt pans at the storage yard.

A compact arrangement of asphalt plant, derrick and sand bins has made it possible to run all materials through the asphalt plant without handling any of them by hand, except for the rolling of the asphalt cans up over the heating kettles. These kettles, as well as the revolving cylinders in which the sand and grit for mixture with the asphalt are heated, are fired with oil sprayed through the burners by means of steam from a small boiler. The entire plant is motor-driven. After being properly heated in the kettles, the asphalt is pumped out of these receptacles up into a receiving bucket hung on a monorail, which extends over the mixer. A motor-driven centrifugal pump is used for this purpose and the asphalt is constantly circulated through steam-jacketed piping and a by-pass valve at the outlet to the bucket, so that it will not become congealed. The sand and grit for the mix is taken from a pile at the rear of the machine and carried by means of a bucket conveyor up into the revolving cylinders concealed under the large drum hood seen in the picture. After being heated sufficiently here the sand is elevated from the dump from these cylinders by means of another bucket conveyor up into the screen chamber, where it is separated into two sizes and discharged into the sand hoppers beneath. From these it is drawn by gravity into the mixer in measured quantities, while the asphalt is poured into the mixer simultaneously from the bucket on the monorail seen at the front of the plant. After suitable mixing the paving material is discharged by gravity into wagons below.

When using the plant as a sand dryer for car use, the sand passes through the plant in the same manner as in preparing paving material except that it is discharged from the sand bunkers by gravity into sand bins conveniently located, instead of into the mixer. All sand for both purposes is unloaded from the cars in which it is brought to the yard by means of a grab bucket and motor-driven stiff-leg derrick adjacent to the plant. This derrick is also used for various other purposes in the yard, so that it is kept in service a large part of the time. The capacity of the asphalt plant when drying sand for use in the cars is about 100 cu. yd. a day. This amount is in excess of the needs of the railway, so that an accumulation of sand is readily obtained, making it possible to utilize the plant for the purpose for which it was originally designed without causing a shortage of sand for car use. The storage bins are so located that the sand may be handled entirely by mechanical means from the cars in which it arrives at the yard, through the plant, and from the storage bins into the work cars for distribution to the various division carhouses.

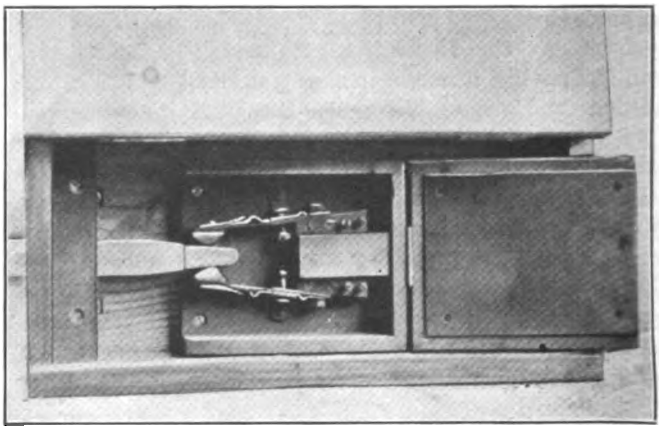


KANSAS CITY RAILWAYS ASPHALT MIXING AND SAND DRYING PLANT

The asphalt plant, without the derrick, which was already a part of the yard equipment, was installed in the yard on concrete piers at a cost of approximately $10,000. The saving in labor the first year will practically pay for the plant.

Electrical Interlock for Use with Folding Car Steps

A NUMBER of cars of the International Railway in Buffalo, N. Y., have been fitted with a home-made electrical interlock like that shown in the accompanying photograph. It consists of a pair of standard



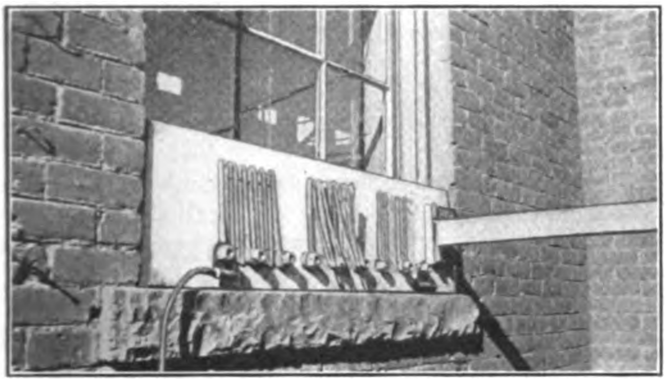
ELECTRICAL INTERLOCK FOR USE WITH FOLDING STEP controller fingers supported on brass blocks which in turn are mounted on a block of wood. The brass blocks form the terminals of a loop from the resistor circuit of the control system. Brass stops are mounted as shown to permit adjustment of the spring tension by means of the set screws. The contact fingers are bridged by means of a brass, wedge-shaped contact block mounted on the end of a wooden rod which is retracted whenever the step is down.

The contactor is inclosed in a wooden box, 8 in. long and 7 in. wide, lined with asbestos board. This is surrounded by another box 20 in. long, 9½ in. wide, 5½ in. deep, with cover, in one end of which is the guide for the step rod.

Reclaiming Warped Resistance Grids

By W. H. McAloney
Superintendent of Rolling Stock Denver (Col.) Tramway

MANY resistance grids which are broken or badly warped can be reclaimed to make savings which represent quite a considerable proportion of the cost of new grids. On our system the broken grids are reclaimed by welding, which is a rather simple process. We have also devised a scheme for reclaiming warped grids by heating them with current and holding them in proper position while they cool.



SCHEME FOR HOLDING GRIDS IN SHAPE WHILE COOLING

The rig fixed up for doing this work is shown in the accompanying illustration. A piece of ½-in. transite board, 13 in. wide and 48 in. long, reinforced on the back with a ¼-in. iron plate, is equipped with ¾-in. bolts properly spaced so that three grids can be bolted on the board at one time. The proper spacing between adjacent segments of the grids is maintained by inserting No. 8-32 machine screws as spacers. These project through the transite and into a ½-in. fiber strip on the back, which is used in order to make the threads hold.

An arm made of ½-in. x 3-in. transite, 36 in. long, is hinged at one end of the board and clamped down at the other, thereby holding the grids firmly against the board. Electrical connection is made by means of copper connecting strips on the back of the board. A current of about 250 amp. is maintained for approximately thirty seconds through the three grids in series. This brings the grids to a red heat, and as they are held firmly in position while they cool off they remain permanently in a plane.

In the illustration, the middle grid is warped, typical of the condition before reclaiming, while the one at the left shows the result of this reclaiming process. The cost of doing this work, including energy and labor, amounts to only 3 or 4 cents, as against a present net cost of 14 cents to 28 cents for a new grid, depending on the size.

Developments in Electrical Apparatus During 1917

Development Work Has Suffered Owing to Congestion of Orders for Standard Apparatus

THE Westinghouse Electric & Manufacturing Company has prepared a comprehensive review of the manufacturing and engineering situation in this field during the last year. From this review the following paragraphs have been abstracted.

POWER GENERATION AND DISTRIBUTION

The demand for underfeed stokers has been greater than was anticipated, most of the stokers for new plants being for use with relatively large boiler units. The 1200-hp. to 1400-hp. sizes are popular. In a plant at Windsor, W. Va., which will be described in a later issue of the ELECTRIC RAILWAY JOURNAL, stokers of this type have been installed to evaporate 100,000 lb. of water each per hour from 100 deg. feed-water temperature to steam at 250 lb. gage pressure, superheated to 250 deg. For two hours these stokers can cause an evaporation of 120,000 lb. per hour. The company finds a demand for the Roney stokers which is still ahead of available production. Most of these, however, are for small industrial plants.

In generating equipment the most notable feature has been the increasing use of hydroelectric power, stimulated by the high cost of coal. During the year the Montana Power Company has installed four 12,000-kva. vertical units at Holter, Mont., very largely to supply power for the Chicago, Milwaukee & St. Paul electrification. The high cost of materials, labor, etc., has also stimulated the use of synchronous condensers for power factor correction and voltage regulation. This it has done because the installation of such apparatus saves an increase in transmission line copper, or allows additional load to be taken on a given line.

The outstanding feature of the switchboard business has been the continued purchase of switch gear of great initial and ultimate capacity. A number of 150,000-volt outdoor oil circuit breakers of rupturing capacity far in advance of anything heretofore within the limits of high-voltage breakers have been completed. These breakers have round instead of elliptical tanks, domed instead of almost flat tops, and are of rolled steel construction.

Among other developments worthy of mention are the frame-mounted, indoor and outdoor high-powered steel tub 73,000-volt breaker, the combination 37,500-volt and 132,000-volt outdoor single-pole disconnecting switches and choke coils all on a common base, and the 66,000-volt post-type bus supports and disconnecting switches. There has also been developed a very compact drum type of circuit breaker controller. A number of outdoor switch houses have been installed to control circuits up to 6600 and 11,000 volts, a considerable increase in voltage over previous practice. The Westinghouse Company has also developed a control equipment for automatic rotary converter substations.

For the protection of apparatus on railway cars further developments have been made in the use of condensers by surrounding them with molded insulating cases impervious to moisture. The capacity has been increased to 1 microfarad in all forms of arresters (for pole mounting as well as car mounting) giving a static discharge capacity said to be sufficient to take care of the worst conditions found in practice.

During the year the company has added to its line of motors a new type, No. 577, having a rating of 200 hp. at 600 volts. This motor is especially suited for heavy subway service and is a striking contrast to the "Wee" motor. The H.S. and H.S.D. types of control have been combined into a one-piece outfit for economy of space and simplicity of wiring and mounting.

Regeneration has been extended to ordinary interurban applications, especially in locomotive service, and it is expected that this development will rapidly expand.

STEAM RAILROAD ELECTRIFICATION

The past year has seen considerable detail development and improvement in apparatus pertaining to electrification of steam railroads. The company has developed a very powerful split-phase locomotive which weighs 250 tons complete, has a horsepower capacity of 4800 and a maximum tractive effort of 130,000 lb., all concentrated in one single cab unit. The locomotive contains a synchronous phase converter by means of which 100 per cent power factor can be obtained. This eliminates some of the line losses encountered with the induction type of phase converters.

The high-voltage direct-current system has also received attention and a high-powered passenger locomotive was designed. This will be rated at 4000 hp. and the starting tractive effort will be 112,000 lb. The total weight will be 266 tons. This engine will also be a single cab unit.

Cooling Water for Power Plant Purposes*

New Type of Adjustable Spray Head—Nozzles Should Be Kept as Low as Possible—Efficiency Increases with Increase in Pressure and Decrease in Capacity

EXPERIMENTS to ascertain the conditions governing the cooling of water by means of spray ponds, involving the efficiency of the cooling process under varying conditions of pressure at the spray nozzles, temperature of water to be cooled, power applied to the pump, and height of sprays above the pond, have been conducted by the department of engineering of The Johns Hopkins University. The pond used was 35 ft. in diameter and 4 ft. deep and the water was ordinarily sprayed through one spray head, or nozzle. A motor-driven centrifugal pump with 4-in. suction and discharge was used to send the water through the condenser tube to the spray head. The pressure of the spray head was in all cases measured by means of a mercury column connected to the entrance of the spraying device. Wind velocity was measured on a standard anemometer and the humidity by means of a wet-and-dry-bulb sling psychrometer. The amount of water circulated was measured over a 10-in. weir, fitted with a micrometer hook gage. About 600 tests were made.

The adjustable spray head used in most of the tests consisted of a cast-iron supporting base containing the water-entry opening, and carrying a 3¼-in. outside diameter bronze tube in which was cut a spiral opening of coarse pitch. This opening was cut with a tool placed at an angle of about 60 deg., with the axis of the tube so that the water was thrown up at this angle. The spiral tube was held between the base and a cap which fitted the top by means of a central bronze stem. This passed down to a close clearance bushing in the base. The stem was movable and operated through a bell-crank and an extended vertical arm, giving accurate control of the position of the stem. The result of the motion was to either increase or decrease the fineness of the film of water as it left the spray head. When the head was in operation, the water was discharged in a continuous sheet in a direction which inclined upward, due to the angle of the spiral opening. As the water film spread, it became thinner on account of its increase in diameter until a point was reached where the surface tension was overcome, and the sheet of water broke into a uniformly fine spray, a mist or a large number of small drops, depending upon the size of opening to which the spray had been adjusted. This principle of spraying a liquid as a result of the spreading of a film of water until it breaks into mists, or spray, or fine drops, is particularly applicable to low-pressure work. The pressures used in the experiments described are relatively low, being in general from 5 in. to 8 in. of mercury.

It was desired to ascertain, among other things, the effect of placing a wire fly-screen cylinder about the spray head, and many of the tests were so made. Under some conditions this screen seemed to improve the efficiency, but in general it was not found to be necessary.

The efficiency of a cooling pond or tower may be expressed as a ratio between the cooling actually produced and that which would have resulted from cooling the water down to the dew-point or wet-bulb temperature. A perfect spray cooling device would be one capable of subdividing the water so that evaporation would take place at the dew-point and to an extent such as to lower the pressure of the remaining liquid spray to that temperature.

Experiments were made at three initial temperatures, namely, 98, 105 and 125 deg. Fahr., adjusting the spray head to suit the weather conditions. The results show that the efficiency increases with an increase in pressure, and with a decrease in capacity, and that the increase in efficiency is slightly less for temperatures of 105 and 125 deg. than for a temperature of 98 deg.

Tests made to obtain the efficiencies with water falling upon the bare cement bottom of the pond as compared with those resulting when the pond contained its normal amount of water were rather surprising in their results, showing efficiencies of from 15 to 20 per cent less for the former. If a bare pond would serve as well as one containing water, the construction of the pond could be cheapened since less weight would come upon the foundation and less material would be required for the pond as a whole.

The average evaporation may probably be taken at about 2¼ per cent. This will, of course, vary with weather conditions, initial temperature of water, pressure at the nozzle, and humidity. A large number of tests made with water at high and low initial temperatures indicated that 2 to 2½ per cent per hour represents fairly well the average loss of water, but that it may be as low as one-half of 1 per cent and in windy weather as high as 10 per cent.

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*Abstract of paper delivered before annual meeting of American Society of Mechanical Engineers, by Carl C. Thomas.

The power required to circulate the water was determined by experiments made on a 40-ft. x 60-ft. pond equipped with two sets of nozzles. One set consisted of forty-two non-adjustable, spiral-core nozzles and the other set of twelve adjustable spray heads. The power appears to be practically independent of the type of spraying device used. The cooling seems to be principally dependent upon the energy put into forcing the water through some suitable spraying device, and, given the requisite energy, a great variety of forms of nozzles would yield about equally good results. The adjustable spray head has many operating advantages, some of which are the ease with which the heads can be kept clean, and the possibility of regulation of the spray to suit weather conditions and to minimize loss of water in windy weather. Each head will handle from 150 to 250 gal. per minute, making the cost of piping small, and will take care of the condensing water for a 50 to 75-kw. plant.

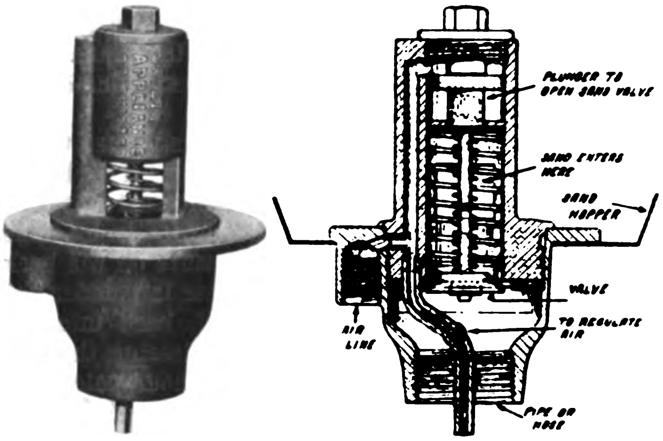
The height of spray nozzles above the surface of the pond has an important effect upon the cooling of the water. Experiments made in a small pond and in three larger installations have shown that the nozzles should be kept as low as possible. In the experimental pond heights from 8 ft. down to 3 ft. have been used and in larger ponds from 6 ft. down to 3 ft. A loss of several degrees results from placing the nozzle high above the pond due to the fact that a given pump placed in a certain relation to the surface of the pond will deliver a smaller amount of water to a high level than to a low level, and this smaller amount will leave the condenser at a higher temperature than would the larger amount of water. Also, with a given amount of power at the pump, less energy will be available for breaking up the water if the nozzle is placed high than if it is placed low, and it appears that minute subdivision of the water is more important than is a long path through the air.

With a given adjustable spray head, as the spiral opening is made wider the degree of atomization and resulting cooling are reduced. This is advantageous in that in windy weather very good cooling can be obtained when spraying a very large amount of water per nozzle and loss of water due to windage can thus be greatly reduced. Very good cooling effects are frequently obtained in very humid and even in rainy weather. Also the cooling effect seems to bear no direct relation to humidity, but to depend largely upon conduction of heat from the air, and it varies directly with the fineness of subdivision of the water particles.

The New York State Railways, Syracuse, N. Y., is rearranging the lighting on fifteen of its interurban cars, a row of ten 94-watt tungsten lamps being placed along the center line of the ceiling, seven lamps in the main compartment and three in the smoking compartment. The result is a very satisfactory distribution of light. On the platforms 23-watt Mazda lamps will be used in series with the gage lamps.

New Sander Designed to Prevent Causes of Stoppage

THE effect of atmospheric conditions upon track sand, one of the common causes of stoppage in sanders, has been overcome in the Reliance sander produced by Holden & White, Inc., Chicago, by placing a valve at the bottom of the sand chamber to prevent contact of the atmosphere with the sand. This sander is installed in the usual manner at the bottom of the sand hopper and is operated by the motorman with the ordinary sander valve. With this device, when air is admitted a small plunger is forced downward, opening a valve at the base of the sand chamber and allowing the sand to drop by gravity into the pipe leading to the track. Air is admitted simultaneously to the main pipe or hose, serving to force the sand to the track. As air pressure is not applied directly to the sand in the sand chamber, there is no tendency to produce a sand blast, and since contact with the air and atmosphere is prevented, the sand remains perfectly dry.



SANDER DESIGNED TO PREVENT EFFECT OF AIR IN CAUSING SAND TO CLOG

The Reliance sander is designed to deliver any amount of sand up to 22 lb. per minute, and it is claimed it will force the sand around bends in the pipe. Installations of the device have been made by the Chicago, North Shore & Milwaukee Railroad, the Michigan Railway, the Milwaukee Electric Railway & Light Company, the Chicago & West Towns and other railways, and from the experience of these roads it is understood that it has proved satisfactory in handling wet sand and that no trouble has been had from clogging. The sander is made of bronze and malleable iron, and weighs 2 lb. It is easy to install and can be used on a car where the sand hopper is not placed over the wheels.

Storage Rack for Wooden Car-Repair Parts

IN the shops of the New York State Railways, Syracuse, N. Y., a series of wall racks have been installed in the erecting shop for the storage of standard wooden pieces required in car repairs.

This procedure has resulted in great saving of time in making such repairs, as the foreman is able to determine at a glance whether a reasonable stock of each piece is on hand and thus keep the stock up to requirements. Proper labeling of the sections of the racks makes possible the selection of the proper piece for a given repair on any type of car by workmen who may

be unfamiliar with the details of the car construction. The racks are arranged for vertical storage of pieces to economize space and prevent warping.

Retaining a Record of Transfers

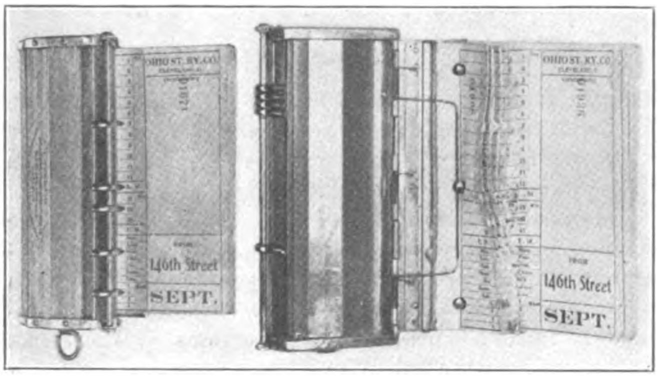
Adaptation of Cash Fare Receipt Box to Transfers Gives Very Simple and Inexpensive System of Checking Back—Large Part of Waste Eliminated

THE Macdonald Ticket & Ticket Box Company, Cleveland, Ohio, has brought out an adaptation of its well-known cash fare receipt box for use in issuing transfers on city lines. The arrangement consists of one of the standard holders in which the printed transfer slips are inserted and which is equipped with five movable pointers determining the hour, minute, day of the week, week of the month and whether issued in the morning or afternoon. On the printed transfer are included the name of the company at the top, a space in which special conditions of transfer may be printed, the name of the car line from which the transfer is issued and the name of the month. A serial number in red is also printed on each transfer.

In issuing transfers the conductor simply has to set the pointers and tear off the printed slip. This leaves a stub giving a duplicate record of the transfer issued, which is retained in the folder and turned in by trips at the end of the run. A slight pressure on the back of the holder draws the points of paper left under the pointers when a transfer is torn off, back into the holder, thus retaining the record and clearing the cutters for the next transfer. Since the hour pointer is moved but once an hour, the day-of-the-week pointer but once a day, and the week-of-the-month pointer but once a week, it leaves only the minute pointer as an active one which the conductor must watch.

It is claimed that this form of transfer prevents illegal transfer sale or "trading," since the time indicated on the audit stub retained in the holder must correspond to the running schedule time. In order either to sell or trade transfers, it is necessary to date the transfer issued in advance, and, of course, if the stubs or transfers issued were all in advance of the regular schedule time, it would give ample evidence of manipulation.

Another advantage claimed for the transfer is that all the information which the receiving conductor requires is to be found in a single line on the left edge of the paper. In view of the fact that the device has but one really active pointer, it is said that it may be operated with a speed equal to a one-punch transfer. With transfers which have the date printed on, the wastage is naturally considerable on account of the impossibility of estimating closely the requirements of any particular day. Under this Macdonald scheme only the month is printed in, thus saving a large part of the wastage, since it is possible to estimate much more closely the requirements throughout a month than the daily consumption. This scheme also eliminates the loss where transfers have only the day of the month printed and the unused transfers are returned for use the corresponding date on the next month, thus involving a cost of filing and a loss due to passengers retaining their unused transfers for thirty, sixty or ninety days, or until such time as they can be used.



TRANSFER BOX AS IT APPEARS IN USE AND OPENED UP

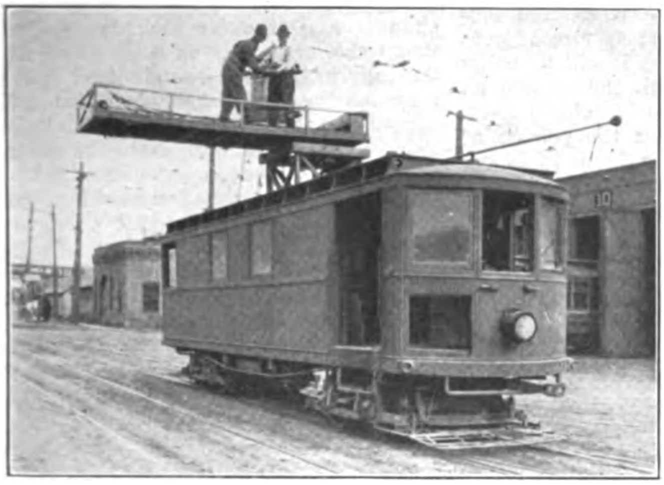
SIMPLE OPERATION FOR CONDUCTOR TO ISSUE DUPLEX TRANSFERS

The principal value of this system of transfers, however, lies in the possibility it gives to the auditing department to check up on a suspected conductor's work at a cost only a small part of that involved in checking under ordinary systems. For example, under present conditions it is usually necessary to gather all the transfers collected and returned for the day. Then the opening and closing numbers for the particular conductor are noted and a search begins. Each transfer issued by this conductor must be segregated, and then filed in numerical order. Then those issued for each trip must again be segregated and the punch marks checked against the running schedule time. In an average city where the number of transfers turned in in a day is around 100,000, it is easily appreciated what magnitude there is to this task, which, of course, multiplies rapidly as the size of the city increases.

Under this record-retaining system of transfers, it is not necessary to segregate the passengers' portions of the transfers, as these are only a duplicate of the audit stubs returned after each trip by the conductors. Thus it is only necessary to collect together the turn-ins from the various trips of the conductor in question for each day to make a complete check. The simplicity of this work practically eliminates the excessive cost of segregation which has prevailed on most properties when it was desired to make a check on the misuse of transfers, thereby making it possible to conduct a much more thorough supervision of the daily income than is now practicable.

Spokane Line Car Has Air-Operated Tower

An air-operated tower is the feature of the line car operated by the Washington Water Power Company, Spokane, Wash. The raising and lowering mechanism is actuated by an air cylinder, 10 in. in diameter and 7 ft. long, which receives its pressure directly from the air-brake system through control valves located in both ends of the car. The cylinder has by-pass ports to prevent the tower from being raised to too great a height. The air pressure will hold the tower with two men working on it for twenty minutes, but chains are used to take the weight off the cylinder if a longer job is to be done.



WASHINGTON WATER POWER COMPANY'S LINE CAR WITH AIR-OPERATED TOWER

The working platform of the tower is 14 ft. x 4 ft., and is mounted on roller bearings so that it can be swung around by one man. The roof of the car is decked over with ½-in. planks to form an additional platform so that the crew can work from any point on the car.

More Brains Needed in the Boiler Room

In response to a request from the Bureau of Mines to a number of prominent fuel engineers for suggestions on coal conservation, Martin A. Rooney of Detroit, Mich., said among other things:

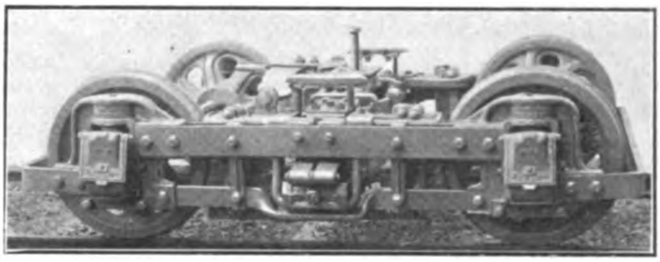
"At best one-fifth of all of our coal is wasted, and it is shamelessly and needlessly wasted. Instruments and machinery for getting out all the heat that there is in the coal are not nearly so complicated or expensive as the cash register used to keep tab on cash receipts in a store, or as the motor truck. Carbon dioxide, temperature and draft are subjects easier to comprehend than bank discount or freight rates.

"The time is coming when the government is going to limit the supply of coal, and fuel will be denied to those who cannot show that it is going to be used efficiently. Let the government show the patriotic coal user how to conserve this most important material. Let us send into our furnace and boiler rooms men who can show our engineers and firemen how to burn their fuel with the least waste, as we have sent them among our fields and orchards to show the farmer how to increase the productivity of the soil."

New Reduced-Height Truck for Low Level Cars

To meet the growing demand for a truck suitable to be used with the latest types of extremely low level cars, either center- or end-entrance. the Taylor Electric Truck Company, Troy, N. Y., is building a new lightweight truck which has several features especially to commend it for such service. The new truck, called the Taylor R. H. (reduced height) truck, is built along lines similar to the company's L. B. truck and is designed to receive the inside-hung so-called "Baby" or "Wee" motors. Although no part of the truck is closer to the ground than any part of the L. B.-type truck, the height of the center plate has been reduced about 6 in., making possible a very low step from the pavement to the floor of the entrance well. The compact arrangement of all the parts affords ample clearance between the top of the rails or pavement and the lowest part of the truck so that the car will not be stalled by obstructions in the street. This feature, of course, is important in operation in congested districts and especially during the snow season. Safety for high-speed service is obtained by the use of a twisted bottom bar which prevents any portion of the swing bale link or bolster from dropping in case of fracture.

The pedestal is of a new type to receive the same size journal spring over the journal box as that used on the L. B. truck. This spring is designed entirely to absorb the shock due to pounding on rail joints and special work, and thereby to eliminate the objections to the arch-bar type of truck which has only spiral springs for the riding of the car body. By the use of the Taylor continuous one-piece bale hanger the end surging or shucking motion of the truck, which is produced by the sudden stopping or starting of the car, is largely overcome. The bale hanger is supported on U-shaped hangers placed between the side bars of the main frame of the truck, and full elliptic springs used for the riding of the car produce the same riding qualities as the S. B. and L. B. types.



VIEW OF NEW REDUCED-HEIGHT TRUCK

Special attention has been given to designing the brakes. The live and dead brake levers and brake hangers have ample clearances and are made without offsets to give a straight-line action and thus eliminate the twisting strains when the brakes are applied. The brake is released by adjustable flat brake release springs and the shoes are fitted to wear even with the periphery of the wheel.

This truck is equipped with a Taylor wrought steel bolster, self-lubricating center plates, adjustable side bearings and renewable wearing shims on the pedestals.

Recent Happenings in Great Britain

Scarcity of Materials and Labor Leads Board of Trade to Appoint a Committee to Deal With Shortages—Government Tramway Direction Likely

(From Our Regular Correspondent)

It is officially announced that, in view of the difficulty of meeting the demands for various materials and for labor required for the maintenance and renewal of the permanent way and rolling stock of the tramway undertakings in Great Britain, the Board of Trade is appointing a committee to consider the needs of these undertakings, so that the necessary steps may be taken to supply, as far as possible, such needs, even at some temporary sacrifice by less essential undertakings.

How Members Will Be Appointed.—The Municipal Tramways Association and the Tramways & Light Railways Association have been invited to nominate members of the committee, and the board has asked the London County Council to allow A. L. C. Fell, the manager of the Council tramways, to serve on it. This request has been granted. James Devonshire has been invited to be chairman of the committee. The London County Council, however, has announced its disapproval of that appointment. It considers the selection of an interested chairman to be unfortunate. It is also understood that J. B. Hamilton, general manager of the Leeds tramways, will serve on the committee. He will probably abandon the Admiralty work with which he has been connected for the last year or two. J. M. McElroy, general manager of the Manchester Tramways, will also serve on the board. He will probably have to abandon the other Government work in which he has been engaged for some time.

Severe Shortage of Material.—The principal difficulty in the way of the maintenance of efficient tramway facilities throughout the country is the lack of material for repairs and renewal. A general rearrangement and redistribution of rolling stock and other plant has become necessary in order to maintain adequate traveling facilities in areas and districts where large numbers of people are engaged on work of national importance in connection with the war.

Government Direction Likely.—The matter has been under the consideration of the Board of Trade and the Ministry of Munitions, and these Government departments have consulted representatives of the various tramway organizations. The result of the deliberations is understood to be that the Government proposes to assume direction of all the tramways, which will be run, as the railways are now run, principally in the national interest. The pooling of resources will permit special facilities to be provided in selected districts. The actual working of the systems will be left in the hands of the present officials, but the board will have the power to order curtailment or rearrangement of services or redistribution of plant and appliances where required.

Cars and Materials to Be Concentrated.—It is understood that it will be the policy of the new board to concentrate available rolling stock and materials in the districts where the continuance of a frequent service of cars is essential. To do this it will probably be necessary to curtail the service on other routes to a considerable extent, even in districts where the volume of traffic at present may be both heavy and profitable. The expectation is that residential districts will suffer except in cases where they are served by the same cars that run to munition areas.

ADEQUATE POWER SUPPLY NEEDED

The Lord Provost of Glasgow and W. W. Lackie, the general manager and engineer of the Corporation Electricity Department, have given evidence in London before the committee on electric power supplies of the Board of Trade. That committee was appointed to consider what steps should be taken to ensure an adequate and economical supply of electrical power for all classes of consumers in the United Kingdom, particularly industries which depend on a cheap supply of power for their development. Recently the Town Council agreed to authorize the witnesses to state that if it was ultimately determined to divide the country into areas for the purpose of generating electricity, and an area was created for Glasgow and the Clyde and places adjacent, the Corporation was prepared to become the generating authority for such area, provided the terms and conditions upon which it was required to do so would not be detrimental to the city and its existing electrical undertaking.

ADDITIONAL WAR BONUS AWARDED

The committee on production has awarded an additional war bonus of 4s. a week, payable at the rate of 8d. a day, to the drivers and conductors, male and female, of the London & Provincial Union of Licensed Vehicle Workers. The committee has also granted an advance of 4s. a week in the wages of all drivers and conductors and the inside staffs of the Metropolitan Electric Tramways, Ltd., the South Metropolitan Electric Tramways & Lighting Company, Ltd., and the London United Tramways, Ltd.

CROYDON GOES BEHIND

The Croydon tramways and electricity undertakings, which in the past have relieved the rates considerably, show deficits of £1,633 and £1,690 respectively on last year's working. War allowances to tramway employees in the forces absorbed £5,824.

NEED FOR HIGHER FARES

The London United Tramways has intimated to the districts through which its lines pass that it is going to apply to Parliament for an Act asking to be relieved from the restrictions imposed on the company with regard to fares, so that it can raise them, and also for power to abandon some portions of its lines in Middlesex and Surrey.

TRANSFER CHANGES BENEFICIAL

The highways committee of the London County Council, reporting on fare changes and transfer facilities on the tramways, says that as a result of altered arrangements brought into operation early in October, facilities afforded to passengers in 1915 have been restored, but on a more extensive basis. The alteration has been effected with the primary object of recovering the necessary degree of control over the traffic. One important effect of the alteration has been a considerable reduction in the number of sections on the tickets. The committee adds that it is satisfactory to note that the alteration is having the effect of improving the carrying capacity of the tramways by acceleration of the service.

220 WOMEN DRIVERS IN GLASGOW

More than sixteen municipal tramway undertakings throughout the country employ women drivers. Glasgow has 220 of them. The highways committee of the London County Council, which has collected the facts, is shortly to consider a proposal to use women on the front platform. Women conductors have been employed for some time. The new Board of Trade committee has been asked to consider the feasibility of using the trams for carrying parcels, as in Bradford, and, to some extent, Leeds, the Potteries, and other places, and perhaps even for the carriage of mail bags.

ADVANCE ASKED IN NEWCASTLE

At a meeting of the tramway committee of the Newcastle Corporation a deputation of tramway workers, headed by the president of the Newcastle branch of the Tramway & Vehicle Workers' Union, waited on the committee in respect of an application for an advance of 5s. a week for motormen and conductors; 2s. 6d. a week for women conductors and cleaners, and 2s. 6d. a week for lads of eighteen and under working as conductors. The application was referred to a sub-committee for consideration.

Many Other Pressing Problems.—The tramways committee is faced with many problems of importance at the present time. Pressure is continually being brought to bear upon the management for an increased service of cars for workmen, a great proportion of whom live far from their work. Another problem the management has to deal with is the difficulty of maintaining a regular service of cars in the winter time, when driving is always more difficult. A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Toledo Report Will Be Made to New Mayor

New Ordinance and Report in Type Awaiting Final Amendment and Signature of Mr. Doherty

The final report of the Street Railway Commission of Toledo, Ohio, will be made to Mayor Cornell Schreiber, successor of Charles M. Milroy. This was indicated by a note written to Mayor Milroy on Dec. 27, in which it was claimed that Henry L. Doherty had sought to reopen some of the features of the agreement which had been made between him and the commission. The note is as follows:

"The Toledo Street Railway Commission had hoped and expected to make a report to you, as Mayor, including an ordinance agreed upon by both parties after long negotiation with Henry L. Doherty.

"The agreement between Mr. Doherty and the commission was reached on Oct. 13, 1917, and the ordinance and a report addressed to you were ordered printed and were given to the printer at once.

"For weeks the ordinance and report have been in type awaiting Mr. Doherty's signature. Just recently Mr. Doherty has sought to reopen negotiations by objecting to some of the provisions to which he had already agreed.

"This has delayed our report and necessitates further postponement, and the making of a final report to your successor, who will have to deal with the street railway situation.

"The commission desires to thank you sincerely for your uniform courtesy and ready disposition to help in every way."

The members of the Toledo commission are: Johnson Thurston, president; E. P. Usher, Nat C. Wright and N. D. Cochran.

Personnel of Original Commission

Originally this commission, appointed soon after Mr. Milroy took his seat two years ago, was a committee, consisting of Carl Spitzer, James Thompson, Henry L. Doherty, Edward Usher, Johnson Thurston, N. D. Cochran, Nat C. Wright, R. C. Patterson and the Mayor himself. Mr. Cochran refused to sit with the committee as long as Mr. Doherty was a member, so Mr. Doherty withdrew. Then a sub-committee, consisting of Messrs. Cochran, Wright, Thurston and Usher, was named. When the sub-committee reported a community of interest plan, it was proposed that a street railway commission be established. Messrs. Spitzer, Thompson and Patterson thereupon resigned, leaving the sub-committee as the commission.

The Toledo *Times* contends that the members of the original committee and of the commission were named while Mayor Milroy was still a private citizen and that neither has a legal standing. If this is correct, it cannot bind the city to any action that may have been taken or may be taken in the future. This paper asks who is going to pay the expenses of the commission and what is proposed to be done about it.

Mayor Schreiber Will Decide

Since the whole matter now goes over to Cornell Schreiber, whose term began the first of the year, he will have the task of straightening out the muddle in which the street railway question and the community plan are involved. As city solicitor some years ago, Mr. Schreiber had considerable experience in street railway matters. What his attitude toward the community plan may be is not known, but his friends assert that he will take a reasonable and proper course in his efforts to secure a settlement.

Mr. Doherty Seeks Revision

At a conference recently it seems that Henry L. Doherty asked for a revision of some of the technical features of the condemnation clause in the proposed community plan, and that the request was refused. Johnson Thurston is said to be responsible for the course matters took, and Mr. Doherty declared that unless he changes his attitude and his tactics there is little hope of a peaceful settlement.

Mr. Doherty has asked for a conference with the entire commission, which now consists of the four men named and Mayor Milroy.

Recently the Toledo *Times* reprinted from the New York *Sun* the article on the community plan to which reference is made on page 56 in this issue.

Eighty-two Miles of Rapid Transit Lines

The Year 1917 Represented the Largest Single Increase in New Rapid Transit Facilities in New York Since 1904, When First Subway Was Opened

Many of the new rapid transit lines of the dual rapid transit system in New York not yet in service will be placed in operation during 1918. It is believed that unless undue delays occur in the delivery of materials, it will be possible to have upwards of 85 per cent of the total track mileage of the new lines of the system in operation by Dec. 31, 1918. Most of the remaining lines will probably be ready for service by mid-summer of 1919 or shortly after. This forecast is based on the theory that contractors will be able to obtain the requisite materials and labor to complete the work approximately within estimated periods.

Contracts already awarded for city-owned lines of the dual system, including those completed, now aggregate more than $200,000,000, in addition to real estate purchases amounting to $15,000,000. Exclusive of their own purchases of real estate, the two operating companies, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation, have entered into contracts or agreements for construction of company-owned lines and for equipment on both city-owned and company-owned lines, involving a total of almost $200,000,000 more.

The year 1916 represented the highest point in construction work under dual system contracts, both the number of contractors and the working forces engaged during 1917 being substantially less than in previous years. Numbers will continue to decrease in the future. Only five general construction contracts remain to be let, out of the approximately ninety such contracts for new lines in the dual system. Practically all will be let during the next six or eight months, together with most of the remaining station finish, track installation and minor contracts.

The year 1917 represented the largest single increase in new rapid transit facilities provided for the traveling public of New York in any one twelve-month since the opening of the first subway in 1904. The lines or portions of lines placed in service in 1917 and to be placed in service early in 1918 aggregate approximately 82 track-miles, added to the track mileage of other new lines of the dual system previously placed in service, a total is had of 174 track-miles out of the grand total of 345 track-miles of new lines in the dual system. It is estimated that by the end of 1918 more than 300 track-miles will be in operation, leaving about 40 track-miles to be completed and placed in service in 1919 or thereafter.

It is expected that during 1918 both the Lexington and Seventh Avenue lines will be in operation, including all of the Jerome Avenue branch and a part of the Pelham Bay Park branch of the Lexington Avenue line; that the Eastern Parkway line in Brooklyn and the Nostrand Avenue line in the same borough will also be in service, with the Webster Avenue Extension of the Third Avenue elevated railroad and the 162nd Street extension of the Ninth Avenue elevated line. All of the above lines are for operation by the Interborough Rapid Transit Company. Of the lines for operation by the Brooklyn Rapid Transit subsidiary, the New York Consolidated Railroad, it is expected that the following will be placed in operation during 1918: The Broadway subway from Fourteenth Street to Forty-second Street for express service, and from Rector Street to Forty-second Street for local service, part of the Culver Rapid Transit Railroad, the remainder of the Jamaica Avenue line, the Montague Street Tunnel line, the Brighton Beach line connection, the East New York improvement and the Coney Island terminal.

City an Obstructionist

Dilatory Tactics of Buffalo City Council Prevent International Railway From Carrying Out Commission Recommendations

Unable to secure the co-operation of the municipal authorities, the International Railway, Buffalo, N. Y., has been prevented from making the improvements to its city lines which were recommended in the recent report of Charles R. Barnes, electric railway inspector for the Public Service Commission of the Second District. In consequence the daily newspapers have criticized the company's service severely, and the Buffalo *Times* has started an agitation for municipal ownership. Members of the City Council have pledged themselves to investigate the possibilities of taking over the railway properties within the city. The new Mayor was elected upon a platform of electric railway service reforms.

Aroused by the demands made by various commercial organizations which have allied themselves with the critics of the company, the Public Service Commission sent a communication to the City Council asking why action had not been taken on the requests of the railway for permission to lay additional tracks in the congested sections of the Main Street district. The company had previously filed applications with the City Council for permission to lay a single-track loop around the Soldiers' and Sailors' Monument in Lafayette Square so as to relieve the Washington Street congestion, and request was also made for permission to enlarge the safety zone in Shelton Square so as to allow three cars to be loaded at one time instead of two cars as under present conditions. The company also sought permission to construct a steel shelter house for the convenience of its passengers at Shelton Square. All of these applications have merely been "received and filed" by the municipal authorities.

In addition to hindering the company from making these necessary improvements to its service so as to facilitate the movement of traffic through congested centers, the municipal authorities did not co-operate with the company when it was making vigorous efforts to clear its tracks of snow after the severe snowstorm three weeks ago. This storm crippled the movement of cars on all lines, and when the city refused to aid the company in cleaning the streets, the company's tracks were blocked with vehicles which caused the bunching of cars.

When the Public Service Commission received the reply of the City Council regarding the delay in considering the requests of the railway, the commission announced a conference to be held in Buffalo between members of the City Council, officials of the International Railway and two members of the commission. On the day of the conference, none of the members of the City Council was present and the city was not represented. E. G. Connette, president of the railway, and Thomas Penney, vice-president and general counsel, attended and discussed the traffic problem with members of the commission.

Supplemental Report by the Commission

Charles R. Barnes, inspector of the commission, was instructed to make an additional survey of traffic conditions, and this supplemental report will be made to the commission at Albany. After the conference with members of the Public Service Commission, President Connette made a statement to the newspapers in regard to the inability to maintain service on most of its lines during the week following the snowstorm. He said that the cars became crippled faster than the shops could repair them. Car door mechanism became disarranged in a large number of cars, air pipe lines froze and motors became crippled. He also placed a large part of the blame upon the "track hog," and he urged the police department to arrest all vehicle drivers who intentionally block the tracks.

Some of the Work Under Way

Answering the criticism regarding the company's alleged inability to handle the employees of the large war plants in the Elmwood-Hertel section, President Connette called attention to the fact that the company had awarded contracts for the erection of a modern passenger loading terminal on property adjoining the plant of the Pierce-Arrow Motor Car Corporation in Elmwood Avenue. The blizzard and heavy fall of snow delayed building operations on the foundation and track work, but Mr. Connette said that work was now progressing rapidly. He also pointed out that the company was working almost night and day trying to complete the North Elmwood Avenue double-track extension to the plants of the Curtiss Aeroplane Company, and other large war industries in this rapidly growing section. It is expected that this line will be completed and placed in operation within the next thirty days.

The Lafayette Square loop which the International Railway seeks to construct would probably halve the Washington Street congestion. The Broadway and probably the Sycamore Street lines, two of the heaviest patronized arteries to the east side, would make this loop and avoid the downtown congestion. The enlarged safety zone in Shelton Square would permit the loading of twice the present number of cars at one time at this point. The Niagara and the Grant Street lines make this loop their downtown terminus. It is also proposed to cut the long cross-town lines in two. The west side lines which continue out toward the east side city line pass through a congested section, and delays in this section caused the bunching of cars along the entire route. It is also proposed to reroute other lines so as to make quicker time between downtown outlying districts.

In replying to criticism of the company E. J. Dickson, vice-president, in a public statement placed full responsibility for delays and bunching of cars during the storm on Dec. 9 and 10 upon the track hog. Mr. Dickson said:

"During the storm thirty-two cars at one station were put out of commission by air pipes freezing. Because of the extraordinary exertion of the motors of the snow-fighting equipment these machines must have constant attention at the carhouses. A large proportion of the men at work in the shops and carhouses are diverted from passenger car maintenance to snow equipment maintenance. Also during the storm the mechanism of passenger cars develop defects which ordinarily would not occur. The operating mechanism of steps and doors is damaged, leads and contacts are broken and frequently air brakes are rendered inoperative because of the collection of snow and ice."

The statement also called attention to the fact that seventy-five men employed at one carhouse quit work when the storm started and that the company experienced the same shortage of help as other industries in western New York.

In replying to the criticism against lack of equipment, Mr. Dickson called attention to the fact that the company was unable to get delivery on 50 per cent of its new cars, orders for which were placed a year ago. The company has also placed orders for additional snow-fighting equipment which has not yet been received. Flat cars have been equipped with steel plows to aid in keeping the lines clear of snow.

Philadelphia Lease Measure Passed

Proposed Contract for Operation of New High-Speed Lines by the Philadelphia Rapid Transit Passed by One Branch of Councils

The Common Council of Philadelphia, Pa., on Dec. 31, by a vote of sixty-three to eight, passed the measure providing for the lease of the new high-speed rapid transit lines to the Philadelphia Rapid Transit Company, after it had been amended. The bill was to be acted upon on Jan. 3 by Select Council, and indications were that it would pass that body with little opposition.

The only opposition voiced in the Common Council came from Councilman Meckert of the Twenty-third Ward and Councilman Conn of the Eighth Ward. Mr. Meckert opposed the passage of the bill because of war conditions, and Mr. Conn moved that the entire matter be postponed until an opinion could be obtained from Mr. Connelly, the city solicitor.

Mr. Conn said that the people should have the expert opinion of the city solicitor, in addition to the "various verbal opinions of the special counsel who has been retained by the Mayor."

AMENDMENTS OFFERED

After Clerk Felton had read the first section of the bill Mr. Gaffney, chairman of the finance committee, offered amendments which made the supervising board a body of three instead of two members, but eliminated previous requirements that they all be engineers. Under the provisions of the lease the city's representative will be the director of city transit. His salary will be fixed by Councils. The company's representative will be appointed by the Philadelphia Rapid Transit Company and his salary will be fixed and paid by the company. The third member, who will serve as chairman, will be chosen by the Mayor and the president of the Philadelphia Rapid Transit Company. The amendments make the board a "supervising board" instead of a "supervising board of engineers."

PASSAGE OF MEASURE URGED

In urging the passage of the measure Mr. Gaffney said:

"All the objections advanced by Mr. Conn and Mr. Meckert were threshed out thoroughly at the various committee meetings. The city solicitor has no objection to the passage of the lease. I see no reason why there should be any further delay. I think the lease should be approved right now. The question is not of abnormal or normal times. It is: Is this the best lease that can be obtained for the people? I tell you, with all the candor I possess, that you couldn't find better servants for the people than Doctor Lewis, adviser to the Mayor, and Director of City Transit Twining have been. If the matter is postponed the lease will simply be thrown back into the political field to be kicked about by both factions."

The chamber then voted down Mr. Conn's motion for postponement and the final vote was taken.

Mr. Lamberton, who had come to be regarded as the leader of the opposition, made a speech in favor of the arrangement.

St. Louis Sleeping

Writer Points Out Wherein City Has Failed to Make Most Out of Opportunities as an Interurban Center

An article by Hugh L. Wood on the front page of the St. Louis *Republic* for Dec. 29 calls attention to the need of St. Louis encouraging the building and extension of electric railway transportation from Illinois, Indiana, Kentucky, Ohio, and even Wisconsin and Michigan into that city. The article urges the building of an immense union passenger and freight station on Gratiot Street, between Twelfth and Fourteenth Streets. This property is now vacant, but Mr. Wood sees no obstacle to its purchase by the city and lease under favorable terms for a long tenure to the several interurban lines using the station. He said the Free Bridge should be opened to passenger, express and freight service.

THE LINKS THAT ARE NEEDED

Mr. Wood urged the connecting of St. Louis by electric railway with Terre Haute, Indianapolis, Fort Wayne, Louisville, Cincinnati, Dayton, Columbus, Cleveland, Toledo, Detroit and other cities and towns. Three links would have to be built, all of them comparatively short. They are: A link between the Illinois Traction System at Ridge Farm, Ill., and the Terre Haute, Indianapolis & Eastern Traction Company at Paris, Ill.; a connection between the Illinois Traction System at Danville, Ill., and the Fort Wayne & Northern Indiana Traction Company and the Terre Haute, Indianapolis & Eastern Traction Company at LaFayette, Ind., and a connection between the Illinois Traction System at Danville, Ill., and the Terre Haute, Indianapolis & Eastern Traction Company and the Indianapolis & Northwestern Traction Company at Crawfordsville, Ind.

Fuel Board Takes a Hand

Becomes a Player in the Detroit Railway Game and Has the Call With a Strong Hand

The Federal Fuel Administration has taken a hand in the electric railway situation in Detroit, Mich. As a result of an order issued by the Wayne County fuel administration the Detroit United Railway on Dec. 23 re-established skip-stop and rerouting operation, which the City Council had ordered discontinued two weeks before as a reprisal measure because of higher fares. The fuel board over-rode the Council even though that body had adopted a resolution warning the fuel board to "keep its hands off" the car question. The fuel board declared that skip stops and rerouting were necessary to conserve coal. It was figured that by a return to their use from 50 to 75 tons a day would be saved.

Whereas formerly the Detroit United Railway had permission from the Council to operate skip stops on only eleven lines the fuel board order commands the company to extend this plan to every line in the city.

The action of the government is a move that the city hall politicians are unprepared to meet. The general public enthusiastically welcomed the return to skip stops and rerouting. Some of the Aldermen are considering further reprisals against the company. These may take the form of ordering the company to keep interurban, freight and construction cars off the city streets.

ILLUMINATION DECREASED

The order by the fuel board to the company also requested that artificial illumination of the cars be reduced 50 per cent. This has also been done.

Sir Albert Quoted

The New York *Times* for Jan. 4 contained a cable dispatch from London by its correspondent, Charles H. Grasty, who interviewed Sir Albert Stanley, president of the British Board of Trade. Sir Albert was quoted as saying that he regarded it as very desirable for the government to take the coal mines in with the railroads and co-ordinate and work them together. It was possible to save much mileage by bringing the source of production and the point of consumption as near together as possible. Both the railroads and the coal mines were under the Board of Trade in England and co-ordination was simple. The interview will prove of particular interest to Americans in view of Mr. Stanley's long association with electric railways in this country.

Preliminary Subway Survey

Cleveland Council Will Be Asked for an Appropriation of $50,000

At a meeting of the Subway Commission of Cleveland, Ohio, on Dec. 28, it was decided to ask the Council for an appropriation of $50,000 to cover preliminary engineering, legal and other expenses while an investigation is being made. A preliminary survey will be made. City Engineer Hoffman and Bridge Engineer Richards will act in an advisory capacity until a permanent engineer can be selected. Former Appellate Judge Walter D. Meals and former Municipal Judge Pierre White will be asked to act as special legal advisers under the supervision of City Law Director FitzGerald.

W. R. Hopkins, president of the Cleveland Rapid Transit Railway; O. P. Van Sweringen of the Cleveland & Youngstown Railway, and other men who have been connected with subway enterprises, will be called into consultation with the commission and joint meetings with the City Planning Commission will be held in order to insure co-ordination between the two bodies.

Attorney William T. Redmond has been selected as secretary of the commission at a salary of $3,000 a year.

U. S. Wants Men with Engineering Experience

The Army and Navy staff departments continue to demand men of engineering experience, especially in industrial lines. At present the outlook is that this demand will continue throughout the period of the war.

In calling attention to this, the United States Public Service Reserve, Washington, D. C., where records of men willing to serve when called will be kept on file, points out that a man of engineering experience has a rare combination of opportunities open to him which are not available to the average patriotic American, as follows:

1. To serve the country in his most effective capacity.
2. To keep in touch with his own profession, with the result that his patriotic service will not have caused him to become rusty by the time peace returns.
3. To become a commissioned officer and receive much better pay than the average man who has wholly subordinated personal interests and now works for the national good.
4. To perform his service usually without leaving the United States.

New City Officers' Plans

Mayor Hylan of New York and his incoming Board of Estimate have decided to ask the Legislature for sixteen specific laws, through which to fulfill the pre-election pledges made by the Democratic candidates. The program includes the following:

Legislation necessary to empower the city of New York to acquire and operate all public utilities.

The election of the Public Service Commission. The commission for the first district, which includes all of the greater city, to be composed of five commissioners, one chosen by the voters of each borough, thereby making that body responsive to the public.

Increase of the city's share of the new corporation franchise tax established by the Legislature in 1917 to 50 per cent instead of 25 per cent, as at present.

Bills to carry out these ideas probably will be introduced into the Legislature at once by Senators Robert F. Wagner and James A. Foley.

Subways for Tokio

Greater Tokio, according to the *Far Eastern Review*, Shanghai, will be surrounded with subway lines when the following plans are carried out: The Ikegami Electric Railway, capitalized at 400,000 yen, will connect Amori Station on the Railway Board Line to the Meguro terminus of the street car line, covering 7 miles. The 5-mile line between Kameido and Matsuemura, starting from the Kinshibori terminus of the city train line, will be completed at the end of June. Other proposed lines are one along the River Edo, between Matsuemura and Shinkawaguchi; the extension of the Oji Electric Railway line from Otsuka to Shinjuku via Zoshigaya; and a line from Shinjuku to Horinouchi via Nakauo.

Bus Injunction Hearing Adjourned

Argument on the application of Henry H. Klein, a taxpayer, for an order restraining the Mayor and the Board of Estimate & Apportionment of New York from holding a hearing upon the application of the Fifth Avenue Coach Company for an omnibus franchise, was adjourned by Justice Platzek of the Supreme Court until Jan. 4. The adjournment was asked for by counsel representing all parties.

News Notes

Daily Paper Describes Toledo Settlement Plan.—The community plan of ownership for the settlement of the Toledo franchise deadlock was described in the magazine section of the New York *Sunday Sun* for Dec. 23. It was a very interesting account of the negotiations, heightened in its value by quotations direct from H. L. Doherty, chairman of the board of the Toledo Railways & Light Company. The article was signed by Harry Esty Dounce. It was accompanied by a portrait of Mr. Doherty.

Representative of the Department of Labor at Toledo.—In reply to the appeal of the motormen and conductors of the Toledo Railways & Light Company, Toledo, Ohio, the Federal Department of Labor has sent A. L. Faulkner, special agent, to Toledo to investigate the claims of the men that they are unable to live on the wages they are receiving. Some time ago they made a demand upon the company for an increase, although their present contract does not expire until April, 1919. Henry L. Doherty, in a conference with their representatives, declared that the wage scale could not be increased unless the rate of fare was increased at the same time.

Arbitration Award Made in Wilmington.—The committee of citizens of Wilmington, N. C., which was formed as a board of arbitration to act upon the complaints of the men and the Tidewater Power Company, operating the local electric railway in Wilmington, has filed its report, which allows an increase of 1 cent an hour to the motormen and conductors. The men in Wilmington went on strike on July 4, 1916, and returned to work on July 12, that year, in accordance with the terms of an agreement reached through the efforts of a citizens' committee. Before returning to work, each man signed an agreement to abide by the conditions of the settlement. The strike was reviewed in the ELECTRIC RAILWAY JOURNAL for July 29, 1916, page 202.

Association Meeting Program

Northern White Cedar Association

The twenty-second annual meeting of the Northern White Cedar Association will be held at the Hotel Radisson, Minneapolis, Minn., on Jan. 22 and 23.

National Foreign Trade Council

James A. Farrell, chairman of the National Foreign Trade Council, has issued the formal call for the Fifth National Foreign Trade Convention to meet at the Gibson Hotel, Cincinnati, Ohio, on Feb. 7, 8 and 9, 1918. The theme of the convention will be "The Part of Foreign Trade in Winning the War."

Approximately one-half of the time of the convention will be given to the presentation of prepared papers and reports dealing with one or another of the numerous phases of this great convention theme. The remainder will be devoted to group sessions for the intensive discussion of single problems under the leadership of specially qualified experts.

CONSULS TO ATTEND

The Secretary of State will assign to the convention several Consuls General and Consuls from Europe, Latin America and the Far East, who are expected in the United States on leave at the time of the convention. These officials, several of whom have been in the consular service for many years, will be accessible to delegates for the purpose of personal conversation or for informal conference with groups of delegates.

In addition the Secretary of Commerce will assign to Cincinnati during the convention officials and experts of the Bureau of Foreign and Domestic Commerce, who will be available for individual consultation.

COLLECTION OF SAMPLES

Among the special features of the convention will be a large collection of samples assembled by the Bureau of Foreign and Domestic Commerce from all parts of the world, vividly showing the character of products marketed by other nations. The Pan-American Union will have representatives at the convention to supply information regarding the Pan-American friendship in commerce, and a number of gentlemen, long experienced in foreign trade, will be present to give particular advice to delegates on the details of foreign trade.

Financial and Corporate

Dallas Railway Reports

Balance of $39,384 Shown for the First Month of Operation Under the New Service-at-Cost Franchise

The net earnings of the Dallas (Tex.) Railway, the electric railways consolidated under the Strickland-Hobson management, for October, 1917, the first month the lines were operated under the service-at-cost franchise, were $66,191, according to the monthly report, filed with the Supervisor of Public Utilities by the company. Various deductions, aggregating $26,807, are applied to the different reserve funds, leaving the company a balance of $39,384 as a return upon the property value allowed by the franchise. This gives earnings of approximately 6 per cent on the agreed valuation. The franchise permits the company to show a return of 7 per cent before fares are automatically reduced.

REPORT SUMMARIZED

A summary of the report, prepared in the office of the Supervisor of Public Utilities, is as follows:

	October		
Gross Earnings—	1917	1916	Dec.
Railway	$139,101	$154,943	$6,842
Interurban term.	9,952	8,930	*1,021
Total gross earnings	$149,054	$154,874	$5,820
Operating Exp's—			
Railway	$78,627	$98,813	$20,185
Interurban term.	4,235	4,454	218
Total operating expenses	$82,863	$103,267	$20,403
Net earnings from operation ..	$66,191	$51,607	*$14,583

*Increase.

These differences, it is said, are in large part due to the fact that under the method of accounting required by the franchise, an amount of $12,260 for maintenance during October, 1917, has been charged to the "repair, maintenance and depreciation reserve" account, whereas the expenditures for this purpose in 1916 were charged to operating expenses.

Short Topeka Line Abandoned

State Commission Agrees to Discontinuance of 1½ Miles of Track

The Public Utilities Commission of Kansas has granted the Topeka Railway permission to remove the old track running southeast to old Vinewood Park. The line from California Avenue in Highland Park will be torn up and the rails will be used in other extensions the company may make in the future. In all about 1½ miles of track with side tracks at old Vinewood will be taken up.

Dan Patch Reorganization

If the Contemplated Plan of Reorganization Is Not Successful the Property Will Be Dismantled and Junked

With the purchase of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company's cut-off from Auto Junction to Luce Line Terminal by C. T. Jaffray and associates under foreclosure, noted in the ELECTRIC RAILWAY JOURNAL for Dec. 22, page 1136, plans were set in motion for reconstruction of the road from Minneapolis to Northfield and Faribault at a cost of $750,000. Mr. Jaffray said:

"If our plans are met by investors, the road will be electrified for both freight and passenger traffic to Faribault. This would mean the bringing to Minneapolis of most of the business from the rich districts near Northfield, Faribault, Rochester and Mankato. Much of this trade now goes to St. Paul. C. T. Bratnober, receiver for the property during pendency of cases involving the status of the line, will have charge of the attempt to reorganize. If the plan for reorganization is not successful the property will be dismantled and sold for junk."

The sale of the cut-off was conducted by Howard S. Abbott, master in chancery. The only bid made was by the committee representing the holders of the collateral notes against the road. The purchasers under the court order have the right to scrap this 14 mile section, but operation has not yet been suspended.

Pittsburgh Interest Arranged

Philadelphia Company Arranges for the Payment of Interest on Bonds of Underlying Companies of Pittsburgh Railways

J. H. Reed, president of the Philadelphia Company, Pittsburgh, Pa., which controls the Pittsburgh Railways, has issued the following statement:

"The Philadelphia Company has, in the past, loaned large sums of money to the Pittsburgh Railways to enable it to continue its operations, and is now a creditor of the railway for a very large amount. The Philadelphia Company directors refuse to make any further loans to the railway, but in order to avoid hardship to security holders whose interest will come due on Jan. 1, 1918, the Philadelphia Company announces that, as the Pittsburgh Railways will not be able to pay the interest due on Jan. 1, 1918, upon bonds of the underlying companies in the Pittsburgh Railways system it has arranged with the Farmers Deposit Company, Pittsburgh, to purchase the coupons representing the said interest, when properly presented to it by the holders, with the certificates of ownership attached which are required by the Federal income tax law."

The companies named were as follows: Central Traction Company, Duquesne Traction Company, Federal Street & Pleasant Valley Passenger Railway (general mortgage), Federal Street & Pleasant Valley Passenger Railway (consolidated mortgage), Pitcairn & Wilmerding Street Railway, Pittsburgh, Canonsburg & Washington Railway, Pittsburgh, Crafton & Mansfield Street Railway, Pittsburgh Incline Plane Company, Pittsburgh & West End Passenger Railway, Second Avenue Traction Company, United Traction Company, Washington & Canonsburg Railway, West End Traction Company, West Liberty Street Railway, West Liberty & Suburban Street Railway.

Canadian Issues Under Regulation

New Financial Offerings Must Have Certificate of Approval from Finance Minister

Under the authority of the war measures act the Union government has passed an order-in-council by which new issues of bonds in Canada, whether by any provincial, colonial or foreign government, municipality, commission, local government, institution, corporation or incorporated company, can only be made or sold with the approval of the Minister of Finance by his certificate in writing.

The order equally applies to any offering of shares, whether preferred or common, of any incorporated company, from this time onward. Provision is made whereby any issue or sale in contravention of the prohibition may be restrained. Heavy penalties are provided for violation of the regulation.

The regulation is similar to that which has been in force in Great Britain and has the same object of conserving the financial resources of the country for war purposes.

Public Represented on Board

Alfred M. Lyon, Newtonville, Mass., has been selected by a committee representing the Newton Board of Trade and all the village improvement societies in the city as their representative on the board of directors of the Middlesex & Boston Street Railway, Newtonville, Mass. This action is on the suggestion of James L. Richards, president of the railway. The appointment of a representative of the people to the board is in connection with the concerted protest of the public against a further increase of fares. Mr. Richards told the committee that in placing a representative in the councils of the road intimate knowledge of its workings and needs could be gained. Mr. Lyon is a lawyer and school board member.

Financial News Notes

Lancaster Company Increases Its Stock.—The Lancaster County Railway & Light Company, Lancaster, Pa., has increased its authorized capital stock from $2,500,000, of which $1,000,000 is 5 per cent cumulative preferred, to $3,750,000.

Lorain Bonds to Be Extended.—The Ohio Public Utilities Commission has authorized the Lorain Street Railroad, controlled by the Lake Shore Electric Railway, to extend for two years the $200,000 of 6 per cent notes maturing this month.

Common Stock Dividend Reduced.—The directors of the Philadelphia Company on Dec. 17 declared a quarterly dividend of 1½ per cent on the common stock. This is one-fourth of 1 per cent less than the company has paid for a number of years.

Charlottesville Preferred and Common Dividends.—The Charlottesville & Albemarle Railway, Charlottesville, Va., has declared a semi-annual dividend of 3½ per cent on its preferred stock, making 7 per cent for the year, and 2 per cent on its common stock, making 4½ per cent for the year.

New Stock for Public Service Railway.—A decision has been rendered by the State Board of Public Utility Commissioners of New Jersey approving the application of the Public Service Railway, Newark, N. J., for authority to issue $1,250,000 of its capital stock. The company is controlled by the Public Service Corporation of New Jersey.

Successor to Snake Line Seeks to Issue Stock.—Officials of the Swansea & Seekonk Street Railway, Swansea Centre, Mass., the successor to the Providence & Fall River Street Railway after the property of the latter had been sold for junk, appeared before the Massachusetts Public Service Commission recently and petitioned for approval of an issue of $100,000 in stock.

May Prove His Claim.—The Supreme Court of Illinois has denied a petition for a rehearing prayed by the Woodstock & Sycamore Traction Company, Genoa, Ill., in its defense against John Seymour, one of the original organizers of the road. Mr. Seymour now has the opportunity to prove his claim of $40,000 against the company.

Action on Boston Suburban Dividend Deferred.—The trustees of the Boston (Mass.) Suburban Electric Companies took no action on Dec. 28 on the preferred stock dividend, due this month. Two payments of 50 cents each were made in January and April, 1917. In 1916 and 1915 $3 was paid. The preferred stock is entitled to 4 per cent per annum, which is cumulative.

Make Your Claim.—J. Moss Ives, receiver for the Danbury & Bethel Street Railway, Danbury, Conn., is giving notice to the creditors of the company that the Superior Court in and for the county of Fairfield has ordered and adjudged that four months from Dec. 14, 1917, be limited for the presentation of claims against the railway and that all claims not presented within the time limit will be thereafter barred.

Dunkirk Railway Seeks Service Reduction and Higher Fares.—Efforts are being made by the receiver for the Dunkirk (N. Y.) Street Railway to sell the property. The company has an application pending before the Public Service Commission of the Second District of New York for permission to abandon part of its line. An application has also been made for permission to increase the rate of fare within the city from 5 cents to 6 cents.

Another Road in Danger of Being Scrapped.—Gustave Benjamin, Buffalo, N. Y., has bought the property of the New York & Pennsylvania Railroad, operating between Canisteo, N. Y., and Shinglehouse, Pa. The amount involved was approximately $350,000. Unless sufficient funds can be raised along the line to keep the property in operation, Mr. Benjamin will junk the road. Commercial organizations in the towns along the railroad are reported to be considering the organization of a company to electrify the line.

Mortgage for $5,000,000 Recorded.—The Springfield Street Railway has filed in the registry of deeds at Springfield, Mass., a mortgage for $5,000,000 in favor of the Old Colony Trust Company, Boston, Mass., for refunding purposes. In November, 1917, the company was authorized to issue at this time not to exceed $3,275,000 of mortgage bonds, payable twenty years from date and bearing interest at 6 per cent. The proceeds of bonds amounting to $2,305,000 will be applied exclusively to the payment, refunding or retiring of bonds issued by that company by reason of its purchase of other railway properties.

Abandonment of the Cincinnati-Bethel Line Proposed.—C. M. Leslie and Charles Thrasher, receivers of the Interurban Railway & Terminal Company, Cincinnati, Ohio, plan to apply to the Ohio Public Utilities Commission for authority to abandon the branch between Cincinnati and Bethel. At the same time application for permission to increase the rates of fare on the Rapid and Eastern divisions will be made. Some time ago Judge Cushing of the Common Pleas Court authorized the receivers to abandon the Bethel branch, but the Appellate Court decided that they had no authority to take this step. Since that time a new law has gone into effect on this point, and, with the authority of Judge Cushing, they will take the matter to the Public Utilities Commission.

Electric Railway Monthly Earnings

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Oct.,	'17	$43,397	*$28,169	$15,228	$6,551	$8,677
1 "	"	'16	36,466	*18,205	18,261	6,568	11,693
12 "	"	'17	450,537	*284,065	166,472	78,684	87,788
12 "	"	'16	387,757	*227,251	160,506	78,470	82,036

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m.,	Nov.,	'17	$1,732,412	$30,050	$1,702,362	$209	$1,702,153
1 "	"	'16	1,328,388	20,021	1,308,367	244	1,308,123
12 "	"	'17	19,110,628	347,281	18,763,347	2,948	18,760,399
12 "	"	'16	9,071,718	236,868	8,834,850	299,480	8,535,370

COLUMBUS (GA.) ELECTRIC COMPANY

1m.,	Oct.,	'17	$104,130	*$36,447	$67,683	$31,593	$36,090
1 "	"	'16	84,786	*30,405	54,381	28,572	25,809
12 "	"	'17	1,057,281	*402,868	654,413	352,640	301,773
12 "	"	'16	847,466	*343,413	504,054	343,884	160,170

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

1m.,	Nov.,	'17	$538,572	*$270,131	$268,441	$217,983	$50,458
1 "	"	'16	512,904	*224,107	288,797	215,702	73,095
5 "	"	'17	2,572,504	*1,260,851	1,311,653	1,088,924	222,729
5 "	"	'16	2,397,008	*1,084,185	1,312,823	1,075,132	237,691

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1m.,	Nov.,	'17	$3,454,687	*$1,900,069	$1,554,618	$1,097,265	‡§$685,035
1 "	"	'16	3,451,756	*1,575,179	1,876,577	1,005,553	‡§934,262
5 "	"	'17	15,928,087	*9,018,680	6,909,407	5,380,053	‡§2,765,798
5 "	"	'16	15,388,778	*7,437,878	7,950,900	4,974,641	‡§3,261,804

JACKSONVILLE (FLA.) TRACTION COMPANY

1m.,	Oct.,	'17	$59,743	*$42,606	$17,137	$15,819	$1,318
1 "	"	'16	49,646	*34,930	14,716	15,437	†721
12 "	"	'17	678,268	*455,967	222,301	188,242	34,059
12 "	"	'16	619,387	*422,793	196,594	182,308	14,286

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m.,	Nov.,	'17	$533,250	$375,467	$157,783	$80,318	$77,464
1 "	"	'16	458,668	238,697	219,971	106,149	113,822
11 "	"	'17	5,814,817	3,648,752	2,166,065	859,140	1,306,925
11 "	"	'16	4,689,676	2,389,776	2,299,900	1,038,490	1,261,410

PENSACOLA (FLA.) ELECTRIC COMPANY

1m.,	Oct.,	'17	$25,807	*$15,592	$10,215	$7,808	$2,407
1 "	"	'16	21,439	*12,319	9,120	7,714	1,406
12 "	"	'17	331,242	*193,106	138,136	93,405	44,731
12 "	"	'16	279,557	*154,398	125,159	91,217	33,942

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m.,	Nov.,	'17	$464,296	*$327,584	$136,712	$90,184	‡$54,033
1 "	"	'16	344,942	*196,083	148,859	70,848	‡78,260
12 "	"	'17	4,770,074	*3,203,779	1,566,295	995,388	‡632,980
12 "	"	'16	3,935,073	*2,271,569	1,663,504	816,605	‡862,798

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m.,	Nov.,	'17	$807,839	$553,543	$254,296	$164,511	$89,785
1 "	"	'16	848,497	521,767	326,730	137,676	189,054
11 "	"	'17	9,345,633	6,250,474	3,095,159	1,691,344	1,403,815
11 "	"	'16	9,290,401	5,727,440	3,562,961	1,572,554	1,990,407

*Includes taxes. ‡Includes non-operating income.

§Includes accruals, under rapid transit contracts with city, payable from future earnings.

Traffic and Transportation

Commission Upheld in Indianapolis Fare Case

Circuit Court Decides Against Indianapolis Traction & Terminal Company in Its Effort to Compel Public Service Commission to Assume Jurisdiction in Rate Case

Judge Lewis B. Ewbank in the Circuit Court, Marion County, on Jan. 2 handed down a decision finding that the Public Service Commission ruled correctly in declining to accept jurisdiction in the case of the petition of Indianapolis Traction & Terminal Company for a 5-cent fare. The decision of court is summed up as follows:

DECISION SUMMED UP

The city franchise of the Indianapolis Traction & Terminal Company—"relator"—fixing the rates of fares on street cars in the city of Indianapolis is a binding contract which excludes all jurisdiction of the Public Service Commission to increase or otherwise modify or change such rates while that contract remains in force. The only consent which the state has given or undertaken to give for any release or modification of any of the terms of that franchise contract was by the voluntary surrender of the franchise "prior to July 1, 1917." It was not so surrendered. Whether its surrender would have released the relator from its obligation to the city and its inhabitants to maintain the franchise rates of fares is not before the court and is not decided. The state legislature has no constitutional power to authorize the Public Service Commission to relieve the traction company "relator" of any part of the obligations of the franchise contract or otherwise to modify that contract so long as the contract has not been surrendered, forfeited, or otherwise terminated. A mandamus will not issue to require the Public Service Commission to entertain in a petition for an increase of passenger fares on an electric railway where it affirmatively appears that, because of a binding franchise contract fixing the rates of fares for the remaining fifteen years of a term for which the contract was entered into by express legislative authority, the commission has not power to grant any relief.

TRIAL OF THE CASE

Arguments were heard before Judge Lewis B. Ewbank on Dec. 26, 27 and 28 in behalf of the petition of the company, to compel the commission to take jurisdiction and investigate the company's request for an increase in rates of fare to straight 5 cents. The commission had ruled several days previously that it was without jurisdiction because the Indianapolis franchise was granted under specific delegated authority by the Legislative act of 1899 and because the company did not surrender its franchise before July 1 of this year and accept an indeterminate permit.

The company was represented by Ferdinand Winter and W. H. Latta. The attorneys who appeared against the petition were W. Masson, M. H. Miller and Assistant Attorney-General Lesh.

THE COMPANY PRESENTS ITS SIDE

Mr. Winter's theory of the case was that the State had full power over franchises, that a city was merely the agent of the State, and that whenever the State, the principal, decided to modify a contract it could do so provided the other party, the public utility corporation, consented. He submitted that there were only two parties to a utility franchise contract, the utility corporation and the State, so that if the two parties to the contract agreed there was no objection in law and there was no impairment of the obligations of a contract, which the attorneys for the Public Service Commission had emphasized in their arguments. Mr. Winter further submitted that the Legislature had conferred full rate-making power on the Public Service Commission, and that if the commission chose to do so it could change any utility franchise rate, with the consent of the public utility corporation, because the commission would be exercising the State power over franchises, which Mr. Winter repeatedly asserted was complete.

In referring to arguments of attorneys for the other side and commenting on the court decisions, they had cited in support of the proposition that a State might delegate express authority under which a contract could be made, which the State itself could not modify, Mr. Winter submitted that all such decisions arose out of a state of facts in which the public utility corporation itself was contending that subsequent action by the Legislature would impair the obligations of its contracts. He said: "Every case on which they rely for authority is where the controversy arose between the State or city on the one side, and the public utility corporation on the other."

Will H. Latta, for the company, said the intention of the State in the act of 1913, creating the Public Service Commission, was to exert all the power it has. He said he went a little beyond Mr. Winter in the belief that in the 1913 law the Legislature gave to every public service corporation just, reasonable and sufficient rates. The law added burdens to such corporations, and at the same time it provided that compensation should be adequate for the increased burdens. He believed that the commission could put any burdens on a public utility corporation it saw fit, but the rates had to be sufficient to carry those burdens. The law of 1913, he argued, was a guarantee of adequate rates.

Mark Miller made the first of the closing arguments. He thought it was not reasonable to assume that the Legislature had created a commission with power to change a contract only adversely to the city.

Chicago Elevated Fare Announcement

President Budd Intimates Chicago Elevated Railroads Favor Zone System for Future Use

Britton I. Budd, president of the Chicago (Ill.) Elevated Railroads, announced on Dec. 30 that the application of the company to the Public Utilities Commission of Illinois for permission to charge a higher rate of fare and probably the right to carry package freight would be filed early in January. Higher operating costs is the reason given. It is likely that the zone district will be the basis for the proposed increased rate.

EXPENSES UP

The *Elevated News*, issued monthly by the railway, outlines the roads' position in the December issue as follows:

"The roads want their patrons to know the facts. Every economy possible is being practised, but the revenue is insufficient. Everything which the road has to buy has gone up in price. The increase in wages alone in the last three years amounts to more than $1,000,000 a year. The pay roll for October last shows an increase of $87,101 over the pay roll for October, 1914. That is at the rate of $1,045,220 a year.

"Through routing and free transfer privileges have increased the length of the haul on the elevated roads until it is now 6½ miles, twice what it was five years ago. The people want to get out of the congested districts. Each year they move farther out, but they still continue to pay the same little old nickel which did service in the horse-car days.

NICKEL HAS SHRUNK

"That nickel isn't nearly as big in purchasing power as it was in the horse-car days, either. If you think it is, try it on the baker for a loaf of bread, or on the milk man for a quart of milk, or on the grocer for a pound of sugar. They won't take it. But the elevated roads have to take it. Don't you think that is just a little unreasonable?"

On the proposed freight privilege is this sentence:

"Hundreds of commodities now shipped as package freight over the steam roads, congesting terminals and utilizing equipment, can be handled by electric lines, can be handled at hours when their equipment is otherwise idle."

Wages Dependent on Fares

Pittsburgh Railways Announces That Increase is Dependent on the Company Securing Six-Cent Fare

The Pittsburgh (Pa.) Railways, as noted briefly in the ELECTRIC RAILWAY JOURNAL of Dec. 29, page 1175, announced on Dec. 21 an immediate increase of 2½ cents an hour in the wages of its trainmen. At the same time the company said that a further advance of 2½ cents an hour would be made if the request of the company to the Public Service Commission for an advance in fares was allowed. A statement which was issued by the company follows:

COMPANY STATEMENT

"As a result of numerous conferences between representatives of the city of Pittsburgh and representatives of motormen and conductors and officials of the Pittsburgh Railways, a tentative arrangement for the temporary restoration of rush-hour tripper and trailer service has been made, effective tomorrow morning.

"In order to accomplish this without further delay, the Pittsburgh Railways agreed temporarily to advance the wages of the motormen and conductors 2½ cents an hour to facilitate the improvement of the rush-hour service pending the filing with the Public Service Commission of a new schedule advancing the present rate of fare to 5½ cents when tickets are used, and to 6 cents when cash fare is paid. As soon as this increased fare goes into effect the advance in wages of the motormen and conductors will be made 5 cents an hour. This will amount to several hundred thousand dollars a year. As a result of this increase the motormen and conductors agreed to operate the rush-hour trippers and trailers, which they have refused to operate for the past nine weeks.

"The advance in wages is given despite the fact that the wage agreement with the motormen and conductors, made in May, 1916, for the existing wages, does not expire until April 30, 1918."

THE NEW WAGE SCALE

The 2½-cent increase is operative until Feb. 1, when, if the increased fare the company asks is allowed by the Public Service Commission, the increase in wages will become 5 cents an hour for every man, or a minimum of 32 and a maximum of 40 cents an hour. On a nine-hour day, which is the average day, the motormen and conductors would, after Feb. 1, receive from a minimum of $2.86 to $3.60 a day. With the increase which has just been granted in effect the wage scale is as follows: First six months' service, 29½ cents an hour, instead of 27 cents, the present minimum; second six months, 31½ instead of 29 cents; second year, 33½ instead of 31 cents; third year, 35½ instead of 33 cents; fourth year, 36½ instead of 34 cents; fifth year of service and thereafter, 37½ instead of 35 cents.

The City Council by unanimous vote has directed C. K. Robinson, assistant city solicitor, to oppose the proposed new tariff before the Public Service Commission. Under the Pennsylvania public service corporations law public notice of a change in tariffs by a public utility corporation must be made thirty days in advance of the new tariff taking effect.

Asked for Bread and Got a Stone

The railway manager who asks his patrons for advice is indeed a brave man. But temerity among managers is not dead, although there has been more than enough in recent years to kill it. One brave manager who recently threw discretion to the winds and asked for advice received this caustic reply:

"The notices you have pasted in the cars asking the help and criticism of the public might be passed as a joke or 'bull' if they were not in fact an insult on injury.

"When you have done 50 per cent of what you or your office boy knows should be done, the efficiency of the service will be materially increased and suggestions from patrons might then be appropriate.

"Possibly you want the patrons to run the business while you devote your time to increasing fares and reducing taxes.

"It is difficult to imagine what more the patrons can do, unless we ride the roof or brake beams and send our money by mail. We wait and wait for cars (?).

"Sometimes one comes along and we crowd in till it is difficult to breathe. As a rule there would not be half straps enough to hang on if all straps were there, but many are absent and others broken."

I. U. T. Fare Increase Allowed

Indiana Commission Grants Main Requests of Indiana Union Traction Company for Fare Increases

The Public Service Commission of Indiana on Dec. 28 handed down its decision on the petition of the Union Traction Company for increased rates of fare.

THE NEW RATES

The commission permitted the company to increase its rate for mileage books on its lines to 2 cents a mile; to increase its rates for commutation tickets to 1½ cents a mile from 1¼ cents, the former mark, and to increase the rate for school passengers on its lines to 1 1/5 cents a mile.

The round-trip fare between Indianapolis and Fort Benjamin Harrison will be increased to 35 cents, and the single fare between the military reservation and the city will be 25 cents. The fare between Indianapolis and Lawrence, under the new order, will be 35 cents for the round trip daily and 25 cents for the single fare between those points.

NEW RATES FROM JAN. 1

Abolishment of the sale of six tickets for a quarter was authorized on the urban lines of the company in Anderson, Marion, Muncie and Elwood, where hereafter a straight 5-cent fare will be in effect. The new rates were to become effective Jan. 1, 1918, provided the company filed new tariffs, covering such advances, by that date.

PART OF DECISION HELD UP

The commission held up its decision in the part of the petition that asked authority to increase the minimum interurban fare of the company from 5 cents to 10 cents, after the members tentatively had agreed that the body would deny the right to increase the minimum under existing statute prohibitions, although at least some members believed that the minimum should be increased. This matter, the underlying legal theory of which will figure also in rate increase petitions from other interurban systems, to be heard by the commission early in January, probably will be decided later.

OPINION BY COMMISSIONER CORR

After a legal discussion regarding the commission's powers in the deciding of the part of the petition referring to the Broad Ripple increase, the opinion, which was written by Edwin Corr, of the commission, says:

"Applying to this statute the well-established rule of interpretation, that the mention of one thing is the exclusion of the others, this commission is forced to the conclusion that the provisions of this franchise contract are void which undertake to fix rates for service outside the town of Broad Ripple. The town of Broad Ripple had authority to regulate and fix rates within said town, but it had not power to fix rates between Broad Ripple and Indianapolis."

The commission further stated that a 5-cent fare between Broad Ripple and Indianapolis was a very low one and that the commission had been disposed to increase this fare were it not convinced from evidence introduced that the company at this time was not providing adequate service between Indianapolis and Broad Ripple. The commission intimated, however, that if the company will improve its service it will entertain an application for an increase of the fare on the Broad Ripple line.

In discussing the increased revenue to the company from the fare increases granted the commission's order said:

"The increase in fares and charges which this commission will allow, as indicated above, based upon receipts for the first ten months of 1917, and an estimate for the last two months of that year, it is estimated, will produce an increased revenue of approximately $101,833."

The hearings before the commission in this case were reviewed in the ELECTRIC RAILWAY JOURNAL of Dec. 22 and 29.

Inquiry into Kansas City Service

The Public Service Commission of Missouri has announced that it will conduct an investigation into the service of the Kansas City Railways. The hearings are to begin on Jan. 9. The service engineers of the commission are in Kansas City conducting preliminary investigations before the hearings proper are begun. In making this announcement the commission said:

"The commission will proceed on its own motion to investigate fully the service rendered. Notice is hereby given that a proceeding of inquiry and investigation be and is hereby instituted by the commission on its own motion to determine the character of the service rendered by the Kansas City Railways."

ACTING PRESIDENT READY AND WILLING

Clyde Taylor, acting president of the company, says:

"The Kansas City Railways will welcome an investigation by the commission and will co-operate with that body and furnish it the fullest information upon any subject. Coal, labor shortage, limitation of power due to long delays in deliveries of electrical machinery, tremendous increased cost of operation, and other factors, and the relation of these to service can be investigated by the commission which is fully equipped for such work. It is the desire of the officials of the company to render the best possible service in these abnormal times and if the commission can find ways in which that can be done it will be rendering a necessary service."

Curtailed Service Protested

Representative of City of Seattle Suggests Use of Women on Cars as One Way Out

In registering a complaint against curtailed service on the railway lines of the Puget Sound Traction, Light & Power Company in Seattle, Wash., A. L. Valentine, Superintendent of Public Utilities, recommended to that company that women be used as conductors. Mr. Valentine said:

"While I appreciate the fact that you are having trouble in obtaining operators for your cars, the transportation situation is so acute that I am going to suggest that you endeavor to obtain women conductors in an effort to relieve conditions which are rapidly growing worse."

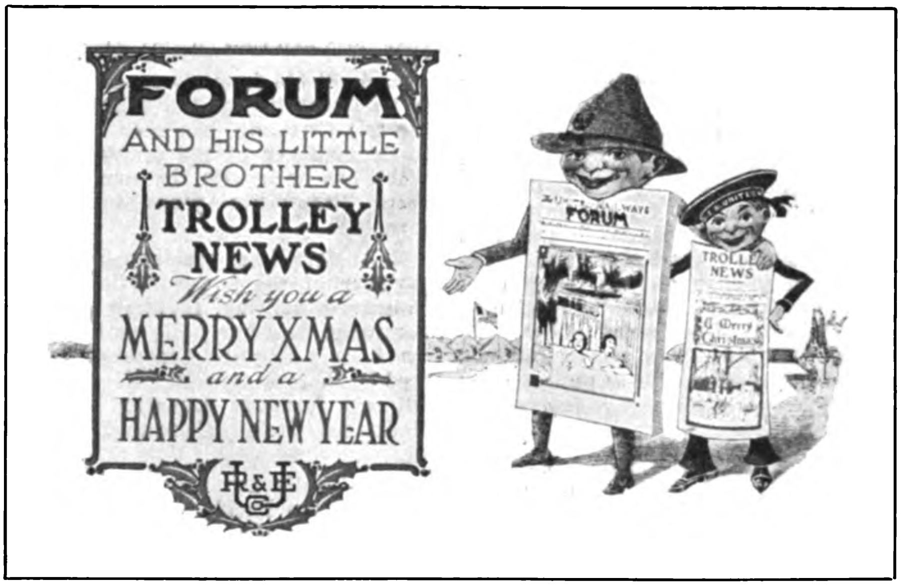
According to Mr. Valentine, the company is called upon to transport more passengers each day than ever before, and to aggravate this condition there is a shortage of from one to eight crews on every line almost every day. In registering his complaint Mr. Valentine accompanied his letter with records of car checks made by inspectors of his department on Dec. 19.

A. W. Leonard, president of the company, said:

"We are making every effort to obtain sufficient men to maintain adequate service on all our lines, and while we are adding men daily, many of the lines are being operated frequently on curtailed schedules, because of a lack of operators. It may be necessary as a war measure to employ women as conductors, in order to release men for other work. No steps to that end have yet been taken."

Forum and His Little Brother

The United Railways & Electric Company, Baltimore, Md., through *Forum* and his little brother, *Trolley News*, the first published by the company in the interest of the employees and the second in the interest of the public, is extending holiday greetings to patrons and friends in the form of a card 6 in. wide by 3½ in. high done in colors. The card, about two-thirds the original size, is shown in the accompanying engraving.



HOLIDAY GREETING OF THE COMPANY AT BALTIMORE

Transit Facilities Poor

Admiral Bowles Complains About Lack of Accommodation for Shipyard Employees

Admiral Bowles, head of the construction department of the Emergency Fleet Corporation, before the Senate committee conducting the shipping inquiry, asked on Dec. 28 for authority to commandeer houses, street cars and ferry boats, and to declare war zones about certain shipyards in order to clean them up and make them habitable for shipyard employees. He explained that his program contemplated requiring electric railways to operate special cars to carry the workmen to and from work. He said:

"It is almost impossible to keep men when they have to hang on a street car for an hour or two in order to get to work and then to get home in the evening."

He said that by commandeering transportation facilities of this kind the force of workmen could be increased by providing a greater living area. Two cases, which Admiral Bowles said were typical, were cited by him.

Appeal to Shop Early

By Josh Wink in "The American"

Shop early and often,
  If so you incline,
O pitying women,
  But please draw the line
At riding in hours
  When workers must rush,
And so keep the traffic
  From being a crush.

So you'll conserve fuel,
  And you'll conserve space,
You'll, too, conserve labor,
  And if by your grace
These do double duty
  Thus economized,
You're doing a service
  To be highly prized.

So, ladies, shop early,
  For leisure is yours,
The hours restricted
  To others restores
Your consideration;
  Then go home and knit
Content with your conscience
  For doing your bit.

According to J. F. Strickland, president of the Texas Electric Railway, Dallas, Tex., it appears most likely in the present government emergency that the transportation of freight will be centered in the steam lines and that the interurban electric lines will be designed as passenger carriers where steam and electrics serve the same territory.

Another Pennsylvania Fare Increase.—The Shamokin & Mount Carmel Transit Company, Mount Carmel, Pa., operating between Shamokin and Ashland, will increase its rates from 5 to 6 cents per zone on Jan. 15, and will withdraw from sale the three-for-a-quarter tickets which have been in use between Ashland and Centralia.

No Expert for St. Louis.—The ordinance providing for an appropriation of $5,000 for hiring an expert to advise the public utilities committee of the Board of Aldermen of St. Louis, Mo., in connection with the preparation of a new franchise ordinance for the United Railways Company was killed in the Board of Estimate and Apportionment.

Legislators Will Not Be Favored.—The Kentucky Traction & Terminal Company, Lexington, Ky., has declined to quote reduced rates between Frankfort and Lexington to persons who, during the session of the coming Legislature at Frankfort, wish to make their headquarters at Lexington. The Louisville & Nashville Railroad and Chesapeake & Ohio Railroad will issue commutation tickets.

Paper for San Diego Railway Patrons.—The San Diego (Cal.) Electric Railway, beginning Jan. 1, 1918, will issue a monthly pamphlet for the purpose of acquainting the public with the aims of the company regarding service, improvements, changes and happenings affecting electric railway operation in San Diego. The pamphlet will be placed in boxes in the cars and will be mailed to persons desiring it. Ernest L. Phillips is advertising manager of the company.

I. T. S. Christmas Greeting.—What should serve as a worth-while reminder of the satisfactory service and amiable relations which have existed during the year is contained in the Christmas greeting sent out by the Illinois Traction System, which was engraved on an attractive card and read as follows: "We feel that the year 1917 should not pass without some expression of gratification over the cordial relations existing between us, and we desire to convey the season's best wishes for a Merry Christmas and a Prosperous New Year. *Signed*, ILLINOIS TRACTION SYSTEM (MCKINLEY LINES)."

Jitney Bonding Company Quits.—The Golden State Indemnity Company of California is retiring from the field. The company was headed by Andrew J. Gallagher, one of the supervisors of San Francisco and enjoyed virtually a monopoly of the jitney bus insurance business. The reason announced for the retirement is the inability to raise $75,000 additional capital by Jan. 10 which the company would require if it were to continue in business under recently enacted laws. It is announced that the Western Indemnity Company will take over the unexpired policies of the retiring company, but that hereafter the insurance rate will be $12.50 per month instead of the $8 previously in effect.

Personal Mention

C. G. Ballentyne has resigned as general manager, purchasing agent and claim agent of the Honolulu Rapid Transit & Land Company, Honolulu, Hawaii.

Howard E. Jaeger has recently been advanced to the position of purchasing agent for the Oakland, Antioch & Eastern Railway at Oakland, Cal., succeeding Ernest E. Haquette, resigned.

W. M. Bird, formerly assistant superintendent of transportation of the Tampa (Fla.) Electric Company, has been appointed superintendent of transportation to succeed G. A. Webb.

B. H. Meyer, appointed to the Interstate Commerce Commission from Wisconsin, has been nominated by President Wilson for reappointment for the seven-year term expiring on Dec. 31, 1924.

G. A. Webb, formerly superintendent of transportation of the Tampa (Fla.) Electric Company, has been appointed traffic manager of the company. Mr. Webb has been with the company for about twenty-five years in various capacities.

E. A. Merrill has been appointed chief engineer of the power station of the Galesburg Railway, Lighting & Power Company, Galesburg, Ill., controlled by the Illinois Traction Company, to succeed L. N. Jenkins, resigned. Mr. Merrill was formerly connected with the Underfeed Stoker Company, Chicago, Ill.

R. E. Kelly has been made general agent of the Pacific Electric Railway, Los Angeles, Cal. Mr. Kelly began service with the Pacific Electric Railway in 1901 as a conductor. At the time of his appointment as general agent he was general agent of the eastern division with headquarters at San Bernardino.

Foster Hannaford, for two years superintendent of the St. Paul lines of the Twin City Rapid Transit Company, has been appointed general manager of the company, the duties of which office have been carried on for six years by President Horace Lowry. Mr. Hannaford was born in St. Paul. He is a son of J. M. Hannaford, president of the Northern Pacific Railway.

William Siebert, superintendent of surface railroad transportation of the Brooklyn (N. Y.) Rapid Transit Company, has been elected a director of the Nassau Electric Railroad; Brooklyn, Queens County & Suburban Railway, and the DeKalb Avenue & North Beach Railroad Company, all subsidiaries of the Brooklyn Rapid Transit Company, to succeed Slaughter W. Huff, now president of the Third Avenue Railroad, New York.

Van Dusen Rickert severed his connection on Dec. 31 with the Eastern Pennsylvania Railways, Pottsville, Pa. Early in October Mr. Rickert resigned as assistant general manager and assistant secretary and treasurer of the Eastern Pennsylvania Railways and assistant general manager and secretary and treasurer of the Eastern Pennsylvania Light, Heat & Power Company. At that time Mr. Rickert agreed to remain at Pottsville until a new general manager was appointed.

Charles Remelius has resigned from the Peter Smith Heater Company, Detroit, Mich., to become assistant master mechanic of the New York State Railways at Rochester. Mr. Remelius has had a long experience with electric railways in mechanical work, having been connected with the Cleveland (Ohio) Railway, Detroit (Mich.) United Railway; Indianapolis Traction & Terminal Company, Indianapolis, Ind.; St. Louis (Mo.) Transit Company; Brooklyn (N. Y.) Rapid Transit Company, and the Public Service Railway, Newark, N. J.

F. J. H. Kracke has been appointed by Governor Whitman of New York to the Public Service Commission of the First District to succeed Col. William Hayward. He is to serve until the return of Col. Hayward from military duty. Mr. Kracke is one of the principal Republican leaders of Brooklyn. He has held the post of Commissioner of Plant and Structures, formerly Bridge Commissioner, in the Mitchel administration, and before that was Naval Officer of the Port of New York from 1906 to 1913. Mr. Kracke managed Governor Whitman's campaign in 1916.

W. T. Waters, former advertising manager of the Georgia Railway & Power Company, Atlanta, Ga., and editor of *Here We Are*, published by that company, is a first lieutenant in the Field Artillery and is stationed at Fort Logan, Houston, Tex. Mr. Waters entered the officers' training camp at Fort Oglethorpe three months ago, after many weeks of hard work on the draft exemption board. He was graduated far up in the A list of first lieutenants. Mrs. Waters, who held her husband's place as advertising manager during his absence in camp, will continue in that capacity.

Charles Bulkley Hubbell has been appointed by Governor Whitman of New York to the Public Service Commission of the First District to succeed H. W. Hodge. He is to serve until the return of Mr. Hodge from military duty. Mr. Hubbell was chairman of three subway commissions by appointment of the Appellate Division. He was the last president of the board of education before consolidation and the first president of the new board of the greater city, and is still chairman of the board of trustees of Hunter College and the College of the City of New York. He has been active in the alumni affairs of Williams College.

W. O. Minard has been appointed electrical engineer of the Rutland Railway, Light & Power Company and the Western Vermont Power & Light Company, Rutland, Vt. Mr. Minard entered the employ of the companies in Rutland about eight years ago as a lineman, in which capacity he worked for three years. He then resigned to become chief electrician of the Consolidated Light & Power Company, Whitehall, N. Y. After a year with this company, he returned to Rutland as electrician and substation repair man for the Western Vermont Power & Light Company and the Rutland Railway, Light & Power Company.

Stuart H. Patterson, who has been appointed comptroller of the Guaranty Trust Company, New York, a newly created office, has been connected with the American Water Works & Electric Company, as vice-president and treasurer, since its organization, in April, 1914. Mr. Patterson was born in New York City on Feb. 12, 1871, and on Jan. 1, 1887, he began his business career as an office boy in a wholesale dry goods house. In 1891 he went to Seattle, Wash., and learned some of the practical side of the electrical business. Mr. Patterson returned to New York in January, 1894, to join his father in the accounting business. He became a certified public accountant in 1896. Nine years later Mr. Patterson withdrew from the accounting firm of Patterson, Teele & Dennis to become associated with a bond house. In January, 1912, he became associated with the Guaranty Trust Company in an advisory capacity.

Fred Boeken has been appointed superintendent of the Municipal Railway, San Francisco, Cal., to succeed the late Thomas A. Cashin. Mr. Boeken has been assistant superintendent of the Municipal Railway since 1912. His first railway experience began in San Francisco as a gripman on the old Market Street Cable Railway. Later he became inspector with the Geary Street, Park & Ocean Railroad, and in 1906 was made assistant superintendent of that company. This position he held until the line was taken over as part of the municipal system of San Francisco in 1912. He was then appointed assistant to Mr. Cashin. Included in the Municipal Railway are 45 miles of line over which more than 190 cars are operated.

FRED BOEKEN

J. B. Stewart, Jr., whose promotion from the position of assistant to the general manager to assistant general manager of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 22, has been with the company since 1913, when he became safety and efficiency engineer and superintendent of freight. Subsequently he was appointed superintendent of equipment and traffic and then was made assistant to Richard T. Sullivan, general manager. Mr. Stewart was graduated from the high school at Newton, Mass., and the Massachusetts Institute of Technology. His first employment in the electric railway field was with the Middlesex & Boston Street Railway, Newtonville, Mass., as an engineer, whence he went to Erie, Pa., as assistant to the general manager of the Buffalo & Lake Erie Traction Company. In 1910 he was engaged in the construction of the Corning division of the Elmira, Corning & Waverly Railroad, Waverly, N. Y., and two years later became park manager and acted as assistant to the traffic manager of the Lehigh Valley Transit Company, Allentown, Pa.

J. B. STEWART, JR.

George A. Mills has been appointed electrical engineer of the Winnipeg (Man.) Electric Railway and subsidiary companies. Mr. Mills entered the engineering field after graduation from Iowa State College in 1909. The next fourteen months he spent with the Allis-Chalmers Manufacturing Company at its Bullock works, as an electrical apprentice. In 1910 Mr. Mills became a member of the instructing staff of the University of Pennsylvania, where he remained one year. In June, 1911, he became connected with the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, as electrical engineer, for which he had charge of the electric design and construction of the Cedar Rapids extension. He also was active in rebuilding the power station and other lines of this company.

Obituary

George E. Baker, chief mechanical expert of the Eastern district of the Westinghouse Traction Brake Company, died on Dec. 26 after an operation. For a number of years he suffered very severely from rheumatism, but never lost his courage or cheerfulness. Mr. Baker was born in New Albany, Ind., in 1865, and after serving his apprenticeship became an expert machinist. Twenty-five years ago he entered the employ of the Gennett Air Brake Company, Chicago, the first to specialize in electric railway air brakes, and continued in that line, joining the Westinghouse Company in 1901. Mr. Baker was widely known as dean of traction railway brake experts and was highly esteemed by all for his comprehensive understanding of his business and his unfailing kindliness. He is survived by his widow and daughter.

Frank M. Mousseau, head bookkeeper in the auditing department of the Twin City Rapid Transit Company, Minneapolis, Minn., died suddenly on Dec. 27. Mr. Mousseau was born in 1873 and entered railway work in Minneapolis as a water boy when the first lines were being built. For several years he was a station timekeeper and for fifteen years had been in the auditing department. His father, Mitchell Mousseau, was in the employ of the company for thirty-three years. He was one of the first superintendents in Minneapolis. An uncle, Henry Mousseau, forty years with the company, was the first horse-car driver in Minneapolis. One brother has worked for the company twenty years and another five years. Horace Lowry, president of the company, said that he felt the Mousseau family were one of the rocks on which the company had been built, typifying as they did a fine loyalty and unswerving devotion to duty under all circumstances.

William H. Goble died suddenly on Dec. 25 while making a brief visit at the home of his youth in London, Ont. Mr. Goble left the farm in Canada in the earliest days of electrification of street railways and joined the car-equipping forces of the Thomson-Houston Company, working in Brooklyn and Baltimore. In 1893 he was employed in Brooklyn, serving as foreman of various surface and elevated shops until 1901, when he became a member of the Christensen Engineering Company's field force. He remained with the company and its successors, the National Brake & Electric Company, as sales engineer of its Philadelphia district until that company was taken over by the Westinghouse Traction Brake Company, and continued with them as mechanical expert and salesman in his old territory until his death. Beloved by all for his great-heartedness, he and George E. Baker, his friend of many years, will be sadly missed by all who know them. Mr. Goble is survived by his widow.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Franchises

Jacksonville, Fla.—The County Commissioners have granted the Jacksonville Traction Company permission to construct a line from Ortega to Camp Joseph E. Johnston.

Cedar Rapids, Iowa.—The Board of Railroad Commissioners has granted the Iowa Railway & Light Company a franchise to construct and operate an electric transmission line along certain roads in Benton County for the transmission of electricity for lamps, heaters and motors.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—This company is double-tracking its line between Baldwin Park and Hayes Station.

Municipal Railways, San Francisco, Cal.—M. M. O'Shaughnessy, city engineer, has awarded contracts for the ties, steel rails and other material required for the construction of the Parkside extension of the Twin Peaks tunnel system. Delivery will be made about Jan. 31 and it is expected that actual construction will be begun early in February. The line will be about 1 mile long and will extend from the west portal of the tunnel to Twentieth and Taraval Streets.

Southern Pacific Railway, San Francisco, Cal.—Plans have been prepared by Alameda County and the Southern Pacific Railway for the erection of a bascule bridge over the inner harbor of Oakland.

Colorado Springs & Interurban Railway, Colorado Springs, Col.—This company reports that during 1918 it will build 1 mile of new track and will reconstruct 4 miles of track.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—Application has been filed by the Murphysboro & Southern Illinois Railway with the Public Utilities Commission of Illinois for permission to issue $63,000 capital stock and $250,000 in bonds. The company is building a line between Murphysboro and Carbondale and the new capital is desired to extend the line from Carbondale to Carterville or to Herrin. A. B. Minton, Murphysboro, president. [June 23, '17.]

Sioux City (Iowa) Service Company.—This company reports that it will reconstruct 2½ miles of track in 1918.

Wichita-Walnut Valley Interurban Railway, Wichita, Kan.—A contract has been awarded by the Wichita-Walnut Valley Interurban Railway to the Scott Construction Company, St. Louis, for the construction of its proposed line from Wichita to El Dorado and Augusta. It is probable that the line will leave the city east on Twenty-first Street to Andover, where a terminal will be built; thence one branch will lead to El Dorado and the other to Augusta. The El Dorado line will be built via Andover, Benton and Towanda. This part of the line will then be built to Augusta, connecting the two large oil fields. As soon as the road from Wichita to El Dorado and Augusta is completed work on the construction of a line from Augusta to Douglass and Winfield will be begun. Charles Payne, secretary. [Dec. 8, '17.]

South Covington & Cincinnati Street Railway, Covington, Ky.—During 1918 this company will rebuild 2.4 miles of track.

***New Orleans, La.**—An interurban railway from New Orleans, La., to Mobile, Ala., is in prospect if the Mississippi Legislature sanctions a bill that has been drafted and is ready for submission at the approaching session. The bill as it will be introduced proposes the authorization and empowerment of municipalities in Mississippi to own, construct and operate electric railways. The measure would authorize cities and towns to take over the Gulfport & Mississippi Coast Traction Company operating between Biloxi and Pass Christian at a fair valuation and extend it from New Orleans to the Gulf city. The bill is now in the hands of Mayor George M. Foot of Gulfport and will be presented early in the approaching session and rushed for passage. The purpose of the bill is to enable cities and towns in the State to combine and co-operate with each other in the ownership, construction and operation of the electric interurban railways. Supporters of the bill believe that, if passed, it will result in the construction of several interurban railway systems in Mississippi, especially in the sections where cities and towns are situated close to others, thus making interurban lines profitable.

Southern Traction & Utilities Company, Thibodaux, La.—It is reported that the Southern Traction & Utilities Company will construct the proposed line from Donaldsonville to Lockport, along the Bayou Lafourche, 56 miles. C. C. Barton, Albemarle, is president of the company, and others interested are Albert Boudreaux and L. C. Roger, Thibodaux; Walter Ohlmeyer, Plattenville; Dr. A. J. Price of the Lagarde Planting Company; Henry LeBlanc, Painscoutville, and Harold Raymond, New Orleans. Practically all the necessary right-of-way has been obtained. Subscriptions to $100,000 of the total capital stock of $500,000 are sought from the people along the line, subscriptions for the other $400,000 being assured as soon as the necessary indorsement of the population to be served is obtained. [Nov. 17, '17.]

Bay State Street Railway, Boston, Mass.—The new line extending on Quincy Street to the Fore River Shipbuilding Corporation has been opened for traffic. Washington Street, widened from 40 ft. to 66 ft. for a distance of 2 miles, now has double tracks, which connect with the double-tracked system in Hancock Street and run through Cleverly Court to the Fore River yard. The government will pay $300,000 of the cost of $350,000 and Quincy will pay the balance for land taking.

Boston (Mass.) Elevated Railway.—The government has nearly completed the big Victory Bridge over the Neponset River. When the work is completed the Boston Elevated Railway will operate cars direct to the Squantum works of the Fore River Shipbuilding Corporation.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—Plans for the reconstruction of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company's line from the Minneapolis terminal at Seventh Street and Third Avenue, N., to Northfield and Faribault, at a cost of approximately $750,000 have been announced by C. T. Jaffray, president of the First & Security National Bank. C. T. Bratnober, who was receiver for the line, is in charge of the new plan. Mr. Jaffray and his associates on Dec. 19 bought that part of the line extending from a point near the Minnesota River to a junction with the Luce line near Glenwood Park for $100,000. If the plan goes through it will mean that the road will be electrified for freight and heavy traffic as well as for passenger travel, and Minneapolis will then have a heavy electric line direct into the heart of southern Minnesota.

St. Cloud (Minn.) Public Service Company.—This company reports that it will build 1 mile of new track during 1918.

St. Louis, Mo.—The Municipal Bridge Commission has decided that the proposed rental of 1 cent per passenger carried by interurban cars for the use of the free bridge and municipal loop shall be eliminated and it will recommend to the Board of Aldermen that the city build a loop and maintain the bridge and loop tracks for one year without charge to street cars, to encourage interurban development.

Interborough Rapid Transit Company, New York, N. Y.—Announcement has been made by the Public Service Commission for the First District of New York that it is hoped to have the Lexington Avenue subway and the Seventh Avenue subway in full operation, in connection with the first subway, as soon after the first of

April as is possible. In the meantime, according to Frank Hedley, vice-president and general manager of the Interborough Rapid Transit Company, which will operate these lines, the earliest date at which partial operation may be expected is on or about March 1. The company plans to operate an alternate service of elevated and subway trains over both the Astoria and Corona extensions, beginning some time between Jan. 1 and Jan. 15. The date on which this service will begin depends upon the completion of work on some safety switches now being installed at the plaza in Long Island City.

Piedmont & Northern Railway, Charlotte, N. C.—An order has been placed by the Piedmont & Northern Railway with the Union Switch & Signal Company, Swissvale, Pa., for two small temporary interlockings at the entrances to the national cantonment at Camp Greene, Charlotte. Each plant includes a three-lever dwarf machine, and the signal indications will be controlled primarily by knife switches and selected over-circuit controllers on the levers of the machine.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—During 1918 this company will build 2 miles of new track between Portsmouth and Union Mills.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont.—James Anderson, manager of the Sandwich, Windsor & Amherstburg Railway, has announced that from $50,000 to $75,000 will be spent in the betterment of electric railway service in Windsor, providing the city will allow the company to construct the Ferry Avenue loop, which caused litigation extending over two years and resulted in the company being told by the courts that it could not build a loop without the consent of the ratepayers. The company's plan is to install a double curve at Sandwich Street and Ouellette Avenue, which would obviate the necessity of running belt line cars on the wrong side of Ouellette Avenue. Double tracks will also be laid on Ouellette Avenue from Park Street to Wyandotte Street. The proposal will be submitted to the Ontario Municipal & Railway Board, which will either order the work done or send recommendations to the City Council.

Montgomery Transit Company, Norristown, Pa.—A report from the Montgomery Transit Company states that during 1918 it will place in service 16.3 miles of new track, consisting of an extension from Harleysville to East Greenville, 12 miles, and from Harleysville to Souderton, 4.3 miles. The company will reconstruct 10 miles of track.

Johnstown-Somerset Traction Company, Somerset, Pa.—This company, which is constructing a line from Johnstown to Jerome, 10 miles, reports that it will probably build a 6-mile extension to Boswell.

Sioux Falls (S. D.) Traction Company.—About 1 mile of track will be rebuilt by the Sioux Falls Traction Company in 1918.

Dallas (Tex.) Railway Company.—Street car terminals will be constructed by the Dallas Railway at Fair Park to care for the heavy traffic incident to the Texas State Fair, formal approval of the plans of the company having been given by the Fair Park directors, the city park board, the supervisor of public utilities and the city commissioners. The company will construct a storage track along the Second Avenue side of Gaston Park and will also build a double-track line on Second Avenue to be a part of the Second Avenue extension. A crossover will be built through Gaston Park from Second Avenue to Exposition Avenue to take care of cars from the storage track to the loading station. The loading station will be entered through pay-as-you-enter gates, which will greatly facilitate the handling of large crowds. In return for these privileges, the Dallas Railway will deed to the City of Dallas the 30-ft. roadway extending from Gaston Park and Parry Avenue, known as Exposition Avenue, title to which is held in fee by the company.

Southwestern Traction Company, Temple, Tex.—The property of the Southwestern Traction Company, which operates a line between Belton and Temple, has been sold under order of the United States Court to F. W. Downs, Temple. It is stated that the company will be reorganized and important improvements made to the property.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company recently made application to the City Council of Seattle for a franchise for a line to extend across the new steel bridge spanning the Salmon Bay Waterway at Fifteenth Avenue, N. W., and a second application for the right to discontinue service on the streets leading to the temporary bridge at Fourteenth Avenue, N. W., reached by the company over private right-of-way. The application for the bridge franchise was referred to the utilities and franchise committees. The bill granting the company operating rights on the second temporary bridge across the west waterway at West Spokane Street was passed by the Council. This right is to be enforced until a permanent bridge across the waterway is constructed, when the company will operate under a franchise granted many years ago by King County, before the annexation of that territory to the city of Seattle.

Seattle (Wash.) Municipal Railway.—The Street Department of the city of Seattle, Charles R. Case, Superintendent, has completed the grading for the Ballard extension of Division A of the Seattle Municipal Railway to the connection with the Loyal Heights Street Railway at Twenty-third Avenue Northwest, and West Sixty-seventh Street, and has laid the track within one block of the Loyal Heights line. However, delay in getting the material for crossovers will prevent operation of the line until the middle of January. The utilities and street department recently inventoried the property of the Loyal Heights Railway, and made a report to the Board of Public Works. The purchase and transfer of the property to the city has been authorized as soon as the corporation counsel passes upon a satisfactory title. Acceptance of the Loyal Heights line by the city of Seattle will make it possible for the residents of that district lying along the Loyal Heights line from Market Street to the city limits at Thirty-second Avenue, N. W., and West Eighty-fifth Street, to reach downtown without a transfer, with but one fare.

Monongahela Valley Traction Company, Fairmont, W. Va.—This company reports that it will construct 4 miles of new track in the city of Fairmont and will rebuild 1 mile of track during 1918.

Shops and Buildings

Saginaw-Bay City Railway, Saginaw, Mich.—Fire recently destroyed a large section of the carhouse and thirty-five cars of the Saginaw-Bay City Railway.

Power Houses and Substations

Alabama Power Company, Anniston, Ala.—It is reported that the Alabama Power Company plans extensive improvements and additions to its Warrior River electric plant to provide power for the operation of the new cyanamid plant now in course of construction for the Government. The work is estimated to cost about $3,000,000.

Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.—Plans have been prepared by the Chicago, Milwaukee & St. Paul Railway for the construction of a substation at Renton, together with three bungalows.

Burlington Railway & Light Company, Burlington, Iowa.—The erection of a transmission line from Burlington to Mediapolis, Morning Sun, Wapello and Winfield is contemplated by the Burlington Railway & Light Company. The company has asked the City Council of Morning Sun for a franchise to furnish electricity to that city.

Public Service Railway, Newark, N. J.—The Board of Public Utility Commissioners of New Jersey has approved the application of the Public Service Railway for permission to issue $1,250,000 of its capital stock at par to be used for extensions to its plant.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The engineering department of the Puget Sound Traction, Light & Power Company is completing the installation of an additional penstock at the White River hydroelectric plant, which is about three-fourths completed. Foundations for the 16,000-kva. generator and water wheel have been placed. The plant when completed will cost about $750,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Market Conditions of 1917 in Review

Industry Reaches Lower Limit of Purchasing Ability, While Prices Showed a Marked Upward Tendency—Brighter Outlook for the New Year

Within the year just closed manufacturers and supply men generally experienced the least electric railway buying of any year during the past decade. Fare increases and better rates for money were held to be necessary to equipment expenditures. The former was slow and the latter did not materialize.

Less rolling stock was ordered during 1917 than in 1916 by some 38 per cent. The mileage of new electric railway trackage was less than in 1916 by a little over 40 per cent. Since so many other items depend on these two and since 1916 was also a particularly bad year, it can easily be appreciated to what extent the railway supply market has suffered. Many manufacturers in this line have been forced to take government munition contracts in order to keep their plants going.

Where the manufacturers had other than street railway business to depend on an excellent business was handled.

ELECTRICAL TRADE $750,000,000

Starting with a heritage from the previous year of a quarter of a billion of dollars of unfilled orders, the electrical manufacturing industry in 1917 far exceeded the record set in 1916 both in buildings and bookings. Although the country was engaged in war nine out of the twelve months of the year, the industry has shown on the whole no diminution of output but rather a very considerable increase. Careful and conservative estimates place the 1917 billings of electrical manufacturers in the near neighborhood of $750,000,000, while unfilled orders at the close of the year were certainly not less than $300,000,000. Thus the 1917 electrical manufacturing industry can be said to have passed the billion dollar mark.

Turbine production for 1917 was early sold out, and by the first of June, 1918 and 1919 production for large sizes had been booked, with orders running in 1920. The largest single order on record, 200,000 kw. in turbines, was placed in May.

Transformers and motors in large sizes were particularly hard to obtain after the middle of the year. Production has been booked far ahead. In the early fall it was estimated that manufacturers were 150,000 motors (of all kinds) behind orders.

The second-hand market flourished as never before during the year. High prices prevailed. Dealers found it very difficult to secure equipment. Much of this equipment was ordered only until such time as new goods could be delivered. In this way some machines were sold and resold many times in the year.

ONE-MAN CARS POPULAR

In strictly electric railway material certain products did show a stimulus of sales. One-man cars, while by no means a new idea, grew considerably in popularity. They seemed to fit in well with economy of operation plans. Besides the sale of pay-as-you-pass cars grew considerably. Other equipment designed for repair work was in greater demand than ever before. Conditions were favorable to the sale of new fare collection devices in which there was particular progress.

Prices, except for certain raw materials, had an upward tendency throughout the year, but not to such a marked degree as in 1916. Glass and porcelain products increased, as did many other staples. As the year closed announcement was made of the first increase in the price of incandescent lamps. On the other hand, certain products, including wire, were lower in price as the year came to a close. Rails advanced considerably during the year, as did practically all car, track and line hardware.

METAL PRICES LOWER

In the raw-materials market the government price-fixing program, which found expression in September in lowering the price of copper and steel products, has been the dominating factor. Metal prices, except for tin and nickel, were much lower in December than in January. Following is a comparison of metal prices in New York during the first and last weeks of the year:

Two of the greatest difficulties that the trade has had to contend with during the past year have been labor shortage and transportation congestion. Both have handicapped production and deliveries. In the manufacturing industry there were fewer strikes and less serious ones than during 1916. Labor, however, was still roving. There was a serious shortage throughout the year in mechanics and similar skilled labor and in unskilled labor. Of the other large class of labor, however, statistics show a growing percentage of unemployed. After the war broke out the labor situation became worse. First, the army and navy took a large percentage of the male labor in the manufacturing industry, and second, the government, through cantonment construction and the shipyards, put a severe strain on labor by offering an opportunity to earn the largest wages on record in the United States for that kind of labor. In addition, the female labor supply apparently became less.

A large amount of female labor is employed in electrical manufacturing, and the scarcity has hampered production considerably. Higher wages were paid during the year and high-cost-of-living bonuses were given by manufacturers rather generally.

The only ray of hope in the labor market came in the winter months early in the year, when the closing of plants that had completed war contracts for Russia and other warring nations released large numbers of skilled workmen. The entrance of the United States into the war, however, made the demand for this kind of labor more acute than ever.

On Sept. 1 the child-labor law guarantee was demanded of dealers as well as manufacturers.

TRANSPORTATION DIFFICULTIES

Transportation congestion as the year opened was very bad, growing worse until the Eastern seaboard in March was in an almost hopeless condition. This was a great handicap to

	Jan. 3, 1917	Dec. 24, 1917
Copper:	£ s d	£ s d
London, standard spot	113 10 0	110 0 0
Prime Lake	29.00 to 29.50*	Govt. price 23.50
Electrolytic	28.00 to 29.00*	Govt. price 23.50
Casting	27.00 to 28.00*	Govt. price 23.50
Wire base	36.00 to 38.00	27.00*
Lead, trust price	7.50	6.25
Nickel, ingot	50.00	50.00
Sheet zinc, f.o.b. smelter	21.00	19.00
Spelter, spot	9.67½ to 9.92½	7.67½
Tin, Straits	42.75*	85.00†
Aluminum, 98 to 99 per cent	55.00 to 58.00*	34.00 to 36.00
Heavy copper and wire	24.00 to 25.00*	22.00 to 22.50
Brass, heavy	14.50 to 15.50*	14.00 to 15.00
Brass, light	10.50 to 11.00*	9.50 to 10.50
Lead, heavy	6.50 to 6.62½*	5.75 to 5.87½
Zinc, old scrap	6.00 to 6.25*	5.00 to 5.50

*Nominal. †None offering.

both buyers and sellers in deliveries already very long. Embargoes were placed on freight for export shipment and a lot of other material eastward bound. The lack of tonnage for export caused docks and warehouses to be filled to capacity, rendering the removal of goods still more difficult. During the summer months, however, the shortage in freight cars was decreased by about a third, but by September it was worse than ever. The transportation situation became still more serious until the government, feeling that private operation could not solve the problem, even with transportation priority orders, stepped in a few days prior to the end of the year and took over the control of all roads under Secretary McAdoo.

STANDARDIZATION

Standardization was urged during the year by both purchasing agents and supply men. A large amount of thought has been given to this subject in past years, but owing to the discontinuance of convention work by the American Electric Railway Engineering Association, no actual progress during the year, so far as the formal adoption of standards is concerned, can be reported. Informally, however, perhaps more progress in car standards was made during 1917 than in any previous year, because of the general acceptance by one-man safety car users of the Birney design.

The outlook for the new year, however, is considerably brighter. Prices, generally, seem to have gone about as high as they will go. Buying is expected to increase considerably. Roads have deferred purchases to the extent where they must of necessity be made soon.

Condition of Copper Wire Supply and Demand

Anticipated That the New Government Price on Copper Will Not Affect Price of Wire

Following the conference of the Board of War Industries with the producers of copper Dec. 14, it was surmised that a change in the price established several months ago might follow. As yet no change has occurred, and there is a division of opinion among authorities on the subject whether a revision will be made Jan. 1. One of the best informed experts is of the opinion that if a new price is announced it will be a higher one. Should this be so it will not affect the market on wire. Base remains at 32 cents to 34 cents.

There is a large demand for armored cable on order of the government for the submarines, and therefore it can only be promptly and efficiently met by the manufacturers direct. Code wire used in building construction, which is almost negligible, is also selling heavily for governmental work. Hard-drawn wire for leading-in wire and copper-clad for telephone and regular signal wire are being called for. Copper-clad is being used more than hard-drawn. Underground cable, made of oiled cambric and lead-covered—power cables and feeders—is also in special demand, with heavy sales reported.

Deliveries are spoken of as fairly satisfactory, code going out of stock in large quantities. On steel-tape cable shipments can be made in from six to eight weeks, provided that the steel can be had. No positive promises can be made on these goods, delays being occasioned by the quantity and size designated. Primary hands are under the impression that not much wire is in the jobbers' stocks or with the distributing houses. It is believed that the copper situation is not so trying as it threatened to be a few weeks back. One jobber said that wire had loosened up and dropped a few points in price, and that deliveries were almost normal.

Supply Men Expect Freer Buying

Retrenchment Policy Has Been in Effect So Long That the Need for New Equipment Becomes More Urgent Daily

For a long period the accessories and supplies people have looked forward to a time when the railways would again be in the market. This state of affairs has not materialized, though there are indications of better buying than has been noted. The improvement, slight as it is, brings the thought to the front that it will be of a progressive nature, gaining momentum as it develops. That the railway companies have curtailed orders for new rolling stock, track maintenance and equipment in general to almost the vanishing point, is more than a twice-told tale. So far has this retrenching policy been carried, say the sales agents, that more than a few roads are now most inadequately supplied with equipment.

The supply branch of the trade is firmly of the opinion that purchases on a considerable scale must soon begin again. This thought has for its basis three conditions. The first is the largely increased traffic which most roads are reporting. The second is that a purchase not made is simply a purchase delayed and that in the meantime both track and cars are wearing out. In the third place, the supply men hope and believe that in general the pending applications for increased fare will be granted. This will mean that the roads will have the money, or the credit, which they have long needed to buy new equipment. Of course, prices are now high, but that is necessarily not a deterrent to purchases if there is no immediate prospect that the prices will go lower. There does not seem to be any immediate prospect of this.

Western companies are buying more freely of rolling stock than the Eastern roads. A "break" is looked for, and on this account, as much as anything else, an effort is being made to keep prices at the present level. The argument advanced is if the railways are not buying now, a further advance in price would certainly not be an inducement to bring them into the market.

Manufacturers Working Closer to Government

Possibility Exists, Should Volume of Orders Greatly Increase, of Allocating Work According to Factory Conditions

By working closer to the government through the electrical division of the War Industries Board the electrical manufacturers have been better able to know the government's needs and to take care of them. At present the manufacturers will receive lists of government requirements daily. However, should the demand become large in volume, it is contemplated that weekly allocations of orders shall be made.

Similar action was taken earlier in the year on a number of electrical supplies by manufacturers' committees. The results accomplished were much more satisfactory to the government and to the manufacturers than the previous method of awarding government contracts. Now there is a possibility of extending this plan to the entire industry. Through this procedure the government can obtain its requirements in the minimum time and at the minimum cost. Furthermore, no manufacturer is unduly loaded up with government work.

To buyers other than the government the results are desirable, for deliveries, while longer perhaps throughout the entire field, are nevertheless surer.

The demand for electrical goods for war purposes is increasing. Still, there appears to be an electrical manufacturing capacity in excess of direct government needs. Manufacturers are being asked by the War Industries Board whether the indirect demands from secondary sources will absorb the available capacity.

Freight Handling Opening Up on Pacific Coast

Smaller Roads Expected to Purchase Special Equipment Before Long

The steadily increasing possibilities in the freight business have opened up a profitable field for the electric railways of the Pacific Coast which has materially improved the outlook. It is as yet too early to expect orders for special equipment for freight purposes but at the present rate of freight business increase this can be expected from the smaller roads before long. The Pacific Electric Railway in southern California territory has developed the largest volume of freight business and the shops of this company have been busily at work on freight-handling rolling stock. Some smaller lines have practically all the freight business they can handle. This has developed still more rapidly since the gondola car embargo went into effect, particularly in agricultural districts. The heavy crops that have been gathered in most all lines this year are helping materially to swell the freight traffic.

Rolling Stock

New Jersey and Pennsylvania Traction Company, Trenton, N. J., is reported as contemplating buying some new cars. It has already inquired for part of the equipment.

Saginaw-Bay City Railway, Saginaw, Mich., by fire had destroyed thirty-five cars together with a large section of the carhouse. The loss is placed at $200,000. Street car traffic was paralyzed for several hours following the fire.

Southern Public Utilities Company, Charlotte, N. C., and the Montgomery Light & Traction Company, Montgomery, Ala., have recently changed a number of their open-end cars to the prepayment type. The work was done in the shops of Perley A. Thomas, High Point, N. C.

Tacoma Railway & Power Company, Tacoma, Wash., is reported as having purchased ten motor cars, costing $3,000 each, f.o.b. Tacoma. The cars have 57 hp. each and will seat fifty-two passengers. Additional cars of the same type will be acquired for the Tacoma Municipal Railway, known as the "Tideflats" line.

Moscow (Russia) Tramway Company, through an agent now in New York, N. Y., is negotiating for brakes with the Westinghouse Traction Brake Company, Pittsburgh, Pa., for fifty motor cars. The cars are to be built by a Japanese company at Darien, South Manchuria, China, the agent here only placing orders for trucks, motors and air-brakes.

Cleveland (Ohio) Railway is reported as having bought twenty-five new all-steel cars, costing $8,000 each. They weigh 31,900 lb. as against the 45,000 lb. of the half-steel, half-wood cars now in use. The cars of the new rolling stock are 50 ft. long, seating fifty-three persons, with front entrance and side exit. Larger and plainer signs are also fixtures. The purchase was authorized by the City Council some time ago. These are the first all-steel cars to be introduced in Cleveland.

Union Railway, New York, N. Y., which operates in the Borough of the Bronx, and is controlled by the Third Avenue Railway Company, in order to comply with the recommendation of the Public Service Commission of the First District, is reported as being obliged to build its own snowplows. The commission suggested light new efficient plows be provided by the company, to properly combat the winter storms, but as the snowplow manufacturers are in no position to make early, let alone immediate, delivery, it is obliged to construct, out of rolling stock on hand, plows that will answer the purpose temporarily.

New Advertising Literature

Poole Engineering & Machine Company, Baltimore, Md.: The company is distributing its bulletin No. 100, descriptive of its turbo gear.

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletin No. 232 lists the company's latest offerings of engines, boilers and general supplies.

De La Vergne Machine Company, New York, N. Y.: Large practical calendar for 1918, has accompanying illustrations of the company's products, arranged in striking form.

Titanium Bronze Company, Inc., Niagara Falls, N. Y.: A pamphlet, "Phosphor Bronze Castings," describing and illustrating its products in this line and its experience in the compounding of brass and bronze alloys.

Rubber Insulated Metal Corporation, Plainfield, N. J.: Illustrated four-page circular, dealing with the company's Rimco rubber insulated pliers, which it states were tested and passed for 10,000 volts by the Electrical Testing Laboratories of New York, N. Y.

Youngstown Sheet & Tube Company, Youngstown, Ohio: The company is distributing a very attractive calendar for 1918. It is featured by twelve large two-color illustrations of as many different operations in the manufacture of iron and steel. The plates were made from photographs taken in the works of the company and are both handsome and instructive. The calendar will be sent to any address on receipt of 4 cents in stamps to pay cost of mailing.

Trade Notes

Perley A. Thomas, formerly chief engineer of the Southern Car Company, has now established a business for himself in High Point, N. C. Mr. Thomas has had many years experience in car work of all kinds.

Ridgway Dynamo & Engine Company, Ridgway, Pa., announces the appointment of the Blake Electric Manufacturing Company, No. 1 Rowe's Wharf, Boston, as its sales representative for the New England states.

Blaw-Knox Company has closed its Philadelphia office for the present and Mr. Pulis, who has been in charge, is transferred to its San Francisco office, to take the place of Mr. Burrows, who is going into the service of the government.

W. C. Carter has been placed in charge of the sales office at Grand Rapids, Mich., of the Westinghouse Electric & Manufacturing Company for the handling of western Michigan business. This office is under direction of the company's Detroit office.

Brown Company, Portland, Me., formerly the Berlin Mills Company, has acquired the property and business of the Burgess Sulphite Fiber Company. The new company will be carried on under the same control and management as heretofore, dealing in, among other things, a line of fiber conduit.

Electric Storage Battery Company, Philadelphia, Pa., has recently completed an eight-story reinforced concrete building. The buildings contain more than 20 acres of floor space. The yard space covers an area of 4 acres, and tracks from two railroad lines run directly into the yards of the works.

W. G. Lawrence has opened an office in the Spitzer Building, Toledo, Ohio, to engage in electrical engineering, and will make a specialty of power plant designing, steel lighting and supervision of construction and electrical installations. One of the associates of Mr. Lawrence is H. A. Seward, who recently came to Toledo from Chicago to join this firm. Mr. Lawrence, also a Chicago engineer, established himself in Toledo several years ago.

RAILWAY MATERIAL PRICES

	Dec. 24	Jan. 3
Rubber-covered wire base, New York, cents lb.	32.34	30
Wire, weatherproof, cents per lb., New York.	34¼-38	34¼-38
Wire, weatherproof, cents per lb., Chicago...	38-38.35	38-38.35
Rails, heavy, Bessemer, Pittsburgh..........	$38.00	$38.00
Rails, heavy, O. H. Pittsburgh, per gross ton.	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb...........	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb...........	$4.50	$5.00
Sheet iron, black (24 gage), Pittsburgh, 100 lb.	$5.80	$5.80
Sheet iron, galv. (24 gage), Pittsburgh, 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents lb..	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl..	$2.22	$2.22
Cement (carload lots), Chicago, per bbl.....	$2.31	$2.31
Cement (carload lots), Seattle, per bbl......	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, gal.	$1.26	$1.26
Linseed oil (boiled, 5 bbl. lots), New York, gal.	$1.27	$1.27
White lead (700 lb. keg), New York, cents gal.	10	10
Turpentine (bbl. lots), New York, cents gal..	47½	48½

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*Nominal.

NEW YORK METAL MARKET PRICES

	Dec. 24	Jan. 3
Copper, ingot	23½	23½
Lead, cents per lb..........................	6½	6½
Nickel, cents per lb........................	50	50
Spelter, cents per lb.......................	6.35	7.82½-7.92½
Tin, Straits, cents per lb..................	*85.50	*85.50
Aluminum, 98 to 99 per cent, cents per lb....	36	36

OLD METAL PRICES—NEW YORK

	Dec. 24	Jan. 3
Heavy copper, cents per lb..................	22	22
Light copper, cents per lb..................	19½	19½
Red brass, cents per lb.....................	17½	17½
Yellow brass, cents per lb..................	14¼	14¼
Lead, heavy, cents per lb...................	5¾	6.00
Zinc, cents per lb..........................	5	5½
Steel car axles, Chicago, per net ton........	$44.00	$42.42
Old car wheels, Chicago, per gross ton.......	$34.00	$35.00
Steel rails (scrap), Chicago, per gross ton..	$34.50	$33.00
Steel rails (relaying), Chicago, per gross ton.	$55.00	$55.00
Machine shop turnings, Chicago, per net ton..	$17.25	$17.50

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, January 12, 1918 *Number* 2

The Zone System Deserves a Fair Trial

THE zone system of fares proposed by the Massachusetts Public Service Commission for the Holyoke Street Railway, although novel in a number of its features, is not a revolutionary move in urban transportation. Other urban zone systems exist in this country, and the plan is growing in popularity for suburban and interurban service, one particularly successful application being that on the Shore Line Electric Railway, as described in this issue. The authorization of such a system for Holyoke has a peculiar significance at this time, when the question of the best method of increasing fares is so acute, and the comments of the Massachusetts Public Service Commission in approving the company's preference should be carefully noted. This body does not find the results of 6-cent fares in Massachusetts especially encouraging, and it is impressed with the possible usefulness of a zone system with a central 5-cent area for some localities. Finding Holyoke a proper subject, it applies such a remedy, without binding itself to the same treatment for future patients. Its attitude is summed up in words which amount substantially to these: "This treatment should have a fair trial." With this we agree most heartily. Without casting any aspersions upon companies that are experimenting with 6-cent fares—nor do we think the commission intended so to do—we feel that it is to the interests of the industry that the zone system of charging be tried more widely, in spite of any difficult study necessary, in order to establish the conditions of successful operation. The railways have much to learn about rate-making, but a one-sided experimentation might only injure them. Perhaps all the different methods of increasing revenues will prove their usefulness under varying conditions. In any case prompt and thorough trials are needed for future guidance. The industry should take the lead in this matter, at least as far as it can, and not leave the initiative to the commissions.

The First Condition of Peace

DID you notice particularly the first item in President Wilson's most admirable summary of the Allied peace aims? "Open covenants of peace, openly arrived at" . . . "No private international understandings" . . . "Diplomacy always frank and in the public view"—why, that is simply free and frank PUBLICITY!

President Wilson knows what publicity in diplomacy will prevent, and what it will accomplish. The powers of darkness cannot avail in the full light of day. The public gives its support only to what it understands. Hence our leader places publicity as the cornerstone for the beautiful edifice of a world made safe for democracy.

This has a meaning to those in public utility service as well. The age is one of publicity. When the last stronghold of secrecy and intrigue in the Old World is falling, there is no place for it in the New.

Does it seem trite to urge publicity after so much ink has been used on this subject? Not when the following can occur:

Installation of a higher fare without a word of explanation to the public.

Adoption of a new fare-collection system, leaving the rider to guess where he gets on or off (to speak literally).

Wake up—the world has moved, and this is the day when the public must know.

Line Losses Are Not All in the Wires

IN TRANSMISSION lines operating at very high voltages, 60,000 or higher, losses over the insulators and through the atmosphere assume formidable proportions. These losses, or rather the costs of mitigating them, form a considerable factor in limiting the voltage. Anyone who has observed a high-voltage line on a dark night has noted the blue corona around the insulators and possibly on the wires also. This represents power loss, the air being heated thereby. At high altitudes the loss is very serious, due to the rarefaction of the air, which loses its insulating properties at low pressure. The so-called vacuum tube illustrates this phenomenon, for such a tube contains air or other gas at a pressure of a few millimeters of mercury, and is a fair conductor. A true vacuum is, of course, a perfect insulator. Data on the subject of line losses are fairly plentiful but accessible mainly to the specialist because embedded in technical language. In this issue is an article by Professor D. D. Ewing giving in more popular style the results of some studies conducted on an electric railway line in the Middle West. To make his article complete he has had to use some geometrical diagrams which will naturally appeal only to electrical engineers, but aside from these there is much of general value and interest in the article. With the comparatively low voltage of 33,000 used on the line tested the leakage losses are not serious, but the results clearly illustrate the principles involved. Owing to the fact that the routine of electric railway operation leaves little time for research work except that directly necessitated by the exigencies of the hour, we must depend upon outsiders to obtain data like those given in the present article. The technical departments of universities located near railway lines are well equipped to make necessary tests; all that is needed is that the railway men formulate their research problems and submit them to the college laboratories for solution.

Don't Let Them Forget About Daylight Saving

IN ALL the zeal of carrying on campaigns for higher fares and co-operating with the government in the various suggested ways for the conserving of fuel, it should not be forgotten that one desired innovation has not yet been effected—daylight saving. A bill to turn back the clock one hour during the warm months was passed by the Senate at the last session but was held up in the House. This matter should now be enacted into law. Daylight saving would be a boon to the nation's workers, and the inertia of conservatism, the only opponent, should be overcome. It may be quite proper not to be the first to cast the old aside, but it is just as fitting not to be the last by whom the new is tried. In daylight saving we have already lagged behind European nations too much. This is something the War Board would do well to keep before the authorities in Washington.

Standardization and Other Points Shown by the Car Statistics

THE table of car statistics published last week presents a number of interesting facts, besides giving a record of the total number of cars ordered or built during the year for electric railway purposes. One of these facts is very gratifying as indicating a real approach toward that standardization of car design which has been the ideal for so many years.

Last year was the first in the history of electric railroading when scores of cities bought exactly the same car, in this case the Birney safety type. This fact at least disposes of the contention that "local conditions" have a controlling influence in determining the exact length, to the fraction of an inch, of a car which can be operated on the streets of any particular city. But if railways have been able to standardize on safety cars, there does not seem to be any particular reason why they should not be able to standardize also on cars of greater length, at least to the extent of not requiring the car builder to get out an entirely new set of drawings so that a car may be a few inches longer, or shorter, than the one he has just built.

On questions of the style of car there may be greater differences of opinion, but even here local conditions, we believe, if analyzed carefully, will not infrequently be found to be "local prejudices." Incidentally, among the larger cars ordered in 1917, there was an evident tendency to use the Peter Witt pay-as-you-pass car, although we do not think that the chief benefits to be derived from car standardization necessarily require the same arrangement of interior or fare payment system on all cars affected. These are details compared with features which concern the construction of the car body.

The table of car statistics also discloses the fact that, although the car builders were far from busy during the year, an unusually large number of railways built their own cars. This condition could not have been brought about in all cases by the desire to reduce the cost of transportation from factory to railway, because in some cases the railway was located in the same town as a large car builder.

In all, five electric railway companies reported having built during the year forty or more passenger cars each. There were also twenty companies reporting as building from one to five cars, although most of these home-built cars were service or freight cars.

Where a company attempts to build anything so elaborate as a passenger car, in our opinion it is very doubtful if any money is saved thereby. Work of this kind is sometimes planned because a company hopes thereby to keep in employment some of its repair men when work of other kinds at the shops is scarce. But even under such circumstances there is a tendency to disregard the overhead costs of the car building as well as to overbuild new shops to take care of this work.

Both Discouragement and Encouragement in the Statistics of the Year

THE statistics for 1917 on track, cars built or ordered, receiverships and foreclosures, published in the last issue of this paper, certainly do not reflect a very flourishing condition of the industry. Exclusive of electrified steam railroads and the new rapid transit lines in New York, the new electric railway track of the country reported is only about 300 miles, or less than three-quarters of 1 per cent of the total number at the beginning of the year.

An examination of the individual reports is probably even more illuminating. It shows that this new mileage is made up almost entirely of very short sections, evidently connections put in purely for operating convenience. Real extensions of lines are rare. Large industrial states, like Connecticut and Indiana, report less than 3 and 5 miles, each respectively, of new track built, while New York State during the year added only 11 miles of surface electric railway trackage.

The rolling stock table tells a like story. Briefly it is that the new rolling stock ordered during 1917 is the lowest recorded since 1907, when this paper began the compilation of its statistics. This means that 1917 had probably the lowest number of cars bought during any year since the general adoption of electricity.

The third table published last week, that of receiverships and foreclosures, was the only one of the three to show an increase.

There is no use blinking the facts. The industry is sore beset, and it would require more than a Pollyanna to become an optimist on the conditions shown by these tables. Nevertheless, there are encouraging signs, if the industry will only take heed and avail itself of them.

Of course, the principal basis for optimism and confidence in the electric railway industry is the essential nature of the service rendered. In spite of past competition of all kinds, the electric railway has remained and must remain the only means of local transportation which is available to the great majority of the people in any community. In other words, the electric railways must continue to run because the people cannot get along without them. Moreover, as the population of the country increases, the need for more and better local transportation will increase in an even greater ratio than the population. Hence the railways must not only continue to give service but must improve and extend that service as the needs of the community require.

Now, while there is nothing particularly new in this truth, the fact remains that there is greater popular recognition of it than ever before. The attitude of the regulatory bodies as a whole is more sympathetic, as was shown during the past year by a greater willingness to grant fare increases as well as to help in other ways. The public also is understanding to a better degree the problems of the roads.

This is the proper time for the roads to take advantage of this condition. Let each explain to its public, if it has not already done so, why its cost of operation has risen and why higher fares are necessary. The public should also be told how it can help the companies in other ways to improve the car service. It is very important that the betterment of public relations should not lag just at the time when the greatest good can come from an intelligent application of its fundamental principles.

Organized Labor Should Not Profiteer

FAITH in the union-labor movement, which has been fostered during recent months under the sane leadership of President Gompers, is due for a setback in the public mind through such actions as the attempt to force wage increases on companies whose old contracts have not expired. In Cleveland and in Toledo efforts are being made to advance the interests of the employees through unfair pressure, notwithstanding the fact that written agreements as to wages and working conditions are still in force. Organized labor has been strong in its condemnation of war profiteering on the part of capital. A fair-minded public must put into the same classification such a movement on the part of trainmen who would take advantage of war conditions to promote their own welfare to the serious detriment of the utility which is affected.

Even in those cases where the wage scale fixed by agreement a year or two ago does not meet the present cost of living, labor leaders must remember that their employers have also to contend against the increased cost of materials and diminishing receipts. Voluntary raises in pay have been given by many companies to the extent that they can stand the extra burden. Other companies will have to take their chances with boards of arbitration when the present contracts expire. But to stir up public feeling by threats of strike or appeals to the federal government to compel a change in the agreement, is an act which should brand the agitators as poor sportsmen, and should not win for their appeal a popular indorsement.

Another view was taken in Chicago some months ago where unionism, under patriotic leadership, negotiated an agreement which showed a proper recognition of the exigencies of war times. In accepting a wage scale which was a compromise, the union employees bound themselves for a three-year period, and pledged themselves to do all they could to promote mutual interests, "keenly recognizing and appreciating the situation now confronting our government." This is the spirit which should govern all employees who are bound by contracts for a definite period. They should bury their cupidity and prejudices and bide their time. Better still, let their organization help to gain a flexible fare for their employers, and thus provide a basis which will meet fluctuating costs.

Rehabilitating the Power System

THE coal and labor shortage has forced into the limelight some unwelcome facts regarding power generation. Many power plants are using too much coal for their output. Even in peace times the older plants, many of them far from worn out, were being relegated to the scrap pile. The present conditions will hasten their progress in that direction.

A pound of good steam coal contains 12,000 B.t.u. more or less, that is, enough heat to raise 12,000 lb. of water 1 deg. Fahr. Converted entirely into electrical energy this would be almost exactly 3½ kw-hr. In other words, *except for conversion losses a kilowatt-hour of energy could be produced from less than a third of a pound of good coal!* Some plants consume fifteen times, and the best of them burn nearly five times, this amount.

Unfortunately, unless new methods of transforming the chemical energy of coal into mechanical energy are discovered we must put up with a loss of at least 75 per cent in the chimney, the boiler, the engine or turbine, the condenser, the piping, the generator and the auxiliaries.

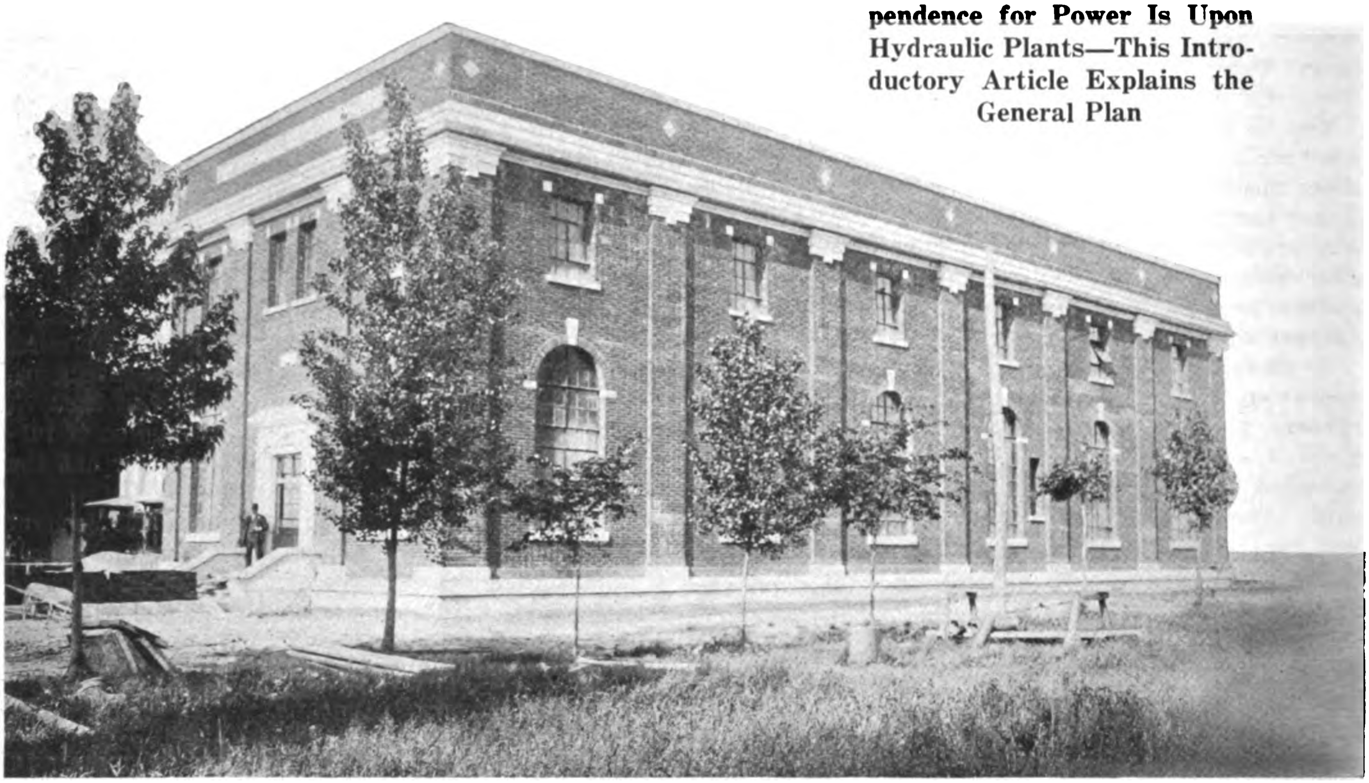
The situation outlined above explains the general rehabilitation of power plants, substations and transmission lines which is general in this country, Canada and elsewhere. These pages have contained many examples of the process.

This week we begin a series of three articles on the very interesting and typical work which is going on in Montreal, and which is as nearly completed as such a mutable thing as a power system can ever be said to be. In studying this account the reader must remember that it is a remodeling that is pictured, not the building of a new system from the ground up. Hence existing equipment has been repaired where it is cheaper to keep it than to throw it out. Of two steam plants still retained, one will seldom be used except as a substation. The other will be operated only on peak loads and as an emergency reserve. The surrounding abundant water power will be used to the limit as it should be. The redesign of the main steam plant, however, has received scrupulous attention, so that when it is running it will give the best possible account of itself. The distributing lines and substations are also being brought strictly up to date.

A feature of this remodeling at Montreal which illustrates the importance of standardization is the provision for shifting substation equipment from one part of the distribution system to another as needed. A company may have a transformer and converting equipment of aggregate capacity sufficient for its needs, but if this is not properly distributed there will be overloading at some points and underloading at others. One condition involves excessive energy loss, deterioration of apparatus and poor voltage regulation; the other is accompanied by operating inefficiency. Ability to move a unit as required will obviate this unbalancing. It might be argued that power needs can be anticipated if the growth characteristics of a community are properly understood, but the fallacy of this argument is proved by experience. It is best to be prepared for the unexpected. Mobility of equipment can well be considered as a factor of such preparation.

Electric Railway Power at Montreal

Montreal Tramways Is Completing Program of Power Generation and Distribution Rehabilitation—Principal Dependence for Power Is Upon Hydraulic Plants—This Introductory Article Explains the General Plan



FRONT AND EAST SIDES OF POINTE AUX TREMBLES SUBSTATION, MONTREAL TRAMWAYS

THE power generation and distribution system of the Montreal (Quebec) Tramways is unusually worthy of study at this time because a train of circumstances has brought about a fairly complete remodeling of the main power plants, the substation layout and the transmission and distribution lines. Ever since the three original electric railway lines in the city were developed, about 1892, there has been a struggle to keep the power supply abreast of the expansion of the railway system, which has coincided with that of the city. In recent years the growth of the city has been very rapid until now the population is in the neighborhood of 800,000. In addition to the city itself the Tramways supplies transportation to Westmount, Outremont, Verdun, Maisonneuve and Mount Royal, which form an integral part of the community. The Tramways now has more than 260 miles of track and more than 1000 cars in service.

The principal source of power for the Tramways has been the water power, in which the neighborhood abounds. Upward of 500,000 hp. is developed within easy reach of Montreal, so that steam power is required by the Tramways only for reserve and to control the peaks of the load, thus limiting the service charge for power. Two steam plants are in operation, the old William Street station, now used practically entirely as a substation, and the more modern Hochelaga plant, which is the principal steam reserve. The Hochelaga plant is in course of remodeling, the details of which process will be covered in a later article.

Power from the hydraulic plants is transformed in several substations containing motor-generator sets. One of these, the St. Denis substation, has been entirely remodeled this year, and a new substation at Pointe aux Trembles is now receiving the finishing touches. One motor-generator set is in operation here and a second is about ready to be started up. In the early days, before the local hydraulic development had progressed very far, steam power was depended upon very largely for the Tramways' supply, but for nearly twenty years an increasing proportion of water power has been utilized. Of late years the tendency seems to have been to keep the steam power about 20 per cent of the total, and generating equipment has been added from time to time to maintain this average.

FACTS PRECEDENT TO PRESENT POWER SITUATION

Going back to the year 1900 we find that the first contract for water power was with the Montreal Light, Heat & Power Company for 5000 hp. delivered at the William Street power house. By this time the Tramways was approaching the limit of the steam capacity, the output being about 13,000 hp., as compared with a possible output of 17,000 hp.

In an article published in the STREET RAILWAY JOURNAL for June 6, 1903, page 833, Ralph D. Mershon, consulting engineer to the company, described the equipment which had been installed to receive and transform the hydraulically produced power, the equipment being for the time rather unique. The power was received in the form of quarter-phase current at 66 cycles and 2200 volts over seven circuits. Six induction motor-generator sets and one synchronous motor-generator set were installed, of a combined rating of 5000 hp. continuous output, and a relay capacity of 15 per cent more than this. When installed these sets, which are still in operation, were said to be among the largest built up to that time, although individually not the largest. The total capacity, however, was probably larger than that of any group of induction motors in the world assembled under one roof.

One of the most novel features of the installation was provision for pumping power back into the line when needed, using the direct-current machine as a motor and the induction machine as a generator. This was probably the first commercial use of the induction generator, although the regenerating ability of the induction machine when supplied with polyphase exciting current was known long before.

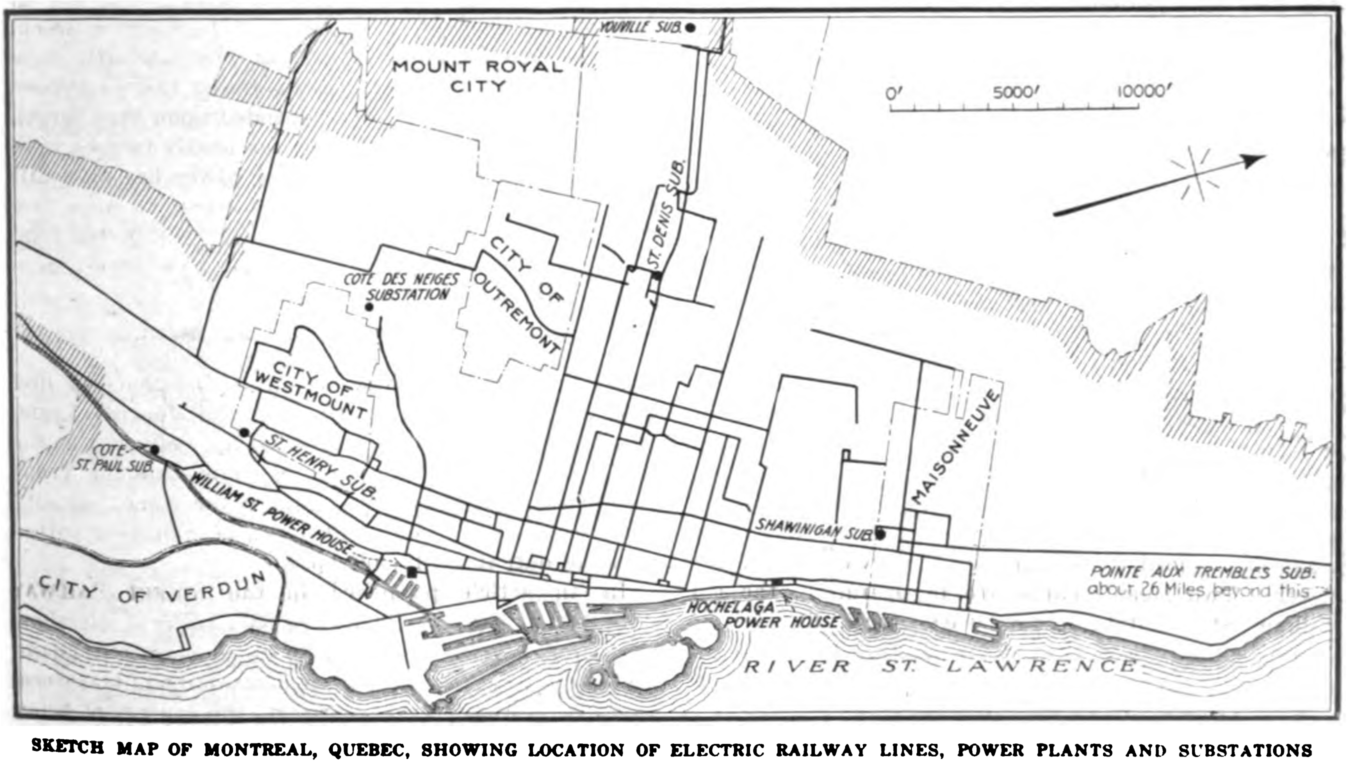
In choosing motor-generator sets rather than rotary converters for the William Street substation the engineers had the following considerations in mind: First it was desirable to have machines that could be operated with the minimum of care, attention and skill. The induction motor had been highly developed and the rotary converter had not by any means attained the perfection which has since been achieved. In the second place it was desired to interfere as little as possible with operating conditions on the power company's transmission system, and it was felt that induction motors, brought up to speed from the direct-current end of the sets, would meet the requirements in this particular. Moreover, started in this way, the motors could be built with practically no resistance in the squirrel-cage secondaries and hence with excellent speed-regulating qualities.

The next increase in power supply came about through a contract made with the Shawinigan Water & Power Company for 3000 hp. delivered at a local substation of the Shawinigan Company. This is in the Hochelaga ward of the city, a section in which the demand for power was rapidly increasing. Also at this time a contract was made with the Montreal Light, Heat & Power Company for 4000 hp., and to utilize this power two 1000-hp. motor-generator substations were built, one on Glen Avenue near St. James Street, opposite the St. Henry carhouses, and the second on Bellechasse Street, west of St. Denis Street. The railway company spent about $500,000 on this expansion. The contract still stands with respect to power furnished through the St. Henry and St. Denis substations, the latter of which has just been entirely rebuilt, and the last 2000 hp. taken from the Montreal Light, Heat & Power Company on above contract.

At present 12,000 hp. of hydraulic power is being taken under the Montreal Light, Heat & Power Company and Shawinigan Water & Power Company contracts. This is purchased at the rate of $25 per horsepower-year for the hydraulic power, with $4 for conversion on the 3000 hp. taken from Shawinigan only. The rate is based on a 70 per cent load factor.

Soon after the provision for distributing Shawinigan power in the eastern section of the city had been completed, the company felt the need for a steam reserve in this section, and in 1906 a standby station along then-approved lines was built. This contained two 1000-kw. and one 2000-kw. marine type compound McIntosh & Seymour engines driving direct-current generators. A few years later this equipment was supplemented with a 2000-kw. alternating-current turbo-generator unit with a large rotary converter. This was put in as a temporary expedient to provide greatly needed additional reserve, and the equipment was selected because it provided a more economical generating unit than the older machines. The turbine, the rotary and the engines are still in use. The station as a whole, however, is being entirely remodeled.

A new source of water power was utilized in 1912 when the Tramways company began to buy hydraulic power through the Montreal Public Service Corpora-



SKETCH MAP OF MONTREAL, QUEBEC, SHOWING LOCATION OF ELECTRIC RAILWAY LINES, POWER PLANTS AND SUBSTATIONS tion, additional substations being installed from time to time. The corporation is the distributing company for the Canadian Light & Power Company. The latter is a subsidiary of the Montreal Tramways & Power Company, of which the Tramways company is also a subsidiary.

The corporation furnishes power on a meter basis in three-phase form at 13,200 volts to a total of 10,000 hp. Of this 4000 hp. is delivered at the old William Street plant, where two 1500-kw. synchronous motor-generator sets serve to convert it into direct-current form.

THE 1916-1917 REHABILITATION

With this outline of the development of the power situation in Montreal in mind it is possible to appreciate the circumstances leading up to the present rehabilitation. It has been seen that the company made arrangements for power supply in different sections of the city to the best possible advantage for the time being, but with a growing need for a unification of the whole system, last year the Tramways company began the execution of a comprehensive plan for the purpose.

SOUTHEAST VIEW OF ST. DENIS SUBSTATION, MONTREAL TRAMWAYS

The decision to overhaul the distribution system at this time was brought about by a number of causes. In the first place on account of the limited number of distribution points it was difficult to distribute power at the low direct-current voltage of 600 without excessive loss. In connection with this was the insecurity of the power supply at any point, as it was difficult for one part of the system to help out another.

Another factor in the matter was the necessity for putting the feeders and transmission line underground. This was not only in accord with the trend of the times in large cities, but the movement was accelerated by act of legislature. Obviously in placing the circuits underground it would be most economical to use high voltage wherever possible.

It was therefore decided first to increase the number of distribution points by adding substations; second, to install a comprehensive high-voltage alternating-current transmission system, and third, to interconnect the substations so that power will be available at any part of the system.

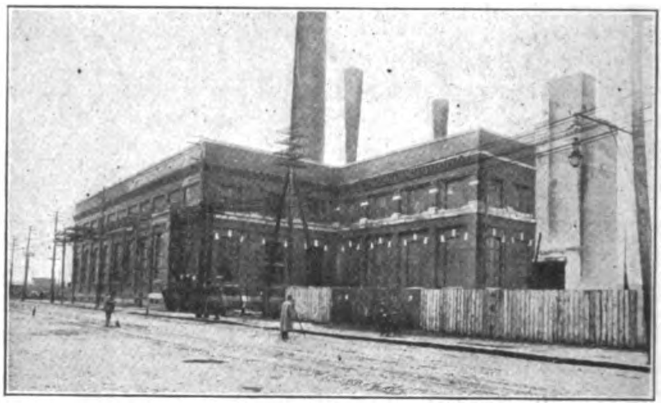
Investigation showed that the instantaneous power demand as a whole on all of the power houses and substations of the company, prior to the amplification of the system, was less than 80 per cent of the sum of the individual instantaneous demands. In view of the large extent to which power is purchased it is evident that a very considerable saving would be brought about by tying the whole system together. This saving, capitalized, would provide for a very considerable investment in underground cables and still leave a margin of profit. A further saving was possible through the use of more centralized energy generation operated according to modern scientific methods.

As a logical part of the development it became necessary to introduce large alternating-current generating units in place of the direct current units in use. By means of the interconnected system the power generated by these units would then be available at any point when needed to supplement the hydraulic power.

IMPROVEMENTS AT HOCHELAGA

In improving its power generating facilities the company naturally selected the Hochelaga power plant as the logical one for improvement because it is located conveniently with respect to water and to land for the storage of coal. In looking to the future it was considered desirable to plan for the possible ultimate installation of four turbo-generator units of 15,630-kva. capacity each. One of these has been installed and a second is on order for delivery in April, 1918. The completion of the plans will involve the abandoning of the three vertical units and the 2000-hp. steam turbine now in place. However, two turbines will take care of the requirements for some time to come and the vertical units will be retained for the time being.

The installation of the turbine units made an increase in boiler capacity necessary, and four 1100-hp. B. & W. marine type boilers, with superheaters and economizers, were added. These were provided with ejector draft fans, motor-driven. The boiler house was further modernized by the addition of such devices as steam flow meters and draft gages, by the elaboration of the coal-handling system, etc. Under way also are changes in the old boiler furnaces for the purpose of increasing the boiler outputs. Taylor stokers with independent draft fans will replace the chain grates previously used.



SOUTHEAST VIEW OF HOCHELAGA REMODELED POWER HOUSE, MONTREAL TRAMWAYS

Even more important than the changes in the power plant have been those in substations and the distributing system. The St. Denis substation has been revamped at a cost of nearly $225,000, and a beautiful substation has been built at Pointe aux Trembles. The latter is designed as a model for future development,

Effects of War Conditions on Cost and Quality of Public Utility Service

Extra Operating Expense of $116,500,000 per Year Should Be Considered by Commissions in Modifying Rates for Electric Service

THE effects of war conditions on public utilities are explained in considerable detail in a paper by Lynn S. Goodman and William B. Jackson presented before the American Institute of Electrical Engineers at New York on Jan. 11. This paper deals particularly with the effects upon electric light and power business, but the same general principles are also applicable to electric railway service. These effects are placed under two general heads, namely, those manifest in the heavy increases in operating cost and those causing the extraordinary increases in cost for new plant required to care for added business.

During the past years individual salaries and wages have been gradually increasing, while the labor cost per unit of service has been decreasing. War conditions, however, have greatly affected this situation, and the growing scarcity of labor in the ordinary occupations of peace tends to increase wage and salary scales. Employment of women has placed an additional class of labor at the service of the electric utilities, but more women employees are required than the number of men replaced, and war conditions tend to exhaust even this class of labor by offering wider fields of employment.

An analysis of the United States Census statistics shows that the increase in the average wages per employee, not including general officers, managers and superintendents, during the ten years from 1902 to 1912 was 11 per cent. Since the beginning of the war salaries of officers, managers and general superintendents have not greatly increased, but the wages in the operating departments have increased from 15 to 50 per cent, and it is estimated that 25 per cent may be taken as the average increase thus far occasioned by the war. The total salaries and wages paid to employees of electric companies throughout the United States make up about one-third of the total operating expense. With normal growth from 1912, at the rate indicated by the growth during the previous ten years, the salary and wage disbursements of electric companies for the year 1917 would have amounted to $90,000,000, of which one-seventh would have been for general officers, managers and superintendents' salaries and six-sevenths for wages. The increase in wages of 25 per cent, therefore, means an outlay on the part of electric companies of $19,000,000 for the year.

INCREASE IN THE COST OF FUEL

Estimates based upon the United States Census reports show that the cost of fuel has an extremely important bearing upon the total cost of electric service. This item of expense for all the electric companies in the United States would have reached $50,000,000 for the year 1917 under normal conditions and would have amounted to about 60 to 65 per cent of the normal generating expense. On the average, the cost per ton of coal to electric companies has increased a little more than 100 per cent on account of war conditions, making the increase of total cost due to the increased price per ton of fuel $50,000,000. A conservative figure for the increase in tonnage due to lower quality and non-uniformity of grade is estimated at 10 per cent, which means an added increase of $10,000,000, making the total increase $60,000,000.

The output which might have been expected for 1917 under normal conditions for steam-driven electric stations is 13,000,000 kw.-hr., and an average requirement of 3 lb. of coal per kilowatt-hour of output shows that the fuel requirements would amount to not more than 20,000,000 net tons. This is approximately 3 per cent of the estimated output from the mines for 1917. Thus a relatively large reserve supply of coal in the hands of every electric company would tie up but a very small part of the coal supply of the country and this supply would be widely distributed over the country, and to a certain extent would be in proportion to the population and industrial importance of the several sections of the country.

The normal cost of materials and supplies other than fuel used in operation and current maintenance of electric properties makes up probably a little more than 15 per cent of the total annual operating expense. The increase in the cost of such materials and supplies due to war conditions have been as much as 75 per cent. Such an increase in this expense means an increase in expenditures in the neighborhood of $30,000,000 over normal expense for 1917.

(*Concluded from Page* 74)

both with respect to architectural arrangement and machinery and control layout. In a large part of the territory the high-tension lines have been put underground in the company's own conduits in accordance with a standard plan. The low-tension cables are being drawn into the municipal conduits. The substations will be made the subject of a separate article, but their general appearance is shown in the accompanying photographs. All of the substations are being tied in with the Hochelaga power plant on a ring system, so that the reserve steam power can be promptly supplied at any point where it may be needed.

In the substations the plan is to use larger units than formerly, eventually practically standardizing on 1500 or 2000 kw. as the size. Previous to 1912 the tendency was toward units of about 500 kw. In remodeling the buildings the engineers have given special attention to improvements in lighting and ventilating conditions, with a result that delightful surroundings are provided. By the use of fireproof construction everywhere the fire insurance premiums have been reduced to a minimum.

Measures which include the development and maintenance of protective structures and lighting systems, as well as special policing, must be taken to protect properties from interference by enemy agents. The government action in restricting the activities of the alien enemy population is an important safeguard, but the necessity for direct protective measures adds hundreds of thousands of dollars to the normal expense account of individual large electric corporations and amounts to at least $2,000,000 or $3,000,000 in the total cost of service throughout the country.

INCREASE FROM TAX ON NET INCOME

According to the United States Census returns, the 1917 taxes paid by electric companies might normally have reached $25,000,000. The proportion of gross revenue required for taxes has been increasing year by year, having been slightly more than 3 per cent in 1902, a little more than 3½ per cent in 1907 and nearly 4½ per cent in 1912. Taxes on net income made up a very small proportion of the total tax in former years, but this form of income taxation has had growing favor in legislative circles. An estimate of the amount of the expense which may be expected to be added to the cost of electric service throughout the country by the operation of the net income tax law will lie between $5,000,000 and $10,000,000 for the year 1917.

The extra expense now imposed on electric companies on account of war conditions, as shown by the foregoing amounts, equals the immense aggregate of $116,500,000 per year. This is a quarter of the normal estimated gross revenue for 1917 of all the electric companies, and it wipes out two-thirds of the sum that would have been available for return and surplus.

In addition to the above expenses there are the additional expenses caused by the difficulty of retaining trained operators, the cost of protecting properties against malicious interference and the possible decrease of consumption of electric power, the magnitude of which it is impossible to estimate.

EXTRAORDINARY INCREASE IN COST OF NEW PLANT

The effect of war conditions in the matter of extraordinary increases of cost for new plant required to care for added business appears in several forms. The increased cost of new plant per unit of capacity manifestly affects the cost of service not only for the period of the war, but for the life of such plant. Many electric companies are now confronted with the necessity of caring for large demands for power arising from the increasing expansion in the manufacture of material for war purposes.

The economical power generating station is the proper medium for the supply of large power requirements arising on account of the war. The purchase of power leaves the manufacturers of munitions and other war materials free to devote their energy to the development and operation of the manufacturing plants without diverting any of their energy to the development of power plants or their operation. These advantages are so great that it is advisable that the government should use every reasonable means to encourage the power companies.

Extension of the totals shown in the United States Census of central stations for past years to the year 1917 show that under normal growth the total revenues in 1917 would have reached $475,000,000 and the operating expenses $290,000,000, making a total income of $185,000,000. Estimating the cost of construction and equipment at $3,500,000,000, the income would represent 5.3 per cent of this cost of construction and equipment. If no other factors entered into the problem besides increases in cost of operation, the fuel expense would have increased $60,000,000 for 1917, other supplies $30,000,000, labor expense $19,000,000 and taxes $7,500,000, representing an aggregate increase of operating expenses for these items of $116,500,000. This is an increase of 40 per cent in operating expenses, and it reduces the divisible income to $68,500,000, which amount is equivalent to less than 2 per cent on the cost of construction and equipment.

Current expense accounts may be reduced by postponement of planned repairs which would normally be made at once, but it is well to recognize that the longer repairs are put off the more they cost. While current expenses may for a time be lower, the cost in the long run will doubtless be increased. The net results of such economies might amount to as much as 10 to 15 per cent of the normal operating revenue of the electric companies, but they are offset by increases in expense which have not been included in the amounts named, such as expenses for obtaining new employees, the lowered efficiency of such employees, special policing, etc.

DECREASE IN CONSUMPTION OF ELECTRIC POWER

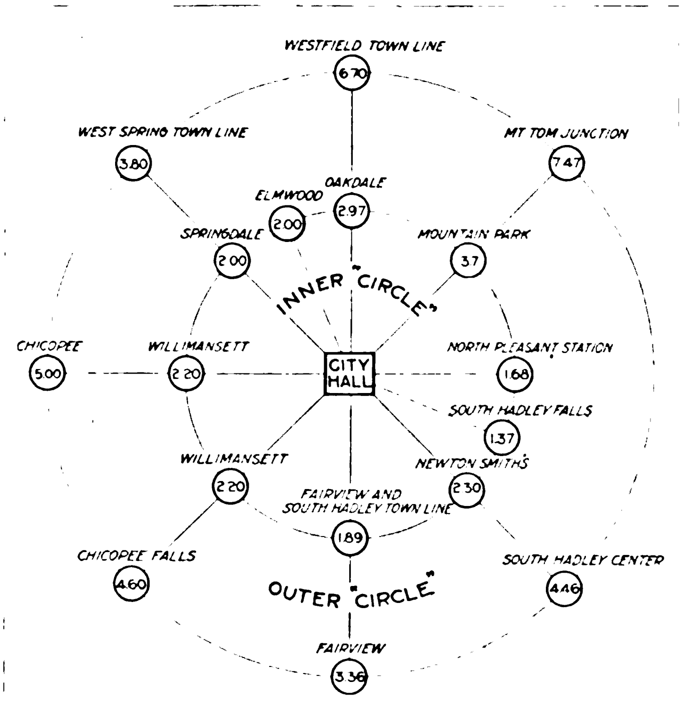
Principal consideration has been given to the effect of war conditions as increasing the demands for service. In England the danger from air raids and the necessity for conserving coal have materially decreased, and in some cases almost wiped out, the street lighting service furnished by many companies, and the domestic and commercial lighting loads have been very materially reduced. There has, however, been quite a universal increase in rates, in some cases flat percentage increases of the same amount for light and power, in other cases differing percentage increases for light and power, and in still others increases depending upon changes in cost of fuel. The flat percentage increases have varied from less than 10 per cent to as high as 50 per cent over the rates in effect prior to the war, London rates having been increased 50 per cent.

From the foregoing it is evident that increased expense for service arises in every department of the business, in operating labor and supplies and taxes, in protection of the property, and in cost for extensions of plant. The latter is affected not only by abnormal first cost for equipment and its installation, but also by the present difficulty in obtaining money for such purposes at other than exorbitant rates as compared with normal. The increases of cost of electric service on account of war conditions are so great that rates for service which were equitable at the beginning of the war are in some cases now not covering the operating expense. Where companies are being loaded with war business, the new business in many cases may become a serious menace to the company, which can only be overcome by taking into account the war conditions in determining the rates to be charged. It seems proper that regulatory bodies should take into account these considerations in their requirements for electric service during the war.

Zone System Approved for Holyoke Company

Massachusetts Commission Decides That Zone System with Central Five-Cent Area Is Best Suited to Local Situation—Decision Not a Binding Precedent for Other Cases, but Commission Says Such Zone Plan Should Have Fair Trial—Experience with Six-Cent Fare on City Lines Not Especially Encouraging So Far

THE so-called zone system which permits city electric railways to raise their fares without increasing the 5-cent rate in the central district should receive a fair trial—this is the point of the fare decision just made by the Massachusetts Public Service Commission in the Holyoke Street Railway case. Without establishing any precedent which must be followed in other cases, the commission holds that such a zone system is well adapted to the Holyoke situation and is likely to produce the most satisfactory results for all concerned. In its opinion, the experience thus far in Massachusetts with a 6-cent unit of fare for city lines has not been especially encouraging.



NEW HOLYOKE ZONE SYSTEM, WITH DISTANCES FROM CITY HALL

The Holyoke Street Railway had asked the commission to select the method, from among several suggested, by which the road could obtain more revenue. No new schedule of rates was filed, but it was proposed to establish a zone system, increase rates, or do both. The commission's decision now authorizes the general zone plan proposed by the company, with a few modifications in details. Complete relief, it is said, should not be expected in these war times.

According to evidence submitted to the commission, the company operates about 72 miles of track, the lines in general radiating from the City Hall in Holyoke to Springfield, Northampton and other towns. The population of the territory served increased from 60,374 in 1890 to 104,296 in 1915. Between Springfield, Holyoke and Northampton the company is in competition with the Boston & Maine Railroad, upon which fares at lower than the normal rate are charged because of the competition. The permanent investment per mile of main track in 1916 was $44,914.

The old fare unit was 5 cents, except on the Amherst and Sunderland division, where it was 6 cents. No workingmen's or other reduced rate tickets were sold except the legally required half-fare tickets for school children. Few changes in fares had been made since the beginning of electric operation. The distance which might be traveled for 5 cents was comparatively long in certain cases, ranging from 7.26 to 10.06 miles in twelve instances. Possible rides of more than 6 miles were frequent.

Until recently, the road had been one of the best paying in Massachusetts. From 1892 to 1915 it paid regular dividends of 8 per cent. In the fiscal year 1916 it paid 6 per cent, and in the succeeding year, 4½ per cent. In all but five years these dividends appear to have been fully earned, and only slight drafts upon surplus were made. Since much of the stock was issued at a premium, the actual return was less than the rate of dividend. From 1908 to 1917 inclusive the percentage earned on the investment ranged from 4.32 to 8.60; the investment from $1,938,334 to $2,953,017, and the income from $119,719 to $155,675. The total permanent assets on June 30, 1917, were $3,051,478. The operating revenue in 1917 was $711,374, and operating expenses $537,170.

The inspection department of the commission found that the track and roadbed had been well maintained and are now in fair condition. During the next five years, it is estimated, about 20 miles of track should be relaid and about 95,000 ties renewed, at a total cost of about $244,000. In addition, about $144,000 should be expended for renewals and repairs of special work, overhead system, telephones and signals.

The company has 139 passenger cars, average age fifteen years. Thirteen of the sixty-six closed cars are of the semi convertible type. Eight were purchased in 1916, and five in 1913. None of the other cars are really modern. Many car replacements should be made in the near future. The single-truck cars have for the most part outlived their usefulness. In this matter the commission's finding says:

"It is desirable that the company should gradually abandon the larger part of its present equipment and substitute semi-convertible cars which can be used the year around. While the management feels that the open cars attract traffic during the summer months, properly designed semi-convertible equipment is in some respects more attractive, and the present double equipment unquestionably adds materially to expense of operation. On certain lines one-man cars can probably be used to advantage."

Out of 384 motors, 186 are of good type and 130 are less efficient but still serviceable. The remainder, in the opinion of the inspection department of the commission, are unprofitable to operate and should be sold before junk values recede. In 1914 the company constructed, at a cost of about $225,000, a modern carhouse, shop and office building in Holyoke. The department reports it to be one of the best of its kind in the State. It has decreased maintenance, car storage and inspection costs. The department, however, believes that better results can be secured if the mileage per car per day is furnished to the master mechanic and inspections made on this basis. About $250,000 was expended in power plant improvements in 1914, and the plant is now in good condition and reasonably efficient. The voltage throughout the system is reasonably good except on the Westfield line, where new feeders are needed. The company, it is said, has always been regarded as well managed and furnishing good service.

RISING COSTS AND DEPRECIATION REQUIRE INCREASED EARNINGS

In support of its petition for increased revenue, the company held (1) that in the year ended June 30, 1917, it did not feel the full effect of prevailing high prices of coal, steel, copper and supplies in general, and these prices will materially increase the cost of operation for some time to come and, in conjunction with certain other factors, decrease net income; and (2) that the company did not in this year make sufficient provision for depreciation.

The coal now being used costs $8.45 per ton delivered, and the increased price for 1918 consumption is expected to total $21,500. Early in 1916 the company anticipated the rise in the material market and purchased a comparatively large stock. The management estimates that if current prices had been paid for materials used in repairs and renewals in 1917, the cost would have been about $13,000 greater.

The commission feels that there is little reason to anticipate lower prices until some time after the war, and it says: "The company may reasonably expect in the immediate future, in our judgment, an increase in operating expenses, as compared with the year ended June 30, 1917, of at least $35,000 per year and probably a greater sum, owing to increased prices of fuel and other supplies without allowing for any greater use."

Expert testimony was introduced by the company to prove that greater provision for depreciation should be made, the lives of the various classes of property being estimated as follows: Rolling stock and equipment, twenty years; track and electric line construction, sixteen and two-thirds years; buildings, thirty-three and one-third years; power plant and equipment, twenty-five years; park property, excluding land, twenty years. The composite life of all depreciable property was twenty-one and three-quarters years. From these life estimates the amount which ought to have been expended or set aside in 1916 was determined, the total being $144,501. The maintenance expenditures were then analyzed to ascertain the portion used for renewals which might properly have been charged against a depreciation reserve, and the unprovided-for depreciation was found to be about $100,000.

The commission in its finding agrees that insufficient depreciation has been set aside, noting as an example the need of new cars to replace those which, while not worn out, are not efficient according to modern standards. Old power plants outside Holyoke have not been adequately charged off. No depreciation account exists to cover certain track and line renewals now overdue. The commission points out that while changes in the art may at any time upset life calculations, estimates must be made, for depreciation is certain and ought to be systematically provided for. It has been urged by certain experts that no depreciation reserve is necessary in the case of a large electric railway which has been gradually built up, since renewals tend to strike a yearly average if made regularly and seasonably. This, the commission concedes, may be true on a large system, but not on a property the size of that in Holyoke. In any case, life calculations are an important check upon yearly expenditures.

The commission is inclined to believe the property lives assigned by the company low, but it concludes that $100,000 per year is needed to put the property into first-class shape within the next five years, besides at least $35,000 per year, or probably double that amount, for increased operating expenses and at least $50,000 per year for current depreciation. With necessary rehabilitation included, from $185,000 to $220,000 per year will be required.

MAXIMUM RETURN NOT TO BE EXPECTED IN WAR TIME

The commission is of the opinion that while the stockholders have already been called upon for a sacrifice of a reasonable return and ought, in justice, to be able to look forward to a day in the not remote future when dividends will be restored to the normal rate, they ought not to expect for the present a rate higher than 6 per cent. This would mean substantially less than 6 per cent on the entire investment. In determining what action is now just and reasonable, the commission gives weight to the following points:

1. The burden of high prices from which the company is suffering is caused by the war, which is falling with equal weight upon most individuals in the community. It is not a time when maximum returns ought reasonably to be expected.

2. Present prices of fuel and materials are clearly abnormal, and it ought not to be assumed that they will continue indefinitely. It is reasonable to suppose that relief will come soon after the war ends, and it is possible that it may come sooner through governmental regulation. So long as these excessive prices continue, it would be unwise to establish a scale of fares for the purpose of making a provision now for past and future depreciation which is theoretically sound but far in excess of any provision which this company and electric railways generally have been making in the past.

3. Under present abnormal conditions it is doubtful whether any extensive process of rehabilitation could be or ought to be undertaken. Even if funds could be obtained, the necessary construction materials and equipment could be secured, if at all, with great difficulty and only at excessive prices.

4. While the rehabilitation suggested is desirable, the property is in sufficiently good condition to furnish service of fair quality without it.

Under the conditions, therefore, it appears to the commission that it would be just at present to establish a new scale of fares estimated to produce about $110,000 in additional yearly revenue. If this were obtained, though as a rule it is the experience of electric railways that the actual results from fare increases fall below previous estimates, it would enable the company, unless conditions change for the worse, to meet increased expenses, pay moderate dividends and make a substantial provision for depreciation.

"No one," says the finding, "can accurately foretell the results which may come from any advance in rates, and electric railway managers themselves are in doubt as to the best method of increasing revenue. Several methods are now on trial in the Commonwealth. The future course of prices, of wages and of traffic are just as uncertain, and it is also possible that new legislation during the year may modify the situation.

"Furthermore, an engineering and operating survey of the property is very desirable and ought to be made by the company. This should furnish full information as to the ages of all important items of existing property; renewals provided for in recent years from the maintenance account; economies likely to result from changes in rolling stock, track, line and shops; methods of track construction; use of power by motormen; routing of cars; layovers, and development of trolley freight and express service, in which last the company has made little progress."

METHODS PROPOSED FOR INCREASING REVENUES

Three methods of increasing fares were suggested by the company. Two were similar, based upon an application of the so-called "zone system." They preserved the 5-cent fare within the thickly-settled part of Holyoke, but reduced the distance which might be travelled, thus creating an outer zone to and from which an extra fare would be charged. The third method was based upon the substitution of a 6-cent fare and a 2-cent transfer charge for the present 5-cent fare. All three provided for a 7-cent fare on the Amherst and Sunderland division instead of the 6-cent rate existing at the present time.

Under the first zone plan the inner circle would include the thickly-settled portion of Holyoke and also the villages of South Hadley Falls and Willimansett. In no case would the limit of the inner circle be placed at a point within the congested territory unless the line terminated within that area. The zones and distances from the Holyoke City Hall are shown in the accompanying diagram. Under this plan it was proposed to charge 5 cents between all points within the inner circle and 5 cents between points in the outer circle located on the same line; 10 cents between any point in the inner circle and any point in the outer circle, and 15 cents between points in the outer circle located on different lines. Tickets would be sold at the rate of four for 30 cents, good between South Hadley Center, Fairview, Chicopee Street, Chicopee Falls or West Springfield town line and the Holyoke City Hall. A charge of 1 cent would be made for each transfer, but this penny would be redeemed if the transfer were presented within the indicated time limit. No transfers would be issued in connection with the 7½-cent tickets.

The second zone plan provided for the same inner and outer circles, but a somewhat different system of charging. Instead of providing for the sale of 7½-cent tickets, good between the City Hall and the points above mentioned, it substituted a 7-cent cash fare, with transfer privileges at the City Hall, except that no transfers would be given from the South Hadley Center, Chicopee, Chicopee Falls or West Springfield routes to or from Mountain Park. In all cases, both for through routes and for rides within the inner circle, 1 cent would be charged for transfers, without redemption. Between Fairview and Chicopee Street, or Chicopee Falls, special tickets would be sold, making the fare 10 instead of 15 cents. The first zone plan was estimated to yield $145,000 additional revenue a year; the second, $132,000, and the 6-cent unit fare alone, $140,000.

COMMISSION FAVORS ZONE SYSTEM FOR HOLYOKE

At the hearings the company expressed a preference for a zone system with a 5-cent unit in the thickly settled district. The communities in general favored a 6-cent unit without change in fare limits. In reaching a decision, however, the commission was guided by its best judgment as to the plan which, taken as a whole, would produce the best results for all concerned. It is difficult, the commission says, to gage public sentiment accurately in advance of actual trial.

It is the commission's belief that experience so far in Massachusetts with a 6-cent unit on city lines has not been especially encouraging. It is an awkward fare, hard to collect, either with the old register system or with the prepayment fare box. In the latter case it lends itself readily to fraud. It has a further and perhaps more serious disadvantage in that it discourages short-haul riding and encourages jitney competition. There is, the commission states, an undercurrent of feeling in electric railway circles in favor of maintaining a maximum fare of 5 cents in compact metropolitan centers. Short-haul riding is the most profitable, and the best minds in the industry are now at work on the problem of attracting and holding this kind of traffic.

The point is well illustrated in the present case. In a city like Holyoke, where a number of lines radiate from a common center, the opportunities for securing short-haul traffic are at a maximum. For example, in the case of the lines which extend to Elmwood, North Pleasant Street and South Hadley Falls, none is more than 2 miles long, and in one case the distance is less than 1½ miles. A 6-cent fare on such lines would, in all probability, lead many present riders to walk and would thus open up an inviting field for jitney competition at the 5-cent rate. It is on such short city routes that jitney operations have proved most profitable. On the other hand, if a 5-cent fare can be preserved on such lines and a regular and a frequent service provided, present service being doubled by the introduction of one-man cars if necessary, opportunities for attracting traffic are great.

To the commission's mind there is equity also in keeping the 5-cent unit within the congested district, for it is this which gives strength to the system. Over two-thirds of the people served live in Holyoke and the adjacent settlements across the Connecticut River, and they have really furnished the prosperity which the company has enjoyed in the past. It has been urged on grounds of social welfare that the zone system ought not to be introduced, because it will further congest the central district and prevent families from living in more comfortable surroundings in the suburban territory. Certain observers, however, are of the opinion that the benefit of a low fare in suburban territory is received by the landowner rather than by the tenant. In other words, where a low fare exists, land values and rents increase, while, if the fare is high, they remain at a low level. The net result, as far as the cost of maintaining a home is concerned, is much the same in either case, in the view of these observers, the difference being absorbed by real estate values.

ZONE SYSTEM WITH FIVE-CENT CENTRAL AREA SHOULD HAVE FAIR TRIAL

If a 6-cent fare were adopted and failed to produce the desired financial result, the tendency would be toward a still higher unit or toward a zone system with 6 cents as the minimum fare. It is easier to increase the minimum than to reduce it. When a company is in need of additional revenue, it hesitates to try a lower rate, and it is doubtful how far the commission may have power to compel such a trial to be made. On the other hand, if the zone system were now adopted, with 5 cents as the minimum, it would be a comparatively simple matter, if the results proved unfavorable, to change back to the present plan and try a uniform 6-cent unit.

In short, the commission remarks, the methods of increasing electric railway fares are now admittedly in their experimental stage. Rates of 6 cents, 7 cents and 8 cents and a mileage system of charging are all on trial in Massachusetts at present. Without in any way committing itself to any method which must necessarily be followed in other cases, the commission believes that the so-called zone system of charging which permits city systems to increase fares without raising the 5 cent rate in the central district ought to have a fair trial, and that, on present evidence, this method is especially well adapted to the Holyoke situation and likely to produce the most satisfactory results for all concerned.

FIRST ZONE PLAN IS MODIFIED

The general scheme for such a zone system which was suggested by the company is said to seem on the whole well-devised. The limits of the inner circle include the compact, densely-settled central district and appear to have been logically located. The two zone plans are very similar, and either one may be used as a basis. In taking the first plan, however, in the judgment of the commission, the following modifications should be made:

1. Tickets good for rides between points in the inner circle and points in the outer circle located on the West Springfield, Chicopee Falls, Chicopee Street, Fairview and South Hadley Center lines should be freely sold, both at convenient outside agencies and on the cars, at the rate of six for 40 cents, and the fact that such tickets are available should be advertised by conspicuous notices on the cars.

2. Provision should be made, either by ticket sale or otherwise, for a rate of 7½ cents for local rides between points in the inner circle and Smiths Ferry or intermediate points on the Northampton line, and between points in the inner circle and the city boundary or intermediate points on the Westfield line. On the latter line, the company may, if it desires, limit this local fare to the hours when workingmen are going to or from work.

3. Lap-overs should be provided for the South Hadley Falls and Willimsett districts, so that passengers may ride between South Hadley Falls and South Hadley Center and between Willimsett and other parts of Chicopee for a 5-cent fare. This can, in the commission's judgment, be done without great inconvenience to the company.

4. Special tickets should be sold at the rate of five for 50 cents good between points on the Fairview line and the city of Chicopee and points on the Chicopee Street and Chicopee Falls line in the same city.

5. Free transfers should be given at the City Hall to all points within the inner circle, and these should be available to passengers using tickets as well as to those paying cash fares.

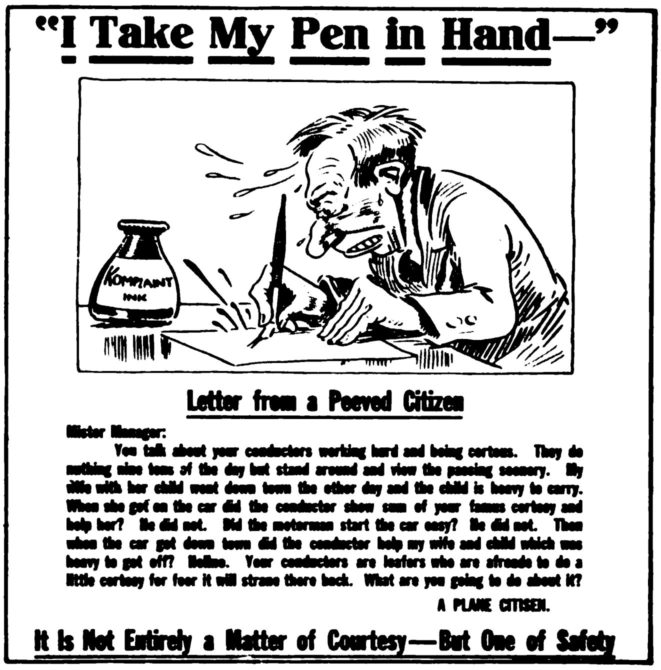
The commission indicates no change in the case of the 7-cent fares proposed on the Amherst and Sunderland line, for the operation of this division has been unprofitable, and the company is fairly entitled to additional revenue if it can be secured. The commission, however, suggests that the company, in its own interest, might well consider the adoption of some plan, either by the sale of tickets or otherwise, whereby local rides could be secured for reasonable distances within the town limits of Amherst at a rate not in excess of 6 cents.

It is possible that the 7-cent fare on this division may not result in the anticipated improvement, and the company, the commission says, should keep a careful record, so that its effect may accurately be determined with a view to possible modifications in the future.

This should also be done in the case of the plan as a whole. It should be clearly understood that the plan is subject to review at the end of one year with a view to possible modifications in the light of experience gained during that period and of the additional information which the company should in the meantime secure by an intensive study.

Courtesy and Safety

THE National Safety Council finds that there is a relation between handling complaints and insuring safety to passengers. The recent poster reproduced herewith tells its own story.


"I Take My Pen in Hand—"
KOMPLAINT INK

Letter from a Peeved Citizen

Mister Manager:

You talk about your conductors working hard and being cortous. They do nothing nine tens of the day but stand around and view the passing scenery. My wife with her child went down town the other day and the child is heavy to carry. When she got on the car did the conductor show sum of your famus cortesy and help her? He did not. Did the motorman start the car easy? He did not. Then when the car got down town did the conductor help my wife and child which was heavy to get off? Nothing. Your conductors are loafers who are afraude to do a little cortesy for fear it will strane there back. What are you going to do about it?

A PLANE CITISEN.

It Is Not Entirely a Matter of Courtesy—But One of Safety

A FORCEFUL N. S. C. COMPLAINT-SAFETY POSTER

Railroad Electrification as a War Measure

The Author Shows that It Will Be Profitable in Spite of the High Cost of Labor and Materials

By F. E. WYNNE

Engineer Railway Section, General Engineering Division,
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

TRANSPORTATION, whether by rail, water or highways, is a most vital factor in prosecuting the war. The service demanded of the railroads of the United States by the present immense volume of traffic, largely due to the requirements of war, has demonstrated very clearly the inadequacy of our existing railroad facilities. Among the urgent necessities of the situation are larger and better arranged terminals, greater track capacity, increased train loads, higher speeds, more efficient motive power, and the conservation of fuel, materials and men. The practical patriotism which the railroads have displayed in combining management, facilities and equipment for the period of the war is accomplishing wonderful results of incalculable value. However, as the situation becomes more acute, through consumption of men and materials, other means may be necessary to secure the essential result.

The *Bulletin of the National City Bank of New York*, for November, 1917, on "Economic Conditions," contains the following comment:

> There is naturally a feeling of uncertainty and apprehension as to industrial conditions after the war. The demand for war materials will fall off, the supply of labor on the market will be greatly increased, and it is a question whether all of this labor can be promptly placed in employment. It will be the most stupendous reorganization of industry ever known, and it is going to be a great social problem to accomplish this change without confusion, loss of confidence and a period of stagnation. It is important that plans be laid on a large scale to take up the slack, and other countries are laying them. In this country, ready at hand, is the task of equipping the railroads, and other industries where practicable, to operate by electric power. . . . The amount of work in sight, if a general scheme of electrification was undertaken, would be sufficient to relieve the business community of its fears as to idleness and poor trade for some years to come, and would thus encourage other enterprises to go ahead.
>
> The danger will be in a pervasive feeling of uncertainty, causing men to wait with their own plans until they can discern the general trend, and waiting of itself slows down business. Large plans for the employment of labor which can be brought definitely forward at the critical time will serve to inspire confidence and support the whole situation.

It seems pertinent at this time, therefore, to consider seriously what electrification is capable of doing for the railroads now, at the same time bearing in mind the desirability of making definite plans for electrification when peace is finally secured. Conservation of fuel is highly important, not only in order to meet the extraordinary demands of our government and the industries and for export to our Allies, but also because every reduction in fuel movement for domestic purposes adds to the equipment and track capacity available for moving export shipments. Electric operation lends itself to fuel conservation in two ways; either water power is substituted for steam power, or the necessary steam power is produced in a central power plant more economically than by burning fuel on locomotives. In the first case, all of the fuel used for train propulsion, fuel handling and haulage (which may be as high as 10 per cent of the propulsion fuel), water pumping, etc., is saved for other purposes. In the second case, approximately one-half of the fuel is conserved, it being a well-established fact that 1 lb. of coal burned in a modern electric power house will produce as much transportation as 2 lb. burned in steam locomotives.

The government requirements for fuel oil are enormous and the supply is restricted on account of the reduced output from domestic fields, Mexican conditions and the fact that the Roumanian fields are in the possession of the Central Powers. Railroad electrification could relieve this situation considerably and water powers are already available or may readily be developed for the electric operation of many of the most difficult sections of the railroads now using oil-burning locomotives. However, the smaller fuel consumption now obtainable by the use of steam-driven stations is equally as important as the utilization of water powers, because the densest railroad traffic and the greatest congestion is in territory within easy range of the best coal fields, but where water power is scarce or extremely costly to develop.

ELECTRIFICATION A CONSERVATION MEASURE

At first glance, electrification may seem not to tend toward the conservation of materials. The construction of overhead lines, substations and possibly power stations calls for a large amount of material, a considerable proportion of which is copper and steel. On the other hand, fewer electric locomotives than steam locomotives are required to produce the same quantity of service. Where congestion is becoming unendurable electric operation will give relief which, with the continuance of steam power, could be obtained only by building additional tracks and greatly increasing the steam motive-power equipment. The steam locomotives released by electrification and the cars relieved from hauling railroad fuel take the place of new locomotives and cars for increasing the capacity of unelectrified divisions. It is apparent, therefore, that these features indicate the conservation of materials by means of electric operation.

Diverting millions of men from peaceful pursuits to war activities impose upon those remaining the duty of working more efficiently. To this end, machinery must replace and release men to a greater extent than heretofore. Railroad electrification helps to conserve man power both directly and indirectly. Since it has been proved practicable to build, and operate with one engine crew, electric locomotives more powerful than steam locomotives, fewer enginemen are required to handle a given traffic electrically.. Not only can larger trains be operated at higher speeds, but delays on the road are materially reduced and there is less overtime and little conflict with the sixteen-hour law. The operation of larger trains at higher speeds also decreases the number of train crews for a given traffic. Material reduction in the roundhouse and shop labor of caring for and repairing motive power is found with electric locomotives. This is effected largely by the elimination of the boiler, firebox and tender which are essentials of the steam locomotive and by the longer time possible between "shoppings."

The combination of engine divisions, together with more exact and more reliable movement of trains with electric power, makes possible a further conservation of man power by reducing the number of dispatchers required to operate a given trackage. The indirect reduction in men comes chiefly through the fuel reduction or elimination. This releases men from mining coal or producing oil, from handling this fuel, and from operating and maintaining equipment in railroad fuel service, so that they are available for performing similar or other service in producing fuel and transportation for the needs of our government, industries and Allies. Of course, all of the man power thus conserved is not a net gain, because the maintenance and operation of power house, substations, transmission and distribution systems require the time and energies of some men not employed in the operation of a steam railroad. However, in any case, the net reduction in men required is great and increases more rapidly than in proportion to the extent of the electrification.

SAVINGS FROM INCREASED TRACK CAPACITY

One of the greatest benefits derived from electrification is the increase in track capacity without laying additional rails. Probably there are few places where, under steam operation, the capacity of existing track could not be increased by the use of larger, more efficient locomotives, changes in train make-up, increased car-loading and modified operating conditions such as the "sailing dates" for l.c.l. freight recently introduced on certain railroads. All such improvements can be secured equaly well with electric operation, and in addition still larger trains may be operated at higher speeds with greater safety and reliability and fewer delays. These results are obtained through the ability to concentrate in an electric locomotive greater power than in a single steam locomotive, to operate locomotives in multiple, and in the electric locomotive's smoothness of control, its greater availability for service, the greater mileage between overhauling periods, the reduction in railroad fuel handled, the less serious nature of road failures, the elimination of intermediate engine terminals, and the definite speed of operation on the road.

The movement of trains at higher speeds with fewer delays and less damage enables greater mileage to be secured from cars in a given time. This saves time in furnishing any quantity of transportation service and the time thus conserved is equivalent to increasing the number of cars available for service. In fact, it is more than equivalent, for there is less likelihood of congestion in handling a certain traffic with 1000 cars than if 1200 cars are required to accommodate the same traffic.

The *National City Bank Bulletin* for December, 1917, contains the following:

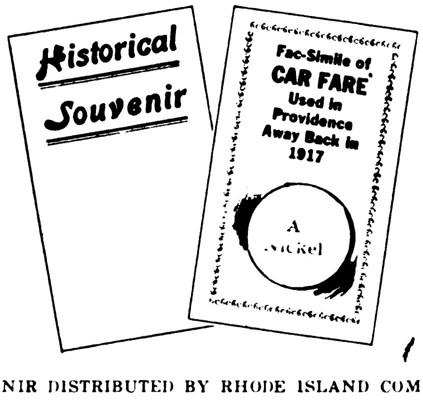
> The industries cannot expand beyond the limits fixed by the supply of pig iron, coal and railway service. If government funds can be used to remedy this situation it will be the most effective use to which, at this time, they can be applied. Here is the narrow place in the road, and if it can be widened the energies of the country will produce immensely greater results.

Electrification is admirably adapted to "widening the narrow places" in the railroads. The greatest congestion, aside from terminals, occurs on roads handling ore, fuel, grain and munitions. The suggested use of government funds (where necessary) to assist in relieving this congestion appears to be both legitimate and logical. Government assistance might be secured in getting priority of manufacture also, since the apparatus to be built would be utilized to improve transportation facilities largely for government business. The manufacture of a number of electric locomotives would release a much larger number of steam locomotives and take some of the present burden from the steam locomotive factories by reducing the number of boilers, tenders, engine frames and running gears which such factories would have to build for a given amount of relief.

Not only must maximum capacity of existing facilities be secured but increased facilities at the weak points of our transportation systems should be provided with the utmost speed. Labor should be diverted from non-essential channels to the construction of these additional facilities. The diversified character of the materials and apparatus used and the greater service obtained from equal weight of material in electrical service make it practicable to secure a definite increase of railroad facilities with electrification more readily than by building additional tracks, widening tunnels and bridges and building additional steam locomotives. Incidentally, in many cases, electrification is economically the best method of securing such increase in track capacity. It appears, therefore, that intelligent consideration of the present situation, the probable duration of the war and the future of the country, carried on jointly by our government and the railroads, should lead to some electrification immediately and to the greater use of electric power by railroads when peace comes.

"Looking Backward"

THE Rhode Island Company, Providence, R. I., at a recent souvenir dinner of the "Town Criers" did a little advertising stunt that created considerable comment. At each plate it caused to be put a little "historical" souvenir ($1\frac{3}{4}$ in. x 3 in.), showing a fac-simile of the car fare used in Providence "away back" in 1917. The idea seemed to make a hit with the diners.



SOUVENIR DISTRIBUTED BY RHODE ISLAND COMPANY

Reasonable Rate of Return Has Advanced

At Recent Milwaukee Fare Hearing Mr. Mortimer Discussed Hazards and Needs of Electric Railway Industry—Fundamentals of Proper Wage Basis Outlined—Need Emphasized of City Co-operation in Effecting Economies

AT A HEARING before the Wisconsin Railroad Commission on Dec. 20, on the application of the Milwaukee Electric Railway & Light Company and the Milwaukee Light, Heat & Traction Company for revision of rates of fare, filed on Nov. 6, 1915, J. D. Mortimer, president of the petitioning companies, testified as to additional revenue requirements, efforts in economy and efficiency, and prevailing rates of return on public utility investments. A synopsis of Mr. Mortimer's remarks is given in subsequent paragraphs.

HOW THE INVESTMENT HAS GROWN

The original cost of the railway property of the Milwaukee Electric Railway & Light Company on Dec. 31, 1916, was $19,972,896, amounting to $4.33 of investment per $1 of annual operating revenue. The corresponding ratio for the year ended Dec. 31, 1911, was $4.18 of investment per $1 of annual operating revenue. The increase in investment per $1 of corresponding operating revenue during the five-year period was $5.25.

The original cost of the Milwaukee Light, Heat & Traction railway property on Dec. 31, 1916, was $9,204,441. This investment was $9.13 per $1 of annual operating revenue. The investment ratio was much higher in the case of this company, with its suburban and interurban business, than in the case of the Milwaukee Electric Railway & Light Company, serving the city business, due to the difference between the annual earnings per mile of track.

The ratio of operating expenses, including depreciation, to operating revenues for the twelve months ended Oct. 30, 1917, in the single-fare area was 82.7 per cent. To produce an 8 per cent rate upon the property would have required an operating ratio of 68 per cent, and it would have been necessary to increase revenues $723,377 to achieve this ratio. The ratio of utility capital to operating revenue would then have been reduced to $3.49.

1918 WILL SEE HIGHER COSTS

These figures, Mr. Mortimer said, summarize conditions as they obtained during the twelve months ended Oct. 31, 1917, and do not cover increased operating expenses which will be experienced during the ensuing year. The largest single item of expense is the wages of the trainmen, and it is believed that these should be increased at least 15 cents per man-hour. Such an increase when applied to the city and suburban zones would amount to $660,000.

Another item of increase is the cost of power. For the twelve months ended Oct. 30, 1917, this amounted to $566,193. Coal cost $3.67 per ton. For October coal cost an average of $4.35 per ton, while effective Nov. 1, 1917, there was a further increase in price of coal of 45 cents per ton. In view of the possible further increases in cost of coal at mines, increase in freight rates, war tax on freight and increase in storage and handling costs, it is reasonable to predict that the cost during the ensuing year will be increased an additional 75 cents per ton. Substantial necessary increases are also scheduled for labor in power plants and substations. The total increase in power cost will amount for all railway departments to $253,200, of which $223,000 is applicable to the city and suburban fare zones.

Maintenance of equipment costs are similarly estimated to increase $110,000, of which $96,700 is apportionable to the Milwaukee city and suburban system. Maintenance of way and structures expenses are anticipated to increase $106,300 for the entire system, $75,400 for the urban and suburban business. Wages of miscellaneous car-service employees, carhouse employees, car cleaners, telephone operators and miscellaneous transportation expenses are likewise estimated to increase $88,756 for the system as a whole, of which $82,100 would be chargeable against the Milwaukee city and suburban zone. Mr. Mortimer also pointed out that many of the items of general expenses, undistributed expenses and taxes will sustain important increases, estimated at $184,100 for the entire system and $167,000 for the Milwaukee city and suburban zones. Summarizing the probable increases in operating cost, Mr. Mortimer stated that these were estimated at $1,471,550 for the entire railway department and $1,304,200 for the city and suburban business.

REASONABLE RETURN TO-DAY HIGHER THAN YEARS AGO

Mr. Mortimer then noted important changes that have taken place in the returns demanded by investors in electric railway securities. The capital invested in public utilities is planted and must be considered as invested in perpetuity. The problem of determining a reasonable rate of return is necessarily one of the future. The investor considers the actual return which his money will earn in good years and bad, and the prospects for future increase. No investor will knowingly put money into an enterprise where prospects are they will suffer loss. The prospects for future increases either in rate of return or in margin of safety are very important considerations in inducing investors to part with their savings.

In Mr. Mortimer's opinion, the great mistake made by regulation in many states is that its calculations have been based entirely on past records without forecast of future conditions. When, about ten years ago, commissions announced that a return of 7½ to 8 per cent, made up of 6 per cent for interest or pure cost of money and 1½ to 2 per cent as profit of the proprietor, would be allowed on capital invested in public utilities, investors assumed that these returns would be assured in bad as well as good years. Such a policy had a tendency to stabilize investment values. The failure of such returns to materialize during periods of depression has now placed public utility investments in a semi-hazardous class.

Investors expected that all new investments made since the beginning of regulation would be allowed at least the announced rates of return. They did not anticipate that these investments would be subjected to valuation at amounts considerably below the actual investment. It was also not anticipated that the rise in commodity prices and in rates of wages would outrun any possible economies which could be effected, nor was the full effect of additional burdens through the exercise of municipal police powers and by the imposition of service orders by regulating commissions appreciated either by the investors or by the commissions. Returns have accordingly not been stable.

At the present time the enormous government borrowings running far beyond anything in this country's experience, and paying much higher than the usual rate of interest of borrowers in pre-war days, have contributed to a rapid rise in the old interest plane. The problem of reasonable return to-day is accordingly a very different one from what it was nine years ago when interest rates were on a much lower level than is now the case. Returns of 7½ to 8 per cent are to-day wholly inadequate for the purpose of securing additional capital to flow into the business. A return of 10 per cent to 12 per cent might accomplish such a result, but this is not at all certain.

Shortly after April, and for a few months during the summer, it was possible for public utilities to finance themselves temporarily by the sale of short-term notes secured by bonds, but the interest-rate cost to the issuing company was 8 per cent per annum or more. This figure is higher than public utilities are earning, but even then the amount of money that could be secured by this means was comparatively small. It is a well-established economic fact that there is a marked tendency for security values to depreciate as the prices of commodities rise—that is, the interest yields increase with an increase in commodity prices. Hence, Mr. Mortimer said, it would appear that in the ideal system of regulation there should be some advance in the reasonable rate of return as commodity prices increase in order to parallel as far as practicable the increasing cost of money and the other factors that go to measure a reasonable return from time to time.

HAZARDS OF THE ELECTRIC RAILWAY BUSINESS

The hazards of the electric railway business are very important considerations in determining whether or not it is a good business for a man to engage in as an employee or wage earner, and as a business in which to invest money. The particular hazards of the business enumerated by Mr. Mortimer are variation in gross earnings arising from fluctuation in business conditions, competition with other forms of transportation, small rate of growth of earnings, the general rise of the wage level and cost of materials, higher service standards, increased wages, unproductive investments required by municipal enactment (such as paving within the track zone, placing wires underground, grade crossing separation and abandonment of existing lines before the normal useful life of the utility property has expired) and uncertainties of valuation arising out of lack of agreement on fundamental principles.

The rate of return upon the bare cost of reproduction of the physical property used and useful in the single-fare and suburban areas amounted to 4.52 per cent for the year ended June 30, 1914; 3.28 per cent for the year ended June 30, 1915; 4.23 per cent for the year ended June 30, 1916; 4.79 per cent for the year ended June 30, 1917, and 4.20 per cent for the year ended Oct. 31. 1917. The basis upon which these returns are computed does not include working capital, stores, or going value. The cost of money can be reduced and the rate of return stabilized by contractural guarantees on the part of the municipality. This method will go some distance in reducing the cost of capital and the cost of service.

RATE REGULATION SHOULD BE AUTOMATIC

In Mr. Mortimer's opinion, regulation of rates of fare or lengths of haul should be automatic. It should not be necessary that the commission be required to hear a case on a petition initiated by some party every time the rate of return increases or decreases one-half of 1 per cent. It is entirely conceivable that the commission can establish fundamental factors upon which the rates of fare are to be computed or the distance traveled for the same fare and have the same modified automatically at three or six months intervals as the conditions of the time demand.

WHAT CONSTITUTES A PROPER WAGE?

With respect to the wage policy of the company, Mr. Mortimer pointed out that public utility employment should be the most stable and best paid in the community. Economy can only be obtained with competent employees, and the greatest competency can only be obtained by stable service. Stable service requires most favorable working conditions, such as the eight-hour day and the highest rate of wages. It is believed that the public desires well-paid employees.

The index number of the cost of living indicates a substantial increase in living cost. If the year 1914 is taken as a reference wage basis, the relative cost of living may be taken as 146. The relative average for the year 1916 would then be 176 and for the year ended Oct. 31, 1917, it would be 259. The cost of living for November, 1917, alone shows an increase of 90 per cent over that obtaining in 1914.

The management of the Milwaukee companies believes that the proper wage should consist of three elements: (1) a component that would measure the cost of the necessaries of life and vary at six months intervals with some reliable index number of commodity prices; (2) an amount determined by individual or group efficiency according to reference standards, and (3) an amount determined as the employees' share of surplus profits. The company has numerous profit-sharing plans in operation, but it has been unable to include in these the sharing of surplus profits since such profits did not exist.

It is expected that during the continuation of the war there can be no additions to the electric railway system. Such a policy is in the interest of the nation, in order that all money, materials and labor may be available for the use of the government as far as practicable.

ECONOMIES POSSIBLE WITH MUNICIPAL CO-OPERATION

As affecting the increased costs of operation, however, Mr. Mortimer averred that there are opportunities for economy through a policy of co-operation with the municipal authorities. An increase in schedule speed by introducing alternate stops would permit a reduction of about 8 per cent in car-hours for the same number of car-miles. The number of car-miles operated can be further reduced by modifying service standards to conform to wartime conditions. Economy can also be effected by modification of present ordinances relating to car heating. There are substantial opportunities for economy in relief from such unnecessary burdens as sprinkling streets, removing snow and ice, paving within track zone and changing track grades.

A hostile municipal administration increases the hazards in the business and increases the rate of return, by not less than 1 or 2 per cent, which investors have a right to demand as reasonable before placing their capital at the disposal of the public. The advantages of open municipal co-operation are readily evident, and no municipal or state official is performing his sworn duty when his official acts are hostile to the public utilities serving the district in which he acts.

In conclusion, Mr. Mortimer stated that the present methods of regulation are much too ponderous and slow to meet the requirements of the times. Near-bankruptcy must be shown in order to procure adjustments of fares, hauls and service.

Parcel Freight Plan for Chicago

Tentative Ordinance to Be Prepared—Conference Between Aldermen and Companies Brings Out Important Points Regarding Freight Possibilities

REVIVAL of a plan to permit the elevated and surface lines in Chicago to carry package freight was initiated on Jan. 4 at a meeting of the local transportation committee of the City Council. The discussion resulted in a request on the Corporation Counsel to provide the companies with a draft of a proposed ordinance to be worked out by them in a form satisfactory to all parties.

Representatives of both systems agreed to hurry up the presentation of a tentative ordinance. The aldermen conceded that the public probably would not object to the hauling of freight cars if there was no interference with passenger transportation. It is thought that an ordinance can be drafted which will specify certain classes of freight to be handled and will permit the cars to be operated during all except the rush hours.

No Heavy Investment for Short-Term Use

An important point brought out by the traction representatives, John E. Wilkie for the surface roads and G. T. Seeley for the elevated lines, was that the railways should not be required to make an investment in switch tracks, sidings, elevators and connections between the two systems under a short-term arrangement. Such changes would require a heavy investment, and there was no assurance that the plan would be accepted if its operation were only for the war period.

General Hauling and Two-Way Business Desired

For some years past there has been discussed at intervals a plan to haul market produce on the tracks of both systems. The surface lines already haul garbage cars under an arrangement with the city, which provides a safe margin of profit. There is also a limited handling of small freight over one of the city lines by cars of the Kankakee Interurban, reaching to Sixty-third Street, a point about 7 miles from the downtown district. All this business, however, is confined to a few hours after midnight.

The electric lines contend, however, that an increase of such business would not be worth while unless the period for freight handling is extended to cover all hours of the day other than the rush hours. Another contention is that any ordinance to be favorably considered should provide for the hauling of such classes of freight as would give a two-way business.

The elevated roads are in a favorable position at the present time to handle considerable merchandise if satisfactory arrangements can be made for connections with the Great Lakes Naval Training Station, Fort Sheridan and Camp Grant.

The surface lines, of course, cannot compete for such business. One handicap under which they labor is the type of rail, which will not permit the use of the ordinary interurban car wheels. It has been suggested, however, that a wheel design could be worked out for freight cars of the surface and elevated lines, which could be used by both.

Possibility of Department Store Traffic

The management of the Chicago Surface Lines sometime ago endeavored to interest the large department stores in a proposition to take merchandise from the downtown stores to outlying distributing stations owned by these stores. This would have meant the handling of such business after midnight. The department store officials were somewhat interested, but they said that a large portion of their purchases must be delivered the same day. It is thought, however, that the patriotic spirit inspired by war times might bring about such a change in public sentiment as would permit the delay of such shipments for a possible twenty-four hours. This would give the stores and the companies an opportunity to get together on the night-handling of such packages.

Another objection made by the stores was that they have a large investment in motor vehicles, which could not be used for another purpose. They also contended that they would lose a certain amount of advertising by the removal of such motor trucks from the street. Some aldermen, however, have gone on record as favoring a reduction in the number of such trucks, because of their noisy operation and their wear and tear on pavements.

Question of Milk Distribution Important

The question of milk distribution also enters largely into the present discussion. The Aurora, Elgin & Chicago Railroad, which operates to the city's center, is permitted to haul freight cars only to a point about 7 miles distant from the downtown district.

Mr. Seeley referred to the handling of freight in Detroit, Boston and Philadelphia. He said that in Detroit the company handles about 90 per cent of the milk entering that city.

According to the *Manchester Dispatch* the Germans have built a large number of trackless trolley lines as a substitute for motor bus transportation. This is because of the scarcity in Germany of gasoline as well as rubber for pneumatic tires.

The Zone System in Practice

Experience With the Zone System Lasting Several Years on the City and Interurban Lines of the Shore Line Electric Railway Proves Its Desirability. The Zone Rate Has Been Raised 50 per Cent in This Time Without Adding to the Difficulties of Fare Collection

By R. W. Perkins

President Shore Line Electric Railway

THE Shore Line Electric Railway consists of 240 miles of track in eastern Connecticut, including the city systems in New London and Norwich. These cities have a population respectively of about 18,000 and 22,000, but Norwich really should be considered to include in its area the town of Norwich, which would make its population more than 30,000.

This system was made up of a number of independent properties, all operating on a 5-cent zone system. When they were consolidated there were a number of troublesome questions involved in the matter of transfer from one line to another, and many of the divisions lacked sufficient revenue.

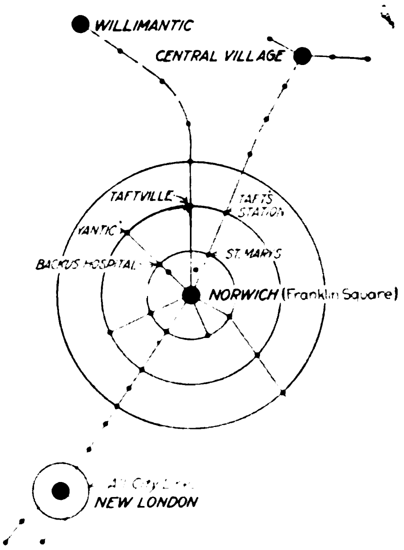
To increase the revenue, the first proposition was to increase to 6 cents per zone, and approval of this change was voted by the board of directors, but after more mature consideration, it was felt that this simply emphasized the faults of the old nickel-zone system, and the officers went into a very careful study of the property with an idea of adopting some more modern method of charging for passenger transportation.

A plan of the property was made and the exact mileage determined to every white pole stop. Then each particular community received careful consideration with regard to the direction in which the people most often traveled. The location of the new zone terminals was then determined upon. These zones vary in length according to density of population and volume of business.

The shortest zone on our line is about 3/8-mile in length, and the longest one 2.4 miles, and in each of these zones we are charging 3 cents with a minimum charge of 5 cents for a single zone; 7 cents in two zones; 9 cents in three zones and so on in multiples of three, except that within the city areas of Norwich and New London we permit a ride of two zones for a nickel. This, in some instances, calls for the issue of a transfer, although on the main-line cars this would mean a ride into or through two zones without a transfer, the long-distance rider paying 3 cents a zone in these same zones.

The application of the zone system calls for a good deal of study, and I think that is what has restrained many of the railway managers from adopting it. There is a certain amount of opposition on the part of the operatives to a change of any kind where they have been using the nickel register, but after our men became familiar with the system I think the majority felt that they would oppose the idea of going back to the old 5-cent zone, where it meant going through the car four or five times, and in some instances as many as thirteen times on a trip.

According to the present plan, when the conductor goes through his car the first time he rings up all the nickel fares on the register and issues an identification check punched to destination to each passenger paying more than 5 cents.



EXPLANATION

Formerly a 5 cent fare with transfer included a ride practically anywhere within the two inner circles. This is now limited, as follows:

A 5 cent fare covers a ride from Franklin Square to the outer edge of the first circle and, by use of transfer, a ride anywhere within the inner circle but not outside the city line.

The fare from Franklin Square to any point in the second circle is 7 cents and from Franklin Square to any point in the third circle it is 9 cents. The fare then continues at the rate of 3 cents a zone to New London, Westerly, Willimantic or Central Village. These points are suggested by the broken lines.

A 3 cent zone rate applies for riders through the city of Norwich. For instance, from Yantic to Franklin Square, with a transfer at that point to Taftville, is now four zones. Again, a ride from Yantic to Backus Hospital, Backus Hospital to Franklin Square, Franklin Square to St. Marys and then to Taft's Station would be through four zones or 12 cents. This ride was formerly 5 cents.

We find one marked advantage in retaining the nickel. Our city rider is not affected by the increase, and we do not lose patronage from the people who can most easily get on without us; that is, the very short rider. In fact, the division of our property in which our city zones appear shows a much larger increase in gross than is apparently the experience of those systems that have changed to the higher unit of 6 or 7 cents. As an example, take our so-called New London division, which includes the cities of Norwich and New London. Our change of rate went into effect on Oct. 4, and for the following month we showed a gain in receipts of 17.46 per cent.

There is one great advantage, it seems to me, in the adoption of the zone system, namely, that it places the sale of transportation upon a basis that is right. Consequently the rate per zone can be readily varied from time to time, according to the cost of producing the service. In other words, if a road has a rate of 2 cents a zone and finds that this is not sufficient, the rate can be increased to 2¼, 2½, 2¾ or 3 cents with no more difficulty than the steam railroads change from one rate per mile to another, except that the local fares often involve the use of the fraction of a cent, calling for a charge of the next higher unit. We changed our interurban fares from 2 to 3 cents a zone, which represents about 2.7 cents per mile.

We believe absolutely in the need of using a zone varying in length, or the so-called flexible zone, to meet the varying conditions of a property that covers both city and interurban service and the study necessary to make the length of zones equitable is the greatest difficulty in connection with the system. Our patrons also consider the plan a fair one.

How Use of Fuel Will Be Economized

Fuel Administration Schedules Public Utilities for 100 Per Cent Supply for 1918

THE United States Fuel Administration has made public the method adopted for supplying coal and other power-producing fuel to the industries of the country classed as not absolutely necessary to the conduct of the war. The method is called the "coal-budget plan."

Committees representing the large industries not engaged in war work, more than one hundred in all, will be called into conference with the officials of the Fuel Administration. They will be shown the amount of coal available for all purposes, the amount required for war purposes and domestic consumers and the total curtailment of the use of coal which must be effected to satisfy these demands. They will be asked on patriotic grounds, as well as for their own future interests, to volunteer in behalf of their respective industries a reduction of the coal consumption for the year 1918. They will be asked to show the Fuel Administration the best method of accomplishing this curtailment. They will also be asked to advise the Fuel Administration as to how to arrange these restrictions so as to affect only the less essential portions of their own lines of business, if possible.

When an agreement is thus reached as to the quantity of coal to be conserved in each industry the Fuel Administration order will be issued, making this agreement effective as regards the total industry involved.

The voluntary annual saving shown by the first dozen industries called into conference promises to be between 15,000,000 and 20,000,000 tons. The total offering, from all non-war industries, will be between 36,000,000 and 50,000,000 tons for the year 1918.

One of the striking instances of curtailment is in the brewing industry. Representatives of the American Brewers' Association and others affiliated with the industry, after a conference with the Fuel Administration, volunteered a reduction of 700,000 tons annually. Other industries whose representatives have been to Washington already are paint and varnish, wall paper, confectionery, artificial ice, boxboard and glassware. The voluntary reduction of one day's running per week on the part of the boxboard manufacturers amounts to 1,000,000 tons a year and will take 30,000 carloads of merchandise freight off the congested railroads. The Fuel Administration asks that other industries affected get in touch with Washington without waiting for formal notice.

It is believed that the operation of this plan of voluntary conservation on the part of non-war industries will forever lay the ghost of the "cut-off-the-non-essential-industries" agitation, which has been going on since the United States entered the war, and automatically will balance the relation between the production and consumption of coal and prevent any repetition of the present coal shortage.

It is not the least of the merits of this plan, according to the Fuel Administration, that it is simple. Perhaps its greatest merit lies in that fact that such restrictions on fuel consumption as are absolutely necessary to keep the budget balanced will be arranged by the industries restricted and will be volunteered by them. The Fuel Administration merely comes in at the end with an order to make the voluntary curtailment fully effective.

Fuel needed in 1918 for army and navy purposes, for munition works, for public utilities, for domestic consumers, and for factories working on war material is scheduled in the budget for 100 per cent fulfillment. With this figure, and the estimated production of coal during 1918 as a basis, a subtraction shows the amount of fuel left for non-war industries.

The percentage of reduction asked of the different industries by the Fuel Administration will, of course, vary, partly upon advice of the leaders of each industry as to what is practicable and safe shrinkage as compared with the great business activity of 1917; partly, also, it will vary with the character of the business. In proportion as an industry contributes less to the war of domestic necessities, it will naturally increase its contribution of self-limitation.

One advantage of the plan is elasticity. The total curtailment of coal consumption when completed will theoretically equalize the coal demand of the country with the coal supply for 1918. If later it turns out there is still a prospect of scarcity, a slight increase of the voluntary curtailment can be arranged instantly and without confusion. Every industry through this first order will be in touch with the government and its requirements. It can put into effect a still further curtailment if necessary, or it can quickly increase its activity if notified by the government at a later date that the curtailment already arranged appears to be excessive.

This plan, if completely successful, will quickly solve the fuel problem and will introduce a new and valuable principle into the settlement of many difficult war problems. First: Advantage is taken of the unquestioned patriotism of a large majority of business men to devise with their aid an intelligent program of curtailment, sufficient for government purposes but not destructively exaggerated. Second: An order of the Fuel Administration backed by the authority and penalties of the Lever law will compel an equal compliance by every member of each industry and thus assure those who would gladly make their share of the sacrifice that no advantage will be taken of their patriotism by unscrupulous competitors.

New York Fuel Conservation Committee Holds Meeting

THE fuel conservation committee for the electric railways of the Second Public Service District held a meeting at Rochester on Jan. 10. In addition to the members whose names were printed as members of this committee last week, W. J. Harvie, president Syracuse & Suburban Railroad, is a member. H. B. Weatherwax, vice president United Traction Company, Albany, is chairman of the committee.

After a week's shutdown at the Fern Hill coal mines outside of Owensboro, Ky., due to the blocking of railway tracks by snow, the Owensboro Street Railway finally prevailed on the miners to get to work and clear the track.

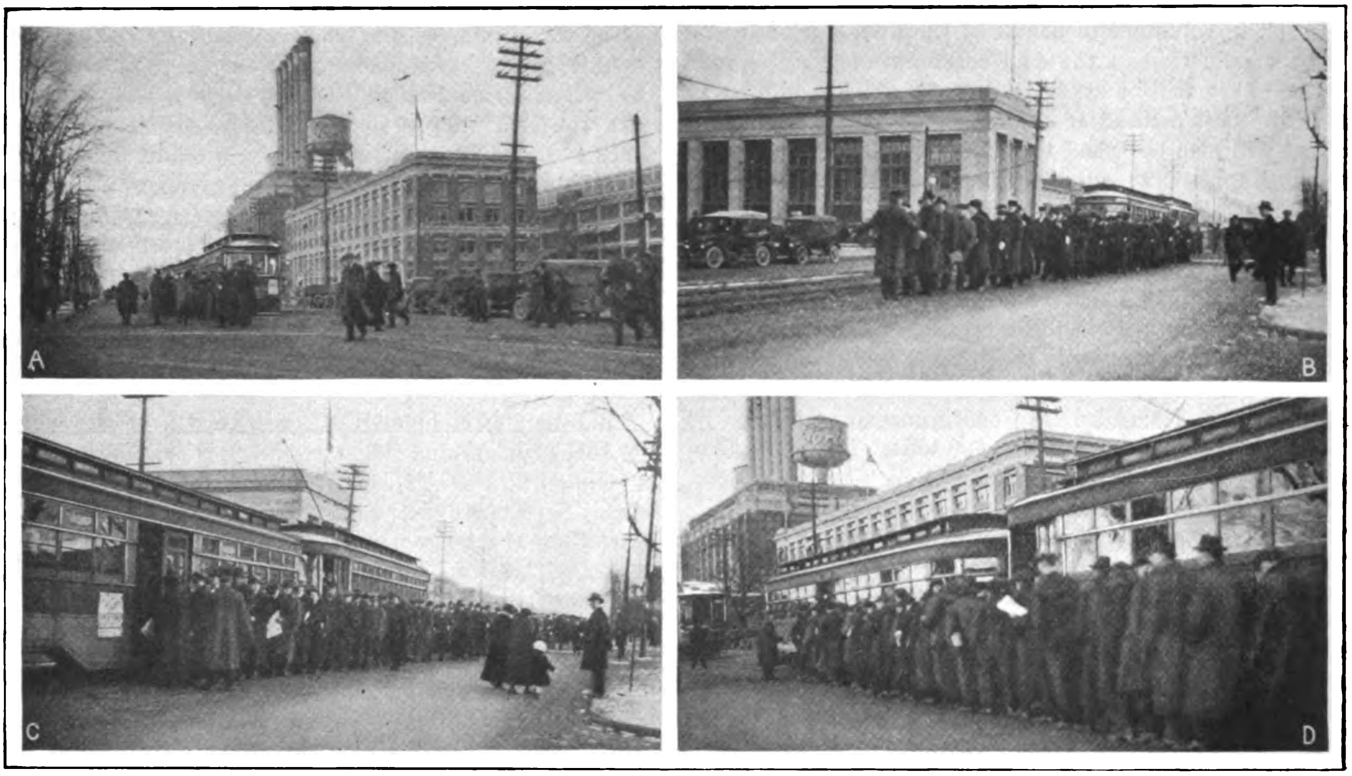
Loading Surface Cars at 400 Passengers Per Minute in Detroit

Through Co-öperation with the Ford Motor Company Detroit United Transports 30,000 Employees in Seventy-five Minutes

By W. E. Cann

Assistant to the General Manager Detroit United Railway

THE transportation of the employees of the Ford Motor Company has presented problems of no small difficulty to the transportation department of the Detroit United Railway. In spite of the company's best efforts it found great difficulty in handling crowds of 10,000 to 20,000 men, all anxious to get home on the first car. There was so much crowding that many fares were missed, intending passengers even climbing into the cars through the windows. After some months of this experience and without being able, even with the assistance of special police officers and carhouse employees, to develop any semblance of order, the company appealed to the Ford Motor Company for co-operation. As a result a plan has been put into effect which has given very satisfactory results. The operation of the plan is shown in the accompanying photographs.



SCENES ON WOODWARD AVENUE, DETROIT, SHOWING MANNER OF LOADING CARS AT THE FORD MOTOR COMPANY'S WORKS DURING THE AFTERNOON RUSH HOURS

Now between the hours of 3.30 p. m. and 4.45 p. m. there are handled at the Ford plant approximately 30,000 to 40,000 employees of the plant, and this with good order and dispatch. The benefits of a systematic and just loading plan are now so apparent to the men themselves that they would hesitate before going back to the old way even if given the opportunity. The pictures show the loading only on Woodward Avenue, but the same arrangement is in effect at four or five other points on the streets and on the company's own property in the vicinity.

The plan is simply this: At the entrance doors of both the motor car and the trailer are stationed employees of the railway company, the man at the motor car being a car starter who dispatches the cars at regular intervals. During the rush-hour peaks in the evening this interval is about thirty seconds. The employees form in two lines, the line nearer the track entering the front car and the other the trailer. When the starter decides that a car is to leave he steps in behind the last passenger on the steps, the man at the trailer car door, who is watching for this move, doing the same. These two men see that the car doors are closed and the car starts on its trip.

For the first week or two of this operation there were some difficulties in keeping the men in line, but after the Ford Company had discharged some of the most obstreperous of its men, the employees began to realize that it was to their advantage to line up and to board the cars in an orderly fashion and in their proper turn. They insisted that the last men to arrive should always be forced to fall in at the tail end of the line.

Under the present arrangement cars leave the Ford works, generally speaking, with something less than a seated load, thus allowing the crews to pick up passengers on the way downtown. It might seem at first that it would be difficult to overcome the objections of men to being stopped from boarding a particular car when there is still room inside. Fortunately the justice of leaving some space for passengers who may wish to board later appeals to the men, and now any dispute is stopped by them by the simple expedient of pulling an objector out of the line and forcing him to the rear.

A committee of prominent railway men from the East who visited Detroit recently to study the operation of this loading plan stated that they considered as no less than remarkable the way in which co-operation had been secured.

"Credit System" of Wage Payments in Chicago

A Novel Plan for Encouraging Long Service Has Been Introduced by the Chicago Motor Bus Company—Each Employee's Earnings Are Based Upon the Length and Character of His Work, the Older Employees Sharing Also in the Profits of the Company

A NOVEL system of wage payments has been adopted by the Chicago Motor Bus Company, whereby each employee's earnings are dependent upon a "rating" that is established by the length and the character of his services. The new plan, which has been called the "Credit System" by its originator, Harold B. Weaver, vice-president of the company, applies to all drivers, conductors, starters, inspectors and others occupying comparable positions. Its application is effected by means of "credits" which are given for each month's service and entered upon each employee's record, certain "discounts" being deducted from the total in case the employee violates rules of the company. Older employees who, by their long service have acquired a very large total number of credits, participate to a certain extent in the company's earnings through "employees' dividends," these being declared as a percentage of the employees' annual earnings at the same percentage rate as is paid upon the company's stock.

CREDITS AND DISCOUNTS

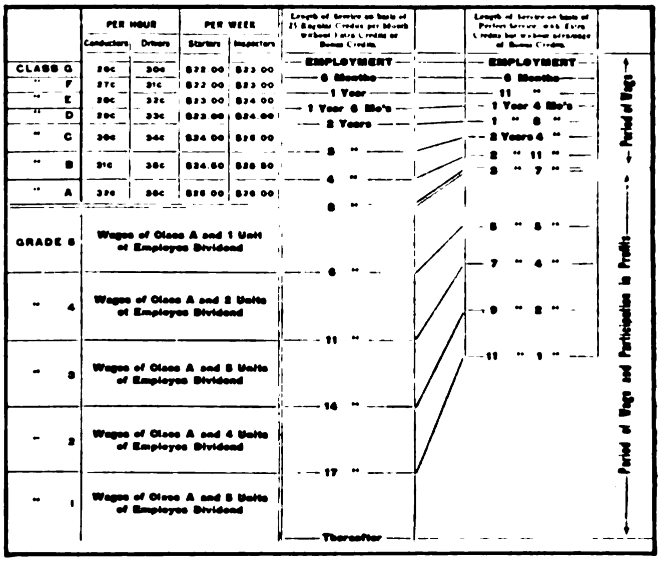
There are three kinds of credits, as follows: Regular credits, which are given for one month's service; Extra credits, which are given for continued perfect service; Bonus credits, which may be given in the discretion of the company for extraordinary services or on a competitive basis under prescribed conditions.

Regular credits are given at the rate of twenty-five for each month that an employee remains in the company's service, regardless of his capacity. Extra credits are given after any three consecutive calendar months of perfect service, that is to say, three calendar months during which no discounts have been imposed. Such employees receive five extra credits per month from the fourth to the ninth month (inclusive) of continued perfect service, and thereafter are given ten extra credits from the tenth to the twenty-first month (inclusive), subsequently being given fifteen extra credits per month so long as perfect service is continued. Bonus credits may be given at any time for extraordinary services or unusually efficient work, upon the recommendation of a superior officer and with the approval of a board of employees of the same rank as the recipient.

In the case of violation of any of the rules, there shall be charged to the record of an employee a number of discounts ranging from one to fifty, according to a printed schedule of discounts. These discounts are imposed only by the heads of departments or general company officers, and their application cannot be remitted in case infractions of discipline have actually taken place. Neither can there be imposed any greater number of discounts than fifty for any particular offense.

The record of each employee's credits and discounts are kept by the company, and each employee has the right of access at any time to his own record, but not to the record of any other employee. The total number of credits obtained from all sources and total number of discounts imposed for all reasons are totaled at the end of each calendar month, and the total number of discounts subtracted from the total number of credits. The balance of credits represents the "rating" of each employee, and this rating is used as the means for determining his rate of wage and, subject to certain conditions, his right of preference as to work and promotion.

Whenever discounts are charged against the record of an employee, written notification is submitted to him, and in the event that an employee believes a charge of discount to be unjust or otherwise in error, he has the right of appeal by signing his name in the space provided on the notification for that purpose. Such appeals are heard before a board appointed by the president of the company from among officials equal or superior in rank to the one imposing the discount. Witnesses in such hearings may be called by either side, and these are paid their regular rate of wage for the time thus occupied.



CREDIT SYSTEM OF WAGES—CHART SHOWING WAGE RATES AND PERIOD OF SERVICE REQUIRED FOR EACH

EFFECT OF DISCONTINUANCE OF SERVICE

In the event that an employee resigns or is laid off through reduction of force, or if for any other reason not reflecting upon his record he leaves the service of the company, he is given a certificate of honorable discharge which shows his rating at the time. If he again enters the service of the company he starts to work with all of the credits that he possessed at the time he left the service and is entitled to whatever rate of compensation this rating brings.

In the event that an employee again enters the service of the company after he has been discharged for cause, he has to start on his duties without any credit whatsoever. Dishonorable discharge is brought about by a failure to perform work assigned to an employee, thus automatically forfeiting all credit acquired up to that time. Discharge is also brought about by the establishment, on an employee's record at the end of his first two months of service, of more discounts than credits. Also, any employee who has been with the company for a period in excess of four months and who for any period of three consecutive months averages less than fifteen credits per month, or for any period of six consecutive months averages less than eighteen credits per month, or for any period of one year averages less than twenty credits per month, is subject to discharge.

Demotion without discharge may be applied at the discretion of the company, but such demotions do not affect an employee's rating nor do they suspend his right to extra credits.

Credits continue to accrue to the benefit of an employee while on a regular vacation, but in case an employee obtains an extended leave of absence from work the accumulation of regular credits during the period of absence is in the discretion of the company, and extra credits for continuous good service do not accumulate.

EFFECT OF RATING ON WAGE

In the schedule of wages seven different classes are provided for, these differing from each other by increments of 1 cent per hour, each class including employees whose ratings, or net total of credits for each month have upper limits amounting respectively to 150, 300, 450, 600, 900, 1200 and 1500. The rates of wage applying to each one of these classes are more or less arbitrarily fixed and may be revised from time to time, the operation of the system being independent of the actual rates of pay by the various classes. Thus if the rate of wage for conductors in Class G (the lowest of the seven classes) is 26 cents, all conductors with ratings of less than 150 will get 26 cents per hour. When a conductor accumulates more than 150 credits he moves up into Class F and is paid 27 cents per hour.

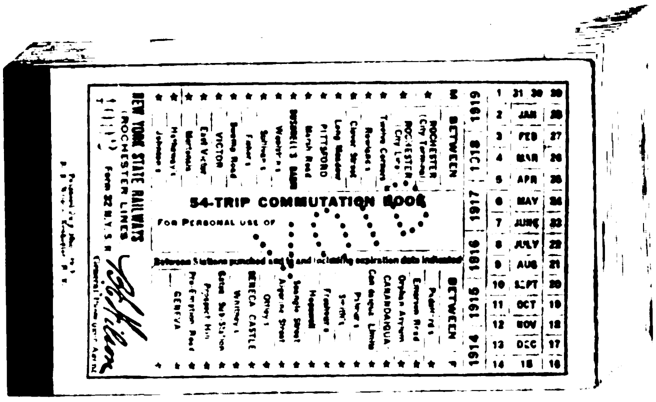
For employees having ratings that are in excess of 1500 credits, there are provided five grades, and these employees, in addition to Class A wages, participate in the company's earnings through an "Employees' Dividend." This is declared at a rate which, if possible, is to be equal to the dividend declared on the stock of the company for the same period, but in no case is the employees' dividend to be less than at the rate of 3 per cent per annum. This dividend is to be based on the total amount of money paid during the period involved, as wages to each of the employees participating in the dividend.

All employees in the five grades that have, during the period covered, earned an average of not less than twenty credits per month are to be entitled to participate in this dividend. Each of those in the lowest grade is entitled to an amount equal to the declared percentage applied to his total earnings during the period covered. For each employee in the next higher grade, the amount of the dividend is based on the same percentage as in the lowest grade, but this percentage is applied to twice his total earnings during the period covered. For the three higher grades the amount is based respectively on three times, four times and five times the employee's total earnings during the period covered. Thus, if employees' dividend is 6 per cent, the employees in the highest grade receive bonuses equal to 30 per cent of their earnings during the previous year.

In general, it may be said that this system permits employees to enjoy an income which increases over a long period of time and is an inducement for them to remain in the service of the company. Long service not only produces individually efficient work, but also efficiency of the all-important character that co-operates with other members of the organization and is thus of special value to the company. The company recognizes that each employee who remains in its service has, in a sense, an investment value in the company. This is the investment of years of service which, except for general experience gleaned, is of no value to him in the service of another company. Naturally, such a principle points to an eventual participation in earnings by employees, but inasmuch as it is continuous service that is of value to the company, and since it is continuous service alone that is an investment by the employee, any participation must be purchased not with money but with time. In brief, the right to participate in earnings does not accrue to an employee who has not earned this privilege by a certain length and character of service.

Commutation Ticket Book for Interurban Railway Lines

THE New York State Railways and the Salt Lake & Utah Electric Railroad are using a form of commutation ticket book devised and patented by B. E. Wilson, general traffic and freight agent of the first-mentioned road. The feature is that all of the tickets are punched at one time to indicate the points between which the holder has purchased transportation.



COMMUTATION TICKET BOOK FOR USE ON INTERURBAN LINES

The punching is an easy matter and a punch suitable for the purpose can be had at a cost not to exceed $1. On the New York State Railways a round hole about 1/16 in. in diameter is punched. This company uses a ticket 2¾ in. x 4⅜ in. in size and a weight of paper such that the thickness of a fifty-six-ticket book, including both covers, is about 3/16 in. The Utah line ticket is 2⅜ in. x 4½ in., and it is on much lighter paper. The proper size and weight of ticket is a compromise of cost and of convenience in carrying the books and handling the coupons.

LETTER TO THE EDITOR

Fundamentals of Successful Transportation

BOARD OF PUBLIC UTILITY COMMISSIONERS
NEWARK, N. J., Jan. 8, 1918.

To the Editors:

In response to a notice on advertising page 20 of the ELECTRIC RAILWAY JOURNAL for Dec. 22, under the title "Have You Got the Goods?" I am inclosing a statement relative to the handling of passengers at greater speed, but with greater safety and comfort. While these suggestions are probably not entirely new to operating officials in general, yet their arrangement and grouping may place them before officials and others who may be interested in such a manner as will be conducive to a more intelligent, practical application of some or all of them where practicable.

FOUR FUNDAMENTALS TO BE CONSIDERED

To handle passengers with a maximum degree of speed, safety and comfort in connection with cars operated on surface lines, certain factors should be taken into consideration as follows: (1) Type of car. (2) Character of platform employees. (3) Character and distribution of traffic employees. (4) Education of the traveling public.

1. In designing cars with these objects primarily in view the following points should be observed: (*a*) Type, arrangement and location of entrance and exit. (*b*) Seating arrangement; width of aisle. (*c*) Height and type of step. (*d*) Type and arrangement of doors.

2. In selecting employees, especially conductors, observe the following: (*a*) Disposition. (*b*) Age. (*c*) Training.

3. As regards distribution and character of traffic employees consider: (*a*) Transfer intersections. (*b*) Other points of heavy loading or unloading. (*c*) Disposition of employees.

4. In educating the public, note the following: (*a*) Best method of advertising within the cars. (*b*) Best method of general advertising.

1*a*.—*Entrance and Exit.*—The rear-entrance and front-exit type, especially for urban and suburban service, furnishes the best type for speed, safety and comfort. For interurban service with few stops the rear entrance and exit will be found satisfactory, although the front exit in such cases is also recommended.

DESIGN OF CAR

1*b*.—*Seating Arrangement.*—For all urban and for short suburban service, longitudinal seats with ample aisle space should be adopted. For long suburban and for interurban service, cross seats with a reasonably wide aisle is advisable.

1*c*.—*Steps.*—Low steps should be adopted on cars for all classes of service. Height should not exceed 15 in. from rail to first step, 14. in. from step to step or step to platform, and 8 in. from platform to car floor. Shorter dimensions should be adopted wherever possible. Platform and car floor should preferably be on the same level on cars operating in all classes of service. Steps should be of the folding type in all cases, except, possibly, for interurban service.

1*d*.—*Doors.*—Doors should be of the folding type, preferably manually operated. In the case of suburban service particularly, bulkhead doors and the bulkhead itself should be eliminated.

CHARACTER OF PLATFORM EMPLOYEES

2*a*.—*Disposition of Employees.*—One good-natured, even-tempered platform man, using good judgment, can accomplish more in the matters under consideration than a dozen men of other types.

2*b*.—*Age.*—Young men, and also many men of middle age, are best adapted for most efficient service.

2*c*.—*Training.*—Much can be accomplished in the proper training of employees in habits of courtesy, exercise of good judgment, etc., who without such training would be totally unfitted for the job.

DISTRIBUTION OF TRAFFIC EMPLOYEES

3*a*.—*Transfer Points.*—Inspectors should be stationed during periods of heavy traffic at all heavy transfer intersections. Their primary duty at such localities should be to facilitate and regulate the loading of cars and the dispatching of the same.

3*b*.—*Other Heavy Loading Points.*—Inspectors or other traffic men should also be located, during periods of heavy traffic, at all points of heavy loading other than transfer intersections. Their duties should be the same as mentioned in 3*a*.

3*c*.—*Disposition of Traffic Employees.*—Inspectors and other traffic employees should be men of good judgment and even disposition. They should be selected from among such platform men as have proved themselves most efficient in handling passengers.

EDUCATION OF PUBLIC

4*a*.—*Advertising in the Cars.*—Notices posted prominently and attractively in the cars requesting passengers to "Leave by the Front Door," "Move Up Forward," "Step Lively," "Put Yourself in the Other Fellow's Place," etc., materially aid in accomplishing the objects desired.

4*b*.—*General Publicity.*—Periodical publicity campaigns carried on through the local newspapers and other advertising mediums invariably bring about good results. Such notices or advertisements should be carefully worded and should demonstrate the many methods whereby patrons of the road may aid in promoting speed, safety and comfort of themselves, as well as of their fellow travelers.

GENERAL CONCLUSIONS

It is, of course, realized that *all* of the herein mentioned suggestions are not practically applicable in their entirety in all cases, or possibly in any one case, especially in the present period of abnormal conditions. These suggestions are submitted, however, as approaching what are believed to be ideal conditions for accomplishing the results desired. Any step in the directions suggested which has not been already adopted will be a further approach to the ideal conditions as set forth.

H. C. EDDY,
Senior Inspector of Traffic, Board of Public Utility
Commissioners, State of New Jersey.

Council of National Defense Issues Extensive Report

More Than 400 Persons Were Engaged Continuously During the Past Year in This Work which Is Elaborately Organized

IN INTRODUCING a report of its work from inception to the end of the fiscal year closing June 30, 1917, Director W. S. Gifford of the Council of National Defense outlines the scope and purposes of the work of the Council. He states that the effort has been to make available to the United States the best thought and effort of American industrial and professional life for the successful prosecution of the war. The organization of the Council has endeavored to hold itself in readiness to meet new demands caused by the swift changes in strategy and rapid improvement in war machinery.

The several fields covered by the Council's work have been as follows:

1. Supervising co-ordination of purchases for the executive departments of the government, including the development of new sources of supply for both raw materials and finished products.
2. Standardization of specifications for tools and implements used in the manufacture of munitions.
3. Co-operative organization of transportation and electric communication for war service.
4. Inauguration with the government departments of an aircraft program and assistance in rendering this program an industrial possibility.
5. Organization for war of the medical profession.
6. Conducting a campaign to assist commercial business in meeting the demands made upon it by the war, and aiding establishments to make available for the needs of the government men, supplies, and equipments without impairing the essential service of trade and without imposing unnecessary hardship upon the people at large.
7. Development and stimulation of motor transportation facilities for government use.
8. Organization for common counsel of the leaders of the American labor movement, joined with representative employers and persons prominent in civic and industrial life, for the effective enlistment of the labor forces of the country for the conduct of the war.
9. Bringing together and concentration on war work of the engineering and educational professions, including the promotion of scientific research for the benefit of the national defense.
10. Effective centralization and direction of the efforts of American women on assistance in the conduct of the war.
11. Organization of the coal industry for more effective production and distribution of fuel.
12. Centralized direction of the activities of the several states in their effort to aid in war.

At the end of the fiscal year, the report states, there were 408 persons engaged on continuous work for the Council. Of this number 168 were receiving compensation and most of these were clerks and stenographers. This summary does not take into account the large number of additional volunteers who were devoting part of their time to the Council's work, whether in Washington or elsewhere.

Coal Shortage and Electric Railway Service

There Was No Material Change in Conditions During the Past Week—They Are Still Critical in All Sections

ALTHOUGH the United States Geological Survey reports a recovery from the recent "slump" in soft coal production, there is no evidence of adequate increase in production. December was the leanest month since April. The production was at the annual rate of about 545,000,000 tons, an increase of 8.3 per cent over 1916.

LIGHTLESS NIGHTS SAVE COAL FOR KANSAS CITY RAILWAYS

After a few days of mild weather at Kansas City, returning cold put gas usage out of the question. The new year found consumers using unusual means to economize in the use of coal to enable the Kansas City Railways to keep street-car service as nearly normal as possible and at the same time furnish a normal supply of current to the Kansas City Light & Power Company for distribution to homes and industries.

The advent of lightless nights makes an estimated saving of 150 tons of coal per week for the railway company. However, officials of the lighting company say that the success of the lightless nights depends more upon the patriotism of the average citizen than upon the big industries. More strenuous methods must be used, it is believed, to cause smaller consumers to economize on lights during the fuel shortage.

A propaganda is being started by Missouri officials to cause consumers of coal to purchase early next spring for use the following winter. State Fuel Administrator Crossley was in Kansas City on Dec. 30 for the purpose of instigating such co-operation on the part of consumers to guard against a repetition of this winter's crisis.

OHIO UTILITIES IN BETTER CONDITION

While electric-railway operation was far from normal in Ohio last week the actual danger of suspension had passed for the time because of the arrival of fuel sufficient to last until further expected shipments can be received.

It is hoped that the pooling plan devised by the coal operators, and the supervision of railroads by the government, will have the effect of furnishing a steady, if not a plentiful, supply hereafter.

Normal street-car, power and light service at Columbus depends in part on the transportation of coal from a mine in West Virginia in which the Columbus Railway, Power & Light Company purchased an interest last fall. Its contract provided for half of the output of 1500 tons daily, which should have increased the company's coal protection by 500 per cent for the winter. The government, however, commandeered the output for Eastern shipment early in the winter, and the company was left to do the best it could. This coal is now available, and the supply depends only upon the ability of the railroads to haul it. The company owns rights in slack piles in the Hocking Valley district, but transportation facilities are just as bad there. At present it is receiving a supply from day to day.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

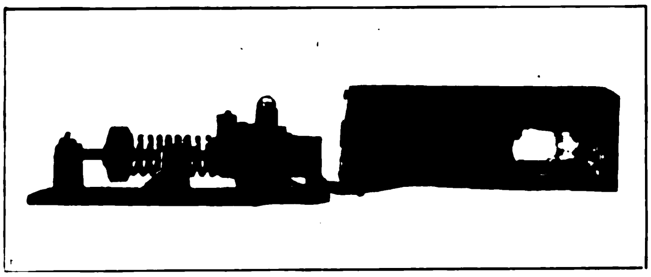
ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

Decreasing Governor Maintenance

By James W. Brown

Superintendent of Shops Wilkes-Barre & Hazleton Railway, West Hazleton, Pa.

THE accompanying illustration shows a Westinghouse G.I.A. governor changed from a double to a single contact. This company has ten equipments of G.I.A. governors, now twelve years old. Up to five years ago we had a great deal of trouble with this governor due to the contacts burning off, the average length of time in service being about three months. They run now from shopping to shopping, which means from eighteen to twenty-four months, and during the time since the change we have had no failures. This change was brought about by our air-brake inspector, Dave Kauffman. We put a long sliding contact on the coil side of the governor. This contact is a piece of tobin bronze 3¾ in. long, ¾ in. wide and ¼ in. thick, with about 3-lb. tension on the contact and only charged when the governor cuts in.



GOVERNOR CHANGED FROM DOUBLE TO SINGLE CONTACT

We made a sliding contact out of tobin bronze on account of its superiority over copper, as we found that two sliding contacts of copper do not wear smooth and soon cut, resulting in a sluggish governor, whereas tobin bronze with a copper contact sliding on it wears very smooth.

Empire State Shop Notes

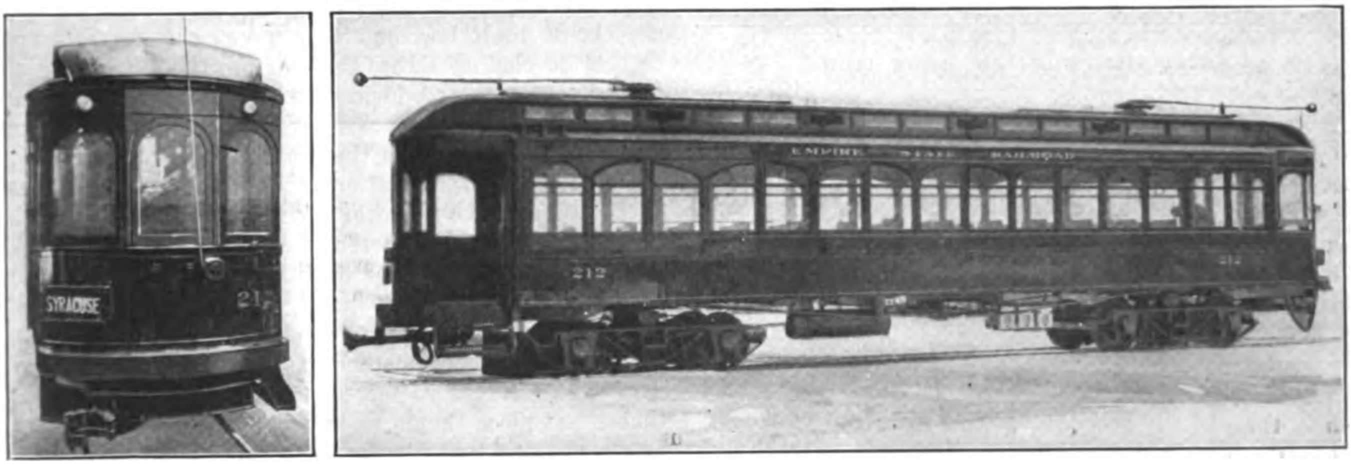
Large Interurban Car Remodeling Job Just Completed—Sheet Steel Pilot a Feature

WHEN J. C. Nelson took over the general managership of the recently organized Empire State Railroad Corporation, a part of the former Beebe system centering at Syracuse, N. Y., he was in doubt as to the extent to which the federal government would require transportation for soldiers between points on the system and the temporary encampment located near the company's shops at Lake Shore Junction. Therefore, to be safe he decided to remodel six long interurban trail cars, built originally for summer traffic, by making motor cars of them and inclosing them for winter service. This job has been going through the Lakeland shops during the fall and early winter under the direction of A. B. Metcalfe, master mechanic, and the cars are now giving excellent service on short runs on the line between Syracuse and Oswego.

The cars formerly had low side sheathing with correspondingly deep windows. The sheathing has now been brought up to standard height, the line of the original sheathing and the added height being clearly discernible in the accompanying photograph of the complete car.

In accordance with the new color standards adopted by the company these cars have been painted a Pennsylvania Railroad red and varnished. They are striped in black and lettered in gold.

The bodies are mounted on light trucks, equipped with four 40-hp. Westinghouse 101-B motors, gear ratio 22 to 62. This power is ample, as the line is practically level. The truck frame carries a special sheet-steel pilot made in the company's shops. This weighs 150 lb. and is of No. 10 gage sheet. The pilot forms an excellent snowplow as well. As it is attached to the truck frame rather than the car body, its motion with



FRONT OF EMPIRE STATE REMODELED CAR, SHOWING CLASSIFICATION BULL'S EYES, AND LONG TRAIL CAR TRANSFORMED INTO INTERURBAN MOTOR CAR

Experiences with Interurban Car Axles

The Author Gives the Results of Experiments with Several Kinds of Steel—Wheel Fit Was Increased from 6 In. to 7 In. with Good Results

By A. B. Metcalfe
Master Mechanic Empire State Railroad Corporation,
Syracuse, N. Y.

[Note.—In view of the present interest in improving the quality of car axles and knowing that the mechanical department of the former Beebe Lines had made extensive studies of the subject as related to interurban car operation, we asked Mr. Metcalfe, formerly connected with the Beebe System, to give our readers a brief summary of his observations. This article is the result.—Editors.]

On the lines of the Beebe System, of which this railway formerly was a part, we tried out a number of different grades of material for car axles, with varying results. Until the last year or two all of our axle defects occurred at a point between the hub of the gear and the hub of the wheel on the gear end of the axle. On our equipments the gear was mounted close to the wheel. Recently, however, we have had some failures at a different part of the axle, namely, on the motor axle bearing seat. We have not as yet been able to determine the cause of this. At one time we thought that it was due to hot motor axle bearings, but we have had at least one case of breakage at this point without previously having had any hot axle bearings. Curiously enough, this occurred on a hard vanadium steel axle.

At one time we had about come to the conclusion that mounting the axle gear on an extension of the wheel hub was the solution of the breakage problem, but this scheme proved to be impracticable in the case of rolled steel wheels on account of the expense of making the wheels. To test out the matter, however, we purchased some chrome nickel sleeves, on which the wheel and gear were pressed, and the sleeve was then pressed onto the axle. Bearing was provided, however, only for the length of the wheel hub, the sleeve being counterbored about 1/16 in. larger than the axle, under the gear. The idea was that the point of greatest stress in the axle would be inside the sleeve, and in the case of a break in service the longer piece of the axle holding the motor could not drop down because it would project 6 in. or more into the sleeve.

To prove that the use of this sleeve removed the danger resulting from an axle breaking in service, we cut an old axle into two pieces, the cut being about where they nearly always broke, and mounted the sleeve, gear and wheel on the short end. We ran a car equipped with this axle all around the shop tracks, curves and switches, and out on the road, the only indication that the axle was in two pieces being that on a quick acceleration the end on which the gear was mounted would spin, while the other end moved only as fast as the car. These sleeves are still in service and have given very high mileage, but the shop operations involved in applying them made their extensive use, we thought, impracticable. The sleeves, also, were expensive to make. One fine feature about them, however, was that we were never afraid to operate the axles fitted with these sleeves. Later to reinforce the axle at the weak point we increased the diameter of the wheel fit from 6 in. to 7 in. As the gear seat was originally 7 in., this made the axle 7 in. in diameter at the point where practically all the cracks had developed. None of the axles which have a 7-in. diameter wheel and gear fit has developed cracks at this point, which tends to prove that the previous axles were weak here. Cracks developed at the other end close to and inside the wheel hub.

When we first started operation the cars were equipped with open-hearth untreated steel axles, most of which developed cracks in the first 250,000 miles, but others are still in service. Some of these have made between 600,000 and 700,000 miles. Next we got some heat-treated carbon steel axles, but these were found at first to be too hard and gave trouble in less than 100,000 miles. Lower carbon steel was procured and has given very good service. We tried some low carbon and nickel steel axles, specially treated. These were very soft and the elastic limit low, and they gave very low mileage before developing defects requiring them to be discarded. The axles which have given the best results are of vanadium steel, with wheel and gear fit 1 in. larger in diameter than the main body of the axle.

Our method of inspection is to take a very fine cut with a sharp lathe tool over the section where the crack is liable to develop, and if the axle has the least crack in it the operator can see it with a naked eye. We had scrapped more than 200 axles from fifty cars in the last seven years. All of the cracks were discovered in the above-mentioned method of inspection. The cracks have varied in dpeth from 3/32 in. to 7/8 in. We believe that a test piece should be taken from each end of each axle made, and that a report of a test made by the manfacturer should be furnished to the customer.

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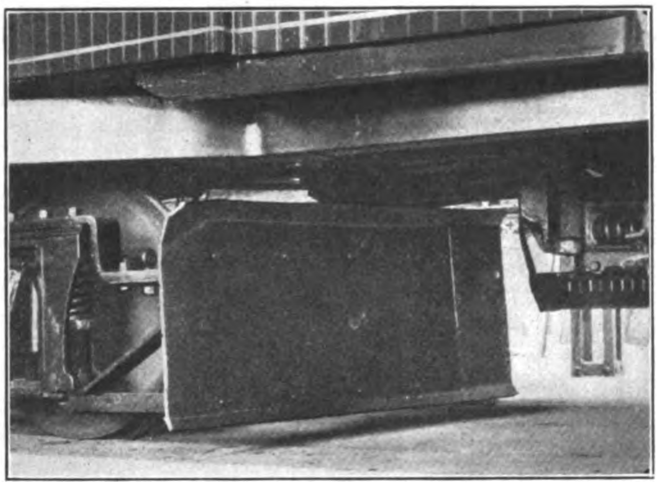


SHEET STEEL PILOT AND SNOW PLOW

respect to the track is very small, hence it can be set quite close to the track.

For classification markers on these cars two bull's-eyes are set into the letterboard just under the vestibule hood and lighted through colored glass slides. Between the lamp and the lens is a frame in which is a two-color slide by means of which the color can be changed very quickly.

These cars weigh, equipped, about 56,000 lb., and the seating capacity is sixty. The rattan-covered cross seats give the interior the appearance of an unusually long city car. There is no separation into general and smoking compartments.

Determining Stray Power of a Transmission Line

The Author Presents Data Taken in a Test on a 115-Mile Railway Transmission Line in the Middle West

By D. D. Ewing
Associate Professor of Electric Railway Engineering, Purdue University, Lafayette, Ind.

THE data presented in this article were taken in a test made under the writer's direction for the purpose of studying the operating conditions existing on the transmission line of the Fort Wayne & Northern Indiana Traction Company. This line extends from Fort Wayne to Lafayette, Ind., a distance of 115.4 miles, measured along the line. It connects the power plants of the company located at the two places. The system is three phase, with a line-to-line voltage of 33,000 and a frequency of 25 cycles. The line consists of three No. 2 B. & S., hard-drawn copper wires, arranged to form an equilateral triangle, and with a spacing which varies from 36 in. to 72 in. The average spacing was estimated to be 60 in. The wires are supported on pin insulators mounted on wood poles spaced 100 ft. apart. Some of the crossarms are of wood and some are of steel, the former predominating. Air-break sectionalizing switches are located at each of the ten railway substations. The lengths of the several sections between substations, starting at the Lafayette end, are as given in the accompanying table.

TABLE GIVING LENGTHS OF LINE SECTIONS

Section	Length, Miles	Total Distance, Miles
1	9.50	9.50
2	8.71	18.21
3	10.66	28.87
4	11.03	39.90
5	11.28	51.18
6	12.52	63.70
7	11.56	75.26
8	14.12	89.38
9	8.82	98.20
10	17.20	115.40

In the Lafayette station the high-tension lines are connected to the 370-volt buses through three step-up transformers having an aggregate capacity of 1125 kva., connected delta-delta. The measured ratio of transformation was 88.8. At Fort Wayne the transforming apparatus consists of two banks of transformers connected in parallel, each bank being of the same rating as those at Lafayette.

The measuring instruments were connected in on the low-tension side of the step-up transformers at the Lafayette power house. Power was measured by the two-wattmeter method. Voltage readings were taken for all three phases, and the current in two lines was measured.

Preparatory to making the test all transformers were disconnected and the line was sectionalized. With the step-up transformers at the Lafayette station connected to the busbars, readings were taken of power, current and voltage. The first section of the line was then connected to the high-tension side of the transformers, and readings were again taken. This process was repeated by connecting on section after section until the end of the line was reached. During the test the voltage at the generating station was maintained as nearly as possible at 370 volts.

The amperes per line, corrected and adjusted to 370 volts, are recorded in Fig. 1. The figure gives the graphical average of the currents in the two lines in which meters were placed. The current shown by the graph as corresponding to a certain distance from the power station is not the current in the line at that point, but is the current input to a line of length indicated by the abscissa of the point. The current at zero length is the exciting current of the step-up transformers. The numerical value of this current is 68.3 amp., and, of course, has a large lagging component. As the sections of the line were connected on successively, the leading current—due to the electrostatic capacity of the line—neutralized the lagging component until a line length was reached at which the power factor was unity. Beyond this point the current input increased rather rapidly, the power factor with the last section connected being 10.4 per cent leading. The drop shown at the end of the graph was occasioned by the exciting current of the Fort Wayne transformers when they were connected to the line with their low-tension windings on an open circuit.

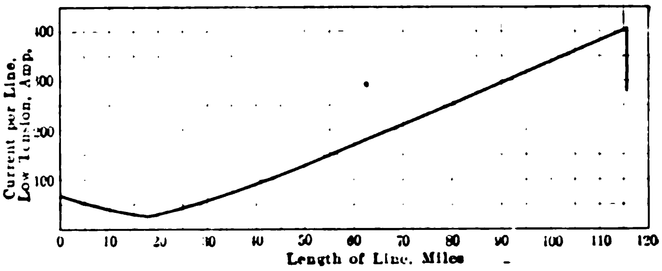


FIG. 1—RELATION BETWEEN LINE CURRENT AND LENGTH OF LINE

The power readings, corrected for scale errors and phase-angle displacements, and adjusted to 370 volts, when plotted gave the straight line *AC* in Fig. 2. On the basis of constant loss in the step-up transformers the intercepts between the lines *AC* and *AB* are the leakage losses of lines corresponding in length to the abscissas at which the intercepts were taken. The input indicated by the point *A* is the no-load loss of the Lafayette transformers. At first thought it might seem that the line *CD* would represent the corresponding no-load input to the Fort Wayne transformers. It will be shown later, however, that this is not quite correct.

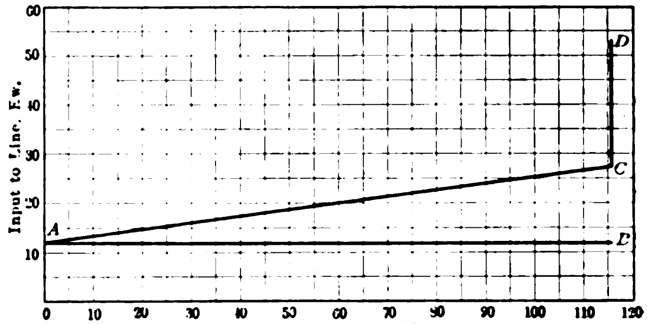


FIG. 2—RELATION BETWEEN POWER INPUT TO OPEN-ENDED LINE AND LINE LENGTH

The assumption of constant transformer loss in drawing the line *AB* is not much in error, since any increase in losses must be due to copper losses. These, even with the whole line connected, will not be great, as the charging current of the line is only about 25 per cent of the current rating of the transformers. In this case the increase would be of the order of 0.6 kw.

The actual charging current for different lengths of line can be found by subtracting vectorially the exciting current of the transformers from the current input to a given length of line. The graphical solution of this problem is illustrated by the vector diagram, Fig. 3. The vector *O*0 is the exciting current of the transformers, and *O*1, *O*2, etc., are the current vector for lines of the several lengths. The vector differences between these vectors, 01, 02, etc., are the charging currents for the different lengths of line referred to the vector for the voltage of the Lafayette station. The horizontal projections of these vectors, 0′1′, 0′2′, etc., are the quadrature components of current for the several lengths. Vector *O*-11 represents the current input with the Fort Wayne transformers connected, and a line drawn from 0 to 10 would be the vector for the current in the transmission line at Lafayette, expressed in terms of the low-tension current.

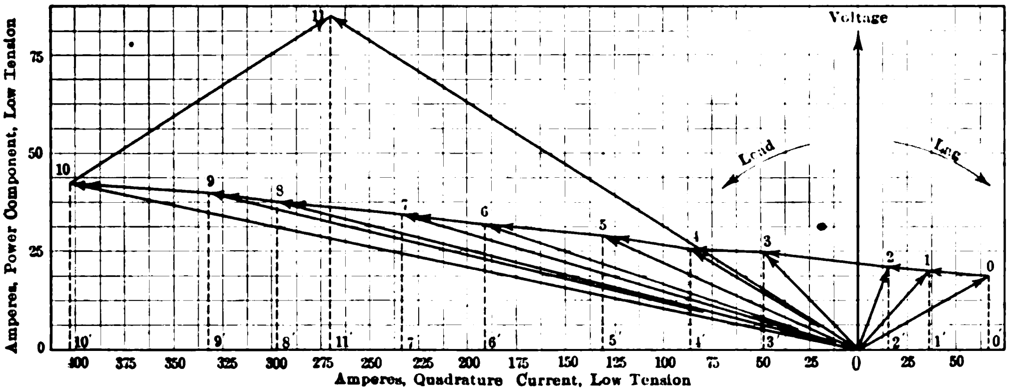


FIG. 3—VECTOR DIAGRAM FOR DETERMINING THE CHARGING CURRENT OF THE LINE

The actual charging currents, quadrature components, for different lengths of line are shown by dots in Fig. 4. For comparison, the upper line, giving the theoretical values, was drawn. Data for establishing this line were calculated from the standard formulas for line capacity, using the average spacing of 60 in. The theoretical value for the capacity current is 0.0437 amp. per mile of line. The lower line in the figure, which was drawn through most of the points plotted, represents the actual power component. The actual line currents, of course, would be found by adding the two components at right angles. As a matter of fact, however, the power components are so small that the actual currents do not differ greatly from those indicated by the upper line in the figure.

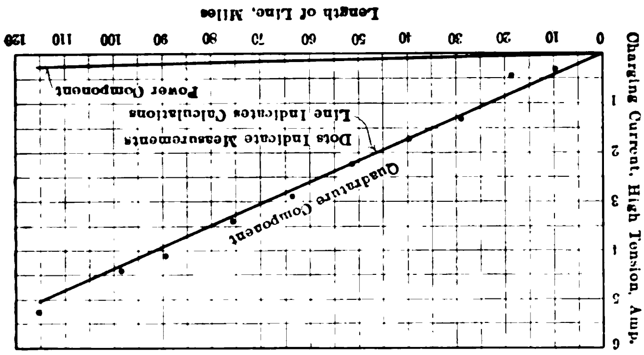


FIG. 4—COMPARISON BETWEEN ACTUAL AND CALCULATED CHARGING CURRENTS

The resistance of No. 2 B. & S. hard-drawn copper at ordinary temperatures is given by wire manufacturers as 0.864 ohm per mile. Using this resistance and the actual currents in the high-tension line for different line lengths, the ordinates for the copper-loss curve in Fig. 5 were computed. Subtracting this loss for a given line length from the corresponding intercept in Fig. 2 gave as remainder the line leakage loss for the given length of line. These losses were plotted to give the leakage-loss curve, Fig. 5, which represents the average of 0.106 kw. per mile for the entire line. This loss obviously is independent of any load on the line.

The copper losses in the line are not the same with the line open-ended and with it closed on transformers. The quadrature current distribution along the line for the two conditions is illustrated in Fig. 6. With the line open-ended, the distribution, at least for the case in hand, will be very nearly as shown by the line *AB;* that is, at the station end the current will be a maximum, and will shade down to zero at the farther end of the line. With the farther end closed on transformers, however, a different condition prevails. The quadrature component of the exciting current of these transformers is represented by the distance 10′-11′, Fig. 3, and has a calculated value of 132 amp. Transferred to high-tension terms, its value is 1.48 amp. To neutralize this lagging current requires 1.48 divided by 0.0437, or 34 miles of line. This will result in a quadrature current distribution for the second case as indicated by the line *CDE*, Fig. 6. Therefore, the only current in the line at a distance of 81.4 miles from the station, is the power component necessary to supply the leakage and copper losses of the last 34 miles of line, plus the no-load losses of the transformers. This would be about ½ amp.

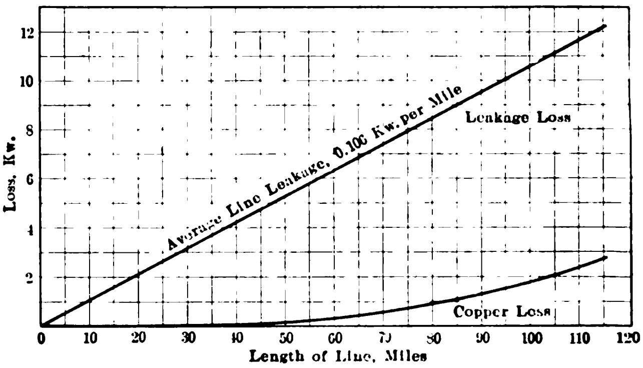


FIG. 5—SEGREGATION OF NO-LOAD LINE LOSSES

For the entire line the copper loss calculated for the first case is 2.75 kw., as shown in Fig. 5. With the distribution of current as in the second case the loss is only 1.06 kw. This decrease in copper loss means that the no-load losses of the Fort Wayne transformers, instead of being 26.4 kw., as indicated by the line *CD*, Fig. 2, are really 1.69 kw. (2.75 kw. minus 1.06 kw.) higher than this, giving a total of 28.1 kw. A check test made from the Fort Wayne end of the line gave results agreeing very closely with this figure.

As a matter of interest, it may be stated that with all substation transformers connected to the line, secondaries open, the input to the line was 90.3 kw. with a leading power factor of 0.90.

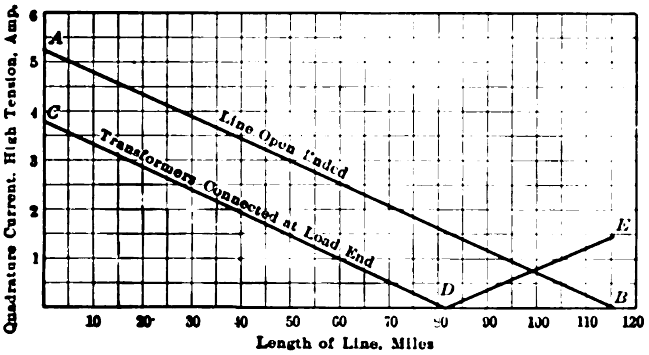


FIG. 6—DIAGRAM SHOWING QUADRATURE CURRENT IN THE LINE AT DIFFERENT POINTS

The author wishes to acknowledge his indebtedness to the Fort Wayne & Northern Indiana Traction Company, whose courtesy permitted the test, and to L. H. Junken, C. N. Iry, E. Pugh, and A. V. Stout, from whose graduation theses the data for the above curves were abstracted.

Coasting at Chicago

SINCE coasting recorders have been installed on the Chicago Elevated Railway, the *Safety Bulletin* published by that company states that records of power consumption show steadily increasing efficiency of the motormen. Some of the most efficient of the men say that they have found it easier to maintain schedule speed although they have coasted more.

One interesting fact brought out at Chicago is that the responsibility for wasted electrical energy should not be entirely placed upon the motorman, as he cannot keep up his schedule without the co-operation of the rest of the train crew. This was proved when a motorman who was found to be very efficient made a remarkably poor showing on a certain day and complained that the fault was due to the conductor, who kept the train tied up at the stations. A conductor who was young and full of "pep" was put on the following day and the coasting time of the motorman was greatly increased.

The coasting records taken on various lines, covering a period of one week, show a percentage of coasting ranging between 33 and 36.4 and a saving of power of 10.6 per cent. The coasting records of individual motormen show variations of 25 to 48 per cent. With a little more experience, this wide margin is expected to be cut down materially. These records are, of course inconclusive, due to the short time that the recorders have been in service, but the Elevated officials are confident that the recorders will do all that was claimed for them.

Effects of Arc on Metal In and Around Electric Weld

By O. A. Kenyon
Electrical Engineer Arc Welding Machine Company, Inc., New York City

THE writer was very much interested in tests reported in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 22, made at the works of the Westinghouse Company at East Pittsburgh, tending to show the effect of the arc on material adjacent to the weld.

Although I have taken an active interest in effects of this kind for a number of years, I was not aware that there was any belief current to the effect that material adjacent to the weld was injured by an arc of 60 volts. It is, however, generally admitted that it is possible to injure material that is deposited in the weld with an arc of 60 volts.

The effect of an arc upon the material adjacent to the weld is dependent upon all factors which determine the temperature of the metal at that point and the length of time that the metal is maintained at a high temperature.

Arcs connected in series with reactance produce a tremendous temperature rise at the moment of breaking the circuit, and it is arcs of this kind which possess the power to injure metal by the mere striking and breaking of the arc. It would be interesting to continue the investigations in series with which a reactor is connected, and also to include pieces in which the metal deposited in the weld is part of the test piece.

Undoubtedly metal deposited on the solid plate in the form of a patch changes the structure of the steel, as was evidenced by the decrease in elongation and reduction of area, as well as the increase in tensile strength. The writer has used this method for local heat treatment of welded joints, that is, by depositing a layer of metal on top of the weld after it is completed and then machining it off, with the result that the weld is stronger and the contraction stresses are practically eliminated.

Commissioners Indorse Fuel Saving but Take Little Formal Action

The various public service commissions of this country are standing ready to co-operate with the government in the saving of fuel, as far as they can be of any assistance. Only a few boards, however, have as yet taken any formal action in this matter. These facts have been brought out by a canvass, begun by the ELECTRIC RAILWAY JOURNAL immediately after Dr. Garfield as United States Fuel Administrator asked the commissions and electric railways to aid in eliminating wasteful uses of electricity. Previous articles, describing formal action taken by the Massachusetts, New Jersey and New York First District commissions appeared in the issues of Dec. 8 and Dec. 15.

In arranging a service flag to be hung in front of its place of business, the Kansas City (Mo.) Railways was confronted with the problem of providing a flag large enough to display properly the 200 stars that will appear in the center white field. By the time the flag is completed there will be approximately 212 stars, as that many men from the electric railways will be enrolled in the service of the government.

Basalt Blocks Make Good Headers in San Francisco

SEVERAL kinds of header blocks have been used on the San Francisco systems, but the United Railroads has chosen the basalt blocks as far superior to others and now uses them exclusively on all parts of the system. Basalt is quarried from the basaltic dikes of California. The four common varieties are gray, blue, brown and porous. The latter is not well suited for headers, and of the others, that having a blue color is the best. This stone if subjected to heavy truck traffic will develop occasional breaks in ten years, but the ultimate life is usually fifteen years. The basalt blocks now cost about $55 per thousand.

The United Railroads has effected some saving where it was necessary to reconstruct the paving between rails in basalt block pavement. These blocks were replaced with asphalt pavement and the blocks were cut up into two or even three pieces suitable for headers at a cost of about $10 to $12 per thousand.

Brick headers have been extensively used in San Francisco, but under heavy traffic they break down quickly. On a thoroughfare where traffic is light an exceptionally good quality of brick put down in 1909 is still in service. Brick from the same source, however, and supposed to be of equal quality, which was put down later, has not given long life under any conditions and under heavy traffic is not expected to have a life of more than a few years. The paving brick available in San Francisco vary in price from local grades costing $25 to $30, up to $46 to $50 for the best grade shipped in from Puget Sound. The latter grade has been used extensively by the Municipal Railway and is considered satisfactory in residence districts or where the traffic is light.

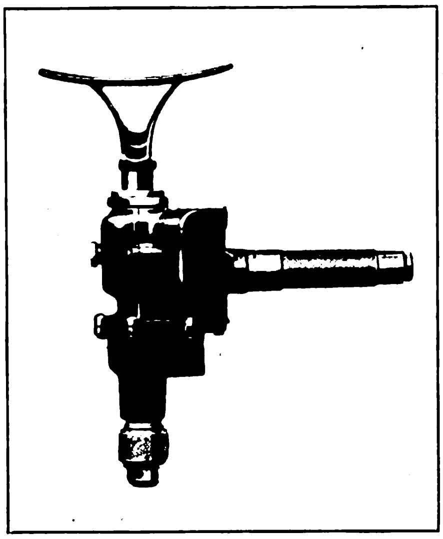
For a while Ohio wood from the Hawaiian Islands was used for headers. This is a very heavy wood with a very low absorption capacity and which will not buckle due to expansion. It therefore requires no creosote or other similar treatment. At one of the crossings where the traffic is very heavy, these blocks have been in service three years and show practically no wear. The Ohio blocks cost only $25 per thousand, while they were available, and they were rated as the best material for headers. The manufacture of the blocks was discontinued, however, because other markets for the wood were found which offered greater profits. If other hardwoods could be procured from the tropics when facilities for water shipment are on a normal basis again, Pacific Coast electric railway operators would doubtless be much interested in their production.

Granite header blocks have been used to some extent and the California granite is regarded as wearing much better than brick but probably not as long as the best basalt. In removing the old granite wall from the site of the former City Hall it was decided to cut the stone up into header block sizes for the Municipal Railway. This is being done by stone masons entirely by hand work, at a cost of $37.50 per thousand. About 50,000 are being made in this way.

The maximum load in the history of the Commonwealth Edison Company of Chicago occurred at 5 p.m. on Dec. 28 when the meters registered 410,910 kw.

A New "Little David" Drill for Light Work

THE Ingersoll-Rand Company has added to its line of "Little David" pneumatic tools a new lightweight, high-power, non-reversible drill especially adapted to that class of drilling and reaming work which may come within its capacity limits of reaming up to 5/16 in. and drilling up to 9/16 in. This new drill has been designated No. 5 "Little David." It weighs 15 lb. and develops a free spindle speed of 1000 r.p.m. With drill chuck its over-all length is 14⅝ in. and the distance from the side of the drill to center of spindle is but 1½ in., which facilitates its operation in unhandy places. The spindle is threaded to accommodate either a No. 1 M.T. socket or drill chuck, and these may be readily interchanged as desired.



"LITTLE DAVID" PNEUMATIC DRILL FOR LIGHT WORK

The four-piston motor is very simple and the convenient accessibility of the reciprocating parts is pointed out to be of advantage. It is stated that the removal of five cap screws permits the crankshaft assembly to be withdrawn in its entirety. The valve is of the rotary type and is gear driven. Roller bearings are used on the connecting-rods and ball bearings on the crankshaft. The No. 5 "Little David" may be had with either breast plate spade handle or telescoping feed screw. In the latter case the length of feed measures

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Twenty Sources of Fuel Waste

ATTRACTIVE posters emphasizing the necessity for saving fuel are being sent each week to all the Doherty properties. A very effective one pointed out the following potential sources of power waste:

1. Too many boilers in service.
2. Holes in the fire.
3. Fires too heavy.
4. Improperly banked boilers.
5. Too much fuel in the ashes.
6. Failure to operate boiler dampers.
7. Irregular steam pressure.
8. Safety valves blowing.
9. Air leaks in the boiler settings.
10. Scale in the tubes.
11. Soot on the tubes.
12. Leaky baffles.
13. Stokers or grates out of repair.
14. Leaky blow-off valves.
15. Steam leaks of any kind.
16. Dirty feed-water heater.
17. Bare steam pipes.
18. Low vacuum.
19. Turbine blading worn.
20. A dirty plant causes fuel waste.

Mechanical Problems in Design of Electric Locomotives

Tracking Qualities—Transmission of Power from Motor to Rail—Design of Motors—Further Development Possible

THE service requirements for steam and electric locomotives are very similar, so that many of the structural problems are common to both designs. There are, however, many problems which are quite dissimilar, due to the fact that electric instead of thermal energy is utilized in the electric locomotives. These points are well covered in an article by W. K. McAfee appearing in the January issue of the *Electric Journal.*

The mechanical problems in the design of the main structures and rotating parts of electric locomotives may be divided into the problems relative to tracking qualities, to the transmission of power from the motors to the rails and to the design of the motors themselves.

The tracking qualities depend upon the position and weight of the motors, the positions of the center of gravity in the vertical and horizontal planes, and the weight transfer. The position of the motor determines the type of drive, and this in turn largely determines the size, number and speed of the motors. A low center of gravity often makes a cheaper locomotive, but better running qualities are secured by a relatively high center of gravity. The important factor concerning the horizontal center of gravity is such disposition of masses with reference to center pins as to eliminate the tendency to swing at high speeds, causing distortion of track and possible derailment. The weight on the rear drivers is increased and that on the front drivers decreased when drawbar pull is exerted, but the tendency of the front wheels to slip is reduced by side rods. In the case of axle mounted motors the dead weight may produce undue stresses in the track structure, but articulated trucks eliminate part of this weight by transmitting it from truck to truck.

Relative to the transmission of power from motors to the rails, solid gear drive with axle suspended motors is used on street and interurban cars. The flexible gear is one of the most important for heavy service, as shocks due to sudden starting and track irregularities are eliminated. The quill type of drive is one solution for mounting motors on the trucks, as with this type vertical motion is permitted between motors and driving axles. Tracking qualities are bettered by mounting the motor higher and connecting to the driver by side rods, many different types of which have been developed.

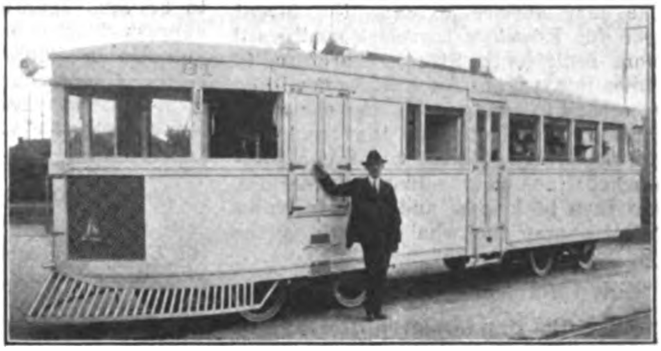
One of the most important problems in the design of motors is the bearings. As the space taken by the bearings reduces the motor length and the output the most economical compromise is to concede enough length to the bearings to permit them to transmit the maximum power that the motor can economically deliver with the resulting length of core. Regenerative braking introduces another problem, as the bearing pressure is reversed without reversing the direction of rotation of motor. The main motor shafts must be capable of resisting strain due to sudden stopping or severe overload when the motors are directly connected to the drivers by means of side bars alone. If desired, yield may be introduced between the motor rotor and the crank on the motor shaft by springs or by a friction clutch. Braces must be designed to withstand heavy stresses due to occasional short-circuit, and castings must fulfill all electrical and mechanical requirements and at the same time not be excessive in cost of pattern and molds. Forced ventilation of motors is becoming more generally used in cooling, the goal being to get maximum cooling with minimum of air, and maximum of air with minimum of power from the blower motor.

There is still an important field for development in the design of electric locomotives, one problem being to increase the drawbar pull without making an abnormally long locomotive.

Gasoline Rail Car de Luxe

THE accompanying photograph shows a very attractive gasoline rail car which has just been completed and is being used for demonstration purposes in the Sacramento Valley, California.

The car is all steel, built with the outside finish ribbed to resemble wood. Its weight is 14,000 lb., its length over all is 40 ft., its outside width is 7 ft. 6 in., and it has a passenger capacity of thirty-one. The arrangement of the floor plan, from front to rear end, is as follows: engine room, baggage room, smoking room, entrance gates and vestibule on each side with lavatories in the center, parlor section with individual chairs and separated by full glass partition from observation platform at extreme rear end. The finish in white enamel with brown trimmings gives the car a de luxe appearance, so that it has attracted considerable attention. Electric starting and complete lighting current at 12 volts is supplied.



GASOLINE CAR IN SACRAMENTO VALLEY, CALIFORNIA

This car was built by the Commercial Cars Construction Company, San Francisco, Cal. The car has not as yet been in operation long enough to determine the operating cost data.

Good Record for Armature Bearings

The International Railway, Buffalo, N. Y., has been experimenting with a bronze armature bearing cast from a formula original with George Kuhn, master mechanic, which has given excellent results. At last report the bearing had made considerably more than 104,000 miles. It has been installed on four GE-74 motors, gear ratio 33 to 56. The motors are on an interurban car running on the high-speed line between Buffalo and Lockport. The company usually gets from 25,000 to 30,000 miles with a babbitted bearing.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Broadway Subway Opened

Local Service by B. R. T. on Line Between Rector and Forty-second Streets, Backbone of System

On Jan. 5, at about noon, New York City celebrated the opening of another new rapid transit line, namely, the Broadway subway in Manhattan, for operation by the New York Municipal Railway Corporation. The new operation consists of local service between Rector Street on the south and Forty-second Street, or Times Square, on the north.

For some time past the Broadway subway has been in operation between Canal and Fourteenth Streets in connection with trains from the Sea Beach line in Brooklyn, the trains passing over the Manhattan Bridge and the Canal Street subway to the Broadway line. The new service extends the 5-cent zone for Brooklyn travelers northward from Fourteenth Street, therefore, to Times Square, but for a while it will be necessary to change cars at Fourteenth Street. Eventually all the tracks of the Broadway subway, which is a four-tracked line, will be placed in service, and then both local and express trains will traverse the whole length of the line.

How Line Will Operate Finally

When the line is placed in operation in its entirety it will run from the Battery northerly through Church Street, Broadway and Seventh Avenue to Fifty-ninth Street, thence easterly under Fifty-ninth Street and the East River to a connection with the new rapid transit lines in Queens Borough. On the southern end there will be a tunnel to Brooklyn connecting with the Fourth Avenue subway, and connection is also made with that line through Canal Street and over the Manhattan Bridge.

The construction of the Broadway subway, Manhattan, was first proposed in 1911 as a means of relieving transportation conditions in that section of Manhattan south of Fifty-ninth Street, and as a distributing line through the heart of Manhattan for the people of Brooklyn and Queens. The proposal was made by the Brooklyn Rapid Transit Company. Two full years of discussion and planning followed before an agreement was finally reached and the plan ratified. Construction was begun, however, before the contract was executed, and the city has been building the subway for about six years. Two tracks have been placed in operation between Whitehall Street and Forty-second Street. It will be some time before all four tracks will be ready for express and local service, and before connections will be made with Brooklyn and Queens via the tunnels at the Battery and at Sixtieth Street respectively.

In a pamphlet which it prepared for distribution among its patrons the company said:

"For intermediate imperfections of service the operating company begs the indulgence of its patrons. The limitations at terminals will temporarily restrict the number of trains to be operated, and the other evidences of incompletion will produce some complaint and inconvenience. But both the Public Service Commission and the operating company feel that it is better to begin operation with facilities as they are than to wait until the work is entirely finished."

Brooklyn subway trains now operated to Union Square via Manhattan Bridge and Canal Street will continue to be thus operated, but will use the express tracks between Canal Street and Union Square, with intervening stops. Change may be made there for local subway trains to Forty-second Street and vice versa.

Severe Storm in West

The severe blizzard which swept over the Central Western states on Sunday, Jan. 6, paralyzed street railway and interurban traffic. City service in Chicago was demoralized and hundreds of residents were compelled to remain in downtown hotels Sunday night because of their inability to get home. In the Calumet region conditions were worse than in Chicago proper. Pullman, Indiana Harbor, Gary and Hammond were left practically without railroad communication. In some cities of Illinois and Iowa electric railway and interurban systems were unable to move any cars after 5 p. m.

Hundreds of soldiers from Camp Grant, near Rockford, Ill., were caught in the city of Rockford and were unable to return to their cantonment. Finally about 150 of them appealed to W. C. Sparks, general manager of the Rockford City Traction Company, who ordered two interurban cars, equipped with snow sweepers, to make the trip to Camp Grant. More than two hours were required for this trip of about 5 miles. Joliet, Ill., was also hard hit by the storm and while city railway traffic was maintained, the interurban service in and out of Joliet was very infrequent. Plainfield, Ill., a village 10 miles north of Joliet, was completely isolated by the storm. Several cars were almost buried in the snow in a deep cut between Joliet and Plainfield. By Monday morning, Jan. 7, however, most of the railway companies were able to resume normal service.

State Directors Urged

Speaker Cox of Massachusetts House of Representatives Declares Against Public Ownership of Railways

Public ownership of electric railways was condemned by Speaker Channing Cox of the House of Representatives of Massachusetts in his inaugural address at the opening of the 1918 Legislative session. He impressed upon the House the necessity of action to relieve the electric railways of their financial burdens and argued strongly for "intelligent State supervision with State directors," as the solution of the present problem. The Speaker's reference to the electric railway situation was the most important feature of his address. In this connection he said:

"The people of the commonwealth are dependent upon the continuance of the electric railway systems. Our future prosperity, our comfort, our convenience, require not only a continuance but indeed an improvement of such service. One by one the electric railways are showing their inability to continue under present conditions. This is true of railways in cities and of those in rural communities. The money honestly invested in these railways represents in part the savings of the toilers. I hope that Massachusetts will always deserve a reputation of dealing honorably with those who have loaned their savings to build up our industries and to develop our commercial life, but the question is bigger and beyond fair treatment to investors. It is a question of continuance of railway service and development and improvement. The issue is between progress and something worse than stagnation—retrogression.

Something Must Be Done

"Obviously the Commonwealth could take over the electric railways, paying therefor a fair value, and then operate them. I have little doubt that the owners of stock in Massachusetts electric railways would welcome such a step. But I hope the day is far distant when Government ownership and operation of electric railways will be necessary in Massachusetts. I cannot believe that the most efficient and economical conduct of our electric railways lies in that direction.

Solution Not Impossible

"With strong and intelligent State supervision, with State directors, the cost of electric railway construction and operation plus a fair return on the honest capital invested can be determined. On that basis a proper and sufficient charge for service can be fixed by State authority. The public is

Views of Massachusetts Board

Chairman Macleod of Massachusetts Public Service Commission Questioned on Electric Railway Problems

Frederick J. Macleod, chairman of the Public Service Commission of Massachusetts, appeared recently before the legislative street railway investigating commission at Boston and submitted to an extended series of questions regarding the views of the board on the electric railway situation in general. Mr. Macleod said that there were companies where there was no reasonable outlook that the road could put itself in a sound financial condition by any fares which it was possible to impose. In other words, higher fares would discourage riding to a point where the net results might be less advantageous to the companies than the lower rates. Under such conditions the company ought to be permitted to abandon the service if it found that it was not earning operating expenses. On the other hand, if the communities affected believed that the service was of vital importance, some provision ought to be available by which part of the continued operation of the company should rest with the community served. He then cited the case of the Providence & Fall River Street Railway which would not stay abandoned.

ASSESSMENT MATTER ABANDONED

The question was raised whether the Massachusetts commission had ever considered the wisdom of assessing betterments on abutters where there were extensions of rapid transit lines. Mr. Macleod said the commission had suggested, in connection with the Boston Elevated investigation of a year ago, such a system, but that the subject was complex and that no detailed plan had been prepared. When Peter Witt appeared at the Bay State rate hearings before the board, representing the remonstrants in that case, he expressed himself very strongly in favor of the application of that principle, and in the city of Cleveland when certain communities were being built up and a certain number of real estate operators were very anxious to get street railway service extended into this new territory, Mr. Witt, as street railway commissioner of Cleveland, insisted upon securing special contributions from the real estate owners on those lines before they were put into operation.

Mr. Macleod said that the situation of Massachusetts electric railways reflected in general electric railway conditions all over the country. Representative Hays asked Mr. Macleod whether he thought that it was a part of the duties of the commission if it saw a road going down financially to advocate higher fares. Mr. Macleod did not know whether the commission had the authority to do that under the law. The Interstate Commerce Commission did not have the authority to deal with the matter in that way. He said: "So far as the necessity of increase in fares is concerned, if it was just that larger and higher fares should be charged in order to provide proper service for the communities and to keep the electric railways going, in so far as I am personally concerned, I would have no hesitation whatever in saying that such increases were necessary in the general interest."

CARING FOR DEPRECIATION

The Massachusetts commission in certain fare cases had indicated that the company should provide depreciation on a scale that had been indicated. Under the form of the return which the commission had prescribed the company must report some reserve for depreciation on electric railway equipment, but there had been no requirement for larger depreciation reserve for maintenance of ways and structures, and the Massachusetts Board had followed practically the same course as the Interstate Commerce Commission in that respect, and had urged the company to lay aside and had required it to lay aside some reserve for depreciation. But the commission had not attempted to indicate any definite amount which ought to be set aside by any company. Laying aside a depreciation fund was possible only if the revenue of a company was sufficient. The question of rates and the question of laying aside a proper depreciation fund were inextricably bound together. The commission had ample power to handle this matter, in the opinion of the chairman, who said that if that power had not been exercised it was due to the fact that the commission as a matter of discretion did not believe that under the present financial condition of the companies it should attempt to make specific requirements for depreciation except in so far as the board was able to deal with companies in cases where increased fares were given.

IMPROVING RAILWAY CREDIT

The commission had attempted to make better credit for electric railways by taking action in giving the companies increases in fares to which they were entitled, by recommending the elimination or changing of certain forms of taxation and suggestions in regard to the regulations of jitneys.

The commission had reversed itself on the one-man car question, but considered itself in good company in that respect in view of the early lack of advocacy of this type of rolling stock displayed by Massachusetts companies. Chairman Macleod said that whereas the carmen's unions were opposed to the introduction of one-man cars at the outset, he thought that employees of operating companies now held a different view, having a better appreciation of the advantages of such cars to the employees themselves, as well as to the companies and the public. In the one-man car matter the commission gave very full and careful consideration to the objections raised by the employees and the commission believed that these objections were not controlling and permitted the companies to make the experiment.

(*Concluded from page* 100)

reasonable. The public wants to pay the honest and necessary cost of service rendered. If we address ourselves to this problem with the public good singly in mind we can find a solution, difficult though it may be. It may not enhance our own personal political fortunes but that consideration ought to be of no moment compared to the satisfaction of doing right."

Railway Hit

P. R. T. Protests Against Proposed Power Rate Increase of Philadelphia Electric Company

Ellis Ames Ballard, chief counsel for the Philadelphia (Pa.) Rapid Transit Company, has filed a complaint with the Public Service Commission against the advances in rates for electrical energy proposed by the Philadelphia Electric Company. According to this complaint, the Philadelphia Rapid Transit Company has contracts with the Philadelphia Electric and its subsidiaries, the Delaware County Electric and the Beacon Light Companies, for a supply of current to operate trolley lines. Originally the contracts were made for a term of ten years, and, according to Mr. Ballard, they still have five years to run.

CHARGES CONTRACT VIOLATION

It is charged in the complaint that the schedules of increased rates asked for by the Philadelphia Electric and its subsidiaries are in violation of these contracts. The petition also sets forth that the increased rates may necessitate an advance in fares. Mr. Ballard is quoted as stating:

"We are contesting the right of the Philadelphia Electric Company, first, to abrogate its contracts with us without notice, and, secondly, the method of breaking the contracts. I have not the exact figures of the railway's annual electric current bill at hand, but the sum is considerable. With other expenses of operation increasing, naturally there must be some increase of revenue if the electric power rate is to be increased. We have ten-year contracts with the electric company that still have five years to run. The rate in those contracts was fixed by the electric company. They were good contracts for five years, but now that the shoe is beginning to pinch they want an increase, and we have protested against it."

Individual consumers will not be affected by the increases, the petition of the electric company exempting municipal and residential bills. Appeal is made for an increase of 20 per cent in the surtaxes on all classes of power current. The increase will apply upon $9,000,000 of revenue out of a total gross revenue for 1917 of $11,700,000.

Director General of Railroads Not Planning to Take Over Electric Lines

Measure Now Pending in Congress Likely to Result in a Law That Will Clear the "Twilight Zone"

Reports published in various newspapers that William G. McAdoo, director-general of railroads, has issued orders for placing certain electric railways under Government control are not borne out by inquiries made at Mr. McAdoo's office by the Washington correspondent of the ELECTRIC RAILWAY JOURNAL. There is no record at the director-general's office of an order placing the lines of the Lehigh Valley Transit Company under Government control, according to official statements made in Washington, and the director-general, it is stated, is not contemplating any similar move in regard to those or any other lines, at this time.

One of the most important reasons why no such step is now under consideration is the fact that the administration railroad bill, designed to carry out provisions of President Wilson's recommendations to Congress in regard to transportation systems, is now before Congressional committees. Until Congress acts, it is stated at the office of the director-general, there will be no move which members might consider an invasion of their all-powerful rights, or which, to say the least, might be considered not in the best taste on the part of an executive official of the Government. Government executives rarely if ever take action on matters being considered by Congress. This custom applies even to the President of the United States.

It is pointed out in Washington that the proclamation of the President taking control of the railroads of the country, and making allusion to the possibility of eventually taking over certain electric railways engaged in interstate commerce, was issued while Congress was in recess. Since that time the President has made a number of recommendations to Congress in regard to the railroads, and it is expected that Congress will bring forth a law which will take many questions out of the "twilight zone."

On the other hand, it is recognized in administration and executive circles in Washington that the time may come when it will be desirable from a Government point of view to take over certain electric railways serving works of important manufacturers of munitions and engaged in interstate commerce. Surveys of such fields and possibilities by the officials attached to the staff of the director-general of railroads are being made, in a tentative manner, for the sake of gathering information.

Philadelphia Transit Lease Signed

Both Branches of Councils Pass Measure for Development and Operation of High-Speed Lines

The Select Council of Philadelphia, Pa., on Jan. 3 concurred with the Common Council and passed without debate the ordinance authorizing the lease of the city's high-speed transit facilities, when and as built, to the Philadelphia Rapid Transit Company. The bill was approved immediately by the Mayor. Only the formality of confirmation by the stockholders of the company and the sanction of the Public Service Commission are necessary to complete the compact.

PROVISIONS OF LEASE

The principal provisions of the lease are:

Payments to the city and company, in proportion to the relative investment of each, equal to a 5 per cent dividend.

Eight-cent exchange tickets to be abolished outside of the delivery district in the central part of the city within sixty days after the signing of the lease, and universal free transfers to be substituted therefor.

On the opening of the Frankford line, exchange tickets to be abolished inside the delivery loop and free transfers substituted therefor.

Fares to be revised upward or downward, according to the amount of the gross revenue and the fixed demands on that fund.

Broad Street subway, from League Island to Olney Avenue.

Frankford line, from Front and Arch to Rhawn Street.

Bustleton and Byberry surface line.

Darby line, from Thirtieth and Market Streets to Darby.

Parkway subway, from City Hall to Fairmount Park, connecting with an elevated line to Roxborough.

Delivery loop-subway in Arch, Eighth and Locust Streets, connecting with the Broad Street subway.

Chestnut Street subway, as a possible connection between the Frankford and Darby elevated lines.

One of the features of the proposed lease is a board of supervising engineers, which will have control over the operations of the unified system. Through an amendment to the lease, made before its passage by Common Council, the director of city transit will be a member of this board. The company will name a member and it is assumed that one of the transit company's chief engineers will be chosen. The third member will be named by agreement of the city and the company.

The next step is the signing of the lease by Thomas E. Mitten, president of the Rapid Transit Company. He cannot affix his signature for a month, for the reason that the proposition must be advertised to the stockholders for thirty days and then a meeting of the stockholders will be held. Finally, the lease will be submitted to the Public Service Commission for its approval.

Trenton Tax Case Appealed

Frank S. Katzenbach, Jr., counsel for the Trenton & Mercer County Traction Corporation, Trenton, N. J., has filed in the Supreme Court reasons why the court should reverse the decision of the State Board of Taxes and Assessments sustaining the assessment of the Mercer County Tax Board on the company's property in 1916. One of the reasons is that the going value of the property, as defined by the State Tax Board, is not taxable under the laws of New Jersey.

M. O. Bill in Rhode Island

An act has been introduced in the House of Representatives of Rhode Island by Mr. Kiernan, creating a commission of three men to draw up and present as soon as possible, such legislation as would be necessary and desirable to enable the State to take over, run and own, all of the electric railways in Rhode Island. The measure has been referred to the judiciary committee for consideration.

Editors Praise Mr. Dempsey

Brooklyn Papers Are Agreed that Wise Choice Was Made in Electing Him Vice-President

The election of J. J. Dempsey as a vice-president of the Brooklyn (N. Y.) Rapid Transit Company, announced in the ELECTRIC RAILWAY JOURNAL for Dec. 29, was promptly recognized by the Brooklyn papers as a just reward for ability displayed previously. Many complimentary things were said by them editorially of Mr. Dempsey in commenting on the changes in the personnel of the company. The *Standard Union* said:

"Mr. Dempsey's career has been brilliant. There can be only one explanation of a rapid rise like this. Mr. Dempsey, of course, is a technical expert of the first rank. In addition to that, he possesses personal qualities that enable him to obtain results from a large working force, under insistent demands for good quality of service from an exacting public. The Brooklyn transit directors do well to give such a man as Mr. Dempsey the widest field for the exercise of his powers. The war, with its draft of man power and curtailment of material resources, brings serious problems to the B. R. T. The system is to be congratulated on its success in producing a man from the ranks capable of approaching the highest places."

The *Times* said:

"It was eminently wise of the directors to elect Mr. Dempsey vice-president of the company, because, unless it be Colonel Williams, who has been with the railroad system since he was the secretary of Gov. Roswell P. Flower, no man in Brooklyn knows the borough transportation problem like Mr. Dempsey, and none in the country surpasses him in the field of operative management. We regard it as a good fortune to the community that his merit has been so signally recognized by the representatives of the owning interest."

News Notes

Street Railroad Department Established.—On Jan. 3 the office of the City Street Railroad Commissioner of Cincinnati, Ohio, was abolished and the Department of Street Railroads, administered by the Director of Street Railroads, was established in accordance with the new city charter. Mayor John Galvin has appointed W. C. Culkins to the new position, the duties and authority of which are described in the new city charter and the new franchise ordinance of the Cincinnati Traction Company.

Expense of the Toledo Street Railway Commission.—In replying to a request from Councilman Frank Miller, Mayor Milroy made the following statement to the City Council of Toledo, Ohio, on Dec. 31: "There is no moral or legal obligation on the city to pay for any service of the commission. The commission, of course, must pay for its legal counsel and for its office room. There was a public spirited citizen who offered to pay this expense. If the commission reports an electric-railway plan suitable to the voters of Toledo, then I think there would be a moral debt to the commission. No expense could be charged to the city without the consent of the people by vote."

New Franchise for East Cleveland.—A managerial form of government went into effect in East Cleveland, Ohio, on Jan. 1, with C. M. Osborn at the helm. Mr. Osborn is an engineer. He has had long experience in municipal affairs. Under him negotiations will be taken up with the Cleveland Railway for a new franchise covering both the Euclid Avenue and Hayden Avenue lines. The franchise on the latter expired last April, but that on Euclid Avenue runs to February, 1921, with the same fare as prevails in Cleveland. At the present time cars are being operated on Hayden Avenue under a temporary contract at a fare of 5 cents. Citizens of East Cleveland want a blanket contract.

Association Meeting Program

Illinois Electric Railways Association

It is expected that the Illinois Electric Railways Association will hold a convention at Chicago some time the latter part of January. A program is being arranged and it is possible that the meeting will be held on Jan. 26.

Financial and Corporate

Oakland, Antioch & Eastern Reorganization Plan Filed

San Francisco, Oakland & Sacramento Railway, the Proposed Successor Company, Will Have $8,500,000 of Stocks and Bonds Outstanding

A plan for the permanent financing of the Oakland & Antioch Railway, the Oakland, Antioch & Eastern Railway and the San Ramon Valley Railroad has been adopted by the committee representing the holders of the bonds of the companies and is about to be submitted to security holders. The submission of the plan at this time is pursuant to the order of the California Railroad Commission made in 1915, providing that one be submitted for its approval before the beginning of 1918.

The details of the plan were made public in the following official announcement:

DETAILS OF PLAN

"The Railroad Commission in a decision rendered in November, 1915, provided that a plan for the permanent refinancing should be submitted to it on or before Jan. 1, 1918.

"Pursuant to this mandate, the bondholders' committee of said roads, consisting of S. Bachman, Fred H. Beaver, A. Christeson, C. Osgood Hooker, John Lawson, Jesse W. Lilienthal, Paul A. Sinsheimer and Sydney M. van Wyck, Jr., proceeded to a careful consideration of the finances of the roads and, after many months of deliberation, is about to submit to the security holders the following plan:

NEW NAME FOR COMPANY

"A new company will be organized to take over the properties of the old companies. For the time being, the name San Francisco, Oakland & Sacramento Railway has been tentatively adopted.

"The new company will be authorized to issue the following securities:

"1. $3,000,000 par value of twenty-year first mortgage 5½ per cent bonds.

"2. $1,500,000 par value of 6 per cent preferred stock, consisting of 15,000 shares of a par value of $100 each. Preferred stock will be non-assessable and will be callable at any time at 110.

"3. $4,000,000 par value of common stock consisting of 40,000 shares of a par value of $100 each. The common stock is to be non-assessable.

"The amount of the securities so authorized which the new company is to put out for purposes of reorganization is as follows:

"1. Twenty-year first mortgage 5½ per cent gold bonds. Not to exceed $1,950,000 of the par value of these bonds is to be issued or set aside for the purpose of carrying out the reorganization plan. The balance of the bonds, to wit, $1,050,000 par value, will remain in the treasury to be issued only under stringent restrictions.

"2. Preferred Stock—Not to exceed 13,300 shares of this stock will be issued for reorganization purposes. The balance, to wit, 1700 shares, is to remain in the treasury.

"3. Common Stock—All of the common stock is to be issued.

"These securities of the new company are to be distributed among the bondholders of the companies and among persons holding bonds in pledge, so that they will receive securities of a par value equal to the par value of the securities now held by them upon the following basis: Twenty per cent bonds, 20 per cent preferred stock, 60 per cent common stock.

"Secured creditors are to be treated in accordance with the securities held by them and common stock remaining in the treasury after distribution to bondholders and holders of bonds in pledge is to be divided among the unsecured creditors."

Receiver Asked in St. Louis

Stockholder Begins Suit to Protect Equity, but Complaint Is Said to Disclose No Cause for Action

On Jan. 7 suit was begun in the United States District Court in St. Louis, Mo., for the appointment of a receiver for the United Railways of St. Louis. The petition made by the attorney for a New York holder of a small amount of preferred stock, is said to be for the purpose of preserving the equities of shareholders and securing certain restitutions from old directors.

Judge Dyer on Jan. 10 refused to issue a temporary order appointing a receiver for the company, and made subpœnas returnable in ten days. At that time the company can either file an answer or a motion to dismiss the proceedings.

The petition asserts that the company is solvent, but that money has been needlessly expended under power contracts made by directors in 1908 and in mill-tax litigation. Restitution of such money is demanded. Furthermore, it is alleged that if the pending resettlement franchise falls through the company may be forced into receivership in the interest of creditors and that this might mean disintegration of the property.

James D. Mortimer, president North American Company, which controls the United Railways, has issued the following statement:

"From a reading of the complaint it

does not appear to disclose a cause of action. The matters complained of are well known to the St. Louis public and have been explained at considerable length, so that they now know all the essential facts. The plaintiff, however, evidently remains unconvinced that the contracts under which the railway is purchasing electric power for the operation of a portion of its system are advantageous to it. Without the power so purchased the railway could operate only one-third of the number of cars it now runs regularly during rush hours, and it could not engage a new power supply at rates nearly as low as those now paid. The accomplishment of the plaintiff's purpose would be most disadvantageous to the company and the public it serves."

Several protective committees have previously been appointed in the interests of bondholders, but no interest has been defaulted on the company's indebtedness. The Board of Aldermen, as noted from time to time in these pages, has under consideration plans for a resettlement of the franchises under which the company operates.

Abandonment Prevented

Kentucky Court Says Company Must First Prove That It Cannot Operate Except at a Loss

The Southern Traction Company, Bowling Green, Ky., will not be permitted to carry out its plan of selling its property to be scrapped for junk, for the Kentucky Court of Appeals has affirmed the finding of the lower court. Meanwhile differences between the railway and the company from which it purchased power have been composed, a suit for receivership brought by the city and county has been filed away and service resumed. Under the decisions of the courts the railway will be required to show that it is losing money before it can scrap its lines and discontinue service. The Court of Appeals said:

How the Court Decided

"We do not consider or determine the question whether under any circumstances an electric railway that has obtained a franchise may, in opposition to the will of the municipality from which the franchise was obtained, abandon its line of road and remove its rails, poles, cars and other equipment, but we are agreed that in any event before a common carrier should be permitted to do this it should be made plain that it cannot operate except at a loss."

The Court of Appeals concurred in the opinion of the lower court, which held that if the bondholders and stockholders, who are identical, do not desire a foreclosure and a sale to determine whether a purchaser can be had, they must continue operating. If they fail it might become proper and necessary for the court to take control through a receiver and operate the property until it could be ascertained whether it could be continued as a going concern.

Better Outlook for Petaluma & Santa Rosa Line

Despite Strike and Passenger Traffic Loss, $150,000 of Floating Debt Was Paid by the Company in 1916

Conditions more nearly normal existed in 1916 in the territory served by the Petaluma & Santa Rosa Railway, Petaluma, Cal., as far as the income from production was concerned. The prices prevailing were high enough to offset a shortage in production. This enabled the producers to recover partially from the losses suffered in the two years previous and generally improved business conditions in the territory, with a natural indirect effect on the earnings of the railway. The decrease in the amount of production of many commodities, however, made a corresponding decrease in tonnage for the railway without any direct benefit from the high prices obtaining.

	1916	1915
Gross earnings	$273,534.19	$283,047.63
Operating exp....	196,885.61	201,150.07
Surplus	$15,046.05	$19,534.05
Net earnings	$76,648.58	$81,897.56
Fixed charges....	61,602.53	62,362.99
Railway passengers	619,729	691,611
Steamer passengers	2,826	6.020
Railway freight (tons)	67,987	64,061
Steamer freight (tons)	89,464	87,615

Note—Operation was charged in 1916 with $10,934 on account of depreciation and compensation insurance, while no charge was made for these items in previous years.

Both steamers of the company were tied up between June 1 and July 20, at the busiest time of the year, on account of a general strike of bay and river steamboat firemen and deckhands. The company maintained its service during the strike, practically without interruption and without any appreciable loss of patronage, and resumed the operation of its steamers without paying any increase in wages. While the entire decrease of $9,500 in gross earnings is probably attributable to the strike, the company suffered practically no net loss on account of it.

The reduction in operating expenses for the year amounted to $15,200, as shown by the accompanying comparative statement of earnings and expenses, with charges for depreciation and compensation insurance deducted in 1916 and not in previous years. About $8,500 of this amount is accounted for by the elimination of the expense of operating the steamers during the strike.

The passenger earnings decreased $8,692 for the year. The decrease in 1915 was over $10,000. Up to 1915 the passenger earnings show a consistent increase, and it is difficult to satisfactorily account for such a marked decrease in such a short time. There are several conditions which have probably contributed to it, the principal one being the increase in the use of automobiles, a great number having been sold throughout the territory during 1915 and 1916.

Notwithstanding the decrease in passenger earnings and the strike of the steamer deckhands and firemen, $15,000 was paid on the company's floating debt during the year. The amount of cash available for meeting current obligations was about $3,000 more at the close of the year than at the close of 1915.

As to the outlook, the annual report states that there seems to be no reason to doubt that the earnings will easily meet operating expenses and fixed charges in 1917. Under normal conditions and any reasonable increase in rates, which will be applied for, a substantial increase in the surplus should be realized.

Municipal Railway Earned $7,000,000 in Five Years

The San Francisco (Cal.) Municipal Railway system has earned $7,039,999 since the beginning of operations, according to a statement issued recently by the Board of Public Works. On Dec. 28, 1917, the road had been in operation five years. The statement which has been made public is only inclusive of October.

Of the $7,039,999 earned there have been disbursements amounting to $5,193,084, with the balance in the depreciation and various other funds. Of the depreciation fund $547,643 has been invested in bonds and there is a cash credit of $533,803. Of this amount contracts for future extensions totaling $454,857 have been pledged by the Board of Supervisors, leaving the actual cash balance of $78,946 in the Municipal Street Railway fund.

New Toledo Bonds Offer to Pay Normal Income Tax

On Jan. 7 Harris, Forbes & Company and the National City Company, New York, N. Y., announced a public offering of $10,500,000 of two-year 7 per cent coupon bonds of the Toledo Traction, Light & Power Company, Toledo, Ohio, at 98½ and interest to yield 7.82 per cent. The bonds are a first lien and secured through deposit of securities, on the electric light and power and street railway business of Toledo. Earnings of the controlled operating properties at present are more than double the interest charges on the new bonds.

With respect to tax provisions, the company agrees to pay any normal federal income tax which it may lawfully pay at the source to an amount not exceeding 4 per cent. The company also agrees to refund, through the Pennsylvania Company for Insurance on Lives & Granting Annuities, Philadelphia, the Pennsylvania 4 mills tax to holders of these bonds residing in that State.

Five years ago the Toledo Traction, Light & Power Company sold $7,500,000 five-year 6 per cent first lien collateral bonds due on Feb. 1 next. The bonds were sold at 100 and interest to yield 6 per cent. The new bonds to take their place will yield more than 1 per cent additional and at the same time be secured by collateral $4,000,000 in excess of the collateral that has secured the five-year 6 per cent bonds. In addition to the $7,500,000 bonds to be taken up there will be some additional bonds, making $8,699,000 maturing bonds that will be retired.

Utility Issues Investment Booklet

Utility properties managed by H. M. Byllesby & Company, Chicago, Ill., are distributing a sixteen-page investment booklet to 200,000 electric and gas customers. The booklet points out the difference between speculation and investment and describes the advantages of the preferred stocks of successful utility organizations. The title is "The Straight Road to Financial Independence." It was written by W. H. Hodge, manager of the publicity department of H. M. Byllesby & Company.

Financial News Notes

Mount Vernon (Ill.) Line Wrecked.—According to official information just now available, the City Railway, Mount Vernon, Ill., was wrecked and sold by the receiver in 1917. The Hyman-Michals Company, Chicago, purchased the material.

Receiver for Abilene.—W. G. Swenson was appointed near the end of 1917 as receiver for the Abilene (Tex.) Street Railway. This action was taken on the petition of bondholders. The outstanding capital stock of the company is $25,000, and the funded debt $30,000.

Receiver for Defunct Line.—A receiver was appointed late in 1917 for the St. Louis, Lakewood & Grant Park Railroad, St. Louis, Mo. This line has not been in operation since the floods of 1915. A receiver was sought by the bondholders in order to sell whatever property still remains.

Sacramento Line Abandoned.—The property of the Sacramento Valley Electric Railway, Dixon, Cal., was sold at foreclosure in 1917, without the appointment of a receiver, and the line was abandoned. The right-of-way, roadbed, bridges, fences and ballast for 12 miles of track are for sale.

Chicago City Dividend Action.—The trustees of the Chicago City & Connecting Railways have declared a semi-annual dividend of 1½ per cent on the preferred stock, which makes the total declaration 3 per cent for the twelve months' period. It has also been voted to retire $250,000 of the 5 per cent bonds and pay $50,000 of floating debt.

Satisfactory Adjustment Made.—The Chickasha (Okla.) Street Railway has made a satisfactory adjustment with the State Board of Equalization to secure a fair valuation of the property. Some time ago the ELECTRIC RAILWAY JOURNAL published an item to the effect that this company intended to suspend operation unless such an adjustment was made.

Missouri Company Voluntarily Stops Operation.—The owners of the Mexico Investment & Construction Company, Mexico, Mo., late in 1917 decided to abandon operation of the property, after a voluntary petition for permission to cease operation because of its unprofitableness. Dismantlement was to begin at once, and the material was to be offered for sale.

Waycross Property Being Scrapped.—The foreclosed property of the Waycross Street & Suburban Railway was resold late in 1917 to the Southern Equipment Company, Atlanta, Ga., for $30,000, and dismantlement was begun. The foreclosure sale of the property to the Waycross Savings & Trust Company was noted in the ELECTRIC RAILWAY JOURNAL of June 23.

Receiver's Certificates for the Bay State.—Judge Morton in the United States District Court on Jan. 2 authorized Receiver Donham of the Bay State Street Railway to issue $378,987 of receiver's certificates to pay bond interest due on Jan. 1. The receiver asked for $766,035. The company had $355,000 on hand Jan. 1 of which $200,000 must be reserved for working capital.

New Key Route Bond Issue.—The California Railroad Commission has made an order authorizing the San Francisco-Oakland Terminal Railways to issue its 6 per cent demand notes for $218,459 and to issue and pledge for their payment $337,000 of general lien bonds, under the company's general lien mortgage. The notes and bonds are to be issued to banks in lieu of notes and bonds now held by them.

New Capital Issues Proposed.—The Murphysboro & Southern Illinois Railway, Murphysboro, Ill., has applied to the Illinois Public Utilities Commission for authority to issue $63,000 of stock and $250,000 of bonds. The company now has 8 miles of electric railway in operation between Murphysboro and Carbondale and the new capital is desired to extend the line from Carbondale to Carterville or Herrin, thus reaching the coal fields of Williamson County.

Suit to Foreclose Begun.—The Mercantile Trust Company, San Francisco, Cal., which has been operating the Fresno (Cal.) Interurban Railway, filed complaint on Dec. 28 looking toward the foreclosure of the trust deed covering all the property of the company. The trust deed was given in September, 1914, to secure a bonded indebtedness of $250,000. According to the complaint filed by the trustee, interest at 6 per cent payable semi-annually has not been paid since March, 1916.

New Vice-Presidents for American Water Works & Electric Company.—At the regular meeting of the board of directors of the American Water Works & Electric Company, Inc., J. H. Purdy and Harry E. Towle were elected vice-presidents of the company. Stuart H. Patterson's resignation as vice-president was accepted to take effect Feb. 1 next. As noted in the ELECTRIC RAILWAY JOURNAL of Dec. 8, Mr. Patterson has been elected comptroller of the Guaranty Trust Company, New York.

Bondholders Agree to an Extension.—More than 85 per cent of the bondholders of the Barre & Montpelier Traction Company, Montpelier, Vt., have agreed to an extension of their holdings, and it is anticipated that the balance will consent in the near future. For this reason, it is said, there seems to be no likelihood of the appointment of a receiver. An application to the court, noted in the ELECTRIC RAILWAY JOURNAL of Nov. 17, was followed by efforts to effect a readjustment of the finances of the company.

Common Dividend Passed.—The Pacific Gas & Electric Company, San Francisco, Cal., with an authorized capital of $100,000,000 and nearly $66,000,000 common stock in the hands of the public or owned by subsidiary companies, has passed its dividend on the common stock. For eleven months to Nov. 30 the balance after all charges and the preferred dividend allowances was only $1,569,068, against $2,340,568 for the eleven months of 1916. This was not nearly sufficient to meet the dividend on the common.

Move to Lift Receivership.—The directors and the stockholders of the Southern Cambria Railway, Johnstown, Pa., have voted favorably upon an additional issue of bonds of $100,000 to make settlement for damage claims of August, 1916, if they are accepted and the issue is approved by the Public Service Commission. It is said to be expected that the claims will be settled in this manner. The receivership of the company, noted in the ELECTRIC RAILWAY JOURNAL of Feb. 24, has been continued until June 1, 1918, to permit such a settlement.

Orleans-Kenner Sale Jan. 15.—William C. Dufour, special master, will sell the property of the Orleans-Kenner Electric Railway, New Orleans, La., on Jan. 15 at New Orleans, under foreclosure of the mortgage dated April 13, 1914. The property will be disposed of subject to all taxes due and unpaid, assessments on liens prior to the lien of the first mortgage, the purchaser to assume all debts, obligations and liabilities of the receiver. The court reserves the right of exacting payment in cash of a sufficient sum to meet and retire all obligations of the receiver and all costs and expenses of the receivership. The property was offered for sale in September, but no bids were received.

Richmond Line Suspends Operation.—The Richmond & Chesapeake Bay Railway, running from Richmond to Ashland, Va., 14.8 miles, has ceased to operate. The attorney representing the controlling interest in the property obtained from the State Corporation

Commission an authorization for the suspension of business. The road was opened in 1907, and it was intended to continue construction to Washington, D. C. The bonds are said to be held by Gould interests, which own the road. It was suggested that the Virginia Railway & Power Company take over the property in order to furnish transportation to suburban residents who were only partly supplied by other means, but the company did not take any action on the proposition.

New Rochester & Syracuse Mortgage Filed.—The Rochester & Syracuse Railway, formed as successor to the Rochester, Syracuse & Eastern Railroad, has filed for record its first mortgage to the Trust Company of Onondaga at Syracuse, as trustee, to secure an authorized issue of not to exceed $5,000,000 of first mortgage 5 per cent gold bonds dated May 1, 1917, and due May 1, 1957. Under the terms of the plan for the reorganization of the company, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL, $2,500,000 of the bonds are issuable forthwith in partial exchange for old first mortgage bonds, $500,000 are also issuable at once for improvements, and $2,000,000 are reserved for future improvements, additions, extensions, etc.

Offer for Rails of "Dan Patch" Cut-Off.—President C. T. Jaffray of the First & Security National Bank, Minneapolis, who is chairman of the bondholders' committee which recently purchased the 14-mile cut-off of the "Dan Patch" line under foreclosure, received a telegram on Jan. 4 from R. B. Marchand of J. G. White & Company, New York, N. Y., another member of the committee, offering a price of $75 a ton f.o.b. at an Atlantic port for the rails of this section. The remaining part of the company's 56-mile system was not bid in at the recent sale and is still being operated by the receiver. Mr. Jaffray, Mr. Marchand and A. H. Jackson of the General Electric Company formed the bondholders' committee which bought the cut-off. Mr. Jaffray wants, if possible, to keep the line in operation for the benefit of the city of Minneapolis.

Seven Pines Line Sold to Ambassador Willard.—Under a decree of the law and equity court on Dec. 17, Joseph E. Willard, ambassador to Spain, acquired from the Richmond & Rappahannock River Railway its line between Twenty-ninth and P Streets, Richmond, and Seven Pines. Mr. Willard is the principal stockholder and the only bondholder of the Richmond & Rappahannock River Railway, the receivership of which was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 17. The Seven Pines lines, it is said, will be operated as a separate and distinct corporation, the Richmond & Seven Pines Railway having been chartered for this purpose. The remaining 16.3 mile section is headed toward dismantlement. According to the latest information the State Corporation Commission has granted the petition of the Richmond & Rappahannock Railway for dissolution, but the sale of the equipment is to be held up until Director of Railroads William G. McAdoo decides upon the utility of the line for public or war purposes. Service has been discontinued on the unsold part of the property.

Reasons for Plymouth & Shelby Receivership.—A change in mileage has taken place in connection with the Sandusky, Norwalk & Mansfield Railway and the Plymouth & Shelby Traction Company, which explains the recent receivership of the latter line. The change is the result of a lawsuit which was begun against the receiver of the Sandusky, Norwalk & Mansfield Electric Railway in 1913, when the Plymouth & Shelby Traction Company sued for rental from the receiver. The receiver, however, contended that at least 1 mile of the track belonged to the Sandusky, Norwalk & Mansfield Railway, and he questioned the ownership of the other 6.97 miles of track supposed to be part of the Plymouth & Shelby Traction Company. In October, 1917, the United States District Court finally disposed of the case and conveyed the 1 mile of track to the Sandusky company. Moreover, the court held that the Plymouth & Shelby Traction Company was a fraudulent corporation and placed the property in the hands of the receiver of the Sandusky line. The bondholders of the Plymouth & Shelby Traction Company will have to show they were innocent purchasers of bonds, and all who are not found to be such will have their bonds wiped out by the court.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$181,128	*$135,239	$45,889	$35,619	$10,270
1 " " '16	173,987	*115,884	58,103	35,819	22,284
10 " " '17	1,819,988	*1,301,182	518,806	357,279	161,527
10 " " '16	1,711,658	*1,137,113	574,545	362,313	212,232

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

1m., Nov., '17	$76,081	*$38,838	$37,243	$19,657	$17,586
1 " " '16	73,298	*41,330	31,968	18,408	13,560
12 " " '17	876,070	*498,516	377,554	227,430	150,124
12 " " '16	823,553	*453,550	370,003	213,869	156,134

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Nov., '17	$111,216	*$112,519	†$1,303	$30,866	†$32,169
1 " " '16	103,536	*73,866	29,670	29,735	†65
12 " " '17	1,335,115	*1,096,202	238,913	358,507	†119,594
12 " " '16	1,230,205	*798,411	431,794	355,949	75,845

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Nov., '17	$1,822,283	*$1,186,101	$636,182	$466,230	$169,952
1 " " '16	1,510,666	*860,290	650,376	426,081	224,295
12 " " '17	19,460,726	*11,919,695	7,541,031	5,255,160	2,285,871
12 " " '16	16,705,218	*9,064,088	7,641,130	5,020,444	2,620,686

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Nov., '17	$788,828	*$698,131	$90,697	$109,825	‡$3,327
1 " " '16	759,716	*636,392	123,324	96,488	‡49,557
11 " " '17	9,185,515	7,293,993	1,891,522	1,098,820	‡991,276
11 " " '16	8,758,236	*6,294,702	2,463,534	1,079,337	‡1,633,225

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

1m., Nov., '17	$243,036	*$170,298	$72,638	$69,843	$2,795
1 " " '16	229,986	*154,531	75,455	69,058	6,397
12 " " '17	3,078,224	*2,036,623	1,041,601	816,409	225,192
12 " " '16	2,845,347	*1,751,043	1,094,304	808,838	285,466

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$71,307	*$57,327	$13,980	$15,457	†$1,477
1 " " '16	61,871	*47,460	14,411	15,246	†835
12 " " '17	899,313	*672,771	226,542	186,425	40,117
12 " " '16	798,318	*543,474	254,844	188,312	66,532

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Nov., '17	$212,264	*$134,094	$78,170	$40,628	$37,542
1 " " '16	199,981	*120,520	79,461	42,314	37,147
12 " " '17	2,452,118	*1,577,178	874,940	492,061	382,879
12 " " '16	2,370,491	*1,445,906	924,585	509,791	414,794

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

1m., Nov., '17	$24,889	*$24,220	$669	$7,982	†‡$7,239
1 " " '16	22,650	*22,367	283	7,987	†‡7,659
11 " " '17	369,882	*314,853	55,029	87,818	†‡32,168
11 " " '16	332,520	*270,906	61,614	87,836	†‡25,716

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

1m., Nov., '17	$44,345	*$46,699	†$2,354	§$5,725	†‡$7,362
1 " " '16	52,414	*47,276	5,138	§5,972	†‡266
11 " " '17	509,569	*508,601	968	§79,507	†‡68,580
11 " " '16	515,498	*535,956	†20,458	§85,391	†‡60,203

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Nov., '17	$525,811	*$324,600	$201,211	$177,512	$23,699
1 " " '16	479,367	*242,563	236,804	182,115	54,689
12 " " '17	5,942,084	*3,354,412	2,587,672	2,156,099	431,573
12 " " '16	5,453,455	*3,035,833	2,417,622	2,177,998	239,624

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

1m., Nov., '17	$18,669	*$24,472	†$5,803	$2,633	†‡$8,410
1 " " '16	14,063	17,211	†3,148	2,018	†‡5,138
11 " " '17	228,459	*256,773	†28,314	24,630	†‡52,631
11 " " '16	210,971	*226,143	†15,172	20,014	†‡34,898

*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds of the company, paid by the New York, New Haven & Hartford Railroad under guarantee, also interest on notes held by the New York, New Haven & Hartford Railroad not credited to income of that company.

Traffic and Transportation

Through Service Case Decided

Public Service Commission Refuses to Order Restoration of Through Service by Foreign Cars

Restoration of through service by foreign cars between Lexington and Harvard Square, Cambridge, Mass., was recently petitioned the Massachusetts Public Service Commission by citizens of Lexington. The service complained of is furnished by the Middlesex & Boston Street Railway, operating between Lexington and Arlington Heights and by the Boston Elevated Railway between the latter point and Harvard Square, where transfer to Boston is made via the Cambridge subway.

Formerly the cars operated by the Middlesex & Boston Street Railway were operated over the Boston company's tracks to Harvard Square on a thirty-minute headway. In June, 1916, through service was discontinued. The Middlesex & Boston Street Railway cars are now operated to Arlington Heights only so that Lexington passengers going to or from Boston are compelled to change cars at the former point.

The Boston Elevated Railway operates surface cars on a six-minute headway between Arlington Heights and Harvard Square, and the Middlesex & Boston Street Railway on a thirty-minute headway during normal hours, with rush-hour service on fifteen-minute time. The petitioners complained that the transfer causes them much inconvenience and delay, especially when outward bound from Boston to Lexington.

LARGE CARS AND TRAILERS NECESSARY

At the hearing the Boston Elevated Railway presented evidence that the line from Arlington Heights to Harvard Square, especially between the latter point and Arlington Center, has a very heavy traffic and contended that the present facilities for handling surface car traffic at Harvard Square were inadequate and that, in order to utilize present car and track facilities most efficiently, large car and trailer operation was necessary. Under the old arrangement the lack of carrying capacity and the smaller entrances and exits of the cars of the Middlesex & Boston Street Railway caused delay in loading which retarded traffic generally on the line.

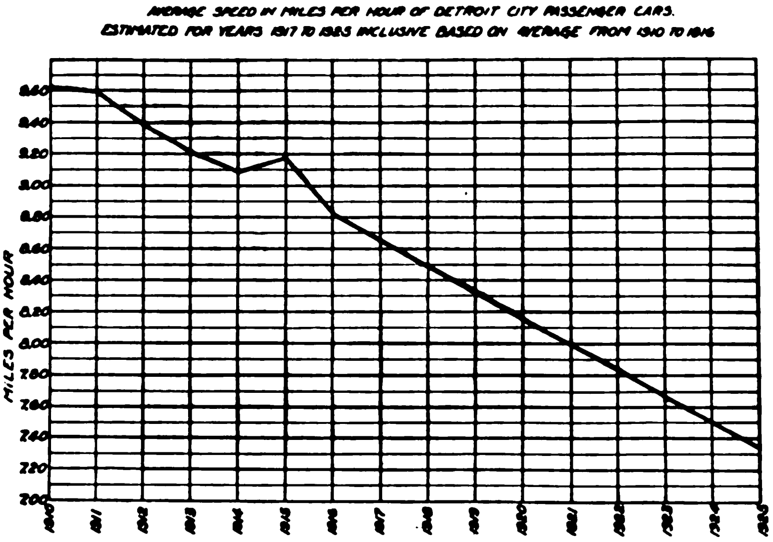
COMMISSION CONCEDES OBJECTIONS

The commission has issued a decision, in which it concedes these objections to be valid. It points out that if either company had sufficient or suitable cars to operate on the joint route, these objections would be of less weight; but as neither company has such cars that it can divert to this use, it follows that the part of the complaint relating to through service must be dismissed. Incidental to the discussion of through service there was much complaint regarding the inconvenience of transfer facilities at Arlington Heights, the terminus of each system. The commission recommends that as soon as financial conditions warrant, a waiting station be constructed with platform arranged between tracks of the two companies, to facilitate transfer under shelter.

Diagram of Detroit Speed

The Detroit (Mich.) United Railway published in *Electric Railway Service* recently the accompanying diagram, showing the average rate of speed of Detroit city passenger cars as it has been in the past, commencing with the year 1910 down to the present time and estimated from 1917 to 1925 based on past experience. In Detroit skip-stop operation has not increased the speed of the cars as has been stated so often; the saving has been wholly in reducing the number of unnecessary stops.

From a speed of something more than 9½ m.p.h. in Detroit in 1910 the reduction has been gradual, except when conditions in 1914 permitted a slight improvement. Since then the decline has been steady until at the present time the average is less than 8½ m.p.h. The abolition of skip-stop operation will make the decline even more marked in the years to come if Detroit continues to grow. The company asks whether the outlook is pleasing to those who travel over its lines for any considerable distance.



HOW SPEED OF DETROIT CARS IS DIMINISHING

Massachusetts Governor Reasonable

Governor McCall of Massachusetts Urges Equitable Rates of Fare for Electric Railways

A rate of fare which will pay the fair cost of rendering good service was advocated by Governor McCall of Massachusetts in his inaugural address. In referring to transportation problems, he said:

"I urge upon you (the Legislature of 1918) the importance of improving the efficiency of the transportation systems of the commonwealth. The national government is now operating the steam railroads of the country, and for the present they are practically taken from the field of our consideration. Our electric railway systems are in a deplorable condition, both with regard to their financial strength, and, as to the most of them, with regard to the character of the service they render the public.

"The State should require that these corporations be honestly and economically managed, and that they provide good accommodations for their patrons and do away with the excessive crowding of cars. The companies should, however, be permitted to receive for this service a rate of fare which would pay the fair cost of rendering such service. Our people do not desire transportation wholly or in part free, but they desire and should receive good service and at its fair cost. The chief elements of cost of such service are reasonable wages, maintenance of the property, and a fair return upon actual investment, and not upon inflated values.

"I recommend legislation designed to enable our electric railways to be efficient servants of the public. If the Public Service Commission does not possess sufficient authority in the premises I recommend that additional authority be granted to that body."

Company Paper

San Diego Electric Railway States What It Hopes to Accomplish with Its New Paper

Brief mention was made in the ELECTRIC RAILWAY JOURNAL of Jan. 5, page 62, of the establishment of the *San Diego Electric Railway News*. The company has stated its aim in the first issue of the paper as follows:

"The purpose of this little paper is to create friendship between the public and the street car system. Its policy is to tell people the truth about railway operation in order that they may acquire a better knowledge of the subject and consequently be better able to exercise their judgment in railway matters when the same shall be necessary. It is hoped through this publication to promote a closer relationship between the traveling public and the electric railway system.

COLUMNS OPEN TO THE PURLIC

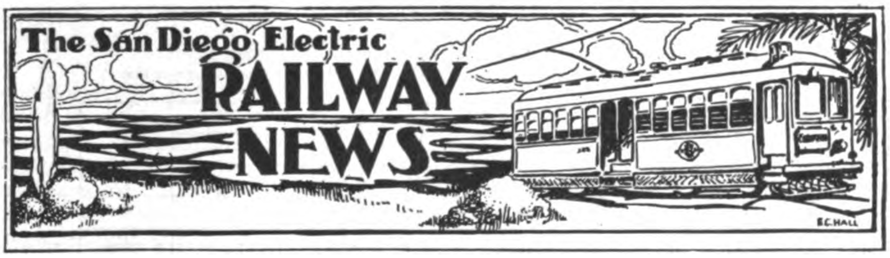
"The *San Diego Electric Railway News* will print from time to time matters of interest in connection with the transportation of passengers not only in San Diego, but in other communities in the United States and in foreign countries as well.

"The columns of the paper will be kept open to the public as far as possible. The editor will be glad to receive signed letters containing suggestions regarding service, etc. After such letters have been referred to the proper department head for consideration, if they are of sufficient public interest, they will be published with the company's statement in reply.

EMPLOYEES HUMAN—LIKE PRAISE

"The San Diego Electric Railway aims to give satisfactory service to its patrons and to have its employees both courteous and attentive to the needs of the public. Its officials are glad to be informed of any defect in the service or any discourtesy or inattention on the part of its employees. Any complaints along these lines should be sent to the editor of the *San Diego Electric Railway News* where they will be promptly taken care of. At the same time, it is hoped that the public will just as readily write to the editor when they think a conductor or motorman or any other employee is deserving of praise for attention to his duties and his attitude toward the patrons of the company.

"This little paper will be published once a month and distributed in the company's cars as long as the edition lasts."



HEADING OF NEW PUBLICATION OF THE SAN DIEGO ELECTRIC RAILWAY COMPANY

Freight Plan Discussed

Matter of Handling Freight on Chicago Surface and Elevated Lines Before Council Committee

The proposed plan to allow the surface and the elevated railways operating in Chicago, Ill., to carry freight was discussed on Jan. 4 before the subcommittee of the City Council on local transportation. The Aldermen favored the proposition, except that such a plan might interfere with the carrying of passengers.

John E. Wilkie, assistant to the president of the Chicago Surface Lines, is reported to have said:

"We would have to construct elevators and loading stations and certainly would have to look on the proposition as a permanent one and not a war measure, because it would entail the expenditure of a lot of capital."

G. T. Seely, assistant general manager of the Chicago Elevated Railways, agreed with Mr. Wilkie. He said:

"Before this could be carried out a plan should be made for developing it on a big scale. It would not help matters simply to adopt it as a war measure. The investment must be considered."

Most of the members of the sub-committee declared that they would sanction the plan if it provided for carrying freight after the usual hours. The representatives of the roads will go into the matter and report back to the sub-committee before any further action is asked.

Pittsburgh Fare Answer

The Pittsburgh (Pa.) Railways on Jan. 3 filed with the Public Service Commission an answer to the complaint of the city of Pittsburgh against the proposed increase in fares from 5 to 5½ and 6 cents. The company declares the proposed increase is absolutely necessary if it is to operate under its present organization.

It is hinted in answer that unless the increase is allowed the company will break up into separate units represented by various underlying companies, thus depriving the public of benefits incident to operating the lines as a unit. Intense labor competition due to the war, the high cost of materials, and the refusal of trainmen to operate trailers and trippers are among the reasons set forth urging more fare.

It is maintained that the service is reasonably adequate under existing conditions. The Public Service Commission will fix a date for a hearing on the city's complaint. The increase is to become operative on Jan. 22.

Six-Cent Fare for Portland

Commission Considers Existing Rates Confiscatory — Public Ownership Would Not Help

The Portland Railway, Light & Power Company was granted a 6-cent fare in a decision handed down by the Public Service Commission of Oregon on Jan. 5. The new rates are effective from Jan. 15. They are as follows: Cash fares, 6 cents. Unlimited tickets five for 30 cents to be sold by all conductors. Unlimited book tickets of fifty to be sold for $2.75. Limited tickets for school children 4 cents each. All tickets and cash fares are to include transfer privileges. In its ruling the commission says:

"It is evident to the commission that if the company be denied relief it must inevitably go into the hands of a receiver, for on the interurban lines the operating expenses equal the receipts, and the earnings of the light and power department are insufficient to meet the bond interest of the whole system or even to make a fair return on the investment in that branch of the utility."

The commission holds that relief is absolutely necessary because since 1912 the company has encountered financial stringencies, suffered from an enormous increase in the number of private automobiles, had to meet jitney competition and been confronted with war prices, a combination of adverse conditions with which no industry unable to protect itself by an increase of prices could possibly contend.

PUBLIC OWNERSHIP WOULD NOT HELP

The commission holds that public ownership would not solve the problem because the cost of service would not be less than now and because if the city undertook to take over the property it would be required to pay probably 25 per cent more than the commission valuation, and the money for such purpose could not be secured for less than 6 per cent, so that the present interest charge would not be reduced.

The decision also holds that in spite of the fact that the company for the last two months has attempted to inaugurate all the economies suggested in the commission's former decision refusing an increase in fare relief sufficient to prevent insolvency would not be forthcoming. The commission also points out that the law forbids the establishment of rates whose effect would be confiscatory of the property of a utility and that "it has been shown to the satisfaction of the commission that the existing rates with the present cost of operation are in fact confiscatory."

Hearing on Indianapolis-Cincinnati Fares

Indiana Commission Takes Under Advisement Request for a Two and One-Half Cent Rate

The preliminary hearing on the petition of the Indianapolis & Cincinnati Traction Company for a 2½-cent rate of fare was heard before the Public Service Commission of Indiana on Jan. 3. The principal argument hinged on the question as to whether the 2-cent railroad passenger fare law of the State applied to the interurban railroads.

PRESIDENT HENRY REPRESENTS THE COMPANY

Charles L. Henry presented the case of the company. His argument was based on three principal points. He contended that if the 2-cent fare law, as applied to the interurban roads, was shown to be confiscatory, there should be relief under the Constitution for the interurbans, regardless of the 2-cent fare law; that many decisions of courts and opinions of attorney-generals and rulings of the public service commission and the former railroad commission showed that the trend of opinion generally on these authorities was to the conclusion that the 2-cent fare law did not apply to interurbans, and that the Public Service Commission act, and its later interpretation, implied, at least, that the law was not applicable to the interurban roads, and, therefore, that the interurbans might legally secure through the commission increased fares for passenger service.

CITY ATTORNEY PROTESTS

R. W. Harrison, city attorney of Shelbyville, one of the principal towns on the lines of the company, argued that the Indiana courts had uniformly held that statutes may not be repealed by implication. He pointed to the fact that the Legislature of 1917, which amended the 2-cent fare law, did not see fit to amend it so as to make the interurbans specifically exempt from its provisions. He stated that the Legislatures had felt that the interurbans, by competition, would be kept within the 2-cent limit, and that the law intended throughout that the interurban roads should not exceed the 2-cent-a-mile limit.

OPPOSITION LACKS SUPPORT

Mr. Henry has received a communication from the Chamber of Commerce of Shelbyville that they were not in sympathy with the attitude of the city in opposing the petition of the company, and that they believed the interurban railways were entitled to receive increases in the rates of fare for both passenger and freight service.

CASE UNDER ADVISEMENT

The Public Service Commission announced at the conclusion of the argument that it would take the case under advisement, and if it decided that it had jurisdiction in the matter would appoint a time within a few days to hear the evidence. On Jan. 7 the commission forwarded a communication to the company, stating that it had been unable to reach a decision in regard to its jurisdiction, but appointed Jan. 9 as the time when a hearing would be held and the attitude of the commission in the case made known.

Transportation News Notes

Straight Fare for Danville.—The Danville Street Railway & Light Company, Danville, Ill., a subsidiary of the Illinois Traction System, is said to be preparing to petition the Public Utilities Commission of Illinois for permission to abolish the sale of eleven tickets for 50 cents and to charge instead a straight 5-cent fare.

"Trolley Weal" to Issue Quarterly.—In keeping with the national movement for conservation of material and labor, the *Trolley Weal*, which is published in the interests of the employees of the Public Service Corporation of New Jersey, will, until further notice, be issued quarterly instead of monthly. The next issue of the *Trolley Weal* will appear in March.

Near-Side Stops Desired. — Councilman Meyers has prepared a resolution to be introduced in the Council of Cleveland, Ohio, which will require all cars to stop on the near side at crossings. At the present time they stop on the near side at all safety zones and at crosstown lines. His desire is to make this custom uniform throughout the city.

Electric Railway Rate Application Not Affected.—The Railroad Commission of California has decided that Government railroad control will not affect the applications for rate increases which electric railways have filed. The news has strengthened electric railway securities, and, with the freight business these lines are developing, the prospects in this field are much better than they have been.

New Beaver Valley Rates.—The Beaver Valley Traction Company, New Brighton, Pa., has issued on the thirty days' statutory notice a new schedule of rates and fares for service in the Boroughs of Beaver, West Bridgewater, Rochester, Monaca, Freedom, Conway, New Brighton, Beaver Falls, College Hill and surrounding territory. The fares between all points shown in the former tariff as 5 cents will hereafter be 6 cents. A fare zone has been added for through passengers from Twelfth Street, Conway, to Vanport. Cut-rate tickets in books of twenty-one for $1 will be discontinued. The new 6-cent tickets will be offered in strips of ten for 55 cents. The new rates are effective from Jan. 26.

New York Roads Cancel Interchangeable Fares.—The Auburn & Syracuse Electric Railway; the Buffalo, Lockport & Rochester Railway; the New York State Railways and the Rochester & Syracuse Railroad have all filed with the Public Service Commission for the Second District of New York rate changes which indicate that the rules and regulations governing the sale of interchangeable coupon ticket books at a price of $10 for an aggregate of $12 worth of transportation will be canceled and their sale discontinued, effective from Feb. 1.

More Snow Equipment Recommended.—Because of the practical tie-up of a number of surface railways in the Bronx, some of which were not opened for full service until four days after the recent storm, the Public Service Commission of the First District has sent a letter to Edward A. Maher, Jr., vice-president of the Union Railway, recommending that that company purchase six snow plows in order to clear its tracks in time of future storms. The letter points out that the type of snowsweepers used by the company are not sufficient or efficient during a heavy fall of snow.

Fare Hearing in New York Goes Over.—The hearing before the Public Service Commission for the First District of New York on the applications of the Third Avenue Railway, the New York Railways, the Brooklyn Heights Railroad, the Staten Island Midland Railway and the Richmond Light & Railroad Company relative to changes and advances in rates of fare has been postponed until Jan. 21. F. J. H. Kracke and Charles Bulkley Hubbell, new commissioners appointed recently by Governor Whitman, have taken up their duties with the commission as the successors to William Hayward and H. W. Hodge, both in military service. Meanwhile they will acquaint themselves with the proceedings so far taken with respect to the fare applications.

I. T. S. Flat Fare Allowed.—The Public Utilities Commission of Illinois on Jan. 5 issued an order allowing the Illinois Traction System to change the basis of fares from the 5-cent zone system to a 2-cent-a-mile basis on the showing of the company in the petition that the change would remove discrimination and would increase the revenue less than one-third of 1 per cent. The ruling also allows a 2½-cent cash fare where paid on the train by a passenger boarding at an agency station. This is designed to relieve conductors now overburdened by the collection of cash fares and the war tax and to encourage the purchase of tickets at stations. The company will file the proposed tariffs to become effective on Feb. 1. The reasons for the proposed change were summarized in the item "I. T. S. Applies for Mileage Basis Fares," which appeared in the ELECTRIC RAILWAY JOURNAL for Oct. 27, page 791.

Personal Mention

Thomas F. Mullaney has just resigned as chief engineer of the Third Avenue Railway, New York, N. Y.

W. C. Culkins, who has been street railway commissioner of Cincinnati, Ohio, has been appointed to the office of Director of Street Railroads under the provisions of the new city charter and the new franchise ordinance of the Cincinnati Traction Company.

Henry N. Staats, who resigned on Dec. 1 as insurance expert of the American Electric Railway Association, has accepted the position of insurance expert of the Associated Building Owners of America. Mr. Staats has an office in the Monadnock Building, San Francisco, Cal.

Carrie A. Swartz has been appointed assistant claim adjuster of the Columbus Railway, Power & Light Company, Columbus, Ohio. Miss Swartz is also acting secretary of the American Electric Railway Claims Association, the secretary and treasurer of which, B. B. Davis, died recently.

H. C. Kaerscher, formerly master mechanic of the Elmira Water, Light & Railroad Company, Elmira, N. Y., has been appointed to succeed Niles Persons as assistant master mechanic of the New York State Railways, Rochester lines. The appointment of Mr. Persons to Gary, Ind., is noted elsewhere in this department.

Edward Coy was recently appointed engineer of maintenance of way of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 22. In the item which appeared at that time reviewing Mr. Coy's career the name was printed "Troy" through a typographical error.

Walter C. Douse has been appointed purchasing agent of the Toronto & York Radial Railway, Toronto, Ont., to succeed G. K. Hyde. Mr. Douse spent nearly five years with the Toronto Hydro-Electric system as chief clerk and was also connected for almost five years with the Toronto (Ont.) Railway as assistant purchasing agent.

Thomas P. Burke, who since August last has been supervisor of the railway lines of the Public Service Corporation of New Jersey between Trenton and Newark, has resigned from the company. Before that Mr. Burke was supervisor of the Middlesex division for eleven years. He has been connected with the Public Service Corporation and its predecessors for more than twenty-three years.

Carl H. Van Hooven, claim agent of the Manila Electric Railroad & Light Company, Manila, P. I., is on a visit to the United States. He is calling on a number of the representative electric railways throughout the country to study their methods of handling claims. Mr. Van Hooven went to Manila from St. Paul more than ten years ago and began work on the street railway there as a motorman. Since then he has taken a degree at the university and been admitted to the Bar.

Niles Persons has resigned as assistant master mechanic of the New York State Railways, Rochester Lines, to accept a position as master mechanic of the Gary & Interurban Railway. Previous to becoming connected with the company at Rochester Mr. Persons was assistant master mechanic of the United Traction Company, Albany, N. Y. He has been in railway shop and maintenance work for the last twelve years, starting as apprentice in the armature department of the United Traction Company.

John A. Hillman has resigned as master mechanic of the Dayton (Ohio) Street Railway. Mr. Hillman started his electric railway career as a helper, wiring electric cars for the Cincinnati (Ohio) Traction Company. From there he went to the Cincinnati, Newport & Covington Traction Company and then to the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati. He then became connected with the Bullock Electric Company, Cincinnati, and later entered the employ of the Cincinnati Traction Company. Mr. Hillman's next position was with the Cincinnati Car Company, where he was in charge of truck repairs. He left the Cincinnati Car Company to become connected with the Dayton Street Railway.

John Hayes Smith, consulting engineer, Milwaukee, Wis., has closed his office to accept a position as assistant engineer to the Public Service Commission of Pennsylvania. Mr. Smith was graduated from Cornell University. He associated himself with the Westinghouse Electric & Manufacturing Company shortly after graduation and remained in the employ of that company about six years. He was the first manager of the *Electric Journal*, Pittsburgh. He resigned from that paper to become editor of the *Electrical Age*, New York, in which capacity he continued for four years. Since that time Mr. Smith has been in Milwaukee. For two years he was with the Milwaukee Electric Railway & Light Company, resigning as commercial engineer to take up consulting work.

N. R. Longfellow has severed his connections with the Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., to accept the position of general manager of the Waterville, Fairfield & Oakland Railway, Waterville, Me. Mr. Longfellow is thirty-two years of age. At the age of seventeen he entered the service of an electric launch manufacturing company in New Jersey. Two years later he entered the service of the Augusta, Winthrop & Gardiner Railway, Lewiston, Me., as general repair man. In 1910 he was made foreman of the repair shops at Augusta, then under the management of the Lewiston, Augusta & Waterville System. In 1914 he was made general foreman of repairs for the entire system with headquarters at Lewiston and has continued in that capacity since then. Mr. Longfellow is a man of pleasing personality and is exceptionally popular with all the employees and the heads of the departments.

Robert A. Hadden, Joplin, Mo., has been appointed assistant manager of the Bangor Railway & Electric Company, Bangor, Me., succeeding Maurice E. McCormick, who resigned to accept the position of assistant to Harry Hooper, manager of the New Brunswick Power Company, St. John, N. B. Mr. Hadden was educated in Missouri and engaged in electric railway work there. His first work in the East was in New Jersey, where, as a representative of the Cooley & Anderson Company, Ann Arbor, Mich., he was engaged under the direction of the Public Service Corporation of New Jersey on valuation work. His association with that company lasted for several years. In 1916 Mr. Hadden was engaged by the Bangor Railway & Electric Company as an appraisal and valuation expert. His work was of such high order and his services of such value that when the vacancy occurred in the office of assistant manager Mr. Hadden was offered the position. After leaving Bangor in 1916 he went to the Acme Power Company in Toledo, Ohio, controlled by H. L. Doherty & Company. There he had general oversight of electrical construction work in one of the largest electrical plants in the country.

M. J. Perrin, manager of transportation of the San Diego (Cal.) Electric Railway, recently completed his thirtieth consecutive year of service with the company. One night in December last he and about twenty other heads of various Spreckels companies and departments who have been associated with Mr. Perrin during his long connection with the railway celebrated the event in a dinner at the Hotel del Coronado. Among those present were: William Clayton, vice-president and managing director of the Spreckles Companies; Reed Dilworth, James MacMullen, Major C. G. Ross, B. M. Warner, A. Ervast, Claus Spreckels, John J. Hernan, E. M. Harris, George Holmes, J. Fred Traggardh, Frank Von Tesmar, E. L. Phillips, E. J. Burns, W. A. Moore, Nat R. Titus, George A. Cheney, D. W. Pontius, H. G. Wellman, W. R. Saxon, Neil Brown and M. J. Perrin. While the majority of the guests had been connected with the company or associated with Mr. Perrin for a shorter period than thirty years, there were many personal reminiscences of times dating back to the horse-car days. The evening was closed with the presentation by Mr. Clayton on the part of those present of an appropriate token of regard for the host.

Changes in Twin City Officers

New General Manager and New Division Superintendents Appointed by the Twin City Rapid Transit Company

A number of changes has been announced in the personnel of the Twin City Rapid Transit Company, Minneapolis, Minn., further strengthening the organization of that company. Foster Hannaford, for two years superintendent of the St. Paul lines, has been appointed general manager of the company, the duties of which office have been carried on for six years by President Horace Lowry. C. B. Goodsell has been appointed superintendent of the Minneapolis lines to succeed Donald Goodrich, who has enlisted in the naval reserve. Austin L. Cunningham has been appointed superintendent of the St. Paul lines to succeed Mr. Hannaford. O. J. Gilcreest has been appointed assistant to J. J. Caufield, general superintendent.

MR. HANNAFORD

Foster Hannaford, for two years superintendent of the St. Paul lines of the Twin City Rapid Transit Company, has been made general manager of the company. Horace Lowry, president of the company, has carried on the work of this office for six years. After he was graduated from the Sheffield Scientific School Mr. Hannaford was for two years in the Westinghouse shops at East Pittsburgh, did technical work for one year abroad and then entered the employ of the Illinois Traction Company. He became superintendent of substations of that company, and then chief engineer of the McKinley power plant at St. Louis, the largest power plant of the Illinois Traction System. Later he became operating engineer and finally general superintendent of the Galesburg Railway, Light & Power Company, controlled by the Illinois Traction Company. In January, 1916, Mr. Hannaford returned to St. Paul, his birthplace. He is the son of Jule M. Hannaford, president of the Northern Pacific Railway.

A. L. CUNNINGHAM

O. J. GILCREEST

FOSTER HANNAFORD

C. B. GOODSELL

MR. GOODSELL

Mr. Goodsell was born on Sept. 21, 1886, at Fergus Falls, Minn. He attended the public schools in Minneapolis and was graduated from the South High School in that city in 1904. He then took a course in the Minneapolis Business College. For about a year after leaving school he was employed in a grain office at Duluth. He next was secretary to the manager of the Minneapolis *Journal* for a year. He joined the Twin City lines on April 1, 1907, as secretary to the general manager, and in 1913 was appointed assistant to the general superintendent, in which position he has continued to the present.

MR. CUNNINGHAM

Mr. Cunningham was born on March 26, 1884, in St. Paul. He was educated in the public schools. He left Cretin High School in 1901, before completing his course, and entered the service of Swift & Company and then worked as a weigher in railway mail service. In 1906 he worked for a general contracting company. In 1908 he was timekeeper and branch office cashier for the Barber Asphalt Company, and from February to September, 1908, was with the Mendota Stone Company. The same year he entered the service of the Twin City Lines. Mr. Cunningham has worked for the company as dispatcher, inspector, chief clerk and supervisor.

MR. GILCREEST

Mr. Gilcreest was born in Gainesville, Tex., on Aug. 18, 1886. He was graduated from high school in 1905 and was graduated from the electrical engineering department of the University of Texas at Austin in 1909. During the summer of 1909 he was with a construction crew at Gatesville, Tex. In the fall of 1909 he entered the testing department of the General Electric Company at Schenectady, and in the fall of 1910 took a post-graduate course at the Massachusetts Institute of Technology. In the fall of 1911 he returned to the General Electric Company and then served one year in the switchboard engineering department and two years in the railway commercial department. On Oct. 13, 1914, he entered the service of the Twin City Lines. Mr. Gilcreest has worked for the company as motorman and conductor, inspector, supervisor and later on followed up power saving and more efficient operation of car as to coasting, etc.

Obituary

Alex P. Humphrey, Jr., son of Judge Alex P. Humphrey, the chief counsel and vice-president of the Louisville (Ky.) Railway, was killed when his airplane fell 1500 ft. at Camp Taliaferro, Tex. Cadet Humphrey had been in training since last August.

Peter Leidenger, western sales manager of the Dayton (Ohio) Manufacturing Company, died suddenly of pneumonia at the Buckingham Hotel, St. Louis, Mo., on Dec. 28. Mr. Leidenger was born at Ironton, Ohio, in 1862. He had been with the Dayton Manufacturing Company for the last thirty years.

George Alvah Kittredge, a pioneer in the operation of electric railways in India, died at his home in Brookline, Mass., on Dec. 26, aged eighty-four years. Mr. Kittredge lived in Bombay for more than half a century, going there as a representative of consular interests soon after his graduation from Yale.

A. C. Miller, president of the Chicago-New York Electric Air Line Railway, Gary, Ind., until May 1, 1916, died suddenly on Jan. 4. He was also vice president and general manager of the Gary & Interurban Railroad for a number of years.

William Abial Scott, who [illegible] association with Governor L. B. Hanna and J. W. Smith established the Fargo & Moorehead Street Railway, Fargo, N. D., now controlled by the Northern States Power Company, is dead at his home in Fargo. He was the first vice-president of the company. Mr. Scott was [illegible] the North Dakota State Fair Association.

Charles S. **Foller**, sales manager of the Union Spring & Manufacturing Company, Pittsburgh, Pa., is dead. Mr. Foller was evidently drowned in an attempt to cross the Monongahela River on the ice. Mr. Foller went to Pittsburgh when he was twenty-four. For five years he was affiliated with the American Locomotive Company in that city. Then he entered the employ of the Union Spring & Manufacturing Company. Mr. Foller is survived by his widow, one son and three daughters.

Edward B. Smith, head of the banking house of Edward B. Smith & Company, Philadelphia, Pa., is dead. Mr. Smith was born on Sept. 23, 1861. He entered banking in 1886 and in 1892 organized the firm of which he was the head. The firm had a part in many of the large Philadelphia underwritings, among others the Philadelphia Electric Company. Among the electric railways of which Mr. Smith was a director were the Lehigh Valley Transit Company and the Philadelphia & Western Railroad. He was one of the organizers of the Lehigh Power Securities Company.

Lee Howell, president of the Evansville, Suburban & Newburgh Railway, died on Jan. 3 at Evansville, Ind., at the age of seventy-seven. Mr. Howell had spent all his business life in the service of railroad, interurban and steamboat companies. After serving in the cavalry division of the Confederate Army from 1862 to the close of the war, he began work in the steamboat service on the Ohio and Tennessee rivers. In 1872 he became contracting agent for the Louisville & Nashville Railroad and held this position for eight years. In 1880 he was appointed general freight agent and in 1882 division freight agent of the Evansville, Henderson & Nashville division of the Louisville & Nashville Railroad, and on Nov. 1, 1882, became general freight agent of the Evansville & St. Louis and the Evansville, Henderson & Nashville division of that company, with headquarters at Evansville. He was also the head of the Evansville & Bowling Green Packet Company, operating a line of steamboats between Evansville and Bowling Green, Ky., on the Ohio and Green Rivers.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Franchises

North Vancouver, B. C.—The British Columbia Electric Railway, it is reported, will ask the City Council of North Vancouver for permission to lay tracks on the ferry wharf and to operate cars thereon. The North Vancouver District Municipality will vote at the January elections on a by-law authorizing a grant of $2,500 to aid the company in this construction.

Waterloo, Iowa.—The Waterloo, Cedar Falls & Northern Railway has accepted the franchise passed by the voters of Waterloo on Dec. 5.

Cumberland, Md.—The Cumberland Electric Railway has received a twenty-five year extension of its franchise from the City Council of Cumberland. Under the terms of the new franchise, which will expire in December, 1942, the company will construct an extension to the Kelly-Springfield Tire Company and the new Ridgedale addition. The plans also include the double-tracking of Green and Water Streets.

Cincinnati, Ohio. — The Cincinnati, Lawrenceburg & Aurora Electric Railway has received a franchise from the City Council of Cincinnati to operate its line from the western corporate limits of Cincinnati to Anderson's Ferry. The ordinance authorizes the removal of approximately 3 miles of track from the Lower River Road to a private right-of-way on Commercial Avenue.

Track and Roadway

Edmonton (Alta.) Municipal Railway.—A report from the Edmonton Municipal Railway states that it has under construction 900 ft. of track interconnecting two parallel lines.

Municipal Railway, San Francisco, Cal.—About 2.44 miles of line will be placed in service by the Municipal Railway during this year.

Denver (Col.) Tramway.—A report from the Denver Tramway states that during 1918 it expects to place in service 1¼ miles of new track. It also expects to third-rail the Gold division from Gravel Spur, about 4 miles.

Connecticut Company, New Haven, Conn.—It is reported that this company will build an extension to its line from Terryville to Thomaston.

Georgia Railway & Power Company, Atlanta, Ga.—In view of the inadequacy of the single-track line from Buckhead to Camp Gordon, the Georgia Railway & Power Company plans to double-track the line to a point near the intersection of Piedmont Road and Peachtree Road. If it should later develop that extension of the double track beyond the point at present contemplated would be necessary for improved service, the company plans to continue the extension.

Chicago (Ill.) Surface Lines.—An extension will be built by the Chicago Surface Lines on Monroe Street from La Salle to Canal Street.

Peoria (Ill.) Railway.—This company reports that it will reconstruct 5 miles of track during this year.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—The Board of Public Works has extended until June 1, 1918, the time limit fixed for double-tracking the West Michigan Street line from Holmes Avenue to Tibbs Avenue. March 15 was the date fixed as the time when the company should complete the turn-outs and other improvements in Brookside Avenue, so that the line may also be double-tracked, if found necessary. The board extended until July 1, 1918, the time limit for completion of the North Illinois Street car line extension from Maple Road to Forty-sixth Street, and the same date was set for the completion of the South Street tracks from Virginia Avenue to Delaware Street.

Wichita Railroad & Light Company, Wichita, Kan.—This company reports that during this year it expects to place in service about 1½ miles of new track.

United Railways & Electric Company, Baltimore, Md.—This company reports that it expects to place in service during 1918 a 2-mile extension to Fairfield and a 1-mile extension on Columbia Avenue.

Pascagoula Street Railway & Power Company, Pascagoula, Miss.—This company reports that it will rebuild 3 miles of track this year.

Kansas City (Mo.) Railways.—The City Commissioners of Kansas City, Kan., have let the contract for building the Central Avenue viaduct, subject to the approval of the Kansas City Railways. The cost will be $192,000, of which one-third will be borne by the Kansas City Railways and the other two-thirds equally by the Missouri Pacific Railway, the Union Pacific Railroad and the Chicago, Rock Island & Pacific Railway. The completion of the Central Avenue viaduct will extend the traffic way from Riverview Avenue, Kansas City, to the high line bridge across the Kaw River.

United Railways, St. Louis, Mo. — A report from the United Railways states that the company expects to place in service 3½ miles of new track during 1918. It also plans to reconstruct about 15 miles of track during this year.

New York Municipal Railway, Brooklyn, N. Y.—The new Broadway subway, connecting Rector Street, West Broadway and Forty-second Street at Broadway, was opened for service on Jan. 5. This is the most important link in the dual subway system to be placed in operation since 1913. The New York Municipal Railway, which will operate the new line, has been operating trains under Broadway between Union Square and Canal Street, thence into Brooklyn, for some time.

Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S.—This company reports that it expects to place in service about 3½ miles of city track during 1918.

Cleveland & Sharon Rapid Transit Company, Cleveland, Ohio.—A report from C. H. Felton, secretary of the Cleveland & Sharon Rapid Transit Company, states that grading on its proposed line from Lockwood to Middlefield via North Bloomfield and Mesopotamia has been mostly done. It is expected that the line will be completed this year. The line will be operated by the Cleveland & Eastern Traction Company, furnishing direct connection with Cleveland. No contracts for materials have been let. [Dec. 16, '16.]

City Railway, Dayton, Ohio.—During 1918 this company will place in service 1¼ miles of new track and will rebuild 1 mile of track.

Dayton & Troy Electric Railway, Dayton, Ohio.—This company reports that it will rebuild 1½ miles of city track.

Springfield (Ohio) Railway.—An extension is being built by the Springfield Railway in the Northern Heights addition.

Oklahoma Union Railway, Tulsa, Okla.—The Board of City Commissioners has granted the Oklahoma Union Railway permission to double track its Fourth Street line from Boulder east to Boston Street, in order to facilitate the handling of the interurban and West Tulsa lines which radiate from that point.

Brantford (Ont.) Municipal Railway.—A report from the Brantford Municipal Railway states that it expects to place in service 2½ miles of new track during 1918.

***Montrose, Ont.**—The Hydro-Electric Power Commission of Ontario is building a line from the Welland River, near Montrose, around Niagara Falls City to the Niagara River near Queenston, about 12 miles, in connection with the Chippawa-Queenston power canal. It is reported that about 8 miles of construction has been completed at the northern end of the line. The line will be double-track, standard-gage, 70-lb. rails and will be ballasted with rock. The work is being done under the direction of F. A. Gaby, chief engineer of the commission.

***Whitby, Ont.**—Work has been begun on the construction of a line in Whitby from the Grand Trunk main line station to the military hospital on the lake front. This road will be the initial unit of the street railway system authorized by vote of the municipality in adopting the hydro-radial proposal from Toronto to Whitby.

Portland & Oregon City Railway, Ore.—A report from the Portland & Oregon City Railway states that it will place in service 10 miles of new track in 1918.

Portland Railway, Light & Power Company, Portland, Ore.—About 1 mile of track will be rebuilt by this company.

Shamokin & Mount Carmel Transit Company, Mount Carmel, Pa.—This company reports that it will construct about ½ mile of new track.

Ponce (Porto Rico) Electric Company.—This company reports that it plans the reconstruction of about ½ mile of track.

Austin (Tex.) Street Railway.—Operation has been begun by the Austin Street Railway on its extension to Travis Heights.

El Paso (Tex.) Electric Railway.—This company reports that it will build 1 mile of new track in 1918.

Mineral Heights Street Railway, Greenville, Tex.—A report from this company states that it is planning to change its method of operation from the overhead system to gasoline motive power.

Norfolk Southern Railroad, Norfolk, Va.—An extension will be built by the Norfolk Southern Railroad in the village of West Munden.

Richmond & Rappahannock River Railway, Richmond, Va.—Joseph E. Willard, Ambassador to Spain, has acquired from the Richmond & Rappahannock River Railway its line between Twenty-ninth and P Streets, Richmond, and Seven Pines, the receivership of which was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 17. The Seven Pines lines, it is said, will be operated as a separate and distinct corporation, while the remaining section is headed toward dismantlement. According to the latest information the State Corporation Commission has granted the petition of the Richmond & Rappahannock Railway for dissolution, but the sale of the equipment is to be held up until William G. McAdoo decides upon the utility of the line for public or war purposes. Service has been discontinued on the unsold part of the property. The Richmond & Seven Pines Railway was recently chartered to operate the property purchased, the president of which is Thomas B. Love, who is also president of the Richmond & Rappahannock River Railway.

Charleston-Dunbar Traction Company, Charleston, W. Va.—A report from the Charleston-Dunbar Traction Company states that during this year it expects to place in service 9 miles of track between the cities of Dunbar and Poca.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company reports that during 1918 it will reconstruct 5 miles of track.

Shops and Buildings

Southern Pacific Company, San Francisco, Cal.—Plans have been submitted to the Railroad Commission of California by the Southern Pacific Company for the erection of a new $130,000 depot on the Alameda, San Jose, and the moving of the freight yards to the College Park district. The company will abandon its present railway lines on Fourth Street and will move to its new right-of-way on the western side of the city. The new freight yards will cost $430,000, while the entire change will cost more than $1,300,000.

Inter Urban Railway, Des Moines, Iowa.—It is reported that the Inter Urban Railway has had plans prepared for the construction of a four-story brick terminal station to cost about $200,000.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Contracts have been awarded by the Trenton & Mercer County Traction Corporation for the construction of a new building to replace that portion of the carhouse at Trenton recently destroyed by fire. Newton A. K. Bugbee & Company, Inc., will do the steel work; Edward LaRue will do the carpentry and Burton & Burton the mason work. The improvements will cost approximately $11,000. The design of the building will be changed from that of the old structure.

Long Island Railroad, New York, N. Y.—Fire recently destroyed the storage and office building of the Long Island Railroad at Long Island City, together with two freight cars. The loss is estimated at $125,000.

Toronto (Ont.) Suburban Railway.—A new carhouse and express shed will be built by the Toronto Suburban Railway at Guelph.

Power Houses and Substations

Connecticut Company, New Haven, Conn.—The Public Utilities Commmission of Connecticut has approved the application of the Connecticut Company to erect electric transmission lines in New Haven and North Haven.

Hagerstown & Frederick Railway, Frederick, Md.—In addition to the plant at dam No. 4, the Hagerstown & Frederick Railway is building a new power house at dam No. 5. These plants will be connected with the Security plant, which is being enlarged. New transmission lines are being built to Waynesboro and Martinsburg.

Twin City Rapid Transit Company, Minneapolis, Minn.—A new automatic substation is being built by the Twin City Rapid Transit Company at Concord and Isabel Streets, St. Paul. The substation will be ready shortly and will have a capacity of 2000 hp.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Freight Congestion Serious

Time for Pacific Coast Deliveries from East Doubled—Demurrage Rates to Be Increased Jan. 21

So far as can be learned from leading shippers and receivers, deliveries have grown worse rather than better. The situation is said to be more acute in the New York territory than at any other point in the country. The congestion of freight and that of unloaded cars causing this condition has reached the stage where drastic action has been found necessary. Secretary McAdoo, Director-General of Railroads, has named the week of Jan. 14 to 21 for the unloading of cars which have for months been used by consignees here as warehouses.

A jobber carrying one of the largest stocks of railway supplies in the country said deliveries are not only a sore spot, but the situation is almost unbearable. Not only is freight affected by the embargoes, but the express companies, which afforded some relief, even at a higher cost, have in some cases embargoed all but direct and incidental Government business.

Transportation conditions are very much affecting the supply of line material, which is becoming quite scarce in some quarters. Shipments held up by embargoes east of Pittsburgh are a cause of anxiety on the part of distributers. An order for locust pins placed early in June last has not been delivered yet. An acute shortage is in sight. Yellow-pine cross-arms are also in bad shape. Of three cars ordered six months ago one was received here; the others are "somewhere" in the South in transit. Fir arms are hard to get, as the lumber is being requisitioned by the government for aeroplanes and ships.

The time required for Eastern freight deliveries to the Pacific Coast has jumped from seventeen days, which was the average a month or six weeks ago, to thirty to forty days, which is the time in which shipments are now arriving. However, government control of railroads is confidently expected to improve freight shipments.

The California Railroad Commission has decided that Government railroad control will not affect the applications for rate increases which electric railways have filed. This news has strengthened electric railway securities, and, with the freight business these lines are developing, the prospects in this field are much better than they have been.

Relief of congested conditions of the Pacific Northwest terminals is expected to result speedily from the appointment of a joint committee of railway and steamship officials to devise a solution of the problem. Federalization of railroad lines will lead, it is believed, to an early settlement of terminal problems and is certain to result in an issuance of an order to abandon intraterminal switching. Transcontinental lines are striving to reorganize service, which was disrupted during the past ten days by floods. Work of repairing and rebuilding washed-out bridges in mountain divisions particularly is being rushed under difficulties. Collections fair.

On Monday of this week Director-General of Railroads McAdoo issued a statement showing the imperative necessity that exists for releasing cars for further service and for relieving terminals which are now badly congested and at the same time issuing order No. 3. This order increases demurrage charges to a maximum of $10 per car per day reached on the eighth day of detention beyond free time. The new demurrage rates will go into effect on Jan. 21.

Government Statistics on Rail Manufacture

Value of Product in 1914 Was More Than $54,000, a Decrease of 35 Per Cent from 1909

Statistics have just been put out by the Bureau of the Census on iron and steel products manufactured in 1914 showing the production of steel rails and certain rail equipment. Table I shows the rail production in 1899, 1904, 1909 and 1914. The rail production in 1914, it will be noticed, was around 35 per cent less than in 1909.

Rail production in 1914 absorbed 10 per cent of the mill tonnage as compared with 14.8 per cent in 1909, 17.2 per cent in 1904 and 21.6 per cent in 1909, 17.2 in 1904, and 21.6 per cent in 1899. Rail fasteners and rerolled or renewed rails absorbed around an additional 2 per cent.

Data on railroad spikes are available for 1914 only and show fifteen establishments engaged in their manufacture. The output of these mills was 1,366,177 kegs of 200 lb. each, having a total value of $4,201,388.

Trolley Cord Still Advancing

Uncertainties of Present Market Cause Supply Men to Hesitate to Make Quotations

Railway supply men in New York are very careful when it comes to quoting prices on any material of iron, steel or copper. The eccentricities of the market are apparently beyond their comprehension at times, so they state. On one particular article, namely trolley cord, the gyrations have been unusually hard to follow. Prices have been jumping right along, the latest, effective about two weeks since, going up 7 cents a pound. At that, immediate acceptance of the quotation must be made, or else the offer is subject to cancellation.

A reasonable time is allowed between the date when a quotation is asked and the placing of the order, otherwise a new condition is presented for both the seller and buyer. Not infrequently the factory intervenes with a higher figure than originally named, and no preliminary notice is given of the advance. This has led to no end of complications before an adjustment is reached. Just now the attitude of the seller of supplies and accessories is precarious on the matter of prices, which are likely to change without the slightest intimation from the producer.

Rails	1914	1909	1904	1899
No. establishments	15	13	14	
Tons	[1] 1,842,041	2,858,599	[2] 2,194,605	[2] 2,251,337
Value	$54,009,918	$81,128,295	$58,256,750	$46,533,159
Open-hearth—				
Tons	[3] 1,522,684	1,215,072	128,681	Figures not available.
Value	$45,336,381	$36,400,780	$3,608,562	
Bessemer—				
Tons	319,357	1,643,527	2,065,024	
Value	$8,673,537	$44,727,515	$54,627,488	
Rerolled or renewed rails—				
No. establishments	8	9	8	
Tons	63,671	106,352	99,530	
Value	$1,438,237	$2,683,017	$2,480,328	
Rail fastenings (incl. splice bars, tie-plates, fishplates, etc.)—				
No. establishments	26	25	(3)	
Tons	349,307	396,911	174,055	
Value	$11,526,956	$14,488,412	$5,663,052	

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[1] Includes 27,286 tons of alloy steel rails; titanium steel, 7395 tons; nickel-chrome steel, 4174 tons; manganese steel, 3864 tons; and kinds not specified, 11,858 tons.

[2] Includes iron rails; 1904, 900 tons; value, $20,700; 1899, 880 tons; value, $31,180.

[3] Includes 1,522,362 tons of basic open-hearth, 144 tons acid open-hearth, and 178 tons of electric steel rails.

Steel Prices in Effect Until March 31

Current Quarter Contracts Calling for Later Deliveries Subject to Government Price Revision

President Wilson has approved the recommendation of the War Industries Board that the maximum prices heretofore fixed by the President upon the recommendation of the board upon ore, coke, pig iron, steel and steel products, subject to revision on Jan. 1, 1918, be continued in effect until March 31, 1918. No new contracts calling for delivery of any of said commodities or articles on or after April 1, 1918, are to specify a price unless coupled with a clause making the price subject to revision by any authorized United States government agency, so that all deliveries after that date shall not exceed the maximum price then in force, although ordered or contracted for in the meantime.

Particular attention is being paid by the steel interests to that part of the approved recommendation pertaining to contracts placed during the current quarter for later delivery. As stated, no prices are to be specified for deliveries later than March 31 except as subject to Government revision. The natural assumption, and this is borne out by the uneasiness of the steel producers, is that any government revision of prices will probably not be upward.

As matters now stand, therefore, contracts may be placed for certain quantities of steel product for delivery later than the current quarter at a certain price or not, but in any event subject to future Government price regulation, which at the present writing does not seem to be inclined toward higher prices.

Probable Market Effects of Federal Road Control

There seems every reason to believe that the assumption of control by the Federal government of the steam railroads will lead shortly to large orders for both rolling stock and road equipment. The purchases will undoubtedly be made under priority orders of the first class. In markets so far behind on orders as those for rolling stock and rails it becomes evident that buyers not falling in the preferred classes will find it more difficult then ever to obtain materials and equipment.

How far the control of electric railways will be taken over by the government is not known at this writing. The report that the Lehigh Valley electric system has been taken over has been denied. In the event of a wide control of traction properties, it appears that early purchases will probably have to be made of freight rolling stock and rails.

Owing to the existing situation roads have been less careful in rail replacement than formerly. Consequently there is undoubtedly a considerable amount of rail of the country that badly needs replacement.

Just how these purchases are to be financed is for the present a matter of speculation. It does seem certain, however, that nothing of any consequence will be done in the way of purchases for a month or more. Still, provided the government wishes, as has been repeatedly stated, to maintain the roads in as high a state of efficiency as possible, sooner or later orders of considerable size for new equipment of one kind or another must find their way to the manufacturers.

Market Develops for Sleet Scrapers

Deliveries Being Made Out of Stock With Feeling in Trade That Prices Will Go No Higher

As might be expected devices for removing sleet from wires were in strong demand during and following the recent snow storms in different parts of the country. A number of appliances of this kind are in the market, accomplishing their work along pretty much similar lines. Manufacturers of the sleet cutters, or scrapers as they are called, operating in this field, reported an immense sale.

While there has been no recent change in the price of sleet cutters, with the constant change in copper and brass the manufacturers frankly admit the possibility of a reduction in the near future. It was admitted that, in their judgment, prices were at peak, and that the tendency seemed to be for shorting of prices rather than increasing. Deliveries are said to be prompt, as the goods are kept in stock. The greatest difficulty just now was in securing skilled workmen. Mechanics of the ordinary kind in their line were plentiful enough, but the men desired were scarce and hard to engage at any reasonable wages.

Confusion Regarding Priority Transportation

Fuel Administrator Announces That All Priority Orders Were Suspended on Dec. 31

The Fuel Administration issues the following:

"Despite the fact that formal announcement was made that all priority orders in connection with freight shipments were suspended at midnight Dec. 31, considerable confusion apparently exists in many quarters, as evidenced by many telegrams to the United States Fuel Administration, inquiring as to the status concerning priorities."

The following typical answer to these telegrams is being sent out by the Fuel Administration:

"By direction of Director-General McAdoo, all priority orders heretofore issued with respect to transportation have been suspended and no further priorities may be claimed thereunder. Future orders for priorities will be issued in emergencies under Mr. McAdoo's direction as occasion may require."

Increased Demand for Trolley Wire Noted

Stories Stimulate Orders for Maintenance Equipment—Reduction Noted in the Price for Wire

Buying has about reached the minimum level, but maintenance of track and transmission lines must be kept in workable condition at all hazards, the selling trade takes satisfaction in saying. This means something, and the manufacturers and handlers of trolley wire declare they are fortunate in having reasonably heavy orders placed with them for prompt delivery.

At this time of the year there is always a certain amount of movement in trolley wire, but the recent snow storms have occasioned the buying of an additional quantity. A number of large orders have been recently booked from railways in the eastern territory, a greater portion of which was for quick delivery. The producers, however, commenting upon the orders, stated it was evident only necessity compelled the purchase. The traction companies, it was well understood, were finding it difficult to secure funds to maintain their properties in proper shape, let alone for extensions, and also steam roads for the electrification of parts of their systems in contemplation. At any rate, the orders, such as they were, and representing a considerable amount at that, declared one manufacturer, were welcome, although the major facilities of his plant are given over to governmental work.

Another manufacturer, in speaking of the buying of trolley wire by the railways, stated the quantity was above the average for the winter season, and was doubtless for maintenance purposes only.

The price of trolley wire has been gradually lowered during the past two months, totaling in all a reduction in the neighborhood of 10 per cent. When one of the largest manufacturers of copper wire was asked about the current status of base he promptly said "there is no base." The same authority averred that under the pressure of competition and eagerness for orders base had been quoted at 26 cents for large interests, although 30 cents is the generally recognized figure.

Weatherproof wire is also on the downward scale, according to various sources of information. It was stated that the cost of weatherproof had been greatly enhanced by the high cost of cotton, which had advanced considerably. At one time the covering used for weatherproof wire was a waste or by-product, but now plays a large part in adjusting wire prices. With the reduction, however, in copper ingots and consequently base wire the price of weatherproof has been readjusted. On a large order 28 cents was quoted last week for weatherproof.

In 100 lb. lots weatherproof wire was quoted Monday morning of this week for 34¼ to 35¼ cents in the New York market and 38 to 38.35 cents in Chicago.

Rolling Stock

Galesburg (Ill.) Railway & Light Company suffered the loss of a car by fire Dec. 27, the damage figuring $2,500.

Toronto & York Radial Railway Company, Toronto, Can., is reported as negotiating for the purchase of four cars.

Long Island Railroad Company, Long Island City, N. Y., lost a storage and office building by fire on the night of Dec. 30. Two freight cars besides were destroyed.

Illinois Traction System, Peoria, Ill., on Dec. 31 had two passenger coaches and a motor car burned in a fire, which partially destroyed its shops and barns at Staunton, Ill. The damage is estimated at $35,000.

Sandwich, Windsor & Amherstberg Railway, Windsor, Ont., Can., has added to its rolling stock recently three single truck p.a.y.e. cars built in Canada and two double truck steel cars built in the United States.

Pensacola (Fla.) Electric Company recently put in commission two motor cars on its Bayshore line. The cars, which accommodate ninety passengers each driven by two 50 hp. motors respectively, were on delivery since early in August last.

J. G. Brill Company, Philadelphia, Pa., is working on parts for the cars recently damaged by fire in the barn of the Trenton & Mercer County Traction Corporation, as reported in last week's ELECTRIC RAILWAY JOURNAL. One of the damaged cars was repaired at the Trenton repair shop. The cars are valued at $7,500 each.

Georgia Railway & Power Company, Atlanta, Ga., have installed trailer cars on its line to Camp Gordon. Old gondola cars were rebuilt in the company's shops, the motors being removed and new trucks, with 26-in. wheels, substituted. Couplers and air-brakes were installed. Work on several p.a.y.e. cars has also been begun in the company's plant.

Bangor Railway & Electric Company, Bangor, Me., has recently placed an order for three passenger trolley cars of the one-man safety type. They are said to cost $6,000 each, f.o.b. St. Louis. Delivery is expected in March. Considering the trouble the Lewiston, Augusta & Waterville system claims to have had in getting delivery of new cars ordered many months ago, there is some speculation as to whether Bangor gets her new cars on time.

New Advertising Literature

Consolidated Expanded Metal Company, Braddock, Pa.: "The Military Camps of Our Allies," twelve-page pamphlet descriptive of the buildings for housing troops in France, Belgium and Great Britain employing expanded metal lathing with cement plaster. There are many illustrations.

Moller & Schumann Company, Brooklyn, N. Y.: Bulletin No. 3 treats of the company's air drying and baking Hilo White enamels. Each article is described as to the kind of work for which it is suited. The method of handling the enamel in order to assure satisfactory results is also given.

Arthur D. Little, Inc., Cambridge, Mass.: "The Little Journal" for December contains plans and perspective view of the new Charles River Road Laboratory of the company at Kendall Square, Cambridge. The leading article is on conservation of our national resources. Instances are pointed out of the waste going on in potash, fuel, labor, etc., when the greater part of these possessions could be saved by the application of scientific principles.

Wilson Welder & Metals Company, New York: Electric welding catalog No. 2. A book, descriptive of the Wilson system of electric welding which was developed on a large trunk line railroad several years ago. An especial claim made for this system is the control over the heat at the point of application, so that the heating can be kept constant and the welding uniform. Any number of welders can work from one large machine. Reduction in energy consumption and labor, as compared with other electric welding outputs, is also claimed. The company also supplies specially prepared welding metal. The catalog is well illustrated and contains a number of tables.

Trade Notes

McGovern & Company, Inc., New York, N. Y., dealers in second-hand machinery, increased their capital from $150,000 to $200,000.

Ralph C. Davison, for the past six years with the American Mason Safety Tread Company, has joined the American Abrasive Metals Company, makers of Feralun safety treads and anti-slip surfaces.

H. T. Glover, formerly sales manager of the Esterline Company, Indianapolis, Ind., who enlisted last June with the Canadian Expeditionary Force, is about to start for Europe, if he has not already done so, as a member of the divisional signalers of the Canadian forces. Mr. Glover is a British subject, which accounts for his enlistment in Canada.

W. Jerry Stanton has resigned from the sales department of the General Electric Company, Philadelphia office, to become sales manager of the Railway Improvement Company, New York. Mr. Stanton is a native of Schenectady and since his school days he has been employed in the testing, engineering and sales departments of the General Electric Company.

General Electric Company, Lynn, Mass., will soon begin the construction of three new buildings. The plans call for a two-story brick and concrete office building 142 ft. by 60 ft.; a one-story building 226 ft. by 582 ft. to be constructed of steel, brick, concrete and cement plaster, to be used for general manufacturing purposes, and a two-story building 67 ft. x 340 ft. to be used for a cleaning and core shop.

New York Municipal Railway Corporation, Brooklyn, N. Y., that opens its new subway extension from Fourteenth Street to Times Square (Broadway division, New York) to-day (Jan. 5), will have Johnson fare boxes installed on the stations. The Railway Appliance Company, which is Eastern agent for the Johnson Fare Box Company, has encountered more or less difficulty in getting delivery on the boxes owing to the embargo. Other shipments are in transit.

RAILWAY MATERIAL PRICES

	Jan. 3	Jan. 9
Rubber-covered wire base, New York, cents per lb.	30	30
Wire, weatherproof (100 lb. lots), cents per lb. New York	34¼-38	34½-35¼
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38-38.35	38-38.35
Rails, heavy, Bessemer, Pittsburgh	$38.00	$38.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$40.00	$40.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh per 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl	$2.22	$2.22
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.26	$1.29
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.27	$1.30
White lead (100 lb. keg), New York, cents per gal.	10	10
Turpentine (bbl. lots), New York, cents per gal.	48½	48

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*Nominal.

OLD METAL PRICES—NEW YORK

	Jan. 3	Jan. 9
Copper, ingot, per lb	23½	23½
Lead, cents per lb	6½	6.70
Nickel, cents per lb	50	50
Spelter, cents per lb	7.82½-7.92½	7.87½
Tin, Straits, cents per lb	*85.50	*85.50
Aluminum, 98 to 99 per cent, cents per lb	36	36

NEW YORK METAL MARKET PRICES

	Jan. 3	Jan. 9
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	14¼	14¼
Lead, heavy, cents per lb	6	5¾
Zinc, cents per lb	5½	5¼
Steel car axles, Chicago, per net ton	$42.42	$42.42
Old carwheels, Chicago, per gross ton	$35.00	$35.00
Steel rails (scrap), Chicago, per gross ton	$33.00	$33.00
Steel rails (relaying), Chicago, per gross ton	$55.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.50	$17.50

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, January 19, 1918 *Number* 3

The Electric Railway Industry Needs Greater Coherence

IT WAS Benjamin Franklin who during our struggle for independence made the famous remark about hanging together or hanging separately. The same remark applies to-day to the electric railways, and unfortunately some are already beginning to "hang separately." The war is acting as a tremendous force in lining up all industries to make them exert their maximum effort to bring it to a successful issue. Unless an industry can demonstrate that it is directly or indirectly essential to this end it will fare ill at the hands of the public until the war is won. The war then forces the electric railways with other industries to pull together, first to demonstrate to the government their essential character, and second to enable them to give a service commensurate with the needs of the hour. An intelligent fear of what will happen if the war be not won is an influence for unity throughout the whole country which must prove overwhelming.

But electric railways have more than the war to influence them. They must unite to impress the public with the necessity for increased income and to learn how to give a twentieth century transportation service. Organically this is not an easy thing to do, for the reason that the industry is made up of many individual units which have little in common. They are individually strong on what are termed "local conditions," which make it seemingly difficult for one company to co-operate with others. But through organization local conditions can be overcome.

The first step is to use more effectively the organizations already available in the national and sectional associations. The second is to supplement these, if they are not adequate for the work. The third is for each company to feel a responsibility not only for its own welfare but for that of other railway properties. There are unlimited opportunities for good if the energies of all branches of the industry—operating, manufacturing and financial—are united.

Uncle Sam Must Have

MACHINE TOOLS

The federal government faces a momentous contingency in regard to the manufacture of heavy field artillery. Big guns must be had, in large numbers and promptly. But it takes time and tools to make them with. The government is short of both and machine-tool makers cannot supply the tools in time to prevent heavy slaughter of our men in the campaigns of 1918. The tools must be taken from the shops where they are not in use directly or indirectly on work necessary in the winning of the war. Electric railway operators and manufacturers of supplies can do something to help in this emergency. Some suggestions are given on page 137. Read these, if you skip everything else in this issue.

Reduced Schedule Speeds in Detroit

THE chart which we printed in our news columns last week, showing a constantly decreasing schedule speed for cars in Detroit since 1910, discloses a condition which is very serious, if it is at all general. According to this chart, the average schedule speed of the Detroit cars has decreased during the last seven years from 9.6 m.p.h. to 8.5 m.p.h. The fact that the managers of the Detroit Railway published this chart in their company publication shows that they realize the situation and are doing their best to correct it. We recommended that other companies make a similar record to determine whether the average schedule speed of their cars is also falling, and if so to take immediate action toward a change.

A lower schedule speed means less attractive service, larger investment in equipment and higher operating costs. Thus it is objectionable to both the patron and the company. In thinking of schedule speed, one should keep clearly in mind that it does not vary with maximum speed. Indeed, it is often possible to increase schedule speed and decrease maximum speed. Schedule speed is largely under the control of the authorities and the management, but maximum speed is largely a question of the freedom of the streets from vehicles.

There is no doubt that present-day urban conditions tend to reduce the schedule speed of cars unless heroic efforts are made to overcome this tendency. There is increasing interference from vehicular traffic and foot passengers, caused by the greater volume of traffic on the street, and these necessitate non-passenger stops and slowdowns for the cars, which are exasperating and expensive. But if vehicular and foot-passenger congestion on the street is a necessary accompaniment of the growth and business activities of a city, one may naturally ask what can the railway do? The answer is this: Educate the public and the authorities to two facts.

The first of these is that high schedule speed is not only the foundation of good service, but it is also the foundation of economical service, and if a company can operate economically it can introduce improvements which it otherwise could not supply. The second is that the railway cars should not be held down as regards schedule speed and even maximum speed of cars in streets to the standards of thirty years ago, because the standards of speed as well as of service have changed during that time.

If these facts are understood, the railway company should get the co-operation which it needs from both the authorities and the general public for introducing longer spacing between stops, rerouting reforms for its own cars and even restrictions on the use of certain streets by vehicles, all in the interest of higher schedule speed and better electric railway service.

Public Speed Standards Have Changed in Thirty Years

IT is a noticeable fact that each advance in the art of urban transportation has been accompanied by an increase in speed. In its early days the horse car itself made better time than the rumbling, creeping bus, in part probably because of its higher rate of acceleration and because the cars were lower and easier of access. Hence the time of passenger interchange was less. Then the horse car was succeeded by the electric car, which although first built on the model of its predecessor was faster because of a higher accelerating rate and higher maximum speed. Later improvements in car body design and equipment still further greatly reduced the time of passenger interchange as well as increased the rates of acceleration and braking, although these improvements have been counterbalanced, at least in part in many cities by a reduction in schedule speed from street congestion and other causes. This brings us to the present day.

Under existing urban conditions even the fastest electric railway car seems slow in comparison with the automobile. It is this latter vehicle which now sets the pace on the streets, and this pace is a fast one. The electric car must compete with it in schedule speed, if it is to do its full duty to its patrons. The average rider will forget all considerations of safety and comfort as well as of justice to vested interests if only he can reach his destination more quickly. Sentiment cuts no figure with him. Just as the electric railway manager uses an automobile in reaching various points on his company's system because he saves time thereby, so his patrons will desert him if they can find service more attractive than his own. Comparatively speaking, 30 m.p.h. for street vehicles to-day is as slow as the 10 m.p.h. of thirty years ago. Hence the best present attainable speed of the electric surface car frets the restless rider.

This paper has consistently advocated every plan of railway transportation which contained possibilities of speed. Large parts of whole issues have been given up to them. We have, however, no generally applicable formula for obtaining higher schedule speed. Skip stops, stagger stops, short stops, more power per unit of weight (provided safety is duly considered), better car operation, both by motorman and conductor, etc., are all good. The main thing is to speed up, remembering that the speed quality of service is judged by the speediest available competitive facilities.

Constitutional Barrier Is Bugaboo of Commission Imagination

'TIS not a comedy of errors, for to the company the situation is tragic. The New York & North Shore Traction Company, financed under commission supervision and economically managed, is in financial need. Its franchises stipulate a 5-cent fare, but a high court, whose decision has not been reversed, lately held that this restriction could not estop commissions from granting just and reasonable rates to this company. Accordingly the Second District Commission in Albany unanimously increased the rates of the company for part of its line, but the First District Commission in New York City, in whose jurisdiction the rest of the campany's system lies, now unanimously refuses to grant the relief which it admits is needed. The court, it intimates, didn't know the law.

Wherein do the two commissions differ? The Albany body, as it ruled in detail last November in the Huntington Railroad case, believes that franchises cannot be allowed to interfere with the exercise of the sovereign police power of the State, which covers rate-making. The Metropolitan Commission asserts that local authorities have a constitutional right to insert unalterable maximum fare clauses in franchises as a condition to their consent to operation. The two decisions are diametrically opposed, and nothing less than a proper interpretation of the Constitution is the issue.

The New York State Constitution undeniably requires the consent of local authorities to electric railway operation. But does that mean that a municipality can impose any condition it thinks proper? There should be no pussy-footing about this point. Either the local authorities are absolute sovereigns in granting consents, or they are subject to certain restrictions. If, as Commissioner Whitney alleges, a municipality is a completely independent power in dealing with the authorization of new utilities, rates are not the only point subject to sovereign whims. What of service, of facilities, of a prohibition of any control whatsoever by a State regulatory body—in other words, of unrestricted home rule? Manifestly the Constitution never contemplated this. Mr. Whitney's argument, completed, is a fine example of *reductio ad absurdum.*

The unescapable fact is this—that local authorities are not absolutely free in granting consents to utilities. The Constitution does not even by implication prescribe the terms of consent. The best proof of this is the fact that, before the regulatory system was put in operation, proper terms of consent were outlined in statutory law, such as the Railroad Law and city charters. Now the provisions of such laws in regard to rates have been superseded by the Public Service Commission Law, and this should be followed. In other words, the constitutional "consent" clause, not explicitly drawn in early years of regulation, has from time to time been interpreted by statutory law in accord with modern thought and experience. What the New York City Commission asks for is an obsolete interpretation.

But is this commission quite clear itself as to rate-making fundamentals? If Commissioner Whitney believes that the State has no paramount rate-making power when municipalities care to fix maximum fares in consents, his statement about the rate of fare is ridiculous: "Neither [the Legislature or the city] could advance it above a maximum fixed by the other." Thus, if the Legislature should revert to rate-fixing and prescribe a 5-cent maximum, no fair-minded city authorities could consent to a new utility beginning operation at a higher rate. Can a municipality's will in rate-making then be considered supreme? No, its consent must be given with recognition of the rate-making power of the Legislature under the police powers authorized by the Constitution.

This is the view taken by the Albany Commission, and it is the sane one. The New York City Commission has simply gathered a mass of technical and legal subtleties—most of them originating in days of undeveloped regulation—and by means of hard constructions and strained inferences accomplished what has been called the "torture of laws." The Constitution protects the State rate-making power, just as it does municipal consent. The Metropolitan Commission would read into the latter provisions which would destroy the first. Why this favoritism?

New York City Commission Gives Companies Little Chance

THE constitutional obstacle which the New York City Commission finds will prevent the grant of a reasonable fare to the North Shore Company seems a false creation of the imagination. But suppose that the commission, unlike its broader-minded and more constructive companion commission in Albany, is afraid to proceed without reassurance from the court of last resort. This is no reason why the company should be penalized and even allowed to go to ruin in the meantime. The only fair procedure would have been to grant relief with provision for restitution if later required.

But the means of relief suggested in the decision are more to be criticised. Here is the situation. Instead of granting the needed revenues the commission suggests three possible remedies. First, the company might ask the city for a release from the franchise fare limit. This is a touch of sardonic humor, in view of the fight made by the city against the company at the hearings. Second, the company might ask the city for release from certain franchise payments. These obligations, let it be explained, are a part of the municipal consent which the commission deems supreme under the protection of constitutional law.

Or, third—and here is the climax of the scheme—the city might municipalize the property. Commissioner Whitney scrupulously avoids saying that municipal ownership should be sought, but to anyone reading between the lines the decision seems to urge the company toward this. The company is left between the devil and the deep sea—between litigation under financial difficulties and municipal ownership under some plan which is inferentially to be considered easy of accomplishment. It should be noted that heretofore in public utterances, one of which was published in the issue of Dec. 1, Commissioner Whitney has taken pains to explain with what comparative facility the rapid transit act could be extended to authorize the purchase or lease of the surface lines.

Without doubt there will be certain surface railway problems to be solved in New York City when the new rapid transit system is completed. It is most unseemly, however, for any commissioner to talk so much about public ownership of companies while fare cases for such carriers are pending. Commissions are appointed not to spread political propaganda, but, with other duties, to adjudicate rate cases impartially. While theoretically a commissioner can talk municipal ownership and still protect the fair return of the existing private investment, practically such talking is as flagrantly wrong as the holding of securities in regulated utilities.

Electric Railways Offer Attractive Occupation for Women

THE New York Railways Company deserves the thanks of the industry for demonstrating the practicability of the use of women conductors on surface cars. Whether the experiment would have been undertaken had it not been for the existing labor shortage on account of the war, it is hard to say. At any rate, it is a proved success. Some 300 women are now being employed as conductors on the Broadway, Seventh Avenue and Eighth Avenue Lines, as well as on four of the crosstown lines (including one storage-battery line), and others will be employed when the accommodations for them at the different terminals are installed. We believe this was the first instance of the kind, at least on any considerable scale, in this country although to the Brooklyn Rapid Transit Company belongs the credit of using women first in transportation service, namely as guards on its Fourth Avenue subway line.

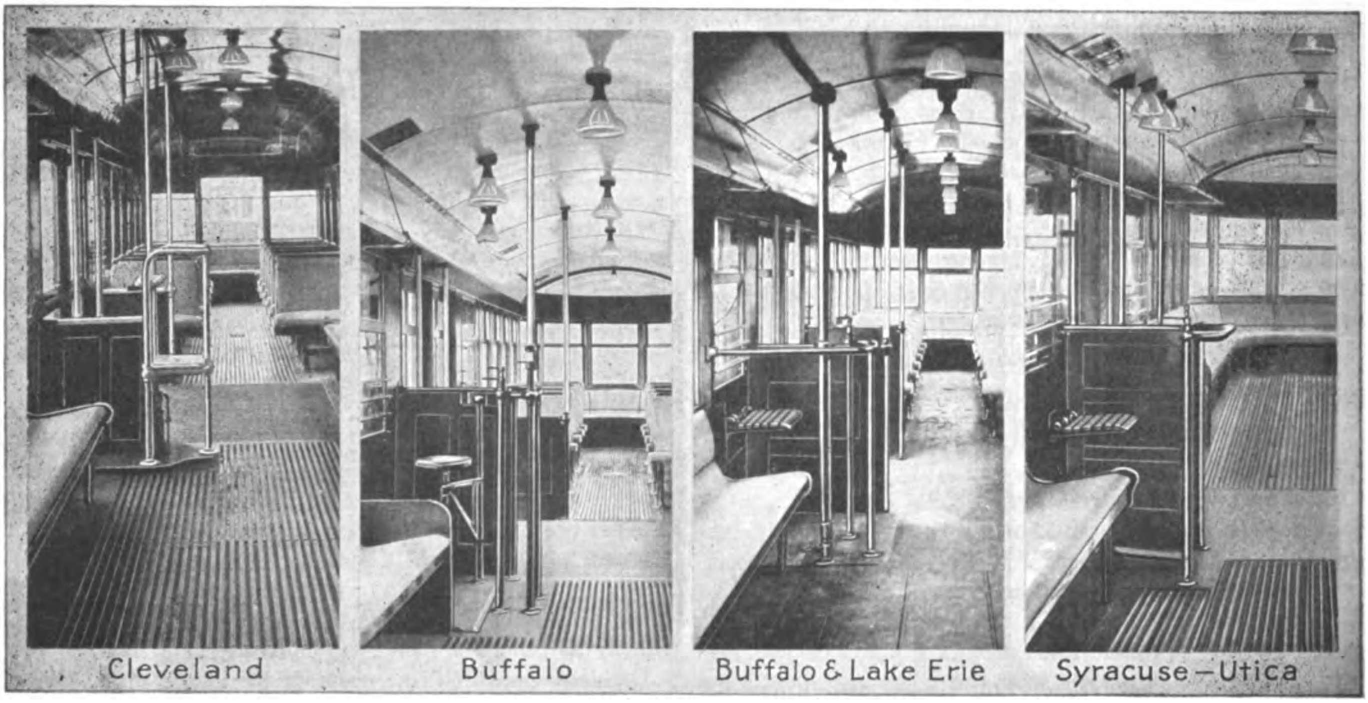
One reason which has possibly held back other companies from this course has been a fear of disapproval on the part of present men employees. The New York Railways Company, however, disarmed all possible criticism from such source by explaining, first, the necessity of the plan from a labor standpoint, and, second, by assuring the present men that none of them would be supplaced. Women would be engaged only to fill vacancies, and any man could retain his position on his line and on its seniority list if he cared to do so, or if he wished to train as a motorman the company would give him the instruction and let him keep the rate of pay which he had earned by seniority as a conductor.

The women receive the same rate of pay as the men, choose their runs according to their position on the seniority lists in the same way as the men, and work on cars in which fares are collected after the passenger becomes seated as well as on prepayment cars, so that no distinction is made in their class of work. Car posters, however, explain to the public that the women are doing a patriotic duty and passengers are requested to help them by having their fares and transfers ready. Although the period since the women have been at work has been about as unfavorable so far as weather is concerned as could be imagined, there has been no complaint from the new employees or from the public.

The result of the New York experiment is that a new and responsible occupation has been opened for women at good rates of pay, under working conditions far less arduous than those under which many women work. We see no reason why women conductors should not be employed on many other roads in this country to the benefit of the women and in the interests of good service.

The Front-Entrance, Center-Exit Car and Higher Schedule Speed

For Conductors' Stations on Recent Pay-As-You-Pass-Cars See Diagrams on Page 122



Experience in Several Cities Is Cited to Show That This Type of Car Is Meeting Expectations —Minor Details Are Undergoing Improvement

FOUR years ago the Cleveland Railway introduced a type of car in which the conductor was stationed near a center exit, the entrance being at the front. The fares were paid as the passengers passed the conductor, the fare-collection period being thus extended as compared with that in the pay-as-you-enter car. The story of the inception of the new type of car was fully covered in an article by its inventor printed in the issue of this paper for Jan. 5, 1918. Since its inception in Cleveland it has been introduced in Schenectady, Syracuse, Rochester, Buffalo, Toledo, and on the lines of the Mahoning & Shenango Railway and the Buffalo & Lake Erie Traction Company.

The purpose of the present article is to give the results of a study of the operation of the front-entrance, center-exit car on the properties mentioned. For this purpose a number of cities were visited by members of the staff of the JOURNAL, managers and heads of the several departments concerned were interviewed, and the car operation was examined under rush-hour as well as average conditions. As any good car is bound to be satisfactory to patrons when there is plenty of unoccupied seating capacity within, attention was particularly concentrated on the rush hour.

In order to focus attention on the essentials, such questions as the following were kept in mind, and were addressed to the officials consulted:

1. What have proved to be the most conspicuous virtues of these cars?
2. Are any data available as to the relative loading and unloading speeds of these cars as compared with cars of other types?
3. What changes have suggested themselves as a result of the use of these cars?
4. Is there noticeable crowding at the entrance end of the cars?
5. Has there been any noticeable loss in fares due to the working off of old transfers on the conductors at heavy unloading points during the rush hours?
6. Has there been any tendency to "beat it" at the front entrance door when the motorman is away from his post for the purpose of changing switches, etc.?
7. Is there much confusion due to the use of the front entrance on account of the patrons being accustomed to entering at other points in the cars?

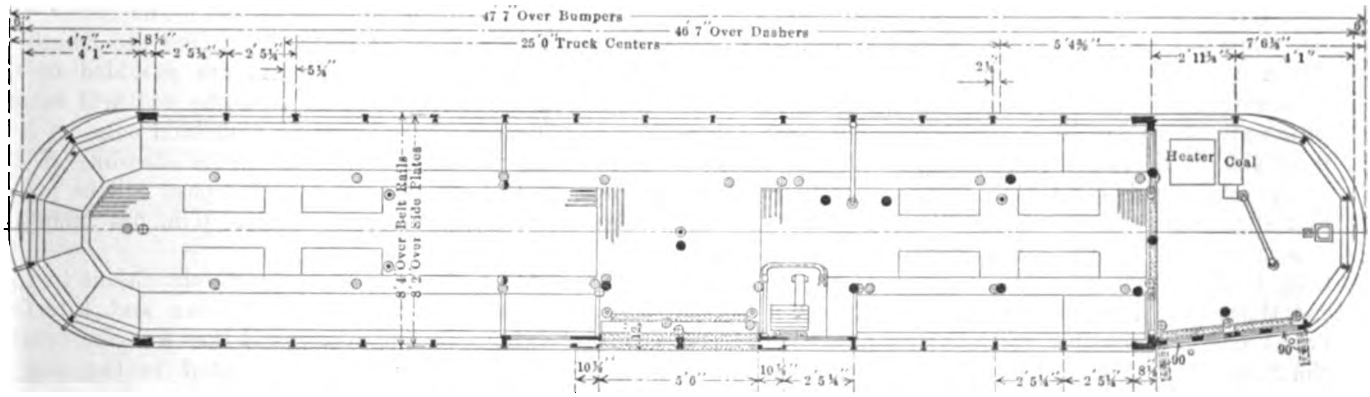
Other questions will suggest themselves to the reader, and it is hoped that any such will be answered at least indirectly in the reports of observations which follow.

It is the unanimous testimony in all cities that the new cars are conspicuous for the facility with which passengers can board and alight. Obviously with two lines entering and leaving, and no throttling of ingress due to fare collection and transfer issuing, there ought to be a considerable saving in time over earlier cars. Curves showing this feature were reproduced on page 31 of the Jan. 5 issue. One superintendent said that he had received much favorable comment from car users, especially from aged people who liked to ride upon these cars on account of the ease with which they could get on and off.

In Cleveland one of the officials of the railway estimated that loading and unloading with these cars are at least 50 per cent faster than with the company's center-entrance cars. As the cars in the city are used mostly on crosstown lines where the passengers are in general picked up in groups, this loading feature is especially important. In Schenectady when the cars were first put into operation it was estimated that from three to five minutes would be saved on a half hour of running time.

When these pay-as-you-pass cars were first designed, and for some time afterward, there was a tendency to use longitudinal seats in the rear as well as the front, where they are of course necessary. As the seating capacity is substantially the same with cross and lengthwise seats the latter were preferred by some because their use resulted in a greater floor space for standing passengers. As the car is particularly adapted for rush-hour service this argument is a strong one. Opposed to it, however, is the psychological fact that passengers prefer to sit in cross-seats, because it is easier to brace oneself against the inertia force when the car stops and starts, and there is a certain sense of privacy due to the stall arrangement thus provided. At any rate, it is easier to persuade the riders to go to the rear of the car, paying their fares en route, when they see cross-seats there.

After experience with the longitudinal seats several companies will use cross-seats in later cars, although it is only fair to say that opinion as to the wisdom of doing so is not unanimous. In the opinion of at least one manager the public is not adverse to the earlier arrangement after a few days' experience, especially those passengers who are obliged to ride in the rush hour. On the other hand, considered as a seating proposition rather than a standing one, there is no doubt that the cross-seats conduce to a better use of the seat-


47' 7" Over Bumpers
46' 7" Over Dashers
25' 0" Truck Centers
4' 7"
4' 1"
8⅛"
2' 5¼"
2' 5¼"
5¼"
2¼"
5' 4⅜"
7' 6⅜"
2' 11⅜"
4' 1"
8' 4" Over Belt Rails
8' 2" Over Side Plates
Heater
Coal
10⅜"
5' 0"
10⅜"
2' 5¼"
2' 5¼"
2' 5¼"
8¼"
90°
90°
● = Location of Stanchions in Rochester Cars
◎ = " " " " Toledo Cars
○ = " " " " Schenectady Cars
◯ = " " " " Cleveland Cars
◎ = " " " " Syracuse Cars
⊙ Location for Additional Stanchions in Syracuse Cars

STANCHION LOCATIONS IN A NUMBER OF CITIES WHERE LONGITUDINAL SEATS ARE USED IN PAY-AS-YOU-PASS CARS

A HEAVY LOADING AND UNLOADING POINT IN BUFFALO, N. Y. WITH THIS TYPE OF CAR THE BOARDING AND ALIGHTING PASSENGERS ARE SEGREGATED ing space. The whole question resolves itself eventually into one of the extent to which the rush hour is to settle the seating arrangement; and, keeping the passengers' comfort in mind, there is no doubt that those fortunate enough to secure seats at all in the rush hour are much more comfortable in cross-seats.

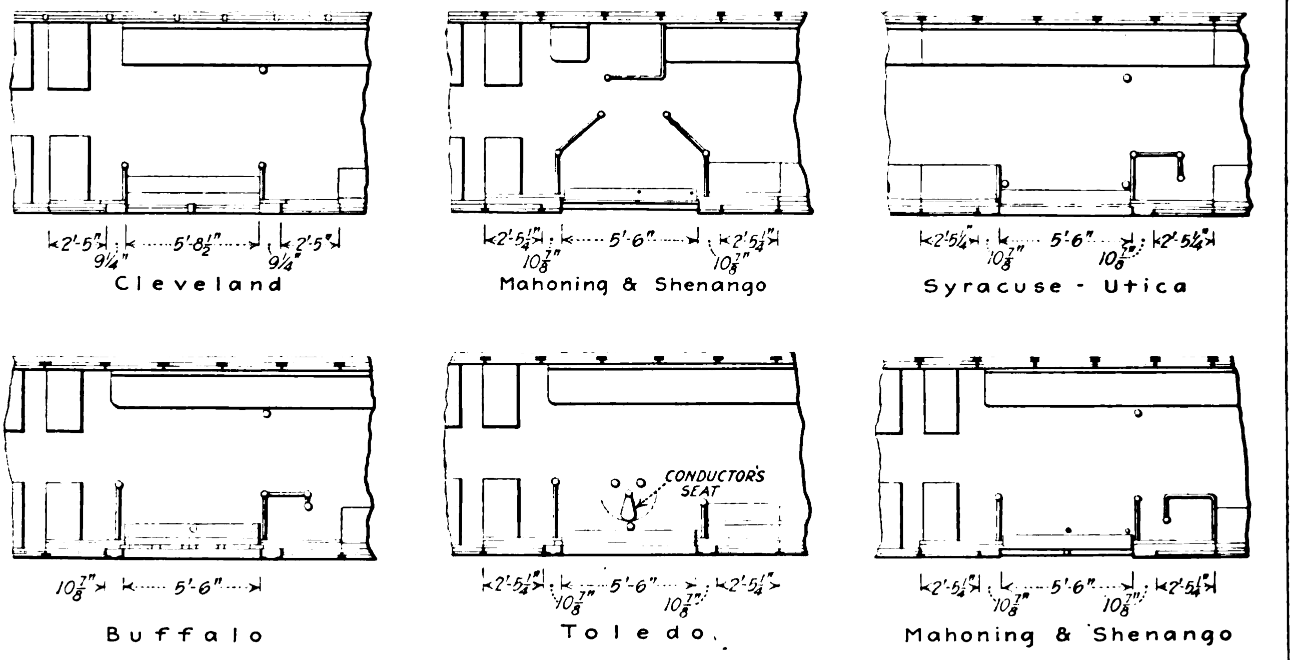
Quite directly connected with the pay-as-you-pass principle is the matter of floor levels and ramps. Here there are two sets of conflicting requirements between which a compromise is necessary. In the first place, it is desirable to get the passengers to their seats and to the street with as little climbing as possible. A low-floor car is therefore practically a necessity, and a single exit step is desirable. But ramps to permit one exit step may cause accident, although properly placed stanchions will minimize this danger. At times other than loading and unloading, a ramp is uncomfortable for those who have to stand upon it, and it should be as easy as possible for passengers to pass from the front of the car to the rear. Therefore, the tendency seems to be to do away with the ramps as will be done in the new Syracuse, Toledo and other cars.

The early Syracuse car has 5½ in. in the ramps, and one exit step. The new cars will have these step heights: Front entrance, rail to step 13⅞ in., step to platform 12 in., platform to floor 5½ in.; center exit, rail to step 13⅞ in.; each step 8 7/16 in.; slight drainage ramp in floor at middle of car. In Syracuse it was found that most accidents occurred near the middle of the front ramp, there being very few on the back ramp. This checks with experience in Rochester, where it was noted that the accidents occurred through the starting of the cars. In Syracuse the moving of the middle stanchion to a position half way up the front ramp has had a beneficial effect in reducing accidents. Another benefit of this has been to cut down the number of arguments between passengers and conductors as to whether fares have been paid or not.

Some support must be provided for passengers standing and in transit. Horizontal hand poles and vertical stanchions have been used for the purpose, preferences regarding them being divided. In Rochester several stanchions have been added to the original equipment, the horizontal rods being removed. The latter are, however, in general retained, extending the length of the car when longitudinal seats are provided in the rear. In the new Syracuse cars the rod will extend from the front of the dividing stanchion only, as it is considered not desirable to encourage standing in the center of the car. The rod in this case will be placed 66½ in. above floor slats, and 13½ in. out from the frieze board.

There is considerable objection to stanchions in that they mar the appearance of the car and interfere with cleaning. On the other hand they are comfortable for the passengers and are adapted to the use of children and short adults.

In seeking the best locations for stanchions in longitudinal seat cars the New York State Railways, Syracuse lines, secured from several other roads information as to their practice. A diagram like that shown was prepared to indicate the several stanchion layouts superimposed. Dummy stanchions were also placed in a car and representatives of several departments were asked independently to place them where they thought best. The averages of these locations were then selected as far as was practicable from the structural standpoint. Some deviation was necessary in cases, such, for example, as when the ideal location proved to be over a trapdoor in the floor. The final selections are indicated on the diagram on page 121.

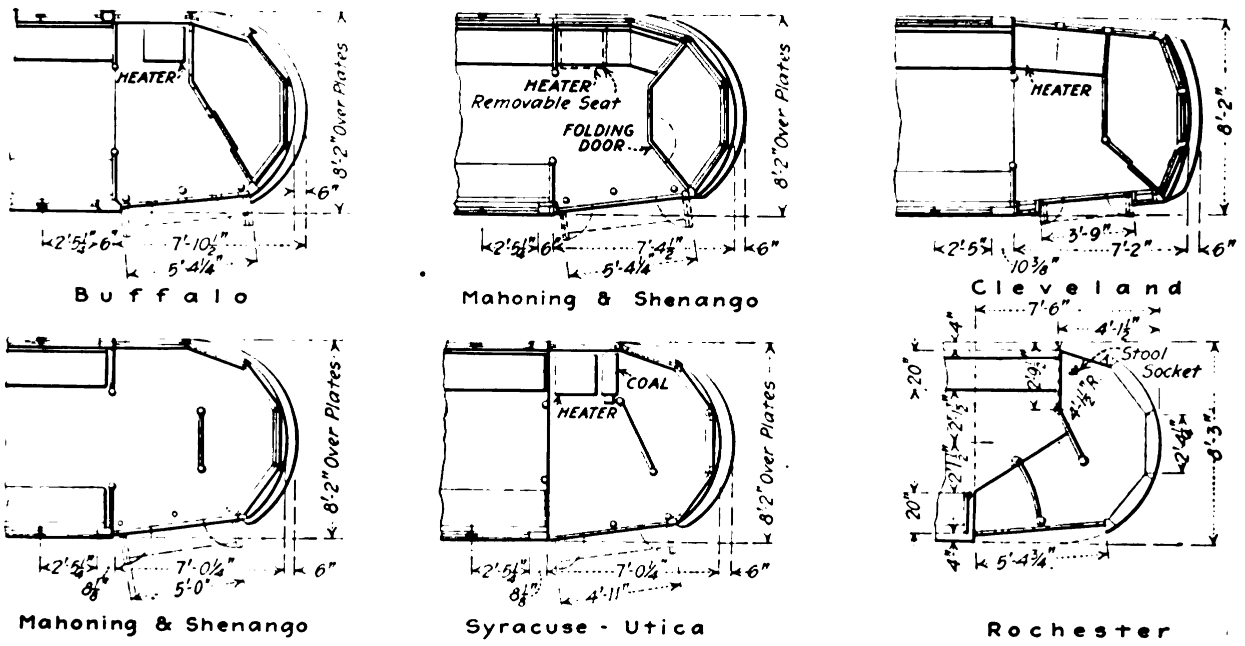


ARRANGEMENT AT EXIT OF FRONT-ENTRANCE, CENTER-EXIT CARS ON A NUMBER OF PROPERTIES

One of the big problems in rush-hour transportation is to utilize all of the space within the car by impelling patrons to distribute themselves uniformly. There is a tendency to crowd about the entrance, and passengers are often quite selfish in this matter. Experience in Toledo, Schenectady, Buffalo, Cleveland and elsewhere indicates that the new car is not a panacea for this difficulty, although conducive to good results if the conductor makes proper use of his favorable location to urge the passengers to move rearward. The motorman can help also. The possibility of getting a crowd on board promptly should, if utilized, tend to keep the passengers moving once they are in the car. In Schenectady the management noted that there is no crowding until the seats are full and about thirty people are standing. Then congestion seems to be about the same as with the pay-as-you-enter cars. If the conductor will request passengers near him to pay their fares and move rearward he can usually secure co-operation, but sometimes they refuse and persist provokingly in standing around the stanchions near the conductor and to some extent blocking the passageway.

In Cleveland also there is considerable congestion, but the railway management believes that the conductor should be able to supervise the passenger distribution well on account of his central position. As one official puts it: "When the conductor is stationed away at the back end of the car his entreaties to move forward have little effect. When he is in the center of the car, and hence right in the midst of the crowd, he can direct passengers to the back end of the car more effectively and thus clear the loading platform for more passengers to enter."

In any pay-as-you-leave feature of car operation there is involved a possibility of a dishonest passenger taking the opportunity to work off an old transfer in the rush of unloading a car, particularly at a transfer point. The conductor has so much to do in issuing transfers and collecting fares of alighting passengers and those passing his stand that an unscrupulous person might be inclined to push into the rear without paying, or to impose on the conductor as suggested above. One railway man offered to demonstrate to the writer that this could be done on the cars of his own company, although he regarded with favor the pay-as-you-pass plan in general.

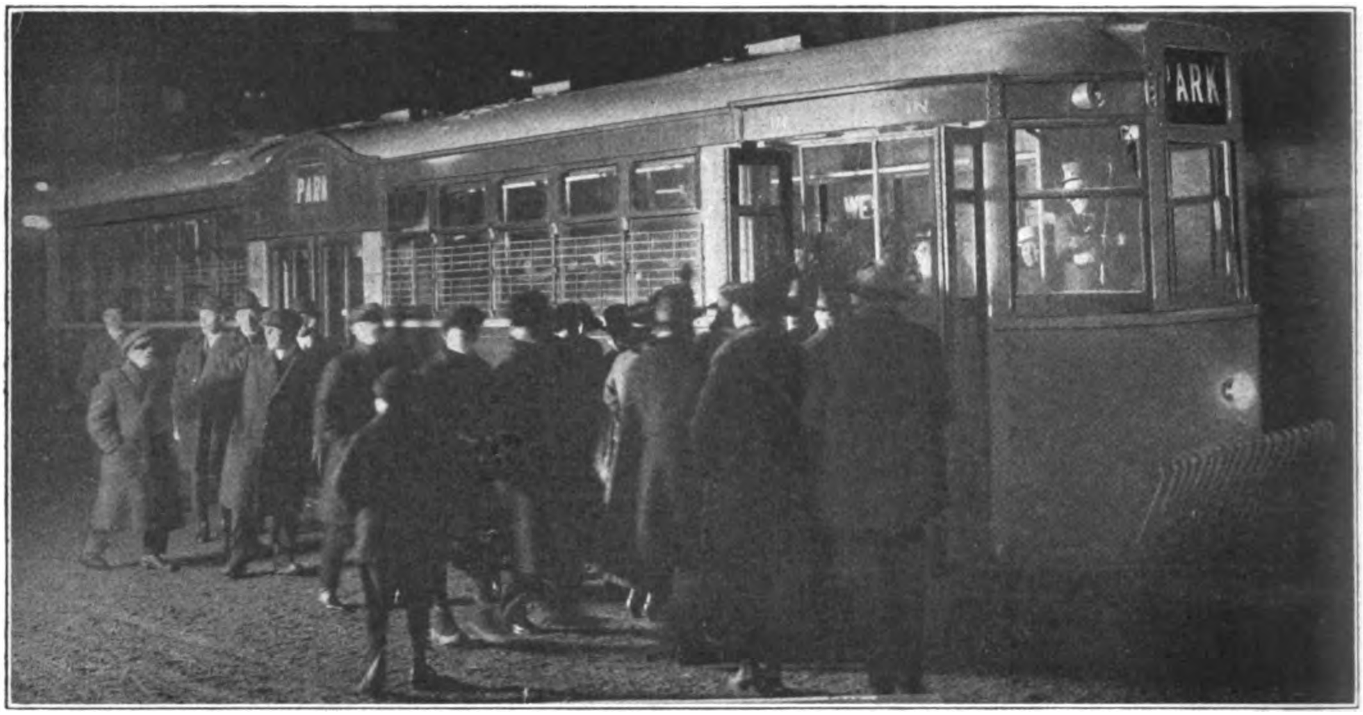


TYPICAL FRONT PLATFORM LAYOUTS, SHOWING MOTORMEN'S STATIONS, STANCHIONS, PARTITIONS, ETC.

The fact is that the public is not to any considerable extent bent upon "beating" the railway, and the losses with these cars are probably no more than with other types. In Toledo, for example, at first some slight loss was noted, but now this has dwindled to negligible proportions. In Rochester, Cleveland and elsewhere the same is true. In Cleveland the loss is less with the pay-as-you-pass cars than it was with the pay-as-you-leave cars. In Schenectady the officials believe that the comparative leisure permitted to the conductor for examining the transfers of those going to the rear results in a considerable saving over former plans of fare collection.

Another remote possibility of loss of fares is that passengers might remain in the front of the car and slip out if the motorman had to leave his post, for example, to move a switch point. So few cases of this kind have been reported that the contingency need not be considered farther. In fact, there are few occasions for motormen to be out of their vestibules, so many switches now being electrically operated.

An element in quick loading is to eliminate possible confusion due to misunderstanding as to car boarding points. As the public is accustomed to rear and center-entrance cars there was a question as to the effect of adding to existing rolling stock new cars with front entrances. Of course, if all cars on a system were alike there would be no confusion, but what if there are other types on the system or were on the same line? This point was therefore carefully investigated.



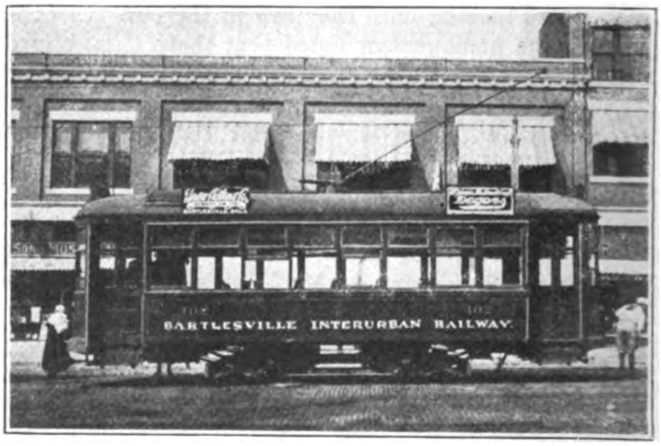
FLASHLIGHT SCENE DURING EVENING RUSH HOUR AT ROCHESTER, N. Y.

The result of the investigation was to show that the public soon "takes to" the front entrance cars, readily learning to distinguish them and locating themselves properly. Entrance signs such as were mentioned by J. F. Layng in his article in the Jan. 5 issue will prevent confusion altogether. In Schenectady the few complaints received by the company that were chargeable to the entrance location were, in the opinion of the local officials, due rather to the other cars than to the front-entrance cars. In Cleveland there was less confusion with the latter than with the older front-and-rear platform car which operated rear entrance on the inbound trip and front entrance in the outbound trip.

In most of the cities where the front-entrance, center-exit car has been introduced the operating conditions have been rather similar, the collection of a single fare being involved. In Cleveland it has been considered impracticable to operate it on the Lakewood line, for example, where the following conditions obtain. The 3-cent fare is collected pay-as-you-leave up to the zone limit and 5 cents is collected from everyone leaving the car beyond that point. Any one boarding the car beyond the limit must pay as he enters and is given an identification slip for use when he gets off. Coming into the city all fares are collected pay-as-you-enter and an identification check is given to all passengers who have paid 5 cents. Then when the zone limit is reached the conductor goes through the car and collects these checks.

The above does not mean that the pay-as-you-pass car is not adopted to the zone system, but is simply cited to indicate that even in the birthplace of this type there are routes on which it has not yet been considered applicable. As stated on page 33 of the issue for Jan. 5, the zone plan will be operated on the five-zone line of the Mahoning & Shenango Railway between Warren and Lowellville, Ohio, for which the pay-as-you-pass cars have been adopted.

Advertising on Top of Cars



BARTLESVILLE, OKLA., INTERURBAN CAR WITH ADVERTISING SIGNS ON TOP

THE cars of the Bartlesville (Okla.) Interurban Railway carry advertising cards on the top outside as well as on the inside. The placing of the exterior cards is shown in the accompanying illustration. The four cards on the outside bring in as much revenue as the thirty or more of those on the inside.

Constitutional Barrier Against Fair Rates

Seven-cent Fare for New York City Line Would Be Reasonable, but First District Commission Refuses Relief—Alleges City Has Constitutional Right to Fix Fare Limit in Consenting to Operation—Municipalization Mentioned as One Way Out

SO near and yet so far! The New York & North Shore Traction Company ought to have a 7-cent fare, in view of its financial circumstances and its right to earn a fair return. The Public Service Commission for the First District of New York, however, believes that it has no power to authorize the increase. In its opinion, only proof of the waiver or modification by New York City of the 5-cent fare limitation which the municipality made a condition of its constitutional consent to the use of the streets could enable an increase to be made through the commission's exercise of power delegated to it by the Legislature. Among the other methods of relief which the commission mentions is municipalization.

To appreciate this decision, which was unanimously approved on Jan. 10, it is necessary to recall that the New York & North Shore Traction Company lies partly within the jurisdiction of the First District or Metropolitan Commission in New York City, and partly in that of the Second District or Up-State Commission. Some time ago the company was refused an increase in fare by the latter commission, on the ground that the local authorities had prescribed a 5-cent fare as one of the conditions of consent to operation. The New York Appellate Division, Third Department, however, ruled that the commission had the power to grant an increase, rate making being essentially a legislative function. In accordance with this decision the Up-State Commission recently increased the rates of the company on the lines within its jurisdiction.

Application was then made for relief for the lines in New York City. Acting under the same fundamental law, the Metropolitan Commission has now reached an opinion diametrically opposed to that of the Up-State Commission, as expressed in the New York & North Shore case and with greatest detail in the recent Huntington Railroad case (ELECTRIC RAILWAY JOURNAL, Nov. 24, 1917). The opinion of the Appellate Division, Third Department, the New York City Commission dismisses with deference, but in words practically amounting to an assertion that the court did not know what it was talking about.

FUNDAMENTAL QUESTION IS ONE OF CONSTITUTIONAL LAW

The point of vital importance, therefore, is this: What does the Metropolitan Commission think it has found to be an insuperable obstacle against what its companion commission believes is a proper exercise of regulatory powers? The decision of the New York City body, eighty-nine printed pages in length, is too voluminous for reproduction here. The following abstract, therefore, will omit entirely the discussion of the financial needs of the company, since the commission finds that a just and reasonable maximum fare would be 7 cents, and will confine itself to the main conclusions reached by the writing commissioner, Travis H. Whitney. The financial needs of the company, it might be added, were explained in these pages at various times last summer in the reports of the hearings that were held in the case.

The legal provisions underlying the case are briefly shown at the bottom of page 126. The vital question, involving basic points as to the demarkation between State and municipal powers, relates to the difference between *constitutional* and *statutory* law. The New York State Constitution (Article III, Section 18) provides that "no law shall authorize the construction or operation of a street railroad except upon the condition that the consent . . . also of the local authorities . . . be first obtained."

Confusion has arisen, Mr. Whitney says, from a failure to keep in mind the contrast between such a constitutional requirement and a mere statutory authorization of such local consent. The issue, he states, has not been passed upon by controlling authority in the State, and co-operation in securing an early adjudication of the question is desired.

RATES ALTERABLE WHERE ONLY STATUTORY LAWS ARE INVOLVED

In presenting what he believes to be the relevant legal principles involved, Mr. Whitney avers that cases which have arisen in the absence of such a constitutional provision as above noted are not applicable. A distinction as to the Legislature's subsequent powers is clearly to be drawn between a case where the city fixes a fare maximum in the exercise of legislative powers delegated to it by the Legislature and a case where the city fixes the fare in the exercise of powers granted to it by the Constitution in limitation on the powers of the Legislature. Where the Legislature delegates its general powers to the city as its agent, the Legislature may lessen or abrogate those powers, or may abrogate or modify, directly or through another agent (the commission), what has been done by and through the first agent (the city).

No more than this, Mr. Whitney states, is held by such cases as City of Worcester vs. Worcester Street Ry., 196 U. S. 539; Arlington Board of Survey vs. Bay State St. Ry., 224 Mass. 463; New Orleans vs. New Orleans Water Works, 142 U. S. 79; North Wildwood vs. New Jersey Public Utilities Commissioners, 95 Atlantic 749; Matter of City Water Company, P. U. R. 1917 B, 624; Puget Sound L. & T. Co. vs. Reynolds, 37 Supreme Court Reporter 705; Bay State St. Ry. Rate Case, P. U. R. 1916 F, 221; Denver R. R. vs. Englewood, P. U. R. 1916 E., 134, and similar cases.

To bring the point closer home, Mr. Whitney admits that, according to the trend of judicial pronouncement which the commission ought in fairness to follow, there is no *statutory* barrier to the granting of a 7-cent fare for the New York & North Shore Traction Company. Along this line he says:

"It cannot be gainsaid that the disposition of the New York courts has been to uphold the view that the Legislature has made the commission a repository of the legislative power, the Legislature's agent for the expert ascertainment and enforcement of reasonable rate standards, empowered thus to supersede for good cause shown a rate once fixed by the Legislature itself. The tendency has been to look upon the language of the various statutes as warrant for the paramountcy of the commission's expert findings over lower or higher rates fixed casually by the Legislature; except, of course, where the Legislature otherwise specifically directs as to the commission's power over rates, as in the case of gas and electrical corporations.

"At least in the absence of a further clarification of the subject through judicial decision, I am constrained to hold that, aside from the limitation contained in the franchise granted by the city under the constitutional provision, there is no barrier to the commission's power to sanction the placing in effect of a 7-cent rate. I believe that the present case may best be determined on that basis, without prejudice to a fuller consideration of this phase in connection with other cases now being heard. It should be said, of course, that in passing upon the issues of the present case, the commission has in nowise dealt with the question of its power to sanction an added charge of 2 cents for transfers, over and above a 5-cent fare, on the part of companies whose franchises from the city contain no conditions as to fares or transfers."

In Mr. Whitney's opinion, however, an essentially different situation arises where, as in New York, the Legislature's power with respect to the use of the streets is restricted by a constitutional requirement, and "the legislative power possessed by the municipality to grant, withhold or fix terms for its consent to such use is derived not from the Legislature but from the Constitution." Under the constitutional provision the city is empowered to exercise the legislative power of determining the conditions on which it will grant its consent, if at all. (Adamson vs. Nassau Electric R. R., 89 Hun 261, 266; People ex rel. Frontier Ry. vs. City of North Tonawanda, 70 Misc. 91; Detroit Citizens' St. Ry. vs. Detroit Ry., 171 U. S. 48; People ex. rel. South Shore Traction Co. vs. Willcox, 133 App. Div. 561; Allegheny City vs. Railway Co., 159 Pa. 411, 416).

DECISION OF APPELLATE DIVISION WRONG

The decision of the Appellate Division, Third Department (175 App. Div. 869), in the New York & North Shore case is asserted by Mr. Whitney to proceed on assumptions unsupported by the authorities. He says:

"Its basic assumption is stated to be, not that Section 18 of Article III of the Constitution is to be read as a limitation and a restriction on the general legislative power conferred on the Legislature by Section 1, or that Section 18 delegates certain sovereign power to the city, just as Section 1 delegates certain powers to the Legislature, but that 'manifestly Sections 1 and 18 of Article III of the Constitution must be read together.' This statement evidently led a majority of the learned court to regard Section 1 as a limitation upon

Legal Provisions Underlying New York & North Shore Case

1. *New York State Constitution:*

Article III, Section 1: "The legislative power of this State shall be vested in the Senate and Assembly."

Article III, Section 18: "No law shall authorize the construction or operation of a street railroad except upon the condition that the consent . . . also of the local authorities . . . be first obtained."

2. *Greater New York Charter:*

Section 73: "Every grant shall make adequate provision by way of forfeiture of the grant, or otherwise, to secure efficiency of public service at reasonable rates and the maintenance of the property in good condition throughout the full term of the grant."

Section 74 (at the time petitioner obtained its franchise): "Before any grant . . . shall be made by the Board of Estimate and Apportionment, the proposed specific grant embodied in the form of a contract with all the terms and conditions, including the provisions as to rates, fares and charges . . . shall be entered in the minutes."

3. *Railroad Law:*

Section 93 (in 1909): "The local authorities may, in their discretion, make their consent to depend upon any further conditions . . . respecting the application of any provision herein contained as to the carriage of passengers for a single fare . . . and also respecting any other matter concerning which, in their judgment, further conditions would be for the public interest."

Section 181 (formerly Section 101): "No corporation constructing and operating a railroad under the provisions of this article . . . shall charge any passenger more than 5 cents for one continuous ride from any point on its road, . . . within the limits of any incorporated city or village . . . The Legislature expressly reserves the right to regulate and reduce the rate of fare of any railroad constructed and operated wholly or in part under such chapter or under the provisions of this article; and the Public Service Commission shall possess the same power, to be exercised as prescribed in the Public Service Commission Law."

Of the above-quoted excerpt from the present Section 181, Commissioner Whitney says, the last clause was added by Chapter 481 of the Laws of 1910, enacting the revised and amended form of the Railroad Law as Chapter 49 of the Consolidated Laws. In other respects Section 181 parallels Section 101 of the statute as it stood at the time the City of New York entered into a franchise contract granting its "consent" to the petitioner.

4. *Consent of City of New York:*

In obtaining the "consent" of the City of New York to the construction and operation of its railroad, the petitioner entered into duly executed contracts under date of Feb. 1, 1909, and April 14, 1909, respectively. Among the conditions in these contracts were the following:

"The rate of fare for any passenger upon said railway shall not exceed 5 cents, and the company shall not charge any passenger more than 5 cents for one continuous ride . . . within the limits of the city.

"This grant is also upon the further and express condition that the provisions of the Railroad Law, pertinent hereto, shall be strictly complied with by the company."

5. *Public Service Commission Law:*

Section 49: "Whenever either commission shall be of opinion . . . that the maximum rates chargeable . . . are insufficient to yield reasonable compensation for the service rendered, and are unjust and unreasonable, the commission shall . . . determine the just and reasonable rates to be thereafter observed and in force as the maximum to be charged for the service to be performed, notwithstanding that a higher rate has been heretofore authorized by statute."

Section 18 of Article III, and as qualifying the power granted to the local authorities by Section 18 of Article III, instead of looking upon Section 18 as *pro tanto* a separate grant of autonomous power possessed by the State or as a limitation upon Section 1.

"This inexactness then brought a majority of the court to the fundamentally erroneous conclusion that 'the local authorities are prohibited from attaching conditions to the consent which assumed to regulate the rate of fare, for the reason that the right to regulate fares to be charged by public service corporations is essentially a legislative function. . . . As well might the Legislature disregard the constitutional rights of the local authorities and itself assume to give the constitutional consent as the local authorities assume the constitutional rights of the Senate and Assembly to legislate regarding the rates of fare. . . . The constitutional provision regarding legislating is a restriction upon the local authorities in the matter of attaching conditions fixing rates of fare.' From this the court concluded that at least where the Legislature had not delegated to the local board the power to exact a fare condition in granting its consent, the Legislature might, through the commission, advance a rate above the figure the local board and the company had agreed upon.

"How far the New York & North Shore decision would, even under its own basis of determination, apply to and control a situation where, as in the present case involving the City of New York, the power to prescribe fares in granting 'consent' had been conferred on the municipality by express terms of a legislative act, if not also by fair implication from the constitutional grant, I do not think it necessary to discuss here. The primary question is whether the learned court was correct in its assumption that the Constitution prohibits the local authorities from making a fare limitation one of the terms and conditions of the local consent. I think it was not."

LEGISLATURE CANNOT MODIFY CONSTITUTIONAL RATES

If, then, a company has assented to a fare limitation as a condition of the city's consent for operation, can it be relieved by legislative action over the city's objection? Mr. Whitney says not. His belief he expresses as follows:

"If a municipality has bound an electric railway corporation to charge no more than 5 cents, the Legislature, in the exercise of its general regulative powers, could itself, directly or through a commission, reduce the fare to 4 cents or 3 cents, or could exercise its regulatory powers in any manner which did not nullify, defeat or impair the standards of maximums in rates and minimums in service which the city had set up as conditions of its consent. On the other hand, a general legislative act prohibiting a fare in excess of 10 cents would not prevent the city from granting its consent on terms prohibiting a charge in excess of 5 cents. Either the Legislature by a general act or a delegation of power to a commission or the city by a franchise contract could reduce the fare below a maximum fixed by the other, but neither could advance it above a maximum fixed by the other."

Mr. Whitney concludes, therefore, that the commission has no power to put a 7-cent rate into effect in the present case, in the absence of proof of the consenting action of the city authorities. In summing up, he says:

"To construe the Public Service Commission Law to vest this commission with power to increase above the franchise maximum rates fixed by contract between a municipality and a street railroad corporation in the exercise of the constitutional requirement of the city's consent, would be to construe the Public Service Commission Law to be to that extent unconstitutional. At least any attempted exercise of such a power would be nugatory, as an attempt under color of statute to defeat a right protected by the constitution. The interpretation that the Public Service Commission Law was not designed to authorize any such interference with a franchise maximum is at least equally open to the commission and the courts, and in fact nothing in the language of this law denotes an intent to confer power to override a franchise contract. The barrier as to rates 'heretofore fixed by statute' is taken down, but there is no reference to rates fixed by a franchise contract under the *constitutional* protection.

"No such franchise contract can be exercised or proceeded under by the company without the approval of the commission and its determination of the public convenience and necessity thereof. The commission can grant or withhold its approval; it can refuse to approve because the city insisted upon a term or condition which defeats the public convenience and necessity; but if it finds that public convenience and necessity would be served, it cannot modify the terms of the city's consent or refuse to grant approval merely because it does not like the terms exacted by the city.

"The view contended for by the petitioner leads to absurd conclusions and would make the law accomplish ridiculous results. For example, that the Legislature could not prevent the city from binding the company to a 5-cent rate before letting the company use its streets but could take out the 5-cent limitation and authorize a dollar fare the day afterwards; and, likewise, that the commission could not modify the 5-cent fare clause of the franchise and substitute a higher fare before approving it, but could approve it first and then modify it as soon as approved. If, by reason of the constitutional provision, the Legislature 'could not' authorize the commission to modify the fare clause before approving the franchise, I do not believe that the Legislature could authorize the commission to modify it afterwards. And if, as the Appellate Division, Third Department, has held, the Constitution prohibits the city from putting a fare provision in its franchise contract, could there be doubt of the commission's power to refuse to approve such a clause?

"Within the sphere of its own constitutional functions, under the grant to it of sovereign powers of legislation, the Legislature is left free to regulate the public service corporations chartered by the State under its authority, and if, by such regulation, requirements are imposed in addition to those stipulated by the municipality, it cannot be said that the Legislature has usurped functions or powers of the city, or vice versa.

"It should perhaps also be emphasized that we are not here dealing with the question of public policy whether the commission ought or ought not to be vested with the power to advance the rates of the petitioner without the acquiescence of the city. That question of public policy is, or was, a matter for the people to decide, not the commission."

Mr. Whitney feels, however, that the present situation is one where the public authorities share responsibility with investors for the construction of the railway. To his mind, if the 5-cent fare does not afford an adequate return, it does not of necessity follow that the situation must be dealt with by the municipality through its consent to a fare increase. The situation may be dealt with in any one of these ways:

1. The city of New York may consent to a waiver or modification of the fare provisions of the franchise contracts, and thus enable the putting into effect of the 7-cent rate, which is found necessary for the continuance of present service under present operating costs.
2. The city and State may to a large extent lessen the company's financial difficulties by remission and repayment of moneys now going into the public treasury out of the company's revenues, by virtue of franchise and statutory provisions.
3. The city may extend to the company the principle and policy of municipalization, already embodied in other aspects of the city's transportation policy—such extension of municipalization to come about through purchase, lease, or acquisition under a municipal guarantee of a fixed return upon unimpaired investment, with a gradual amortization, over a period of years, of this investment out of the earnings, supplemented as need be by contributions from the public treasury.

CITY MIGHT STOP DRAINS ON REVENUE

Under the company's franchise the investment in New York City is being amortized out of earnings, so that at the end of the fifty-year period the property will pass to the city without further payment. In regard to this and other burdens imposed upon revenues by the city, Mr. Whitney says:

"The city is itself responsible for an annual drain amounting to nearly 25 per cent of the company's corporate income. This sum is exacted in addition to all State and local taxes, including franchise taxes amounting to $1,663 more, and this sum is subtracted from the company's corporate income by virtue of the provisions of the same instrument which stands in the way of advancing the fare above 5 cents.

"The bearings of such a policy should be frankly recognized. What goes into the public treasury as taxes, percentages, relinquished property, and the like, must, under circumstances such as those operative as to this company, come out of the fare-payer, or must in some other form come again from the taxpayer. It cannot, over any long period of time, come out of the investors. Efforts to leave the investors to bear the burden can only mean deterioration of service, failure to make needed extensions and eventual receivership. Ought the city to require passengers to pay the cost of early city ownership of all the company's property situated in city streets, and nevertheless leave the company unable to do more than furnish to those passengers grossly inferior service?

"If the city does not wish fares to be advanced so as to enable the company to keep up the present rate of payment of percentages, franchise taxes, amortization and the like, the city might help meet the situation by further modifying the franchise terms so as to obviate this drain on the company's revenues, and might further ask for legislative action dispensing with franchise taxes now payable out of the company's too slender receipts."

In regard to meeting the situation by extending the policy of municipalization from rapid-transit to surface lines, Mr. Whitney states:

"The city must soon face the problems arising from the fact that other corporations engaged in essential services of transportation, particularly if not embraced in and protected by the dual contracts, will continue under the necessity of having such a revenue vouchsafed as will allow them also, in addition to all operating charges and allowances, a reasonable return upon the value of the property used by them for the public service. If this means a cost per passenger in excess of 5 cents, the public is faced with the alternative of requiring passengers in less congested regions to pay a fare in excess of 5 cents or of extending the municipalization of responsibility or ownership so that the cost of transportation, if in excess of that which can be met by a 5-cent fare ordained by public policy, shall to that extent be borne by the public through taxation.

"For it is obvious that if a needed service of transportation is to continue it must derive from some source sufficient revenue to meet all costs of transportation, and that this is true whether such transportation is furnished by private ownership and operation, or by municipal ownership and private operation, or by municipal ownership and municipal operation. If private ownership and operation continues, the public must realize that fares must be such as to produce a sufficient income. But, on the other hand, if the fare is to remain constant and uniform, there must be provision whereby increasing costs of transportation shall be met, if need be, through further extensions of municipalization."

How Municipal Lines Are Aiding Great Britain

THE Municipal Tramways Association of Great Britain has issued an elaborate series of tables in regard to allowances for dependents, war bonuses, enlistments, employment of women and similar matters. Below is published a comparative summary of the activities of the municipal electric carriers along such lines in 1916 and 1917 (data having been supplied in August):

	July, 1916	July, 1917
Number of municipal authorities replying to queries	88	84
Number of towns certified under Munitions of War (Amendment) Act	44	57
Number of employees at normal times	55,208	55,208
Number of men who have joined His Majesty's Forces	20,905	29,268
Percentage to total	38	53
*Number of men who have left municipal tramways undertakings to join munition factories	1,893	1,776
Percentage to total	3½	3.2
Amount paid to dependents of employees serving with His Majesty's Forces	£854,649	£1,437,603
Average allowance per man per week	10s. 7½d.	11s. 4½d.
Amount collected on cars for various national and other objects	£43,800	£84,509
Amount contributed by municipal tramway employees to various relief funds	£36,070	£38,170
Number of municipal systems employing women conductors	75	76
Number of women conductors	8,433	11,757
Number of municipal systems employing women drivers	7	18
Number of women drivers	176	611
Number of municipal systems employing auxiliary drivers	19	26
Number of auxiliary drivers (male)	320	564

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*The figures under this heading are only approximate, as it is not known what particular section or unit the men have joined. Therefore in some cases these have been included in enlistments.

How New York Commissioners Differ in Basic Rate-Making Views

Second District

Commissioner Carr

It may be said to be settled that the Legislature has full power to delegate rate-making powers to the Public Service Commission, and that the Public Service Commission has full power to fix just and reasonable rates for carriers and public service corporations, and that the fixing of rates is a proper exercise of the police powers of the State.

* * *

In view of the numerous decisions from which we have quoted at length we think it is settled beyond question that municipalities have no right to impose conditions in franchises other than those which the statute gives them the power to exact. The fact that conditions restricting the fare within the municipality are imposed in a franchise does not deprive the Legislature of the supreme power to determine what conditions shall be imposed upon a street railroad corporation.

* * *

We are therefore of the opinion that notwithstanding the conditions in the several franchises granted to the Huntington Railroad, which attempted to fix a 5-cent fare within certain specified territory, the same was binding upon the company until such time as the Legislature should intervene for the purpose of regulating this fare, and that this commission has the power under the provisions of the law which created it to revise the fare fixed in the franchises.

Commissioner Van Santvoord

It is and always must be the Legislature which exercises final authority in regulating rates and fares; and authority delegated to a municipality to exercise this purely legislative function must be considered as forever subject to recall or modification by the final law-making power.

Commissioner Emmet

Our first duty is to the public. * * * In cases which involve the nullification of rate agreements that were supposed, when made, to be absolutely binding upon both parties, I think it must appear that substantial benefits will result to the public from the granting of the relief sought—or, rather, that substantial injury will be suffered by the public if relief is withheld, before we can act favorably on these applications against the protest of one of the parties to the bargain.

Commissioner Irvine

The result of such a bargain is merely a contract between the parties thereto, subject to be modified or annulled by the State in the exercise of its police power.

Commissioner Barhite

(Quoting an Illinois decision.) "The general rule is that a railroad company is a quasi-public corporation and under peculiar obligation to the public, and that consequently it cannot make any contract which will disable it from performing its public functions."

First District

Commissioner Whitney

It cannot be gainsaid that the disposition of the New York courts has been to uphold the view that the Legislature has made the commission a repository of the legislative power, the Legislature's agent for the expert ascertainment and enforcement of reasonable rate standards, empowered thus to supersede for good cause shown a rate once fixed by the Legislature itself. The tendency has been to look upon the language of the various statutes as warrant for the paramountcy of the commission's expert findings over lower or higher rates fixed casually by the Legislature.

* * *

Powers possessed by the Legislature may be delegated by it to a municipality, a commission or any other creature of the State. * * * This rule governs all situations as to which the Constitution has vested the legislative power exclusively in the Legislature.

* * *

An essentially different situation arises, however, where, as in New York, the legislative power with respect to the use of public streets by a street railroad is restricted by a constitutional requirement, and the legislative power possessed by the municipality to grant, withhold or fix terms for its consent to such use is derived not from the Legislature but from the Constitution.

* * *

When the Constitution provides (as in New York State) that no street railroad shall be constructed or operated along a public street without the consent of the local authorities of that city or village, the legislative power as to the granting or withholding of that "consent," as to the fixing of the terms thereof, is, *by the Constitution*, vested not in the Legislature but in the municipality, and the power of the Legislature is to that extent qualified and limited.

* * *

To construe the Public Service Commission Law to vest this commission with power to increase above the franchise maximum rates fixed by contract between a municipality and a street railroad corporation in the exercise of the constitutional requirement of the city's consent, would be to construe the Public Service Commission Law to be to that extent unconstitutional.

* * *

I reach the conclusion that the rule, better supported by reason and by authority, vests the commission with no power to sanction and put in effect a 7-cent rate on the lines of the petitioner in the absence of proof of the consenting action of the city authorities.

* * *

It should perhaps also be emphasized that we are not here dealing with the question of public policy whether the commission ought or ought not to be vested with the power to advance the rates of the petitioner without the acquiescence of the city. That question of public policy is, or was, a matter for the people to decide, not the commission."

Commission-Made Rates Are Paramount

Second District Commission in New York Has Laid Down Principle That It Has Full Power to Increase Rates in Spite of Maximum Set by Old Laws or Local Franchises

BY THOMAS CONWAY, JR.
Professor of Finance, Wharton School of Finance and Commerce, University of Pennsylvania

THE decision of the Public Service Commission for the Second District of New York, in the Huntington Railroad case,* marks an epoch in the career of this commission. Indeed, there can be no doubt that it is one of the most important decisions which this body has ever rendered. Judged solely from the standpoint of the size of the petitioning company, this case is relatively unimportant. The Huntington Railroad is an electric line running across Long Island from Huntington Harbor, on Long Island Sound, to Amityville, on the South Shore, passing through Melville, Huntington, Farmingdale and a number of other towns in Huntington and Babylon counties. The entire capital stock of this road is owned by the Long Island Railroad. Its reproduction value, as shown by the evidence presented to the commission, is in the neighborhood of $528,000. Commissioner Carr stated in his opinion: "During this period (1910 to 1916, inclusive) the company has earned $338,840. Its operating expenses and taxes have amounted to $22,798 more than the revenue, and so there is nothing available for interest on bonds, dividends on stock, or reservation for surplus and contingencies, to say nothing of a return upon the value of the property employed in the public service."

CASE SETS FORTH PRINCIPLES OF RATE-MAKING

The significance of the decision arises out of the fact that the case is, by the express terms of the opinion, to constitute a leading one, setting forth the general principles which the commission will follow in dealing with other petitions for increased fares.

Each of the five members of the commission prepared an opinion. The text of these opinions constitute eighty-two printed pages. The opinion which, as stated by the chairman, constitutes the opinion of the commission in the case, was prepared by Commissioner Carr and covers fifty-nine pages. Each of his four associates concurred in the findings set forth, although every member felt constrained, because of the importance of the issue, to express his individual views. The decision of the commission is unanimous, although, as is frequently the case with epochal decisions, the reasoning by which the several members of the body reached their conclusions shows considerable dissimilarity.

The purpose of this article is to endeavor to reflect the views of the several members of the commission upon the general questions presented and the principles laid down by them. In order to facilitate the discussion of the opinion, each phase will be taken up separately, although this plan is not followed in the opinions themselves.

Before the case of the Huntington Railroad could be judged upon its merits, the commission had to decide two legal questions, both of which concerned its power to permit an electric railway to charge a rate of fare in excess of 5 cents. The first question related to the effect of Section 181 of the Railroad Law, which prescribes the rate of fare to be charged within the limit of any city or village. This section provides that no electric railway "shall charge any passenger more than 5 cents for one continuous ride from any point on its road. . . . to any other point thereof, or any connecting branch thereof, within the limits of any incorporated city or village." The section further provides that "the Legislature expressly reserves the right to regulate and reduce the rate of fare of any railroad constructed or operated wholly or in part under such chapter [meaning the act of May 6, 1884] or under the provision of this article; and the Public Service Commission shall possess the same power, to be exercised as prescribed in the Public Service Commission Law."

REVIEW OF OLD LEGISLATION

The act of 1884 referred to above was the first general act passed by the Legislature of New York relative to electric railways. Prior to that time the practice had been to incorporate companies by special acts of the Legislature. Commissioner Carr's opinion reviews in great detail the provisions of these acts. He points out that the Legislature had not hesitated in this special legislation to amend the acts constituting the charters of the several corporations, with reference to not only matters concerning operation, but also the provisions relating to fares. Mr. Carr finds that prior to 1884 no specific provision had been made in the general railroad law to cover the rate of fare within a municipality, except as it might be claimed that it was covered by Subdivision 9 of Section 28 of the laws of 1850, wherein it was stated that the fare for passengers should not exceed 3 cents per mile. Section 33 of that same act also provided that the Legislature might, from time to time, after a railroad completed thereunder was opened for use, alter or reduce the rate of freight, fare or other profits upon such road, but that the same should not be reduced without the consent of the company, so as to make such profits less than 10 per cent upon the capital actually expended.

The act of 1884 set forth the method for incorporating an electric railway and what was necessary to be done in order to entitle it to construct, maintain and operate its road. Section 4 required the company to secure the consent of the local authorities—which requirement carried out the provision of the State Constitution. "The consent of the local authorities shall in all cases be applied for in writing, and when granted shall be upon the express condition that the provisions of this act pertinent thereto, shall be complied with and shall be filed in the office of the county clerk of the county in which said railroad is located." The act further provided that franchises should be sold at public auction; that local authorities had a right to require as a condition of their consent that the electric railways should pay a certain percentage of its gross receipts, not exceeding 3 per cent, into the treasury of the city or village. The municipality could require the company to pave between and outside of its tracks.

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*Preliminary abstract of legal points appeared in the ELECTRIC RAILWAY JOURNAL of Nov. 24, 1917.

Section 13 of the act provided in substance that an electric railway should not charge more than 5 cents for one continuous ride within the limits of any incorporated city or village. It provided, however, that "this section shall not be construed to apply to any part of any road heretofore constructed and now in operation, unless such company shall acquire the right to extend such road or to construct branches thereof under the provisions of this act, in which event its rate of fare shall not exceed its authorized rates prior to such extension." There was no provision in Section 13 of the act of 1884 to the effect that the Legislature reserved the right to alter or reduce the rate of fare therein provided, although there was a general reservation of the right to alter, amend or repeal the act. In 1886 the Legislature, however, amended the law, adding to Section 13 of the act of 1884 the following clause: "The Legislature expressly reserves the right to regulate and reduce the rate of fare on said railroad or railway." The act of 1884 as amended was repealed with the enactment of another general railroad act known as Chapter 565 of the laws of 1890. Section 101 of this act related to the matter of rates of fare and was substantially the same as Section 13 of the act of 1884 as amended by the acts of 1886, except that the provision restricting the 5-cent fare to the area within the limits of any incorporated city or village had been omitted. This omission was short-lived, for in 1892 the Legislature enacted Chapter 676 amending the Railroad Law and adding to Section 101 thereof the proviso that no more than a 5-cent fare shall be charged within the limits of any incorporated city or village.

CHANGES ARISING UNDER PUBLIC SERVICE COMMISSION LAW

With the passage of the Public Service Commission Law it became necessary to again amend the Railroad Law. The revision constituted Chapter 181 of the laws of 1910, or Chapter 49 of the Consolidated Laws. In so far as rates of fare of electric railways were concerned, Section 181 of the new act heretofore amended was substantially the same as Section 101 of the act of 1892, except that there had been added the provision that the right of the Legislature expressly reserved to regulate and reduce the rate of fare was possessed by the Public Service Commission, to be exercised by it as prescribed in the Public Service Commission Law. Commissioner Carr observes: "So we see that Section 181 of the Railroad Law as it exists to-day is substantially the same as the act which was passed in 1884, as far as the requirement relative to a 5-cent fare within an incorporated city or village is concerned."

The legislative injunction that the commission in exercising its power "to regulate and reduce fares" must do so in accordance with the provisions of the Public Service Commission Law, led the commission to examine the provision of that law which would govern in the present proceeding. The opinion calls attention to Sections 33, 49 and 50. These sections permit the commission to prescribe just and reasonable maximum rates for all forms of reduced rates of passenger tickets of steam railroads and electric railways, authorize the commission to investigate the regulations, practices, equipment and appliances of an electric railway and to determine and enforce reasonable, safe and adequate standards of service and equipment, and authorize the commission to order changes and improvements in road and equipment, and additions thereto, if in its judgment the same are necessary to promote the security or convenience of the public or employees, or in order to secure adequate service or facilities for the transportation of persons or property. Section 49 provides that whenever the commission shall be of the opinion that the maximum rates, fares or charges chargeable by any such railroad or electric railway corporation are insufficient to yield reasonable compensation for the service rendered and are unjust and unreasonable, the commission shall determine the just and reasonable rates, fares and charges to be thereafter observed and in force as the maximum to be charged for the service to be performed notwithstanding that a higher rate, fare or charge has been heretofore authorized by statute.

COMMISSION HAS FULL RATE-MAKING POWER

After stating the provisions of the law, Mr. Carr says:

"What was the purpose of these sections giving such drastic powers to the commission and authorizing it to place heavy burdens on the electric railways, unless the commission was at the same time authorized to give such relief in the way of increased fares as might be necessary to enable the corporation to receive a fair return on the increased investment made necessary by the orders of the commission? It cannot be successfully urged that the commission has the right to order such improvements in service and equipment as might be necessary for the safety of the traveling public, even though this action on its part might in effect operate to confiscate the property of the corporation, for this is contrary to the law of the land. What then does the law contemplate in this respect? The answer is, that the commission is empowered to require the corporation to give proper service; and, on the other hand, to require the public to pay reasonable rates for such service. The law as it exists at the present time requires the commission to determine the just and reasonable rates which will enable electric railways to earn a reasonable return upon the value of the property actually employed in the public service and to provide a reserve for surplus and contingencies."

Mr. Carr's opinion reviews in detail the decisions of the courts of the United States and of the State of New York relating to the power of the Legislature to regulate and fix fares and of its creature, the Public Service Commission, to exercise similar powers, by virtue of a delegation of legislative power by the Public Service Commission Law. The apparent conflicts of judicial interpretation of the statutes are carefully analyzed, and the conclusion reached is this:

"We are not left in doubt as to the power of the commission to deal with the question of the fare on electric railways, that having been made clear in the statute itself, but we do think the reasoning in the Ulster & Delaware Company case applies with equal force here, *viz.*: that the statutory rate fixed by the Legislature is the one binding upon the railroad company until such time as it is changed either by the Legislature or the commission, and that therefore the commission can increase this rate if it determines that a fare of 5 cents is unjust or unreasonable to the corporation."

FRANCHISE RESTRICTION NOT CONTROLLING

The second major question which confronted the commission concerned the provisions of the franchise defining the rates of fare to be charged by the carrier. It will be remembered that the several acts of the Legislature, hereinbefore mentioned, provided that an electric railway must secure the consent of the several municipalities to the construction of its lines and that "the consent of the local authorities shall in all cases be applied for in writing, and when granted shall be upon the express condition that the provision of this act pertinent thereto shall be complied with, and shall be filed in the office of the county clerk of the county in which said railroad is located."

The Huntington Railroad had been forced to enter into stringent bargains with the various villages through which it operated. Provisions were inserted in the franchises granted by the town of Huntington, by the County of Nassau, by the village of Farmingdale, by the town of Babylon and by the village of Amityville, restricting the rate of fare to 5 cents per zone and defining in great detail the precise limits of each zone. In several cases the company was required to furnish a bond in a substantial amount. These agreements provided that they were to extend to the company and its successors, and in several cases that a violation should work a forfeiture of the franchise. As Mr. Carr observed at the time the case was tried, it would be almost impossible to find a company with more stringent franchise provisions concerning the rate of fare which it could charge.

The communities through which the Huntington Railroad operated, in inserting stipulations concerning the rate of fare, were following a practice which was quite general throughout the State of New York. The question which the commission had before it was whether it possessed the power to raise rates above 5 cents in the face of such franchise provisions. The opinion of the commission reviews at great length the decisions heretofore rendered by the courts of New York State concerning the effect of franchise conditions upon the utility and upon the power of the commission to raise fares above the rate specified. The opinion states:

"We believe that all of the cases dealing with fare conditions in franchises can be harmonized without difficulty. It will be remembered that beginning with the act of 1884 relating to electric railways there was and has been a specific provision in the law requiring the consent given by the municipality to contain a clause setting forth that it is given upon the express condition that the provisions of the act relative to such railroads shall be complied with. Therefore, even though the municipality should give its consent to the construction, maintenance and operation of an electric railroad in the public streets without attempting to set forth the condition in the franchise relative to fare which is contained in the statute, nevertheless the provision of the statute is binding upon the corporation, and no greater force or effect is given to it and no greater obligation is placed upon it than that which appears in the statute in this respect. The mere reiteration of this condition in the franchise given by the municipality does not place an additional burden upon the corporation, nor does it operate to divest the State of any power which it may have and which it has always had to regulate the fares on electric railways.

"Some of the franchises involved in the present case, as well as others which have been brought to the attention of the commission in similar cases, use almost verbatim the words of the statute with respect to the 5-cent fare, and we think that, notwithstanding this provision has been embodied in a written agreement between a municipality and an electric railway corporation, it only remains in full force and effect as against the State so long as the Legislature or the commission takes no action in regard to the increase or reduction of such fare. Certainly the fact that such a provision was contained in an agreement between the parties could not operate to deprive the State of its sovereign rights without its consent as evidenced through some act of the Legislature."

At another place the opinion says:

"In view of the numerous decisions from which we have quoted at length, we think it is settled beyond question that municipalities have no right to impose conditions in franchises other than those which the statute gives them the power to exact. The fact that conditions restricting the fare within the municipality are imposed in a franchise does not deprive the Legislature of the supreme power to determine what conditions shall be imposed upon an electric railway corporation. There is no decision in any of the courts of this State which attempts to hold that the Legislature in the enactment of general laws governing the creation and operation of railroads, whether street surface or otherwise, has in any respect conferred upon the municipalities the power to fix a rate of fare in a specific amount. It has delegated the power at different times to fix maximum rates, but this was always subject to the right of the Legislature to intervene and revise and alter such rates as might be fixed under the delegated power."

In concluding his exhaustive discussion, Mr. Carr observes:

"The courts are unanimous in holding that the fixing of rates is a part of the police powers of the State and nation, and that public service corporations are entitled as a matter of right to be permitted to charge such rates as will fairly compensate them for the service rendered. We have therefore determined that the commission has power to grant an increase in the rates charged by the Huntington Railroad in the villages and towns in which it operates, notwithstanding the franchise restrictions as to fare and the provisions of Section 181 of the Railroad Law."

The commission was unanimous in its support of Mr. Carr's opinion. Each of the other members of the commission, however, felt constrained to express his individual views. Judge Barhite set forth in his opinion numerous decisions not cited by Mr. Carr, handed down by the Supreme Court of the United States and by courts of other states, supporting the position which the commission had taken. Chairman Van Santvoord, in one of his characteristic opinions, set forth his views as to the legal principles which should prevail. He protested that it was "a shock to be told that a contract as to rates of transportation solemnly entered into between a carrier and a municipality and deliberately accepted by the former as a consideration exacted for its right to exist at all . . . is absolutely void." Judge Irvine expressed a similar feeling. They both agreed, however, that such a contract was binding until modified or abrogated, either by mutual consent or by the exercise of the legislative function, either through an act of the Legislature itself or by the Public Service Commission under a delegation of authority.

Chairman Van Santvoord went on to observe:

"I believe that upon reflection this conclusion is bound to receive the larger measure of commendation. Because if these contract and franchise restrictions as to rates are considered void as being against public policy because of the inherent possibility that some day they may incidentally result either in bankruptcy of the enterprise or serious impairment of the service, to the resultant loss or disadvantage of the public, why should not the same reasoning apply to service contracts between lighting companies and municipalities—or, for that matter, between such corporations and their large consumers—or such corporations *inter se?*"

OTHER VIEWS OF THE ASSENTING COMMISSIONERS

Commissioner Emmet, after expressing satisfaction with the reasoning of Mr. Carr and Judge Barhite's opinion, pointed out the implications of the policy which the commission has adopted. He well says: "If the disposition we are making of this case shall be held upon appeal to be a lawful one, it will follow, I suppose—and with efficient state regulation of rates it certainly ought to follow—that conditions of the kind we are here considering, fixing the fares which shall be charged, will no longer be written into electric railway franchises."

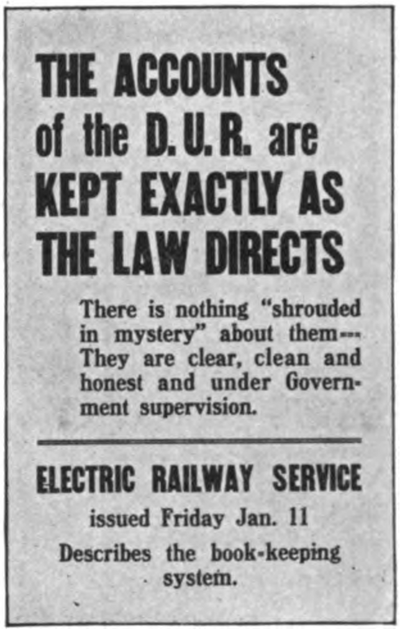
Mr. Irvine apparently felt it was necessary to sound a word of warning to public utility operators, in order that they should not overestimate the power and willingness of the commission to set aside franchise provisions. He stated:

"It is to be hoped that our decision in this matter will not be taken as an indication that, in respect to matters which may properly be bargained about in connection with the granting of a franchise, the commission has in anywise lost faith in the time-honored rule that a bargain is a bargain, even when one of the contracting parties happens to be a public utility. It would be unfortunate if promoters of new enterprises should feel that hereafter when seeking franchises they may safely agree to almost anything that is asked of them by local boards, without any real intention on their part of carrying out these agreements if they can induce this commission to relieve them of their obligations upon the mere showing that their profits have not been quite as large as they ought to have been.

"However complete the commission's jurisdiction may be, it seems to me that in cases where we are asked to set aside franchise conditions that have previously been accepted by the applicant, our first duty is to the public, and it would in my opinion be a violation of this duty for the commission to use its powers primarily or exclusively for the relief of private investors who voluntarily accepted stiff conditions in order that they might go into a business from which they expected to derive large profits, and who have since suffered some disappointment in their original expectations. In cases which involve the nullification of rate agreements that were supposed, when they were made, to be absolutely binding on both parties, I think it must appear that substantial benefits will result to the public from the granting of the relief that is sought—or, rather, that substantial injury will be suffered by the public if relief is withheld—before we can act favorably on these applications against the protest of one of the parties to the bargain."

Accounts Not Shrouded in Mystery

IN ANSWER to a newspaper assertion that the financial condition of the Detroit (Mich.) United Railway is "shrouded in mystery," the company has published in *Electric Railway Service*, its car bulletin, a detailed, clear-cut description of its accounting procedure under I. C. C. classifications. Furthermore, it used, as an announcement of this, the poster shown in the accompanying illustration.



THE ACCOUNTS of the D. U. R. are KEPT EXACTLY AS THE LAW DIRECTS

There is nothing "shrouded in mystery" about them— They are clear, clean and honest and under Government supervision.

ELECTRIC RAILWAY SERVICE

issued Friday Jan. 11

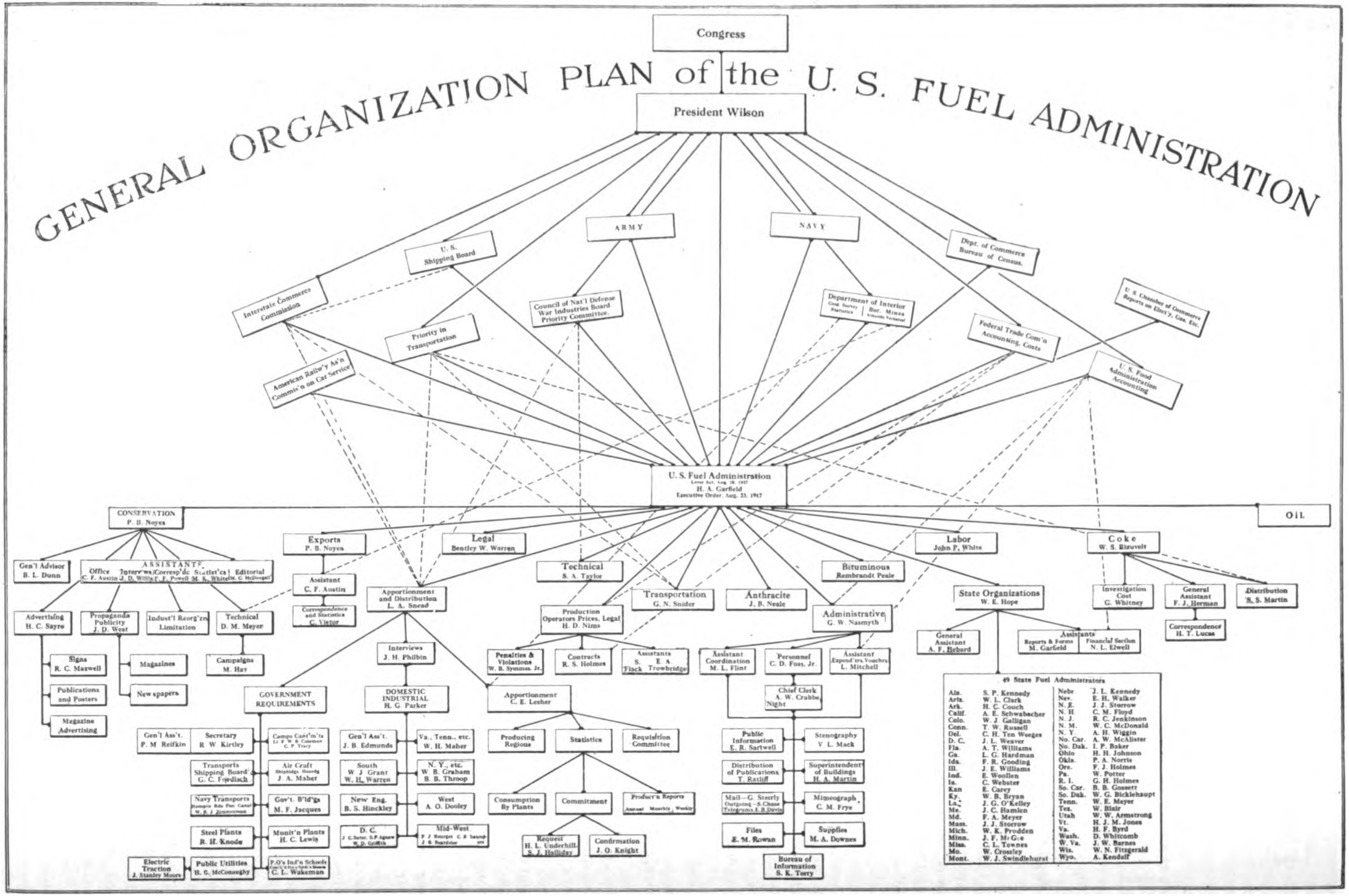
Describes the book-keeping system.

Many people in some localities probably still believe that corporation books are kept wrongfully; that statements regarding the financial conditions of the properties are not based upon official accounts. For the purpose of combatting such impressions the publication of the fundamentals in the accounting regulations under which the companies work is doubtless of much value.

Efforts to Secure Uniform Boiler Laws

THE American Uniform Boiler Law Society, of which Thomas E. Durban, Erie, Pa., is chairman, is continuing actively to urge the legal adoption of the boiler code of the American Society of Mechanical Engineers. The code has been adopted in California, Indiana, Massachusetts, Michigan, Minnesota, New Jersey, New York, Pennsylvania and Wisconsin. The Boiler Law Society hopes to secure favorable action by the nine state legislatures that are to meet this year. Different plans are being followed in these several states, and the society will appreciate co-operation on the part of electric railway men in securing recognition of this code by legislatures.

GENERAL ORGANIZATION PLAN of the U. S. FUEL ADMINISTRATION


Congress
President Wilson
U. S. Shipping Board
ARMY
NAVY
Dept. of Commerce Bureau of Census.
Interstate Commerce Commission
Council of Nat'l Defense War Industries Board Priority Committee.
Department of Interior
Coal Survey Statistics
Bur. Mines Scientific Technical
U. S. Chamber of Commerce Reports on Elect'y, Gas, Etc.
Federal Trade Com'n Accounting, Costs
Priority in Transportation
American Railw'y As'n Commis'n on Car Service
U. S. Food Administration Accounting
U. S. Fuel Administration
Lever Act, Aug. 10, 1917
H. A. Garfield
Executive Order, Aug. 23, 1917
CONSERVATION P. B. Noyes
OIL
Exports P. B. Noyes
Legal Bentley W. Warren
Labor John P. White
Coke W. S. Blauvelt
Gen'l Advisor B. L. Dunn
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Editorial M. C. McDougall
Assistant C. F. Austin
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Bituminous Rembrandt Peale
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Anthracite J. B. Neale
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Production Operators Prices, Legal H. D. Nims
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Personnel C. D. Foss, Jr.
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Camps Cant'm'ts Lt F. W. B. Coleman C. P. Tracy
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Air Craft J. A. Maher
Navy Transports Hampton Rds Pan Canal W. R. J. Zimmerman
Gov't. B'ld'gs M. F. Jacques
Steel Plants R. H. Knode
Munit'n Plants H. C. Lewis
Electric Traction J. Stanley Moore
Public Utilities H. G. McConaughy
P.O's Ind'n Schools C. L. Wakeman
Gen'l Ass't. J. B. Edmunds
Va., Tenn., etc. W. H. Maher
South W J Grant W. H. Warren
N. Y., etc. W. B. Graham B. B. Throop
New Eng. B. S. Hinckley
West A. O. Dooley
D. C. J. C. Suter, S. P. Agnew W. D. Griffith
Mid-West
Producing Regions
Statistics
Requisition Committee
Consumption By Plants
Commitment
Product'n Reports Annual Monthly Weekly
Request H. L. Underhill S. J. Halliday
Confirmation J. O. Knight
Public Information E. R. Sartwell
Stenography V. L. Mack
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Mail—G. Stearly Outgoing—S. Chase Telegrams E. B. Davis
Mimeograph C. M. Frye
Files E. M. Rowan
Supplies M. A. Downes
Bureau of Information S. K. Terry

49 State Fuel Administrators

Ala.	S. P. Kennedy	Nebr.	J. L. Kennedy
Ariz.	W. L. Clark	Nev.	E. H. Walker
Ark.	H. C. Couch	N. E.	J. J. Storrow
Calif.	A. E. Schwabacher	N. H.	C. M. Floyd
Colo.	W. J. Galligan	N. J.	R. C. Jenkinson
Conn.	T. W. Russell	N. M.	W. C. McDonald
Del.	C. H. Ten Weeges	N. Y.	A. H. Wiggin
D. C.	J. L. Weaver	No. Car.	A. W. McAlister
Fla.	A. T. Williams	No. Dak.	I. P. Baker
Ga.	L. G. Hardman	Ohio	H. H. Johnson
Ida.	F. R. Gooding	Okla.	P. A. Norris
Ill.	J. E. Williams	Ore.	F. J. Holmes
Ind.	E. Woollen	Pa.	W. Potter
Ia.	C. Webster	R. I.	G. H. Holmes
Kan	E. Carey	So. Car.	B. B. Gossett
Ky.	W. B. Bryan	So. Dak.	W. G. Bicklehaupt
La.	J. G. O'Kelley	Tenn.	W. E. Meyer
Me.	J. C. Hamlen	Tex.	W. Blair
Md.	F. A. Meyer	Utah	W. W. Armstrong
Mass.	J. J. Storrow	Vt.	H. J. M. Jones
Mich.	W. K. Prudden	Va.	H. F. Byrd
Minn.	J. F. McGee	Wash.	D. Whitcomb
Miss.	C. L. Townes	W. Va.	J. W. Barnes
Mo.	W. Crossley	Wis.	W. N. Fitzgerald
Mont.	W. J. Swindlehurst	Wyo.	A. Kendall

This diagram is the first of its kind to be published and has been made up from information obtained in Washington from the Fuel Administration. It is up to date and should be of interest and assistance to electric railway companies in the present fuel stringency, especially in view of the sweeping order on fuel conservation issued on Jan. 17.

Fuel Conservation and Operating Economies

Two Important Documents Are Reproduced as Typical of What Is Being Promulgated in All Parts of the Country

THE office of the ELECTRIC RAILWAY JOURNAL continues to be flooded with reports of efforts in the line of conservation. Space limitations this week preclude the publication of more than two typical examples.

New York Fuel Conservation Committee Formulates Recommendations

The fuel conservation committee for the electric railways of the Second Public Service District has prepared resolutions as requested by the Public Service Commission for this district. The resolutions follow:

1. *Heating of Cars*: As the amount of current necessary for heating is, in most cases, some 30 per cent of that required for the operation of the car, it is recommended to the different operating companies that the heat be shut off during rush hours, morning and evening, on all cars in service, and that the heat be reduced on cars in non-rush hour service, excepting under extremely severe weather conditions.

It is impracticable to comply with the above suggestions in cases of cars heated by other than electric heaters, but economies in the use of coal in these cases could be effected by a more efficient operation of heaters and a closer supervision of their use.

2. *Lighting of Cars*: It is further recommended that the amount of current now used for properly lighting cars be reduced 50 per cent.

3. *General Lighting*: It is recommended that the general illumination of carhouses, yards, rights-of-way, etc., be reduced to the minimum consistent with safety of operation.

4. *Sale of Power*: It is recommended that the sale of power by railway companies for other than railway or other purposes essential to the winning of the war be discontinued where possible.

5. *Consolidation of Power Plants*: It is the belief of the committee that few if any situations exist where consolidation or paralleling of power houses would result in fuel economies.

It is, however,. recommended that local conditions be studied by each company, and when economies can be made that arrangements for doing so be perfected.

6. *Stops*: Realizing that large economies in power would be effected by a reduction of the number of stops per mile made by all cars, it is recommended that the local conditions surrounding the operation of each company be most carefully studied with a view to eliminating all possible non-essential stops. Consideration of the skip and stagger-stop systems in this connection is recommended.

7. *Service*: This committee realizes the inconvenience to the public which will be occasioned by a reduction in service, and feels that all service reductions should, as far as possible, be confined to non-rush hours.

With this in mind, and appreciating the grave necessity of material reductions in order to meet the emergency fuel conditions, brought about by the war, it is recommended that the possibilities of service reductions be most seriously studied and schedules reduced or rearranged in such manner as to accomplish substantial savings with the least possible inconvenience to the public.

8. *Co-operation of Employees*: It is recommended that each company which has not already done so adopt the recommendations of the Amercan Electric Railway Association's War Board and secure, so far as possible, definite pledges from its employees to aid in the fuel conservation movement by every means in their power.

COMMITTEE ON FUEL CONSERVATION,
H. B. Weatherwax, Chairman; J. F. Hamilton,
J. P. Barnes, W. M. Collins,
W. J. Harvie, C. R. Barnes, ex officio.

[NOTE.—Possibly Clause 4 will now require change in view of the fact that the order of the Fuel Administrator on Jan. 17 makes no discrimination between industries which are essential and non-essential for winning the war in the Monday closing rule.—EDS.]

Connecticut Commission Recommendations Were Effective Jan. 15

Henry F. Billings, secretary Public Utilities Commission, State of Connecticut, has sent to the electric railways of the state a circular letter containing recommendations on fuel economy. They were asked to report on the matter on Tuesday of this week. The letter is referred to briefly in the War Board bulletin abstracted on the Association News page in this issue. The full text of the letter follows.

At this time when every vital energy should be so conserved and regulated as to minimize waste and produce maximum efficiency in meeting the necessary demands of our social, industrial and national life, and prove a potent factor in our first and paramount duty of "winning the war," it is opportune to consider street railway transportation and operation, with a view to making more effective its energies to that end.

Street railways are important agencies, not only for the transportation of passengers, but also in the handling of freight. The abnormal industrial development and demands for all kinds of transportation, upon street railway companies as well as steam railroads, has created a condition which the street railway companies, with their limited facilities, are unable to meet successfully, and which calls for unusual and special methods of treatment.

In the large industrial centers of Connecticut, as Bridgeport, New Haven, Waterbury and Hartford, manufacturing government supplies in the factories, employing thousands of men requiring transportation to and from their work at the same time, it is necessary that some system of co-operation be maintained between the transportation company and the factories and their employees whereby traffic may be best facilitated.

From a recent letter issued by the Board of Public Utility Commissioners of the state of New Jersey we quote: "As the industrial plants must have more men than ever, and as it will be impossible for the railways to carry them all practically at one time, it would seem that the problem would have to be solved by an arrangement which would necessitate some readjustment of the working periods in the shops and shipyards so that all would not start and stop at virtually the same time or within the same hours."

The street railways of Connecticut have about 6000 employees and use about 200,000 tons of coal per annum. Never in the history of this country has there been so great a demand for labor and never so great a necessity for carefully utilizing every ounce of man power. It is of the utmost importance that the energies of these employees be carefully directed in the lines of work most essential at this time, and that the spirit of patriotism augment the efforts of the employees to meet every reasonable demand and emergency.

The necessity for the conservation of fuel and its application to street railways is forcibly expressed by the Federal Fuel Administration in its General Letter No. 18, dated Dec. 1, 1917, from which the following is quoted: "An investigation convinces us that electric railways offer a chance for large savings, particularly through reductions in schedules. We are not suggesting changes in railway schedules which will seriously inconvenience the public, but it is a well-known fact that the pressure of private interests has, in many instances, led the electric railways to provide cars and service which represent a wastage that should be prevented in time of scarcity. . . . We would like to add that all of these companies should be urged to renewed vigilance in the matter of scientific economy in firing their power plants and the cutting off of every kind of leakage and wastage, especially in their transmission system."

Economy should be the watchword and the best possible efficiency consistent with wise economy the purpose which with united patriotic effort will contribute to the nation's success in prosecuting the war.

Patrons of street railways in Connecticut have been remarkably patient with the inadequate service rendered in recent years by companies struggling with only mediocre success to meet the unusual demands made upon them. The best results that may be expected at this time, however, require not only a continuation of that patience but an interested co-operation, with possible readjustment of hours of travel, even at some personal sacrifice. Those who can, should arrange to travel during the hours of normal traffic, and avoid adding to the necessary congestion during the so-called "rush hours" when factory and mercantile employees are obliged to go to and from their work. If it should become necessary or advisable to eliminate certain mid-day schedules as suggested by the Fuel Administration, the hours of travel would have to be adjusted to conform to the revised schedules.

The officials of the street railway companies should be the best qualified to analyze and determine what methods can be inaugurated to meet the economic demands without unnecessary inconvenience to the traveling public or seriously curtailing transportation facilities. We therefore recommend:

1. That the attention of mercantile, manufacturing and industrial institutions be directed to the necessity of co-operation in an effort to bring about a more even distribution of traffic, and a general improvement in transportation facilities.
2. That the attention of motormen and conductors be called to the patriotic duty of saving current and fuel and that their co-operation be enlisted by pledge cards or such other method as may be deemed most advisable.
3. That the officials of all street railway companies in the State make a careful study of the general situation under present war time conditions and put into effect such methods as will more effectively conserve fuel and economize in all labor and material consistent with reasonable service.
4. That each street railway company in the State report to this commission on or before Jan. 15, 1918, the results of its investigation in these matters, and the methods, if any, inaugurated or about to be inaugurated in the interests of fuel and other economic conservation.

Government Requisitions Niagara Power

The United States government has requisitioned electric power generated by the Niagara Falls Company, Hydraulic Power Company of Niagara Falls, and Cliff Electrical Distributing Company. Approximately 110 factories now working on war contracts will curtail their electric power requirements and substitute steam for electricity. About 100,000 hp. more will be imported from Canadian plants to be exclusively used for war purposes.

LETTERS TO THE EDITOR

Another Advocate of the Company Section

THE CONNECTICUT COMPANY,
NEW HAVEN, CONN., Jan. 16, 1918.

TO THE EDITORS:

I have noted with interest the letters from the presidents of the Toledo Railways & Light Company and the Elevated Railroads of Chicago which the ELECTRIC RAILWAY JOURNAL has printed recently. As president of another company which has an active and efficient section I take pleasure in adding my testimony as to the importance of this agency for the welfare of employees and the railway companies themselves. It seems to me at the present time that the importance of company section organizations on electric railway properties is greater than at any time in the history of the industry.

By reason of the abnormal conditions surrounding all branches of nationwide activity, the importance of the transportation utility is becoming more apparent, not only to those engaged in the industry, but to the public and administration officers of the government. For this reason we are being called upon more and more to become an efficient aid in the conduct of affairs, and it is necessary to disseminate through the rank and file of the organization information which is being received and demands which are being made upon the electric railway industry.

Without any question the best method of accomplishing these results is through the medium of the company section. The last two or three of our meetings, which have been reported in the columns of the JOURNAL, have been illustrative of the educational value of the organization. Last night's meeting, at which Dr. Thomas Conway, Jr., explained to our men the serious nature of the economic problems confronting the electric railway, was typical of what can be done at these meetings.* L. S. STORRS, President.

Signals Operated at High Speed

NACHOD SIGNAL COMPANY, INC.
LOUISVILLE, Jan. 8, 1918.

TO THE EDITORS:

In your issue of Dec. 22, 1917, page 1128, the statement is made:

"While electric railway signals operated by overhead contactors placed on the trolley wire give excellent protection on lines where the cars are operated at moderate and low speeds, reliance cannot be placed upon the overhead contactors to operate properly at high speeds."

We infer that a failure to operate reliably at high speed refers to a particular manufacturer's type of contactor signals, although it is not so stated. The Nachod Signal Company has had trolley contact signals in service for several years on interurban lines throughout this country, at speeds of 60 m.p.h., and their operation has always been considered satisfactory.

CARL P. NACHOD, President.

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*See page 141 in this issue for a brief report of the meeting referred to by Mr. Storrs.—EDS.

Mobilization of Machine Tools for Big Gun Manufacture

Government Faces Shortage in Facilities for Manufacture of Heavy Field Artillery Essential to 1918 Campaign

ELECTRIC railway operators and manufacturers of electric railway equipment who can by any possibility release machine tools which can be used in big gun making are urged by the Council of National Defense to do so without delay. The serious fact is that the government is short of heavy field artillery and there is no possibility of producing these guns without machine tools. Enough of these tools are not available and the machine tool makers cannot produce them in time for use in making guns for the 1918 campaign. It is believed, however, that there are in the country, in shops of all kinds, many tools which could be utilized to better advantage in gun manufacture than upon the work on which they are now engaged. Undoubtedly many tools are being inefficiently used where they are. The government wants these and the Council appeals to the owners to sell or rent them to the government for the period of the war.

Readers of the ELECTRIC RAILWAY JOURNAL may be able to help in this emergency either by furnishing tools themselves or by bringing this appeal to the attention of machine shop operators in their acquaintance.

Information regarding available tools should be written or wired to Machine Tool Section of the War Industries Board, Council of National Defense, Washington, D. C.

The essential character of heavy field artillery in relation to assaults is indicated by the following facts. When heavy artillery is not available to clear the way, to shatter the enemy's defenses, to drive such men as remain deep into the ground shelters, to make a veritable inferno of the region to be captured, the loss in life in the assaulting columns runs up to 40 and 60 per cent. With sufficient artillery preparation, with the front cleared by thousands of high-explosive shells which leave no stone unturned—which tear great craters in the fields and wipe out all traces of opposition—the loss is reduced to but 3 to 5 per cent.

It is not necessary at this time to go into the question of why we are short of guns and tools. The shortage is a fact and it remains merely to decide whether it is better to make some sacrifice now or to be treated as Belgium and other violated countries have been treated. No individual or group of individuals can determine where the needed tools are and which ones can be spared. Even if this knowledge were available the government would not wish to commandeer a single machine and does not believe that it would be necessary. Voluntary co-operation should suffice. It is true that the electric railways have been hard hit by the war, and further their shops are none too well furnished with heavy tools. If the whole industry, however, can furnish even a few planers, boring mills, milling machines and lathes it will have done something to save the lives of the boys at the front. Time is at a premium in this matter.

The MACHINES Needed

60- x 60-in. x 20-ft. planing machines.
48- x 48-in. x 20-ft. planing machines.
36- x 36-in. x 14-ft. planing machines.
Nos. 4 and 5 plain milling machines.
Nos. 4 and 5 vertical milling machines.
30-in. x 20-ft. engine lathes.
36-in. x 20-ft. engine lathes.
4- and 5-ft. radial drilling machines.
18- x 130-in. cylindrical grinding machines.
10-ft. vertical boring mills.
5-ft. vertical boring mills.
6-in. floor type, horizontal boring and milling machines.
4-in. floor type, horizontal boring and milling machines.

How the Fuel Order Affects the Electric Railways

THE essential nature to the public of electric railway service is recognized in the federal fuel order of Jan. 17, whose purpose is stated to be "to make provision for a more adequate supply of fuel for railroads, domestic consumers, *public utilities*, and for other uses necessary to the national security in certain parts of the United States." The following sections of the order relate particularly to electric railways:

SECTION 4. On each Monday, beginning Jan. 21, 1918, and continuing up to and including Monday, March 25, 1918, no fuel shall be burned (except to such extent as is essential to prevent injury to property from freezing) for the purpose of supplying heat for:

(a) Any business or professional offices, except offices used by the United States, State, county, or municipal Governments, transportation companies, public utility company, telephone or telegraph companies, banks, trust companies, physicians, or dentists.

SECTION 6. No fuel shall be burned on any of the Mondays specified in the foregoing section for the purpose of supplying power for the movement of surface, elevated, subway, or suburban cars or trains in excess of the amount used on the previous Sunday.

SECTION 9. This regulation is effective throughout the United States east of the Mississippi River, including the whole of the States of Louisiana and Minnesota.

Peter Witt Reports on Trenton

He Recommends Purchase of Fifty One-Man Cars, Introduction of Fare Boxes, Better Maintenance, Purchase of Power and a Number of Service Changes

PETER WITT, formerly street railway commissioner of Cleveland, was recently engaged by the City Commission of Trenton, N. J., to report on the electric railway situation in that city. The report, which was submitted on Jan. 12, recommends, briefly, the purchase of fifty one-man cars, introduction of fare boxes, better maintenance, purchase instead of generation of power, reduction of service on some lines and increase on others and a certain amount of rerouting. For the city the suggestions include better repair and policing of the streets as regards blockades and the erection of certain shelter stations. The car rider is enjoined to move quickly and not to knock.

In the introduction of his report, Mr. Witt comments on the small amount of riding in Trenton. He says that Trenton is a live, progressive, growing city with a population of 125,000, yet the record for 1916 shows rides per capita of only 155. This is a very low figure compared with other cities of the same size, and to increase it is the first thing that needs attention. To do it, he says, calls for heroic treatment, first by the traction officials in making effort as they never made before; secondly, through the assistance of the municipal authorities in the enactment of helpful measures; and last, but not least, by the needed and willing co-operation of the car riders.

MORE CARS AND BETTER SHOPS NEEDED

Mr. Witt finds the double-truck cars too large and heavy for base-table operation and the single-truck cars obsolete and altogether too small for peak-load requirements. To operate them at present he considers an economical mistake, producing a financial loss and failing completely of meeting the needs of the car riders. He recommends the substitution of at least fifty modern cars designed for one-man operation and says: "This will permit the running of more cars, the payment of higher wages to the operators, develop the riding habit and produce a larger net for dividends.

"Next, equip all cars with fare boxes. It will please the honest conductor, for automatically through its use he is relieved of financial responsibility; it puts the near honest beyond temptation, prevents stealing by the crook and will put an end to the cheating car rider who now 'beats his way'."

The tools and shop facilities of the company are also considered wholly inadequate to care properly for the equipment operated. The fire department was called out eleven times in the month of December for the purpose of caring for cars on fire, while the "turning-in" of cars while in service because unfit for operation causes an annoyance to the rider and a loss to the company which can be avoided if inspection is made before and not after the trouble takes place.

The company, according to the report, should give up making its own power with antiquated methods and purchase the energy it needs from a plant where modern methods and latest devices are used. It should also substitute for its horse-drawn line wagon a motor-driven vehicle. It is speed that counts when the wire is down. Also this vehicle should carry "hose jumpers."

Some new special work and considerable double tracking was also recommended, but Mr. Witt points out several lines where the service can be reduced and a few which he recommends should be abandoned. The track, poles and wires from these lines can be used for double tracking those lines where two tracks are necessary. Among those lines on which the service can be reduced is that from Trenton to Princeton, where service should be given every two hours instead of every thirty minutes and where the sale of ticket fares at reduced rates should be abandoned.

WHERE THE AUTHORITIES CAN HELP

Mr. Witt also points out the directions where the city authorities can be of great assistance in getting good service. One of these is to help the company so to regulate the issue of transfers that the practice of some car riders of making a round trip for one fare be made impossible. Other suggestions follow:

"Eliminate all useless and needless car stops. It will save the company money in operation and the car rider time in travel.

"If the streets of Trenton were in a poor condition, there might be some justification for the vehicular use of the tracks, but, having well-paved streets, kept in good repair and cleanly maintained makes this nuisance not only one uncalled for, but intolerable to bear. The place for wagons and automobiles is in the space between the curb and the outer rail. The drivers of vehicles should so be taught. It teaching fails to bring the remedy police activity should commence. All vehicles when standing for the purpose of unloading should stand with and not across the street. The 'road hog' with a vehicle so wide that passing becomes impossible should, by legislative action, be exterminated."

The report also points out that electric cars are often delayed unnecessarily at canal bridges and at steam railroad crossings. The city should see that these delays are reduced. Finally, the city should erect attractive shelters for waiting passengers at four important transfer points. The report states that the city can well afford to build these from the money it receives from the company under the present State franchise tax. In conclusion Mr. Witt says:

WHAT THE CAR RIDER CAN DO

"One more word, and my work is done. The many recommendations above made, if favorably received, cannot be carried out in a day; months will be required. In the meantime co-operate. Have your fare ready. Don't stand on the platform of the car and prevent others from getting on when there is room in the middle. When delay has bunched the cars, don't get on the first one; take the second or the third, as the case may be.

"Don't blame the traction company for everything that happens. Don't criticize your public officials for their failure to change conditions which cause you both inconvenience and annoyance, when their inability to act is caused by laws of your creation. Boost as well as knock. Work as well as kick, so when finis in this struggle is finally written, Trenton will have that which it is entitled to, a traction system equal to the best and with a service meeting every want and fulfilling every requirement."

American Association News

War Board Organizes Traffic Bureau and Appoints E. C. Faber as Manager

Meeting in Washington on January 11

Board Issues Bulletin No. 6, Which Contains General Suggestions and Report Items

Traffic Bureau Now Organized

E. C. Faber Is Appointed Traffic Manager—Names of Additional Sectional Representatives Are Given

THE Traffic Bureau of the Electric Railway War Board has been completed under the direction of Britton I. Budd, president Elevated Railroads of Chicago, chairman traffic committee. E. C. Faber, general manager Aurora, Elgin & Chicago Railroad, Aurora, Ill., has been appointed traffic manager. His headquarters will be in the Munsey Building, Washington, D. C.

In addition to the names listed on page 1080 of the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 15, 1917, the following have been announced:

Northeastern Military District: F. E. Wood, Portland, Me.; Byron T. Burt, Rutland, Vt.

Southeastern Military District: C. S. Allen, Greenville, S. C.; Frank J. Duffee, Natchez, Miss.

Central Military District: C. A. Laney, Akron, Ohio; F. D. Norviel, Anderson, Ind.; Polk Lafoon, Covington, Ky.; W. S. Rodgers, Detroit, Mich.; Frank J. Hanlon, Mason City, Ia.; F. W. Hild, Denver, Col.; A. M. Patten, Topeka, Kan.

Western Military District: W. H. McGrath, Seattle, Wash.; W. C. Orem, Salt Lake City, Utah.

The plans of the traffic bureau are contained in Bulletin No. 4 of the War Board, just issued. The Bulletin states as follows:

> The object of the traffic department is to place such facilities of the electric lines, as may be possible of utilization for the purpose, at the disposal of the government for relief of the present war-time traffic situation.
>
> The bureau will keep in close touch with all government departments having to do with the transportation of men and materials and with the Director General of Railroads and his organization.
>
> It will place before these departments and the Director General all available information, as to the ability of the electric lines to be of service in the quick handling of men and materials.
>
> The traffic manager will inform himself, as far as possible, of all government movements of men or materials and will immediately notify the sectional traffic representatives and the electric railway lines interested. The same course will be pursued in connection with any movements suggested by the steam railroad operating committees.
>
> The War Board has been assured by the steam railroad authorities that they will welcome the assistance of the electric lines in the problem that confronts them.
>
> It is suggested, therefore:
>
> > First, that each electric railway manager make, at once, a survey of the conditions in his territory, with the idea of ascertaining the specific things that can be done by his road to relieve traffic congestion.
> >
> > Second, that each electric railway manager consult with the officers of the steam roads in his territory, in order that a distribution of traffic having for its principal object expeditious movement may be effected.
> >
> > Third, that each electric railway manager communicate with the traffic representative of his territory according to the list given in this bulletin, as to what movements of men and freight he is prepared to take care of.
>
> In connection with any conference with steam road officers, attention is called to Bulletin No. 42, of the American Railway Association recommending that railroads "encourage . . . . co-operation with trolley lines for hauling short-haul freight."
>
> The sectional traffic representatives are expected to thoroughly familiarize themselves with the traffic facilities, both passenger and freight, of every electric line in their territory.
>
> They should post themselves as to rates, routes, steam road connections, and connections with electric railways in adjoining states and with water lines.
>
> They should work to the end of establishing through traffic arrangements on connecting lines, where such arrangements do not now exist.
>
> They should keep in touch with the quartermaster at cantonments, camps, forts, arsenals, etc.
>
> They should, wherever possible, work in conjunction with the state councils of national defense.
>
> Traffic representatives in adjoining states should work in co-operation with each other and with the state or sectional associations in their territories.
>
> It is the belief of the War Board, that existing facilities of the electric lines should be utilized so as to render the greatest possible service, but that any improvements or extensions which require capital expenditure should be approached with great care, as it is evident that any capital expenditure not absolutely essential hampers the government in the raising of funds for purposes of the war.
>
> In general, electric railways can, in many instances, render valuable services in supplementing the steam railroad facilities for short-haul traffic both of passengers and freight; by the movement of recruits, troops and supplies to and from cantonments, camps, etc., and by transporting merchandise around congested points, thus relieving crowded terminals.

E. C. Faber Issues Traffic Questionnaire

THE new traffic manager of the Electric Railway War Board has sent to electric railways a list of questions for the purpose of assembling traffic data for the benefit of the Director General of Railroads. Mr. Faber states that under present circumstances it is the patriotic duty of each American citizen to bend every effort towards relieving the present traffic congestion and towards placing on the highest plane of efficiency every existing transportation facility. This will entail co-operation on the part of everyone concerned, including the public, and this must be constantly borne in mind in any consideration of the subject. It is evident that the electric railways can be used to supplement steam railroad service, thus relieving the steam roads of a considerable amount of short-haul traffic, so as to render steam road cars and facilities available for long-haul business—business which the electric railways are not in a position to handle.

Mr. Faber requests that in furnishing information the railways do not overstate the extent to which they can render such relief, bearing in mind, on the other hand, their duty to make the greatest possible use of the facilities at hand. It is their duty further to increase such facilities whenever they are in a position to do so.

Below are given the questions to which replies have been requested.

What are the cities served, with population opposite each city?

Give names of steam railroads serving same territory served by electric railway lines, indicating after each name the cities, towns and stations served by such steam roads in this territory.

PASSENGER TRANSPORTATION

If any so-called rush-hour service is required in the territory state the extent to which rush-hour service is given by each steam road serving the territory and also state the character and extent of rush-hour service now performed by the electric railways and to what extent the rush-hour traffic now handled by steam roads can be absorbed.

To what extent can the electric railway lines absorb the non-rush-hour traffic now handled by steam roads in the territory served? (Treat each steam road separately.)

State just what relief the absorption of such local traffic would afford the steam roads operating in the territory as to: (1) Number of trains; (2) number of locomotives; (3) number of passenger cars; (4) number of employees.

FREIGHT TRANSPORTATION

If the electric railways can relieve steam railroads, operating in the territory, of any of the local freight (carload or less-than-carload) they are now handling, state in detail the manner in which and amount of relief that can be afforded.

State just what relief the absorption of such local traffic would afford the steam roads operating in the territory as to: (1) Number of trains; (2) number of locomotives; (3) number of freight cars; (4) number of employees.

GENERAL

State briefly a comparison of the proposed electric service with the service now afforded by the steam railroads as to time, rates, location of terminals, and whether the proposed electric service is through (without change of cars) or whether transfer will be required.

Inclose a map showing lines, indicating thereon the steam railroad lines serving the same territory.

State any further suggestions pertinent to the subject matter of this inquiry blank which would offer relief to the steam railroads and which suggestions are not covered by the foregoing questions.

War Board Meets at Washington

THERE was a meeting at Washington of the American Electric Railway War Board on Friday, Jan. 11. All members were present. W. B. Hill, manager California Electric Railway Association, was also in attendance for part of the time and gave the members an interesting account of electric railway conditions on the Pacific Coast.

Among the subjects discussed was whether it would be desirable for the association to hold a mid-year meeting this year. President Stanley had asked the board to give him its views on the subject, in view of its opportunities of observation of national affairs. The board decided to recommend to President Stanley that no meeting should be held at this time.

It was decided to issue a bulletin shortly on the subject of the action of the government in taking over the steam railroads and the relation of this action to the electric lines. There was also a discussion on existing labor shortage and possible means for relieving it, as by the use of women employees or of high-school students during certain hours of the day to serve as conductors.

A considerable part of the meeting was taken up with a review of the activities of the traffic committee. Mr. Budd and Mr. Faber reviewed the work which had been done up to this time by the committee.

War Board Makes General Suggestions

BULLETIN No. 6 of the Electric Railway War Board is dated Jan. 11, 1918. It contains a number of general suggestions and report items. These are summarized in the following paragraphs:

Expenditures for Public Improvements.—Attention is directed to the admonition by federal authorities to the effect that no capital expenditures should be made excepting those essential to conducting the war. To illustrate, two quotations are appended to the War Board's suggestions. The first is from a communication addressed to federal reserve banks by the Federal Reserve Commission. It reads:

"Let the banks tell the people of their communities and their authorities, the mayors and governors, that this is not the time for cities to be spending money on public work; rather they should be considering the suspension of existing work, with the view of releasing men and material for the use of the government and so as not to compete with the government for the savings of the people, thereby weakening the ability of the government to place its loans."

The second quotation is from the annual report of the Secretary of the Treasury, Hon. William G. McAdoo. He says:

"The government must, if necessary, absorb the supply of new capital available for investment in the United States during the period of the war. This, in turn, makes it essential that unnecessary capital expenditures should be avoided in public and private enterprises."

Coal for Electric Railways.—The announcement is made that Col. J. Stanley Moore has been appointed Assistant United States Fuel Administrator, in charge of the coal supply for electric railways. His address is Room 105, Eighteenth and C Streets, N. W., Washington, D. C. He will not attempt to furnish relief to any electric railways unless he has at hand full data as to their requirements.

Co-operation of State Commissions.—New York: Resolutions adopted by a committee appointed at a conference between the Commission for the Second District and representatives of up-state electric railways are reprinted. (See ELECTRIC RAILWAY JOURNAL, Jan. 5, page 42.)

New Jersey: Attention is directed to a circular letter issued by the Board of Public Utility Commissioners mentioning economies possible on the part of electric railways. The Board says: "As the industrial plants must have more men than ever and as it will be impossible for the railways to carry them all practically at one time, it would seem that the problem would have to be solved by an arrangement which would necessitate some readjustment of the working periods in the shops and shipyards so that all would not start and stop at virtually the same time, or within the same hours.

Connecticut: Among the definite recommendations of the Public Utilities Commission of Connecticut were stated to be these:

"1. That the attention of mercantile, manufacturing and industrial institutions be directed to the necessity of co-operation in an effort to bring about a more even distribution of traffic and a general improvement in transportation facilities.

"2. That the attention of motormen and conductors be called to the patriotic duty of saving current and fuel and that their co-operation be enlisted by pledge cards or such other method as may be deemed advisable.

"3. That the officials of all street railway companies in the State make a careful study of the general situation under present war-time conditions and put into effect such methods as will more effectively conserve fuel and economize in all labor and material consistent with reasonable service.

"4. That each street railway company in the State report to this commission, on or before Jan. 15, 1918, the results of its investigation in these matters, and the methods, if any, inaugurated or about to be inaugurated in the interest of fuel and other economic conservation."

Ohio: Mention is made of the fact that the first official act of W. C. Culkins, on assuming the duties of the newly created office of Director of Street Railroads for the city of Cincinnati, Ohio, was to issue an order abolishing 383 stops formerly required by the city authorities. Another interesting instance of co-operation was found in Columbus, where the City Council, upon application of the Columbus Railway, Power & Light Company, has permitted the installation of the skip stop all over the city, except in the business center.

General: The War Board reports that more than 300 electric railways have executed the economy pledge promulgated by it. Director C. Loomis Allen will appreciate information as to what is being done along conservation lines, and he would also like to receive newspaper clippings indicating the trend of public opinion as it affects electric railways.

Why the Electric Railway Must Have More Revenue

AT THE meeting of the Connecticut Company section held on Jan. 15, Dr. Thomas Conway, Jr., University of Pennsylvania, Philadelphia, Pa., gave an illustrated lecture on the economic position of the electric railways. With the aid of charts showing the increasing ratio of operating expenses to gross earnings, the diminishing margin of safety for funded debt, the decreasing ratio of net earnings to reproduction value, the decreasing ratio of net earnings to cost per mile of track, the decreasing amount of new construction, etc., he impressed his hearers with the critical character of the present financial status of the electric railway industry.

In order to give a local flavor to his subject, Dr. Conway referred in some detail to the testimony presented at the recently concluded hearings held in Hartford before the Public Utilities Commission of Connecticut, to show why the protest of the city of Hartford against the increase in fare from 5 to 6 cents is unreasonable. He urged upon his hearers the necessity for co-operation on the part of public utility employees in spreading among their constitutents such facts as those which he presented.

Preceding Dr. Conway's lecture was the usual dinner, during which the members of the section were entertained with vocal music, including selections by a quartet from the Yale University Glee Club. Immediately after the dinner W. P. Bristol, local manager Hartford division, the new president of the section, made a brief address, in the course of which he presented to his predecessor, W. J. Flickinger, the gavel which Mr. Flickinger had used during his term of office. He also announced the appointment of Mr. Flickinger to serve as director of the section for one year, and read a list of members of the program, entertainment, resolution and membership committees for the coming year.

Mr. Bristol was followed by Mayor David E. Fitzgerald of New Haven, who complimented the executives of the company and its employees on the friendly relations existing. He touched upon the present conditions on the system, pointing out that neither company nor employees could be blamed for existing inconveniences, which were the natural consequence of the troublous times in which we are living. He predicted that a time might come when the people of New Haven will have to put up with much greater hardships, through the inability of the trolley company to operate even as large a number of cars as they are doing at present.

"Sparks" from Toledo

THE joint section of the Toledo Railways & Light Company, representing the national electric railway, electric light, gas and heating associations, is issuing a monthly bulletin which has just been christened with the euphonious and suggestive name *Sparks*. *Sparks* contains eight pages of facts regarding the property, section statistics, an article by Secretary H. Friede on "Why You Should Become a Member of the Joint Section," and general matters of interest. Among the last-named is Dr. Charles W. Eliot's list of twenty-five books which will give any man the essentials of a liberal education. *Sparks* carries no advertising.

The section held no meeting in December, as the regular date came in the holiday season. At the Nov. 28 meeting H. M. Johnson, of the General Electric Company laboratory at Nela Park, gave a demonstration lecture on illumination. He showed, among other things, how the appearance of a picture is affected by the lighting. Marcus A. Dow, supervisor of safety, New York Central Lines, is scheduled to speak at the next meeting on Jan. 23.

The Story of a Severe Storm

AT THE meeting of the Public Service Railway company section, held on Jan. 17, David H. Roszel, division engineer Hudson Division, read a carefully prepared history of the terrific storm which visited this section of the country about the middle of December. He related the meteorological story of the storm, described the efforts made by the company to meet it, gave estimates of the cost of the storm to the company (amounting to $150,000 or more), and told some interesting tales of passengers who were caught unawares by the suddenly developed ferocity of the storm on the evening of Dec. 11. This paper brought about a lively discussion on snow fighting.

In addition to the technical discussion, a number of humorous and semi-serious stories were told by L. J. Tynan, attorney in the claim department, who closed with a patriotic appeal for co-operation between the men and Public Service.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

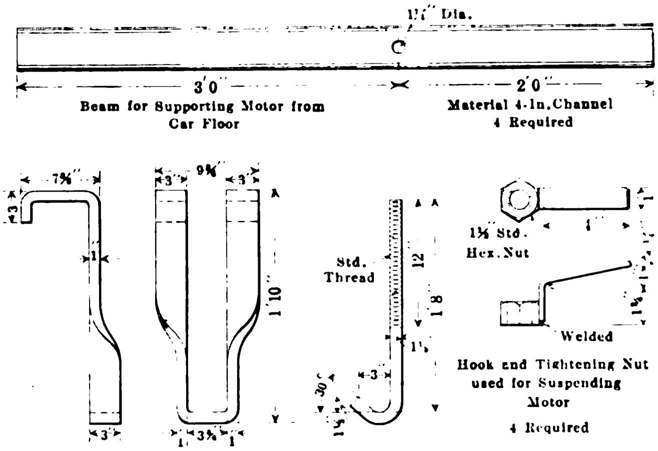
Using Car Hoists for Changing Wheels

By Keith Mac Leod
Engineer of Equipment, Montreal (Que.) Tramways

The accompanying halftone shows a method of utilizing a car hoist for the purpose of changing wheels. This method has superseded the use of wheel pits in our carhouses with gratifying results.

The procedure is to place cross beams (supported from the main beams by saddles or links) under the truck end frames, to remove the pedestal straps of the wheels to be changed, to hook up the motors from the car floor, to remove the axle caps and bearings and then to raise the hoist. When the car is raised sufficiently the old wheels are run out, the journal boxes are changed and the new wheels are run under to their proper places. The journal boxes are then guided into place as the car is lowered.

The method of hooking up the motors from the car floor is illustrated in the accompanying sketch. The motor is simply suspended from a channel iron, which is placed across the trapdoor, by means of a hook inserted in the bale on the motor frame. The hook is held in place with a special nut screwed on the end which projects up through the channel.



Beam for Supporting Motor from Car Floor

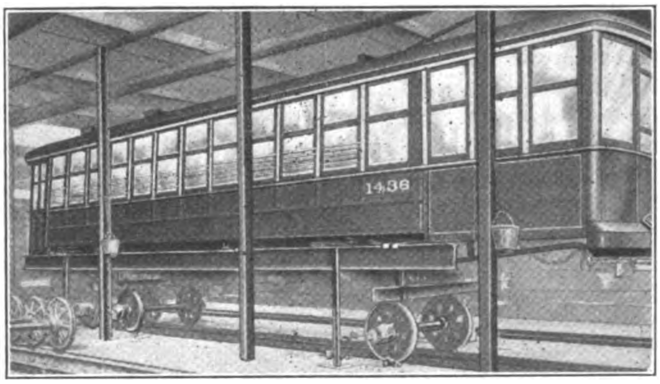
Material 4-In. Channel
4 Required

Link for Suspending Cross Beam from Main Beam

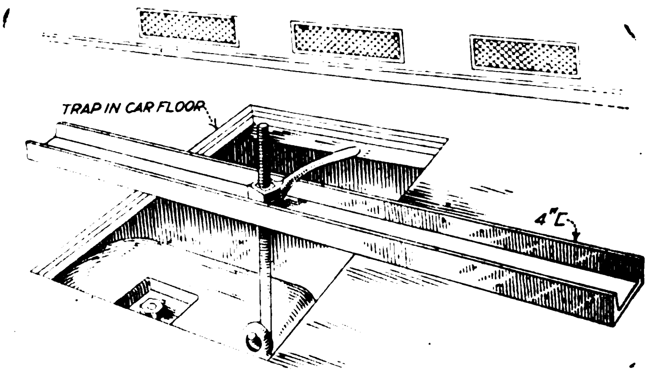
Material
3" x 1" W. I.
8 Required

Hook and Tightening Nut used for Suspending Motor
4 Required

DETAILS USED IN CHANGING WHEELS WITH CAR HOIST



VIEW OF CAR HOISTED TO RECEIVE NEW WHEELS



HOW MOTOR IS SUSPENDED FROM CAR FLOOR

Although there is a saving of time, even for one pair of wheels, as compared with the wheel pit method, the proportionate saving is much greater for two or more pairs. In cases when four axles are to be removed, the relative time required per axle compared with the former method has been found to be roughly one to three.

Aluminum Catenary Construction

In the usual catenary construction, the contact system is not depended on for power transmission. Copper wires were formerly used for this service, but where traffic is heavy they have been largely replaced by bronze or steel wires. These wear better, but have poorer conductivity. The necessary conductivity in the catenary system has been obtained on the Lake Erie Northern Railway, as explained in the January issue of the Electric Journal, by wrapping the conductor around the steel messenger cable. This cable consists of seven strands of 0.1118-in. double galvanized extra high strength steel having an elastic limit of 130,000 lb. per square inch. Fifty-four strands of 0.1118-in. hard drawn aluminum are laid in three layers around this steel core. This gives a cross section of 675,000 circ. mils of aluminum having a conductivity of 61 per cent, which is equivalent to No. 0000 B & S gage copper cables. The complete cable including the steel reinforcement weighs 874 lb. per 1000 ft., while two No. 0000 copper cables would weigh 1316 lb. per 1000 ft.

For the contact wire a No. 0000 B & S gage mild steel, galvanized grooved wire, having an elastic limit of 36,000 lb. per square inch, is used. The coefficient of expansion is two-thirds that of copper and the cost about one-third. The contact wire is supported at fifteen foot intervals by galvanized steel hangers and the catenary cable is strung with a deflection of two feet in 150 foot spans. The aluminum strands of the supporting

Auto Tower Versus Horse-Drawn Tower

In Every Respect the Self-Propelled Tower Has Proved Far Superior to the Horse-Drawn Equipment—Reasons Why This Is So

BY S. L. FOSTER

Chief Electrician United Railroads of San Francisco

AGENTS for self-propelled towers for construction and maintenance of overhead trolley wires have explained volubly the advantages of their appliances over those which are horse-drawn. The favorable financial aspect of the question has already been fully presented, but there has been little in literature to make clear the relative features of the two types of towers in their practical details.

The United Railroads of San Francisco found most of the good points of auto towers after a few days' use of a 2-ton Pierce-Arrow equipment. The hills ceased to have any terrors for the linemen, for, instead of having to be favored on the climbs, the auto readily responded to all demands. Fifteen and 16 per cent grades, which with horse-drawn towers had to be ascended by circuitous routes and necessitated that linework be done down hill, were easily surmounted by the auto and the work was done up the grade. No more time was lost in watering, feeding or resting the horses or in waiting for the blacksmith to replace torn-off shoes. There was no longer any fear of hurrying lest the driver be scolded for overheating the horses. The auto could proceed on the level or climb the ascents more than twice as fast as the horse-drawn vehicle and, on descending, the only limit was the nerve of the chauffeur or the allowance permitted by the auto guarantee. The camouflage of the fire department crimson color of the rig, the "Auxiliary Fire Apparatus" signs, the siren and the portable fire extinguisher made the auto tower independent of even the traffic officer and his rules.

The danger of overturning on steep hills was also reduced. There was no occasion to turn the auto on a grade, as all maneuvers were managed by backing up or going ahead at a slight departure from the line of the rails, whereas backing a horse-drawn tower up a steep grade had been out of the question.

When the auto tower was not in motion the lineman-chauffeur was free to assist in the work aloft or on the ground, as there were no horses to watch and no danger of the motive power taking fright or running away.

In pulling out heavy feeder cables the draft by the auto tower was stronger and steadier than by the horses. There was no compunction felt about overloading the auto a little, pushing it to the full limit of its speed or sending it for long trips, and it was found to have more reserve capacity and to be better able to stand all these strains than was the equine equipment. The increased speed available from the auto reduced the time between spans so that twice or three times as many miles of trolley could be inspected or overhauled in a day as was possible with the horse-drawn rig. The bed of the auto was 6 in. lower than that of the horse-drawn tower, thus making material and supplies more accessible to the groundmen and fewer moves were required. As the auto was longer than the wagon bed of the older vehicle, the extension ladders no longer projected beyond the body, but were entirely protected from injury by collision with intercepting wagons, and yet the auto vehicle occupied less longitudinal street space than the former tower plus the horses.

Rubber tires made the riding more comfortable for the linemen than the iron-shod wagon wheels of the former towers. Instead of a wagon driver with the education and instincts of a hostler, the new vehicle was guided by a lineman with mechanical instincts, who rendered intelligent and efficient assistance to the crew when not acting as chauffeur. The range of the operation of the tower when propelled by the auto was greatly increased over that permissible or wise when horse drawn, as its radius of action was limited only by the time available in the working day and not at all by the endurance of the motive power.

On account of the increased speed of the new vehicle it was unnecessary to provide special stabling facilities with supplies of hay, grain and men or to hire horses from outside owners when a special job of construction was to be done at an abnormal distance from the linemen's base. Formerly this practise had to be followed in order to save the energies of the horses and reduce the time of the men employed making the slow trip to and from the work over the strenuous, hilly routes radiating in all directions from the city.

The generous floor and yard space required for the storage, maneuvering and maintenance of the horse-drawn vehicle and for the lodging and feeding of the horses was all saved, as the less offensive auto tower was willingly admitted for shelter at night into an available space in the linemen's quarters and storeroom. This would have been difficult and objectionable with the former type of tower. The whole equipment of the later appliance was thus stored under cover and protected from exposure to the rain, fogs and thieves of the night, which was not so with the older tower. The replenishing of the supplies on the new tower was also greatly simplified and many steps were saved.

The cost for second-story dry loft space, the labor of hoisting and stowing the hay and grain for the horses and the expense of segregating, storing and removing the stable refuse was entirely eliminated. The liquid

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(*Concluded from page* 142)

cable are protected from abrasion by sheet-steel sleeves provided with flanges between which the loop of the hanger is free to rise slightly when the collector of the car passes under it without lifting the catenary cable. The contact wire and catenary cable are connected by stranded flexible copper conductor every 150 feet.

Joints in the catenary cable are made by steel sleeves of figure-8 section about eighteen in. long. The ends of the steel cable are slipped into the sleeve from opposite ends and the sleeve is then given four or five complete twists. Over the splice of the steel core an aluminum sleeve is placed and the ends are compressed solidly into the strands of the aluminum conductors by means of a portable hydraulic press capable of exerting 100 tons pressure.

Parallel feeder cables are entirely eliminated by this construction, and due to the high elastic limit of the contact wire it is expected that no adjustments will be necessary to take care of temperature differences between winter and summer. A considerable saving in insulators and labor has been effected in addition to the saving of material.

fuel for the auto was stored in a tank underground and was filled from the supplyman's portable tank by gravity at no expense. In the case of the auto there was practically no refuse, either offensive or otherwise, to collect, store and periodically remove. The fire hazard was also reduced by the substitution of the engine for the horses, as the gasoline, though more inflammable than the hay, was so small in bulk and was stored so securely under the ground that the probability of its being ignited was less than that of the great lofts full of hay. It was also free from the extensive destruction that grain is subject to from the army of rats and mice so prevalent about stables. Incidentally, the great saving of hay, grain and men and the release of the horses must have their effect in helping us win the war.

Because of the many heavy grades in San Francisco, when equipping with horse-drawn towers, the one-horse wagon was bought and provided with two horses. The gage of the wheels was increased from 4 ft. 8½ in. to 6 ft. to reduce the danger of overturning on the grades. The result of driving this tower along the standard 4 ft. 8½ in. track was that one wheel ran on a rail and the other ran on basalt or granite paved streets, so that the jouncing of these off wheels made the riding very exhausting for the workmen. As the auto tower does not turn on the grades, there was no necessity of this increase in gage and the standard 4 ft. 8½ in. gage was retained. With the Trilby railhead the auto thus had the smoothest possible path for both wheels when running on the car track.

With the 2-ton auto tower costing $4,000, the two-horse tower costing $800, and assuming 6 per cent as annual interest, it is necessary to save only about 50 cents per day per auto tower over the horse-drawn tower to equalize the two investments. The running expenses, maintenance and depreciation will vary in different localities, but they are apparently strongly in favor of the auto tower, judging from the very general substitution of the auto for the horses throughout the country.

When constructing an auto tower there are two valuable improvements that can readily be introduced that are well worth considering, namely, the substitution of the three-section tower for the usual two-section kind and the arrangement whereby the tower can be raised or lowered by the automobile engine through the control of the chauffeur from his seat, as will be described more fully in a later article.

Summarizing, the auto tower is preferable because it is faster, cheaper, safer, looks better and is more efficient, has greater power, steadiness and endurance, occupies less room for storage and handling, obviates labor of receiving and stowing food, reduces the fire hazard, eliminates the parasite hazard, consumes no fuel when not in motion, rides more smoothly, requires no additional floor or loft space for fuel or motive power, has no daily refuse to take care of and may help win the war by reducing the consumption of hay and grain and by releasing horses and men for other work.

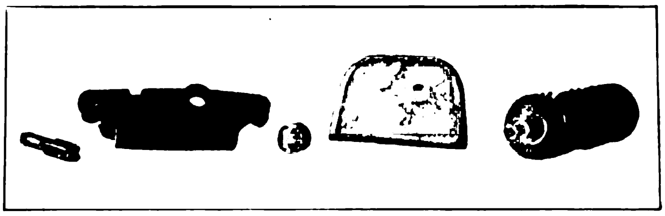
Some sage said that "familiarity breeds contempt," but in the case of the internal combustion engine driven linemen's tower, familiarity breeds admiration and enthusiasm and the wonder how we managed so long without it.

Renewing Worn Controller Parts

By James W. Brown
Superintendent of Shops Wilkes-Barre & Hazleton Railway, West Hazleton, Pa.

For renewing controller parts which have become worn by the action of the controller handle we have developed a very inexpensive method requiring no new materials. This results in a fine job and makes future renewals easy. To repair the top of a G E-C-36 master controller, the hole for the drum-shaft is first tapped out with a 1-in. tap having fourteen threads per inch. This tap is shown at the extreme left of the illustration. In the hole is screwed a piece of tobin bronze, made from pieces of old power-house pump rods cut off to proper length and threaded. Such a piece ready to be screwed into place is shown in the center object of the illustration below.

A new hole for the drum-shaft is turned by fastening the controller top in a lathe with the large casting shown at the left of the illustration. This is faced on one side and is held against the face plate with two ⅝-in. bolts. On the other side are cast two bosses, which are faced off and drilled to receive two ⅜-in. cap screws for clamping on the controller top. The hole in the casting, to coincide with that to be drilled in the controller top, is bored 1¼ in. in diameter in a large boss, which leaves sufficient bearing surface.



WORN CONTROLLER PARTS RENEWED

When the holes in the end of the controller shaft are badly worn we place the controller drum, shown at the right of the illustration, in a lathe with one end in a chuck and the end to be renewed in a steady rest. After cutting off 1¼ in. the end is drilled and tapped with a ½-in. standard tap. A piece of ⅞-in. cold rolled steel, with one end machined and threaded, is screwed into the end of the shaft, and the remainder of it is turned down to size, after which the two holes are drilled in the end. To insure this new part remaining in place a ⅛-in. hole is drilled through it and the drum shaft and into this a steel pin is driven.

Method for Using Old Pinions

The Washington Water Power Company, Spokane, Wash., was recently handicapped by the lack of pinions. There were a number of old worn-out pinions on hand, but no new ones could be obtained without waiting several months. The situation was met by taking the old pinions which had an over-all diameter of 7¼ in., and nineteen teeth, and cutting off the teeth. New teeth were then marked out, giving a pinion 5¾ in. in over-all diameter and having fifteen teeth. For cutting the new teeth a small milling machine was the only available apparatus, and for this reason it was necessary to slot the teeth first and then mill them. The cost of doing the work was a little less than $5 per pinion.

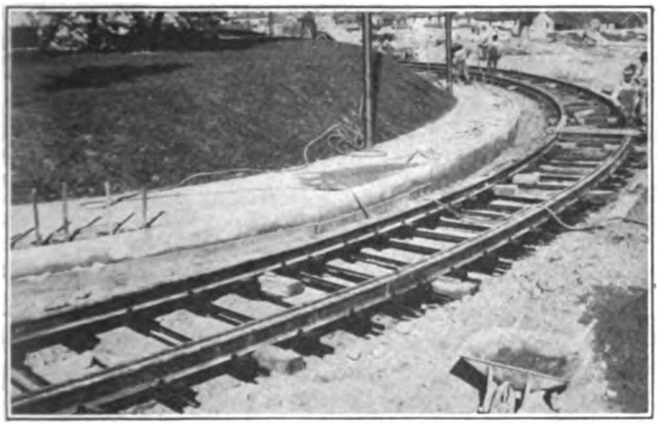
Advantages of Mechanical Ties

Cushioning and Noise-Reducing Effect Favorably Commented Upon by Public—Light Weight Facilitates Assembling

EXPERIENCE in Dayton with the Dayton mechanical tie in railway track is bringing out some striking features of this equipment in comparison with the more common track construction. The cushioning and noise-reducing effect of this type of construction is brought out by the comments of people along a certain street in Dayton on which one of the tracks is built with the mechanical tie and the other with ordinary wood tie and solid concrete construction. These residents say that there is a noticeable quietness about the track laid with cushioned ties.

A very prominent superintendent of rolling stock pointed out the value of the cushioning effect of the mechanical tie by comparing the effect on the rolling stock operating over open-type track construction on summer days and on cold winter days. He states that when the open-type track becomes rigid due to ice that he has a great deal of trouble with broken trucks. This is undoubtedly the result of the very rigid character of track while frozen, since he does not have this trouble on days when the track is in normal condition.

Another interesting feature of the mechanical tie is that it seems to solve the difficulty of obtaining an interurban car motor suspension spring equally satisfactory for open-type interurban track and rigid concrete-type city track. If the spring is flexible enough to serve the purpose well on the rigid track, it is too flexible for the open track, and if correct for the open-type track it is too stiff for city track. By using the mechanical tie and the type of track construction which it involves, it is plain that approximately the same flexibility can be had in city track as is obtainable in open-type country track. The difficulty with the spring is therefore minimized. The flexibility is partly accounted for by the fact that the ½ in. of asphalt under the tie blocks has about the same elasticity, or will compress about the same amount, as the space which is formed underneath the rail by the contraction of the concrete as it hardens and pulls away from the base of the rail. Thus when the asphalt has been compressed an extremely small amount, the base of the rail is brought to bear upon the concrete, thereby making the bearing core solid as it depresses.



MECHANICAL TIES ON 100-FT. RADIUS SPIRAL CURVE

It is claimed that the installation of the Dayton mechanical tie on curves is a more simple operation than that of installing other mechanical ties. The reason for this is that the bearing surface on each tie is only 8 in. wide, so that the small amount of play left by the spacing of the holes for the rail clips is sufficient to allow for the curvature of the rail between bolts. Owing to the change of the center of bearing on the rail at the curves, the setting of the blocks on the ties is specially arranged for a curve of given radius. All the ties of a given curve are drilled uniformly.

It is claimed that the use of the mechanical tie practically eliminates the necessity for tie rods at curves, because the angle irons really serve in this capacity. The bolts extend through the wood blocks and through the angle irons, which are embedded in concrete, so that the rails could not pull apart without actually pulling the bolt through the angle iron. Where it is desired to install rail slightly tilted, this is very readily accomplished by beveling the wood blocks for the mechanical ties.

SEVEN MEN, PREPARING TRACK, KEEP AHEAD OF CONCRETE MIXER AND SIXTEEN MEN

One of the features of the tie is the ease and rapidity with which it may be assembled on the job. The weight of 55 lb. is, of course, in its favor in this respect. On one job seven men were employed to dig the trenches for the concrete sill placed along under each tie, lay the rail, fasten the ties to the rails, block the track to grade, etc., and these seven men were able with ease to keep ahead of a 1-yd. concrete mixer and sixteen men employed in concreting a 22-ft. wide street, including the trackway, with a 6-in. slab.

As to the cost of track built with the Dayton mechanical tie, it is claimed on account of the smaller amount of excavation necessary and reduced quantity of concrete required that the cost is from $2,000 to $2,500 a mile of single track less than it is with ordinary wood ties set in solid concrete.

Turning Steel Wheels

On the Springfield (Ohio) Railway 34-in. steel wheels are used on all cars. It is the practice to obtain three turnings, but many times the third is rendered impossible on account of the development of sharp flanges. In these cases the flange is built up by use of an electric welder. It has been found desirable, however, to turn the wheel before building up the flange as the metal put on by the welder is so hard the machine tool will not touch it. This operation requires about six hours.

High-Pressure Boilers for Joliet Plant

Operating Pressure of 325 Lb. Per Square Inch, Superheat of 225 Deg. Fahr and New Type of Economizer Described

THE Public Service Company of Northern Illinois has just completed the first unit of its new power house at Joliet, Ill. This has many interesting features, but of most value to railway electrical engineers will be those in connection with the boiler equipment. The station has been built on a carefully chosen site and although at present only one 10,000-kw., 12,000-volt machine is in operation, the plant can be extended in unit sections to an ultimate rating of 60,000 kw. or more. The expected industrial growth between Chicago and Joliet will place the plant in the electrical load center of the present system.

THE HIGH-PRESSURE BOILERS

For each 10,000-kw. generating unit there will be two cross-drum, water-tube boilers, each having 9919 sq. ft. of steam-making surface and developing a pressure of 325 lb., a built-in superheater with 3100 sq. ft. and an economizer containing 6730 sq. ft. of surface. The boiler arrangement is shown in Fig. 3. The intention is to use three boilers to carry the two generating units, leaving one boiler in reserve. This arrangement will supply 1.49 sq. ft. of active steam-making surface per kilowatt of generating capacity, or on a basis of 10 sq. ft., 1 b.hp. will serve 7.67 kw. The plates in the boiler drum are 1 5/16 in. thick, the longitudinal seam being a butt and double-cover strap quadruple riveted joint.

The heads are secured by two rows of rivets. Tubes of No. 7 gage are used and all high-pressure steam piping is extra heavy and of relatively small diameter. All fittings are of steel, the manifolds used in connection with the boiler leads having been cast and the smaller fittings forged. On pipes above 4 in. in diameter a special bolted joint with a welded seal at the periphery is used. Each boiler with its steel casing, masonry setting and retreating back covers an area of 294 sq. ft., or 0.296 sq. ft. per horsepower of rating. Including the overhang and space occupied by the stokers, the floor space covered is 585 sq. ft., or 0.59 sq. ft. per horsepower. The height from the floor to the top of the economizer is 42 ft.

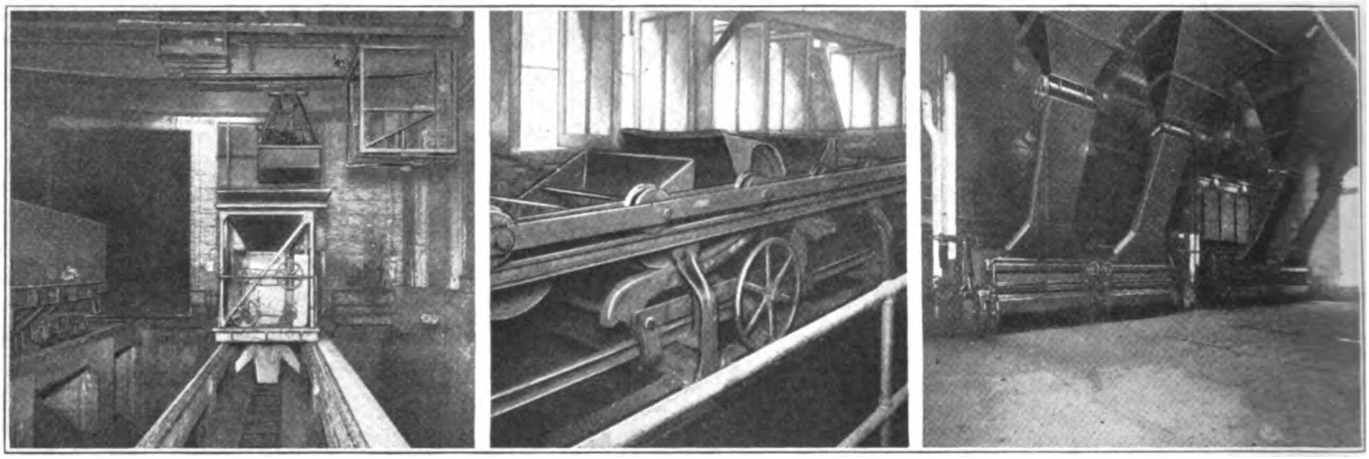


FIG. 1—FOUR-MOTOR CRANE WITH 2-YD. GRAB BUCKET FOR UNLOADING COAL. FIG. 2—BUCKET CONVEYOR DELIVERS COAL INTO OVERHEAD BUNKER. FIG. 3—BATTERY OF BOILERS NOW IN SERVICE AT JOILET PLANT

Two chain grates, each 8 ft. wide, 14½ ft. long and containing 116 sq. ft. of active grate area, are placed side by side in a common furnace. The ratio of the total grate area to the steam-making surface is one to forty-three. The stokers are motor-driven with vertical engines in reserve. An individual self-supporting steel stack, 7 ft. in diameter, rises 125 ft. above the grate. Owing to the low temperature of the flue gases leaving the economizer, the stack is unlined.

HORIZONTAL-TUBE ECONOMIZERS

The all-steel horizontal-tube economizers are of special interest, as they are the first of their kind in this country. Differing from the boiler construction, no drums are used. The headers are of wrought steel and the tubes are 4 in. in diameter, ¼ in. thick and 16 ft. long, of drawn steel, galvanized inside and out to guard against corrosion. The economizer is vertically baffled for three passes, the gases from the boiler entering at the front and from the third pass rising vertically through the induced-draft fan to the stack. The fan has capacity to handle 75,000 cu. ft. of gas per minute at 35 deg. Fahr. At this rating 94 hp. is required. Water to the economizer enters at the bottom of the rear header and passes through 396 tubes, leaving at the top of the front header. The relative flow of gas and water is thus counter-current.

The feed water to the boilers is mainly condensate which has been delivered through a preheater at the top of the condenser containing 1000 sq. ft. of surface, to the heater by either one of duplicate motor-driven condensate pumps. The heater is of the open type, having capacity to serve the two boilers of the unit. Either of two four-stage turbine-driven centrifugal pumps designed to deliver 300 gal. per minute against a head of 375 lb. to 400 lb. feeds the water to the boilers. The turbines are rated at 126 hp. and operate under full boiler pressure, their output being controlled by pressure regulating valves. The water passes through the economizer and enters the boiler at both ends of the cross-drum.

The make-up water comes from a fresh-water reservoir which collects the drips, heat overflow and other available condensed steam. Under float control, it is also supplied with filtered service water. The house service water supply is drawn from the condenser intake tunnel by two 600-gal. pumps, one driven by a turbine and the other by a motor. It is delivered to a service tank on the roof. From the pump discharge line several taps are taken off for transformer cooling and for various services where raw water can be used. Return water from the tank passes through duplicate pressure filters which are cross-connected and used alternately. Each has capacity to filter 150 gal. per minute. Upon leaving the filter the water supply divides, part going to cool bearings and to the lavatory system, and the rest as needed to the hot-water reservoir. The vacuum on the main unit is utilized to draw the water from the reservoir into the condenser, the amount being regulated by a float in the heater. It is removed by the condensate pump in the usual way and delivered to the heater. With the exhaust steam available the water temperature in the heater under average load conditions will raise from 100 deg. to 120 deg Fahr. To maintain the temperature within this range a bleeder connection under thermostatic control has been made to the fourth stage of the turbine.

COAL-HANDLING SYSTEM

Coal for the plant is brought in over the company's siding from the Chicago & Alton tracks at a junction about ¾ mile distant. The company has its own locomotive and coal cars and a yard at the plant containing five tracks. Between the tracks there is space to store about 10,000 tons of coal inside the power house. One track, centering on the firing aisle, leads into the boiler-room basement over a concrete pit capable of storing 800 tons of coal. By a four-motor traveling crane with a 2-yd. grab bucket, shown in Fig. 1 the coal is unloaded into a four-roll traveling crusher driven by a 50-hp. induction motor. This discharges into a bucket conveyor, illustrated in Fig. 2, delivering into the overhead bunker. The latter has capacity to hold 450 tons or 112 tons per boiler. The bunker is made up of steel plates, concrete-lined, and is divided up into compartments with double chutes from each leading to the two stokers under their respective boilers.

Screenings are handled in the same way, with the exception that the rolls of the crusher are spread to allow the coal to pass through to the conveyor. On both sides of the crusher are by-pass chutes to the storage pit. The coal may be unloaded into the pit or onto the outdoor storage space, in the latter case being handled by a locomotive crane.

Under each boiler are ash and fine coal hoppers. The former is lined with fire brick and is equipped with a sprinkling system to wet down the ashes. These are passed directly to railway cars through a sliding gate, thus eliminating ash-handling apparatus. The fine coal hopper, located farther forward, delivers its contents to the concrete storage pit, the outlet being controlled by a sliding gate operated from the boiler-room floor.

Survey of Grade Crossings

The Illinois Public Utility Commission will make a survey of the grade crossings in the State, in compliance with a law passed by the General Assembly, which requires that special precautions be taken at all especially dangerous crossings.

New Floodlighting Unit

As a further development of their line of "Golden Glow" and "Crystal Mirror" floodlighting projectors, the Electric Service Supplies Company has placed on the market a new floodlighting unit to be known as type FL-1419.

NEW TYPE OF FLOODLIGHT PROJECTOR

This new type of projector is particularly designed for short range work where a wide beam dispersion is desired. It is equipped with 14-in., long focus type, parabolic "Golden Glow" or "Crystal Mirror" reflectors which project powerful, dispersed beams of golden light and white light respectively.

In its recent catalog on floodlighting projectors this company classified the different floodlighting subjects into two divisions, namely, those in which the human eye is brought into continuous use to observe detail and those in which the human eye figures only momentarily or where lighting a subject as a whole is the main consideration. For the first classification it recommends "Golden Glow" light and for the latter case the "Crystal Mirror" projector.

The new type, FL-1419, meets a demand for a more powerful projector than any heretofore cataloged by this company, it being adapted to use with 500 to 1500-watt type C Mazda (or nitrogen filled) lamps.

What Causes Car Delays

Investigation in Toledo Shows That in One Week Electric Railway Cars Have 926 Waits, Which Waste 12,300 Minutes

In a recent newspaper article the Toledo Railways & Light Company explained to patrons that they should not be angry when they are forced to wait for cars, because it is not the fault of the company. The article, based upon an investigation made by the company, showed that in an average week the delays resulted in wasting 12,300 minutes, or more than eight and one-half days, but that the great majority of the causes of delay were beyond the company's control.

A. Schwartz, assistant manager of railways, took an average week, Oct. 25 to Oct. 31, and found the car delays in that time resulted from 926 individual delays. There are approximately 5000 car movements a day on the Toledo system.

The biggest cause of delay was railroad-crossing hold-ups. They were responsible for 26 per cent of all delays. Vehicles breaking down in front of cars caused 4 per cent of the delays. Loading passengers was responsible for 12 per cent. This means that many refuse to go forward. Track-construction work caused 4 per cent of the delays; city drawbridges, 8 per cent; waiting at switches, 10 per cent; weather conditions, such as slippery rails, etc., 5 per cent; equipment failure, 10 per cent; trackwork failures, 9 per cent; leaving carhouses, 7 per cent; trolley breaking, 1 per cent, and fire department, 1 per cent.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Pittsburgh Study Presented

Transit Commissioner Makes Recommendations After Investigation Carried on During 1917

E. K. Morse, transit commissioner of the city of Pittsburgh, Pa., has presented to the Mayor and the City Council his recommendations as the result of the study which he made of transit conditions in that city. His principal recommendations are the construction of rapid transit trunk lines, extensions to be built as rapidly as warranted, radical changes in the routing of surface cars, the widening of a number of important thoroughfares, and more rigid regulations as to the parking of vehicles. Mr. Morse was appointed transit commissioner of the city on Nov. 13, 1916. The report which he has presented represents the result of the study of the transit problem entered upon by Mr. Morse as soon after his appointment as he was able to organize his forces.

TRUNK LINE CONSTRUCTION RECOMMENDED

Mr. Morse classifies the trunk lines in periods of construction as follows:

First period: A two-track rapid transit line from the south end of the present Mount Washington tunnel to Dallas and Frankstown Avenues via the Mount Washington tunnel, the Smithfield Street bridge, Water Street, Grant Street, Penn Avenue and Frankstown Avenue.

Second period: A two-track rapid transit line from North Diamond Street in Northside to Schenley Park, via West Diamond, Dasher, Stanwix, Diamond and Forbes Streets and Fifth Avenue.

The first trunk line proposed would be largely of elevated road construction and the second mostly subway construction.

Various extensions to both of the foregoing rapid transit lines, Mr. Morse recommends, be carried out as soon as the conditions of traffic and population would warrant the necessary expenditure of money.

FAVORS MUNICIPAL OWNERSHIP.

In line with a statement Mr. Morse recently made before the City Council, as referred to previously in the ELECTRIC RAILWAY JOURNAL, he takes a stand in his report in favor of municipal ownership of the proposed rapid transit lines. His recommendation on this point reads as follows:

"That all rapid transit lines be municipally owned but operated by the same company as that operating the surface railways, provided that a satisfactory agreement between the city and the operating company can be reached.

"That, in case the operating company refuses to co-operate, the city, under authority of the law recommended, complete an efficient transportation system and lease to another private company.

"That, in case the city cannot lease to any private company on satisfactory terms the system be municipally owned and operated."

BROAD STUDY NEEDED

In concluding his discussion of the rapid transit routes which he recommends for construction Mr. Morse says:

"The study of rapid transit should not stop with the recommendations for the immediate future, but should be broad enough in scope to take into consideration the future growth and welfare of the city. The routes recommended form the base on which may be built a comprehensive system of rapid transit, which, with the extensions recommended, will connect the residence districts with the employment, shopping and amusement districts and provide a fast, comfortable and efficient means of transportation for the people of Pittsburgh. It is realized that it is unwise to predict the growth of a city beyond a moderate term of years and therefore the future extensions are only conditionally recommended."

Mr. Morse deals at considerable length in his report with matters very largely of purely local interest or of interest only to those intimately acquainted with the geographical arrangement of the city.

Change in Indiana Commission Procedure

A reorganization of the Public Service Commission of Indiana has been announced. Commissioners Charles A. Edwards and John A. McCardle will hereafter handle all cases affecting steam, interurban and city railways, telegraph and express companies. Chairman E. I. Lewis, who has been handling railroad problems, will hereafter consider cases involving warehouses and heating plants. Commissioner Paul P. Haynes, recently appointed to the board, will handle problems affecting telephone and gas companies. All matters pertaining to electric light and water plants will be considered by Commissioner Edwin Corr. After each commissioner has handled a case to the point where a decision is to be made, the full commission will discuss the matter and instruct some member to write the order.

Severe Storm in Ohio

Both City and Interurban Traffic Hampered by Gale Which Piled Up the Snow

The blizzard which raged over the Middle West on Jan. 12 and 13 played havoc with both steam and interurban schedules. Few of the railroads entering Cleveland operated their trains Saturday night, and all trains through that day were hours behind time.

Traffic on the interurban roads entering Cleveland was greatly hindered and some of the runs had to be cancelled Saturday night. The Cleveland, Southwestern & Columbus Railway did not run any trains Sunday and the Lake Shore Electric Railway operated only between Cleveland and Norwalk. The other roads operated as nearly to their schedules as possible under the circumstances. The schedules of the Cleveland Railway were somewhat demoralized. The temperature at Cleveland was 8 deg. below zero most of the time, and the wind blew at 75 miles an hour.

CONDITIONS ELSEWHERE IN THE STATE

Information from Columbus was to the effect that the Ohio Electric Railway suffered considerable inconvenience on divisions south of that city, but had no trouble on the eastern division. On Jan. 13 all divisions were opened, except a short section near London on the Columbus-Springfield division. Local service over the lines of the company was delayed to a considerable extent.

At Toledo electric railway service was tied up almost completely on Jan. 12, as were all interurban trains. Some little improvement on the city railway was made the following afternoon, but it was thought that it would be twenty-four hours before the interurban lines would be able to begin operation again.

Electric railway traffic at Marion was suspended on Jan. 13 and the town was in darkness that night. Service on both the local city railway lines and interurban roads at Dayton was almost completely demoralized on the evening of Jan. 12. The same conditions prevailed at Tiffin, Mansfield, Bucyrus and almost every other point in the State.

Cincinnati was storm-bound with a temperature 16 deg. below zero and electric railway service was badly crippled on Jan. 12 and 13.

The temperature began to rise on Jan. 13 and by afternoon the official thermometer marked around 15 deg. above zero. This gave the roads an opportunity to get the tracks in shape again, although the prospects were that service would be somewhat irregular in many places for two or three days.

Commission Procedure Explained

Chairman Macleod Discusses the "Inside Workings" of Massachusetts Public Service Commission

At a recent hearing of the street railway investigating commission at Boston, Mass., Representative Hays of Brighton questioned F. J. Macleod, chairman of the Massachusetts Public Service Commission, regarding the board's methods of working on regulative problems. Mr. Macleod said that after public hearings were concluded on any matter the procedure depended on the character of the case and just how the case was left on the record. There were a number of cases that were disposed of on the day of the hearing. There were other cases, such as the fare cases, where the subject matter of the hearings was so controversial and where such a large amount of technical testimony was involved, that careful consideration by the commission of the evidence presented and any other evidence which it might be able to secure through its own investigation was absolutely necessary before any intelligent decision could be attempted.

The cases were usually assigned to different members of the commission to make a preliminary report for the consideration of the commission as a whole, and sometimes in a large case different branches or departments of the case were assigned to specific members, the whole report being made the subject of searching and critical examination by every member of the commission before it went out. All the members voted whether or not the order should be issued. No formal records were kept of the proceedings in executive session, but if there was any case where any commissioner desired to dissent from the finding of the majority, a record of the dissent was embodied in the report of the case. If, however, the commissioners were all agreed in the final results no specific record was made of the matters considered in conference.

COMMISSIONERS USUALLY IN AGREEMENT

In answering the question whether most of the orders represented a compromise between the commissioners, Mr. Macleod said:

"In certain phases of the opinion I presume it is true that they do represent in part an adjustment of different minds to the same problem. The commission has usually been able to agree upon the result to be reached, but it is not always in agreement in the beginning as to the exact method of expression in the report. The working out of the report and the phrasing of it in a form to which all the members of the commission can agree are matters that sometimes involve extended discussion and frequent conferences on the part of the commission."

Mr. Macleod knew of no such condition as the domination of the board by a minority. On this point he said:

"The commission is made up of five men, and whatever might be their other shortcomings they are men of very decided convictions, and the result that has been reached has been, as I said before, more or less modified in order to reach some adjustment of conflicting personalities; but so far as I know there have been no serious dissentions in the commission on any matter of consequence, certainly not in the last two or three years."

Representative Hays asked if it was possible as a practical matter for all members of the commission to inform themselves of all questions of detail on matters coming before the board. Mr. Macleod replied that the field was so vast that it was impossible for any member of the commission, no matter what his industry might be, to cover personally the entire field and to feel that he knew the entire situation. The members were obliged to keep themselves informed so far as possible in regard to the most essential factors surrounding the condition of the different companies, and to deal with detailed phases of the company's operation in connection with specific problems presented to the board in specific cases. The chairman took issue with the implication of Representative Hays that it had taken a long time to settle the rate cases before the board during the last three years, and he challenged that the time taken had been much less than that required by practically any other commission in the country in a case of equal importance. With respect to the Bay State Street Railway rate case counsel for the company had stated more than once publicly that in his opinion there never was a case in the history of regulation in this country where so many important controversial elements had been involved which was decided by a public service commission in so short a time as the Bay State rate case.

FIVE COMMISSIONERS BETTER THAN SEVEN

Mr. Macleod said that the commission was fortunate in having in its membership at this time one man, Commissioner Stone, who had had a long and exhaustive practical experience in the public service field, and also the services of Commissioner Eastman, who had had a long and distinguished career in connection with the investigation of the financial and accounting side of public service companies. The chairman held that a commission of five members was preferable to one of seven.

Better Public Relations

"Make a Friend a Day" Is the Advice of the Vice-President of the Atlanta Company to His Employees

W. H. Glenn, vice-president and operating manager of the Georgia Railway & Power Company, said some very pertinent things to the members of the Gas & Electric Club of that company at a recent meeting. His remarks about public relations are given in part below:

"Sometimes I wish we could forget that word 'company.' What do you mean by 'company?' It is an impersonal kind of thing, which anybody can 'cuss' or anybody can praise.

"I wish we could think of the company as a person, as an individual, and have the public adopt the same thought. For the company is human, after all. Not one human being, but many! What is a company? The stockholders delegate their business to the directors, the directors to the officers, the officers to the superintendents and department heads, these heads to the men on the job. So the company is, after all, just the employees themselves—just you and me and all of us.

BUSINESS DONE IN THE OPEN

"But this company is in a different position from a factory or a store. Our business is done out in the open, far from the supervision of the superintendents. In a factory, an employee in a bit of trouble may call at once on the superintendent for advice and help. Our motormen and conductors are at work in four counties. Our linemen are all over north Georgia. No one is at hand to give directions when an emergency arises. They must depend upon their own judgment, their own initiative. Therefore, our men must be especially competent to deal with the public. It is an unusual thing to say, but none of our real business is done in this building. Our business is done outside.

"It is a serious business, more so than the ordinary. We handle thousands and thousands of lives every day on our cars. We are responsible for a powerful electric current traversing hundreds of miles of wire. Our business never ceases; our company never sleeps.

PUBLIC OPINION CAN MAKE OR BREAK THE COMPANY

"You have been reminded very often of the absolute necessity of our having the good-will of the public. We depend absolutely upon public opinion. It can make us or break us. We must gain franchises, awarded by city officials who are elected by the people. If the people are against us their attitude is reflected in the officials. It can affect us in the jury box. If a juryman dislikes the company he cannot help but be influenced in his verdict, no matter how honestly he may try to be impartial.

"What is public opinion? Nothing more than the aggregate of individual or personal opinions. If we could do one big act that would win over public opinion at one sweep, it would be

Pennsylvania Association Meets

Fare Increases, Lighting Standards and Employment of Women Are the Principal Subjects Discussed

An informal meeting of the Pennsylvania Street Railway Association was held at the Harrisburg Club, Harrisburg, Pa., on Jan. 4. The principal subjects discussed were fare increases, possible standards for lighting and cleaning cars, and the employment of women.

The first subject was put on the program because of the fact that a committee of the association of which C. L. S. Tingley, Philadelphia, is chairman has the matter in charge.

The subject of standards for lighting and cleaning cars was suggested because Dr. H. F. Snow, chief engineer of the Public Service Commission, had requested that representatives of the electric railways should appear before the engineers' conference committee at Pittsburgh on Jan. 10 to present the views of the companies relative to certain standards.

The final topic was selected because the problem is one which the railways in the State are facing, but restrictions now imposed by the Department of Labor and Industry on the employment of women may affect some roads.

The meeting was well attended, and while no printed papers were presented and no definite decisions reached, there was a lively discussion on the different points under consideration.

Mr. Shonts on Terminal Problems

Theodore P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., was the principal witness at the hearing on Jan. 3 before the West Side Improvement Commission, having to do with the removal of the present steam railroad tracks from the marginal way and streets along the Hudson River. Mr. Shonts stated that he had made a study of the whole problem of port and terminal development at the request of certain banking interests. If the railroads serving New York City would pool their properties or create a new organization and build proper connecting lines to a great common clearance yard the economy in power, coal and wages would be as great as in the West, where by similar arrangements saving as high as 70 per cent has been effected.

Mr. Shonts believed the construction of tunnels would meet the situation much better than a bridge across the Hudson, the cost of which he estimated at $42,000,000, while tunnels could be built for $6,000,000 each. He said that subways through the crosstown streets would eliminate much of the present trucking. The tunnels would free the piers and harbor from the present car-float congestion and leave them clear for ocean steamships. Mr. Shonts said his scheme to improve the city's port and terminal facilities was formulated in 1912 and 1913. He read into the record letters from John F. Stevens and William Barclay Parsons.

Mr. Shonts, as a more immediate method of relieving traffic congestion, suggested that short-haul traffic within a radius of 75 miles from New York City could be handled by motor trucks, perhaps through the agency of the express companies.

(*Concluded from page* 149)

easy. But we cannot do that. We must win one friend to-day and another to-morrow and another the day after. It is the only way, and we must never lose an opportunity to make a friend.

"You can't blame outsiders for criticising what you criticise yourself. The best thing we can do is to do our own work so well that there will be no room for criticism. We do big things well only by doing all the little things well."

Hearings on New Bills Ended

Public Service Commission for the First District of New York Concludes Discussion of Proposed Legislation

The last hearing was held on Jan. 2 under the order of the Public Service Commission for the First District of New York calling for discussion of legislation which it was proposed should be submitted by it or by corporations under its jurisdiction to the Legislature at the present session.

Counsel for the Edison Electric Illuminating Company, Brooklyn, notified the commission on Jan. 2 that those companies did not approve of the commission's proposed amendment to Section No. 66 of the public service commission's law, which would give the commission power to suspend tariffs showing proposed increases of rates for gas and electric companies. The commission possesses such power in respect to transportation companies. The proposed amendment would have the effect of placing the burden of proof for justification of any rate increases upon the companies involved.

Objection was also made to an amendment of the law, which would add to the power of the commission to supervise and regulate the issuance of securities of gas and electric corporations. Arthur G. Peacock, representing the New York Railways, and Herbert J. Bickford, representing the Third Avenue Railway, also objected to similar provisions in respect to the issuance of securities of transportation companies. Mr. Bickford made the point that, inasmuch as the federal government had taken over control of the railroads, new railroad financing might be necessary in the near future under government auspices and the government might be embarrassed by provisions of law which would require lengthy valuations of railroad property. The hearing was then closed.

Joint Operation in San Francisco

Arrangement Suggested for Use of Tunnel by Private Company and Publicly Owned Line

City Engineer O'Shaughnessy of San Francisco, Cal., has made his report regarding a proposed arrangement with the United Railroads for an interchange of railroad facilities west of the Twin Peaks tunnel. The city engineer says that the policy of allowing the United Railroads to operate cars through the tunnel must be decided by the administration. He believes that an equitable arrangement can be made whereby the city's municipal lines will be allowed to operate over the tracks of the United Railroads in exchange for the right of the United Railroads to operate Sloat Boulevard cars through the tunnel.

BASIS OF THE REPORT

The report was the result of a request made by the Board of Supervisors that the city engineer see what arrangements could be made with the United Railroads for affording electric railway facilities to the people who paid for the building of the tunnel. He wrote a letter to General Manager von Phul of the United Railroads, suggesting the use of a part of the United Railroads tracks by the municipal cars past Ingleside Terrace and Westwood Park from the dead end of the tunnel line at the junction of Sloat Boulevard. Also the operation of municipal cars over a part of the United Railroads Parkside system from the dead end at Twentieth Avenue and Tavaral Street.

Sleet Causes Tie-Up at Boston

Heavy sleet and resulting flashovers on the third-rail shoe beam of a train on the Cambridge subway of the Boston (Mass.) Elevated Railway resulted in an interruption of traffic on the morning of Jan. 7 for about an hour and a half. Trouble began when the first eastbound train left Kendall Square station and attempted to traverse the ascending grade on the bridge crossing the Charles River Basin at the foot of Beacon Hill.

Due to flashovers, the shoe beam of the eastbound train leaving Kendall Square became so heated as to cause charring, and the smoke and flashing at the third-rail precipitated a panic among the passengers, many of whom were foreigners. A number of persons jumped through the car windows, much crowding took place, and minor injuries were sustained. During the tie-up and also during two other interruptions which occurred later in the morning from sleet difficulties, of fifteen and twenty-five minutes respectively, inbound and outbound traffic was routed between Boston and Central Square, Cambridge, mainly over the Harvard Bridge lines and Boylston Street subway.

The affair was greatly exaggerated by the local newspapers.

News Notes

Toronto Favors Taking Over Railway.—The ratepayers of Toronto, Ont., voted on Jan. 1 about 39,000 to 3700 in favor of the city acquiring the system of the Toronto Railway in 1921, the year that the present thirty-year franchise of the company expires.

Company to Vote on Philadelphia Lease on Feb. 8.—A special meeting of stockholders of the Philadelphia (Pa.) Rapid Transit Company will be held on Feb. 8 to take action on the proposed lease and agreement with the city of Philadelphia, which has been passed by Councils and approved by the Mayor.

Increase in Wages in Pottsville.—The Eastern Pennsylvania Railway, Pottsville, Pa., has announced an increase of 3 cents an hour in the wages of its crews, making the wage of first-year men 31 cents an hour and those of longer service 33 cents an hour. Two cents an hour will be added to these rates on June 1 next.

Municipal Line to Continue.—At a special session of city officials of Yazoo City, Miss., recently following the presentation of a petition containing the names of between 275 and 300 citizens, it was decided to continue the 4-mile local municipal railway in operation. This decision rescinded the action of the Mayor and the Board of Aldermen in special session some time previously.

Fund for Soldiers Helped.—The International Railway, Buffalo, N. Y., cooperated with one of the local daily newspapers recently by placing tin boxes in each of its cars in which passengers could drop money to be used for the "Smokes for Soldiers" fund. The boxes were placed alongside of the regular fare boxes in each car. More than $700 was collected during the day.

Trenton Argument Set for February.—Argument will be advanced in the February term of the New Jersey Supreme Court on the writ of certiorari of the Trenton & Mercer County Traction Corporation to quash the indictments returned for the city against the directors and officers of the company for the illegal erection of poles and stringing wires on certain streets of Trenton, N. J.

Action on St. Louis Settlement Postponed.—The settlement ordinance for the United Railways, St. Louis, Mo., was not reported on Jan. 4 at the first meeting of the Board of Aldermen after the holiday vacation. The public utilities committee had not yet passed upon several vital amendments proposed by City Counselor Daues and C. E. Smith, the city's consulting engineer, with the sanction of Mayor Kiel.

Valuation of Lines at Dallas.—The Northern Texas Traction Company, Fort Worth, Tex., has designated the J. G. White Engineering Company, Dallas, to make a survey and fix valuations on the Oak Cliff lines, owned by the Fort Worth company and leased by the Dallas Railway. The values will be used as a basis for replacement cost after the leases expire. The Dallas Railway and the supervisor of public utilities have approved the appointment of the engineering company.

New Officers for Portland Club.—At the first annaul meeting of the Employees' Social Club of the Portland Railway, Light & Power Company, Portland, Ore., held on the evening of Jan. 3, B. F. Boynton, claim agent for the company, was re-elected president for the ensuing year. Other officers elected were A. B. Gottschalk of the planning department, first vice-president; J. F. Roach, instructor of motormen and conductors of the interurban lines, second vice-president; R. R. Robley, electrical operating engineer, secretary and treasurer.

Municipal Ownership Urged for Oakland.—Mayor John L. Davie of Oakland, Cal., in his annual message to the City Council urged that immediate action be taken toward municipal ownership of the electric railways of that city. In line with the proposal he advocated complete revision of the city charter, the appointment of an efficiency engineer to take up the city's transportation work, and the appointment of a commitee of citizens to take up the problem. The executives of other East-Bay cities are said to incline toward the opinion that such ownership should be vested in a public utilities district that would embrace the entire transportation system of Alameda and Contra Costa Counties.

First Car Through Twin Peaks Tunnel.—The first passenger car of the San Francisco (Cal.) Municipal Railway passed through Twin Peaks Tunnel on Dec. 31. The run was made from portal to portal, a distance of approximately 3 miles, in six and one-half minutes. M. M. O'Shaughnessy, city engineer, and Fred Boeken, superintendent of the Municipal Railway, rode on the car. They considered the trial trip very satisfactory. It was announced that regular service through the tunnel would start about Jan. 15, with cars running to Sloat Boulevard and Junipero Serra Boulevard. As soon as arrangements with the United Railroads are completed, service will be provided on Ocean Avenue and to the beach.

Commission Seeks to Speed Transit Construction.—In order to speed progress on the construction of some of the new dual system lines, the Public Service Commission for the First District of New York has secured from the priorities committee in Washington promise of priority certificates for steel and other materials necessary for the completion of parts of the system. The committee had at first declined to issue such certificates in respect of orders for steel, which was very much needed. The commission is particularly desirous of obtaining certain steel for the yard improvements at East New York, Brooklyn, and until this steel is received certain changes cannot be made which will permit the operation of all-steel cars on some of the Brooklyn elevated lines.

Niagara Power Order Affects Railway.—The International Railway, Buffalo, N. Y., will be affected by the order of the war department seizing all of the electric energy produced, imported and distributed by the Niagara Falls Power Company, the Hydraulic Power Company and the Cliff Electrical Distributing Company, Niagara Falls, N. Y. There will be a complete redistribution of electric power among industries in western New York so that war industries will have all the electric power they need. The railway will be forced to rely largely upon its steam-generated power. Fortunately the railway's steam plant has been held in reserve in case of a breakdown in the Niagara Falls power.

New Dallas Power Arrangements.—Under a contract just approved by the supervisor of public utilities of the city of Dallas, Tex., the Texas Power & Light Company will furnish 5000 hp. daily in current to the Dallas Power & Light Company for use in operating the cars of the Dallas Railway. Since the organization of the Dallas Railway under the Strickland-Hobson management, about 30 per cent of the current used in operating the cars of the system, or current for operating the Oak Cliff lines, has been purchased from the Northern Texas Traction Company, Fort Worth, a Stone & Webster company that owns the Oak Cliff lines and the Dallas-Fort Worth Interurban. The Northern Texas Traction Company asked to be relieved of this contract, stating that all its current was needed on its line and at Handley. The new contract effects a marked saving to the Dallas Railway.

Association Meeting Programs

New England Street Railway Club

The meeting of the New England Street Railway Club on Jan. 24 at the Hotel Somerset, Boston, Mass., will be annual "Manufacturers' Night."

National Foreign Trade Council

The executive committee of the National Foreign Trade Council announced that "owing to the railroad congestion and the desire of the council to cooperate with the government in the relief of the situation due to the war," the dates of the Fifth National Foreign Trade Convention to be held at Cincinnati, Ohio, have been changed from Feb. 7, 8 and 9 to April 18, 19 and 20. No change is contemplated in the theme of the convention or in its plan and scope as outlined in the ELECTRIC RAILWAY JOURNAL of Jan. 5, page 56.

Financial and Corporate

Reserve Board to Pass Upon New Financing

Plans for New Issues of Securities Are Being Submitted by Private Corporations Voluntarily

Secretary McAdoo makes the following statement:

"In my annual report to Congress, dated Dec. 3, 1917, I referred to the importance at this time of avoiding unnecessary capital expenditures in both public and private enterprises. While no specific authority has been conferred upon me to approve or disapprove new undertakings, a number of corporation executives, bankers and municipal officials, inspired by the idea that they should do nothing which would in any way retard our efforts in the prosecution of the war, have submitted to me plans for new enterprises or new issues of securities.

FEDERAL RESERVE BOARD TO PASS UPON PROPOSALS

"It is now apparent that the government may count upon a full measure of co-operation on the part of the States, municipalities and private corporations, with the result that a large number of such plans for future developments will be submitted from time to time. It, therefore, becomes necessary that each of these proposals receive adequate consideration and that a recommendation be made without delay as to the course to be pursued.

"Pending action by Congress, I have requested the Federal Reserve Board to pass upon such proposals as may be submitted to them or referred to them by me, and advise whether or not such expenditures of capital or such issues of new securities should be made.

CORPORATIONS URGED TO CONFER WITH BOARD

"The board has consented to undertake this responsible work, and I therefore strongly urge upon the corporations and the bankers of the country that before making contracts requiring the use of labor and material, or before placing new issues of securities or agreeing to purchase new issues of securities, they confer with the Federal Reserve Board, in order that it may determine whether the undertaking covered by the proposals is necessary for the public health and welfare, or contributes directly toward winning the war."

Another development in connection with corporate financing is the fact that the bond department of the Equitable Trust Company, New York, N. Y., has announced the details of a plan for economical co-operation among independent bond dealers and banks with bond departments throughout the country. The plan provides for the elimination of a great deal of the local machinery now necessary in the distribution of securities. It will furnish service to local dealers and banks through a central organization. Many dealers and banks throughout the country have already become participants in the plan, as it meets the necessity for "shortening sail" due to war conditions and the lack of trained bond men.

One prominent dealer said of this plan:

"I now feel that the curtailment of my organization, due to the army draft and stringent conditions in the bond business, will not affect the service I can render my clients. In fact I feel that my service has been vastly improved, and I am better able to meet the competition of the large international bond houses maintaining local offices."

The plan is reported as being adopted rapidly by dealers and banks with every prospect for its success as an economical war measure in the security business.

Pittsburgh Protective Committee

Announcement is made that a protective committee for holders of the bonds of the United Traction Company, Pittsburgh, Pa., and all bonds affected by the default of interest on Jan. 1 of the bonds under the mortgage dated July 9, 1897, has been formed. This committee is composed of Thomas S. Gates, chairman; B. Howell Griswold, Jr., J. R. McAllister, J. H. Mason, C. S. W. Packard, A. C. Robinson and George H. Frazier. The amount of United Traction Company bonds is $10,000,000 bearing 5 per cent interest and maturing on July 1, 1997. Defaults in interest payments due Jan. 1 last have also been announced in the case of other mortgage bonds of railways embraced in the Philadelphia Company system at Pittsburgh.

In an announcement given out by Brown Brothers & Company and Alexander Brown & Sons, it is stated that immediate notice will be given by the committee of the name and address of the depositaries. All holders of bonds are advised to deposit their bonds promptly in accordance with the terms of such notice.

Unprofitable Track Torn Up

The Dayton, Springfield & Xenia Southern Railway, Dayton, Ohio, proceeded on Jan. 2 to tear up its track between the towns of Beavertown and Spring Valley, Ohio, a distance of 11½ miles. Operation was discontinued on this branch line on Dec. 1. The property has been in operation since 1899 and has hardly paid the operating expenses. It is a branch line connecting with the main line at Belmont. A portion of this branch line from Belmont, 3 miles, to Beavertown has been profitable and will be continued in operation.

The authority for discontinuing service and selling the road as junk was granted to the company by virtue of a special act recently passed by the Legislature of Ohio, which conferred the power upon the Utilities Commission to hear cases of this kind and grant release despite any conditions in existing franchises which might ordinarily prevent this. The Utilities Commission, after the passage of the act, heard the case and on Nov. 27 issued an order authorizing the company to stop operations any time after Dec. 1.

Ford, Bacon & Davis Acquire Ithaca Properties

Ford, Bacon & Davis, New York, N. Y., have acquired a financial interest in the Central New York Southern Railroad Corporation, Ithaca, N. Y., and have taken over the management of that property. The company operates a 40.28-mile electric and steam railroad between Auburn and Ithaca, and also controls the Ithaca Traction Corporation, the local electric railway in Ithaca. The Central New York Southern owns four steam locomotives, two electric locomotives, two gasoline motor cars, one electric motor car and fifty-five other cars. The Ithaca Traction Corporation owns forty-one motor cars and three other cars. It also owns the power station which supplies electrical energy to both railway companies, as well as to the electrical lighting company in Ithaca.

Suit Maintains Legality of Indebtedness

A suit to recover $1,925,000 and interest at the rate of 7 per cent from Dec. 1, 1916, was filed in the U. S. District Court at San Francisco on Dec. 14 against the United Railroads, San Francisco, by the California Railway & Power Company of Delaware. The complaint declares that the sum demanded is the unpaid portion of a $2,000,000 loan extended on Dec. 23, 1912.

According to Jesse W. Lilienthal, president of the United Railroads, the suit was brought with his sanction and does not jeopardize the readjustment plans for the United Railroads. The action was taken merely because the statute of limitations would become operative against the debt on Dec. 14 and it was desired to maintain the legality of the debt for the protection of the noteholders. In the readjustment now under way plans will be included for taking care of this loan.

The complaint declares that the California Railway & Power Company of Delaware on Dec. 23, 1912, extended a loan of $2,000,000 to the United Railroads in the form of twenty notes for $100,000 each. The money was to be repaid in twenty equal annual installments. The complaint says that only $75,000 of the principal has been returned and that no interest has been paid since December, 1916.

Financial News Notes

Change in Name.—The name of the Ogden, Logan & Idaho Railway, Ogden, Utah, was changed on Jan. 1 to the Utah-Idaho Central Railroad.

New Director for Dayton Street Railway.—Harold E. Talbott, Jr., has been elected a director of the Dayton (Ohio) Street Railway to succeed the late George Schantz.

Preferred Dividend Passed.—The New Orleans Railway & Light Company, New Orleans, La., omitted the regular quarterly dividend on the preferred stock, due on Jan. 1. No dividends have been paid on the common stock of the company since the one made in December, 1916.

New Note Issue All Sold.—Bonbright & Company, Inc., New York, N. Y., announce they have sold the new issue of $1,500,000 of 6 per cent bond-secured gold notes of the United Light & Railways Company, Grand Rapids, Mich., dated Nov. 1 and due May 1, 1920. The notes were offered at 96⅝ and interest, yielding 7½ per cent.

Preferred Stock Dividend Passed.—The Waterloo, Cedar Falls & Northern Railway has deferred the payment of its 1917 preferred stock dividend. The earnings do not justify the payment of the dividend and the directors did not wish it paid out of surplus. The company has $1,106,100 of 6 per cent preferred stock outstanding, which was issued in 1912-1913.

Another Road Suspends.—The Carolina Traction Company, Rock Hill, S. C., operating 3 miles of railway with storage-battery cars, has suspended service. James S. White, secretary of the company, places the blame for the suspension on the present prohibitive prices of materials and supplies. He is reported to have said that he sees no chance for the early resumption of service.

Stock Issue Decreased.—The San Antonio (Tex.) Traction Company has filed an amendment to its charter in the office of the Secretary of State at Austin decreasing its capital stock from $2,500,000 to $300. All the assets of this company were transferred to the San Antonio Public Service Company on Sept. 1, 1917, under terms outlined previously in the ELECTRIC RAILWAY JOURNAL.

Sale Under Foreclosure Confirmed.—Judge Cummings in the Northumberland County Court has confirmed the sale of the property of the Northumberland County Traction Company on Nov. 8, 1917, for $200,000 to Allen P. Perley, John L. Hall and David A. Horne, Williamsport, representing the bondholders. Suit against the company to foreclose was brought by the Philadelphia Trust Company, trustee, under an issue of bonds to the amount of $400,000.

Road for Sale.—The 16-mile electric line of the Mexico Investment & Construction Company, Mexico, Mo., is being wrecked and the rails, trolley wire, contents of the power house and the cars are being advertised for sale through Judge W. W. Botts, Mexico, Mo., secretary and treasurer of the company, or C. J. Harris, Fullerton Building, St. Louis, Mo. The plan to abandon the property was referred to in the ELECTRIC RAILWAY JOURNAL for Nov. 17, 1917, page 921, and Jan. 12, 1918, page 105.

Sale of Fort Wayne Collateral.—Special Master George C. Holt will sell at public auction in New York City on Jan. 28 in one lot $1,941,000 of the first and refunding mortgage 5 per cent gold bonds of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., dated Sept. 1, 1912, pledged as security for the issue of $1,146,000 of 6 per cent five-year collateral gold notes of 1914. The property is not to be sold for less than an amount sufficient to satisfy the principal of the $1,164,000 of notes, with accrued interest, after payment of all costs and expenses.

Common Dividend Passed.—The Little Rock Railway & Electric Company, Little Rock, Ark., has passed the semi-annual dividend of 3 per cent on the common stock payable ordinarily on Jan. 1. The company was at an expense of about $200,000 in furnishing light, power and railway service to the cantonment at Little Rock, and it is stated unofficially that the officers of the company decided that it was better to put the dividend over and pay for the improvements out of the cash returns than to attempt to borrow with rates for money as high as they are at this time.

Dallas Return Decreases.—The consolidated car lines in Dallas, Tex., under the Strickland-Hobson franchise earned 3.85 per cent on the total investment during the month of November, 1917. In October the company earned 6.17 per cent. The gross earnings were lower by $29,325 during November than during October, owing to jitneys and the ending of the State Fair. After expenses and required appropriations were taken from gross earnings, the company had a balance of $24,556 available for the authorized return of 7 per cent on the investment. This figure was $4,323 less than the net receipts during the same month in 1916.

Interstate Dividend Passed.—The directors of the Interstate Railways, Camden, N. J., have passed the 3 per cent semi-annual preferred dividend due this month. This action followed failure of certain leased companies to pay their rental. They will be given until April 1 to make up the rental before any action is taken respecting the leases. Increased operating expenses are given as the cause of the difficulty. The underlying companies of the Interstate Railways are in four groups operating in and around Trenton, Wilmington, Reading and Wilkes-barre. The preferred stock of the company is cumulative at the rate of 6 per cent amounting to $60,000 per annum, there being $1,000,000 of stock outstanding. Until now 3 per cent semi-annually has been paid regularly since the company began operations of the various properties in 1911.

Dividend Passed by Puget Sound Company. — The directors of the Puget Sound Traction, Light & Power Company, Seattle, Wash., passed the dividend normally payable on Jan. 15 on the $14,793,667 of 6 per cent cumulative preferred stock. Frederick S. Pratt, chairman of the board, issued a statement in which he said that the unusual business activity in the Puget Sound territory had called for substantial capital expenditures by the company and that the increases in the plant had been made at a time when it was impossible owing to the prevailing investment market conditions to finance them permanently on a reasonable basis. The result was a floating debt of $1,605,000. Other expenditures are in prospect, and the directors believed that the wisest course was to keep the unsecured debt within reasonable limits and to make no distribution to the stockholders.

Electric Railway Monthly Earnings

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Nov.,	'17	$359,990	*$286,827	$73,163	$45,919	$27,244
1 "	"	'16	316,468	*184,587	131,881	42,862	89,019
12 "	"	'17	3,975,871	*2,853,469	1,122,402	552,618	569,784
12 "	"	'16	3,500,760	*2,069,138	1,431,622	513,997	917,625

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Nov.,	'17	$80,855	*$98,859	†$18,004	$26,845	†‡$41,764
1 "	"	'16	80,136	*72,091	8,045	27,550	†‡19,277
11 "	"	'17	999,813	*904,933	94,880	303,030	†‡200,665
11 "	"	'16	912,408	*757,523	154,885	289,117	†‡132,099

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Nov.,	'17	$329,267	*$223,856	$105,411	$66,944	$38,467
1 "	"	'16	278,467	*168,019	110,448	63,410	47,038
12 "	"	'17	3,630,797	*2,422,740	1,208,057	779,247	428,810
12 "	"	'16	2,970,054	*1,777,194	1,192,860	754,265	438,595

GRAND RAPIDS (MICH.) RAILWAY

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Nov.,	'17	$100,702	*$77,401	$23,301	$18,619	$4,682
1 "	"	'16	102,921	*67,706	35,215	17,322	17,893
12 "	"	'17	1,305,807	*884,788	421,019	216,010	205,009
12 "	"	'16	1,290,412	*840,470	449,942	181,654	268,288

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Traction Expert for Buffalo

Incoming Administration Retains Mr. Brackenridge to Survey Traffic Conditions and Report to It

John C. Brackenridge, formerly with the Brooklyn (N. Y.) Rapid Transit Co., has been retained by the City Council of Buffalo, N. Y., to make a survey of traffic conditions on the Buffalo lines of the International Railway. In addition Mayor George S. Buck has appointed a special committee of eight citizens to co-operate in the survey. An appropriation of $2,000 has been made by the City Council to carry on the preliminary work. This fund is separate from the $50,000 appropriation granted to the Corporation Counsel with which to appraise the physical properties of the company in the campaign for a 4-cent fare within the city limits.

In his first message to the City Council the new Mayor called attention to the railway service and urged the creation of a bureau of public utilities to deal with the railway problem. This bureau would represent the city at all hearings before the Public Service Commission. The Mayor also pointed out that if private ownership of the railway with public regulation proved a failure, steps will be taken for public ownership.

PRESIDENT CONNETTE EXPLAINS

E. G. Connette, president of the International Railway, has issued a public statement in which he expressed the desire to co-operate with the proposed bureau of public utilities and the newly appointed committee which is making a survey of traffic conditions during the rush hours. Mr. Connette also placed the blame for conditions during the last month upon the weather and the company's inability to secure the new cars which were ordered a year ago.

The police department has been instructed to place patrolmen at all congested points throughout the city to aid in loading passengers and to facilitate the movement of cars. Mounted patrolmen have been placed along the main arteries of travel to keep so-called "track-hogs" from blocking traffic.

Mr. Brackenridge is being retained by the city at the rate of $50 a day. He has been asked to remain in Buffalo for one month and to make a report to the City Council at the end of each week. Daily reports are also asked on specific work suggested by the Mayor and the members of the citizens' committee.

Soon after the first meeting of the new citizens' committee, Mayor Buck went to Albany for a conference with Governor Whitman in reference to the railway situation in Buffalo. The Mayor is said to have urged the Governor not to reappoint the two members of the Public Service Commission whose terms are soon to expire. He advocated the appointment of a Buffalo man on the commission.

5,148,063 Potential Competitors

This Is the Total of the Transportation Army of Automobiles That Confronts the Electric Railways

The Chicago *Tribune* of Jan. 6 presented the first detailed figures on automobile registrations in the United States during 1917, wired by its correspondents at the various state capitals after the final tabulations on Dec. 31. Comparison with the 1916 reports shows that 1,629,325 more licenses were issued than during the previous year—an increase of about 46 per cent—and that the number of motor vehicle registrations has reached the amazing total of 5,148,063.

The figures include both passenger cars and motor trucks, many of the states making no distinction between the two in issuing licenses. As nearly as such a count could be made, they represented the actual number of motor vehicles now being operated in the country, for while some few cars have been registered in more than one state, this is more than offset by the fact that some states are just beginning the work of registration. In Texas alone, for example, the authorities estimate that 15,000 cars escaped the operation of the new state motor vehicle law.

Fares Raised in Reading

Six-Cent Fares Extended from Suburban Lines to All City Properties of the Company

The Reading Transit & Light Company, Reading, Pa., put a 6-cent fare into effect on all its city lines in Reading, Norristown, Roxborough and Lebanon on Jan. 10. Fares on the suburban lines were increased to 6 cents on Nov. 6, so that on all the lines the fare unit is now 6 cents. The company issued a statement in which it said:

RAISE FARES OR CURTAIL SERVICE

"It came to a case of either raising the fares or greatly curtailing the service and abandoning all plans for improvements and betterments that we have been carrying out for several years. We realized, too, that our motormen and conductors were deserving of higher wages. Out of the very first additional revenue which we expect to realize from the increased fares, increased wages amounting to $40,000 a year will be paid out to the men.

"We concluded that the public preferred paying 1 cent more for their ride to any curtailment of the service, as inadequate electric railway service is a poor advertisement for any city.

"What we will realize from the additional cost will not mean any great increase in revenue—nothing compared to our constantly increasing expenses. It will not mean any increased dividends to stockholders. It is hoped that it will yield sufficient to help us bear the heavy burden of increasing operating costs that has been confronting us at every turn for several years and that is becoming greater each day."

Several of the municipalities have filed protests against the increase in fares, and the Public Service Commission has fixed Feb. 8 as the time for a hearing in the matter.

In the meantime the company is issuing receipts to passengers for the additional cent that is being collected, so that if the commission should decide that the 5-cent fare shall be restored, the 1 cent additional can be refunded.

One-Man Cars in Tampa

Safety Features Demonstrated for Public Benefit—Name of Operator on Duty Posted Conspicuously

Fifteen of the twenty-three new type, one-man cars purchased by the Tampa (Fla.) Electric Company were put in operation on Jan. 9.

During the trial run the safety features were shown when Mayor McKay of Tampa was invited to operate one of the new cars for a few blocks. As the Mayor was rounding a turn he lifted his hand from the controller handle to raise his hat to a lady on a passing car, and immediately the emergency brakes were automatically thrown on, the power cut off, the rails sanded and the doors unlatched.

The new cars are the first of the closed type of equipment which have ever been used in Tampa, and during the first day they were crowded with persons trying out the novelty. Much rivalry has existed among the crews for places on the new cars. Another feature of the service is the name of the car operator. This is posted conspicuously toward the front end.

In speaking about the car C. O. Birney said:

"The average passenger load in most cities is about fifteen, and to take care of overloads, this car is designed to seat thirty people, which seems to meet the requirements of 90 per cent of the cities of the country. The car measures 27 ft. 9½ in. over all, is 8 ft. wide and of the continuous sash construction. The body is made of steel, the upper windows are stationary and the lower sash raises in the sides of the car and drops in the vestibules. The trucks are ball bearing with a combination leaf and spiral spring. The motors are also ball bearing and designed for high speed and rapid acceleration."

Hearing on Indiana Freight Rates

Interurban Companies Desire to Put Into Effect Schedule Comparable With That of Steam Lines

The Public Service Commission of Indiana held a hearing on Jan. 4 and 5 in a series of cases involving the petitions of many of the interurban railways of the State for authority to increase their freight rates on the Zone A plus 15 per cent schedule, which would be comparable to the basis of freight rates now in effect on the steam railroads.

F. D. Norveil, general passenger and freight agent of the Union Traction Company of Indiana, appearing as a witness, was questioned by Arthur W. Brady, president of that company, and introduced several exhibits showing, among other things, a set of terminal costs of freight handling at the Indianapolis freight house of the company.

TERMINAL COSTS AN IMPORTANT FACTOR

Shippers who were present at the hearing and members of the commission immediately sought to find out whether terminal costs at Indianapolis on the average ton of freight handled were greater or less than terminal costs at the stations in small towns along the lines, such as Pendleton or Noblesville.

When Mr. Norveil stated that he could give no exact data on the subject, but declared it to be his opinion that the costs at the smaller terminals were greater than at the larger terminals for each ton handled, Commissioner Edwards pointed out that in a recent rate case before the Interstate Commerce Commission exactly the reverse had been found to be true with reference to the steam roads. Mr. Brady then repeated a former statement to the effect that the interurbans were not comparable with the steam roads.

After many questions by the shippers and the commissioners the companies stated that they would furnish detailed information based on costs of terminal handling of freight and costs of the road hauls and revenues. Mr. Brady said that his road would attempt to show that it is costing the interurbans more to carry each ton of freight than it is costing the steam railroads.

TECHNICAL RATE TESTIMONY

During the continuation of the hearing on Jan. 5 technical testimony was introduced by the companies concerning rates and the elements of costs entering into the interurban freight business, as compared with the same items of cost on the steam railroads. A statement made in a comparison with three of the steam railroads operating in the State showed that the gross revenue per mile of main track of two of these roads was more than $28,000, while that of the interurban railway was only $5,533. With an assumed operating ratio of 65 per cent of gross earnings, the balance available for fixed charges was only $1,936 per mile of main track in the case of the electric road, as compared with more than $9,800 in the case of the steam railroads.

Double Stops Eliminated

Investigation by W. C. Culkins, the director of street railroads of Cincinnati, Ohio, on his own motion relative to double stops at various street intersections on the lines of the Cincinnati Traction Company, disclosed the fact that at many street intersections cars made what were known as "safety stops" on the near side and an additional "service stop" on the far side of the street. This practice was the result of the far side stop outside of the business section of the city combined with the necessity of making the safety stops on the near side where the tracks cross those of the other lines, or for other well-established operating reasons. It was found that there were 338 of these double stops which could be reduced to single stops not only without any unreasonable inconvenience to the public but to the great improvement of the service. It was therefore ordered that the Cincinnati Traction Company discontinue the stopping of its cars for passengers at locations specified in the order of Mr. Culkins and remove the white stripes indicating such stops.

Man Shortage in Seattle

135 Men Leave Traction Company Service in Twenty-five Days—Women Will Likely Go on Cars

Officials of the Puget Sound Traction, Light & Power Company, Seattle, Wash., are giving serious consideration to the suggestion of A. L. Valentine, superintendent of public utilities of Seattle, that women be employed as conductors on the cars of that company to meet the shortage of labor. A. L. Kempster, manager of the company, declared that the question would be decided shortly. He said that if women were employed they would receive the same wages as were now paid to the men. Wives or other relatives of former employees of the company now in the military service of the United States will receive the first opportunity. Then will come the wives of men serving the colors. The third class will be general. The company is exhausting every means to retain a complete working force, but to date has been unsuccessful, because of the gradually increasing number of men leaving the employ of the company to engage in shipbuilding or other work where higher wages are paid. Mr. Kempster said:

"We realize that the insufficient service is very annoying and unsatisfactory. We know further that in these times maximum service should be given, and we want to give it, but we cannot get the men. The only reason that we will hire women, if we do, is because we cannot get men for the cars. The enormous demand of the shipyards and other war industries is rapidly depleting our ranks. From Dec. 1 to Dec. 26 135 men left the service."

Chicago Traction Report

Board of Supervising Engineers, Chicago Traction, Discusses Service Standards

The eighth annual report of the Board of Supervising Engineers, Chicago Traction, covering the period ended Jan. 31, 1915, has just been issued. This contains the usual statement of financial and operating statistics of the surface lines in Chicago and the report of the engineering department covering track extensions, power distribution, electrolysis and cars. There is also a discussion of service standards, most of this material having been used in a report to the City Council some time ago. It is an argument in favor of a standard based on available floor area for standing passengers, and the board is on record as opposing the non-rush standard prevailing in some cities where the companies are required to provide more seats than the average number of passengers during these periods. In this connection the report says:

"When it is considered that to sustain an economic balance between receipts from fares and expenses for operation every empty seat operated during non-rush hours may mean practically a standing passenger during rush hours, it is clear that liberality in service during non-rush hours can be carried to extreme. With a non-rush interval as short as fifteen minutes it is believed that as liberal service has been proposed in this ordinance as is reasonable under existing conditions of operation."

Rehearings Asked in Jitney Cases

Motions for rehearing have been filed in the two jitney cases in Dallas, Tex., recently decided by the Court of Civil Appeals adversely to the jitneys. Both motions renew contentions made by the losing parties in the two suits.

In one case, the Jitney Association was granted an injunction restraining the city from enforcing the ordinance regulating jitneys. This case was reversed and the injunction set aside by the Appellate Court.

In the other case, styled Henry D. Lindsley et al., vs. the Dallas Consolidated Electric Street Railway, in which the railway was granted an injunction restraining the city in enforcing the ordinance initiated by the jitney drivers and adopted on the face of the returns in a referendum election, the Appellate Court continued the injunction in force. The city seeks to have this injunction set aside that it may enforce the initiated ordinance.

New Fares for Spokane

Cut Rate Tickets Done Away with in New Tariffs Filed by Traction Lines

New fare schedules have been filed with the Public Service Commission at Olympia, Wash., by the Spokane & Inland Empire Railroad and the Washington Water Power Company, Spokane, which provide that school tickets shall be 4 cents each instead of 2½ cents, and that the general sale of eleven tickets for 50 cents or 110 tickets for $5 shall be discontinued. Tickets for pupils are to be on sale only at the general offices of the company. Charges for special cars are to be $6 for the first hour and $3 an hour thereafter. Newspapers are to be transported at 25 cents for 100 lb. The regular fare is continued at 5 cents, with transfer privileges. Children under five years of age will continue to be carried free when accompanied by parents.

INCREASE ABSOLUTELY NECESSARY

Waldo G. Paine, vice-president and traffic manager of the Spokane & Inland Empire Railroad, said:

"An increase in our revenue is absolutely necessary to offset the constantly rising cost of labor and material. We cannot continue to sell our only commodity—transportation—for the price established years ago while the cost of doing business grows greater with each succeeding month.

"Our employees are receiving from 20 to 40 per cent more pay than they did five years ago. They deserve it and the company fully realizes that the cost of living has advanced in like proportions. But while the cost of labor has been steadily going up the cost of material has been increasing at an even greater rate.

"While these costs have been climbing we have had no increased revenue for an offset. Instead of that we have been compelled to keep up our service and to buy new equipment, although our passenger business has fallen off, due largely to automobile transportation. It is impossible to lower our standard of service and we have had no side lines to sell—no other commodities which could be pushed on the market at a profit to balance losses sustained on our chief product.

SERVICE AT A LOSS

"These conditions have been growing more and more burdensome and, like other electric railways, we have been considering an advance in rates for a long time. We have been reluctant to take the step, but we believe that when the public knows that we have been operating at an actual loss of many thousands of dollars a year they will see the necessity. Unless our stockholders and bondholders receive some return the business will not be attractive enough to keep up the investment and to better the service.

"The additional revenue produced by discontinuing the sale of tickets is only a small portion of the advances already granted the men employed on the city lines and other means of increasing the revenue must be speedily found if we are to continue the present service. The solution is either increased revenue for the company or a reduction in the service furnished to the public.

1,700,000 MORE PASSENGERS, BUT AT A DEFICIT

C. S. MacCalla, vice-president and general manager of the Washington Water Power Company, said:

"The cost of everything going into the business is increasing rapidly. Although we carried 17,305,515 or 1,700,000 more passengers in 1917 than in 1916, we closed the year with a deficit of about $60,000 on our transportation system, and such a condition as that cannot continue."

Late Milwaukee-Chicago Train Popular

Electric Road Meets a Business Need to Which the Steam Lines Were Not Alive

The Chicago, North Shore & Milwaukee Railroad sensed the need for a late hour fast train from Milwaukee to Chicago, and on Nov. 1 installed a new service which is proving by its popularity that it fills a particular need. Many business men, after completing transactions in Milwaukee, are desirous of taking late trains out of Chicago for other points. The last steam train between the two cities leaves Milwaukee at 9 p. m., so that unless one has completed the purposes of his visit to Milwaukee very early in the evening he is unable to get any of the numerous trains which leave Chicago between the hours of 12 and 3 o'clock in the morning.

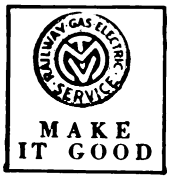
The new North Shore train leaves Milwaukee at 11.15 o'clock, and arrives at Evanston, Ill., at 1.15 a. m. It makes only the principal stops en route. On the way the destinations of those passengers bound for points in Chicago are listed by the conductor as he collects fares. Then upon arriving at Central Street, Evanston, the Chicago passengers find a special two-car elevated train awaiting them, which proceeds over the elevated structure, making only those stops required by the passengers, and continuing on to Twelfth Street, the point nearest to the Illinois Central depot. The train is due at this point at 1.45 a. m., so that the 2.10 train on the Illinois Central for Springfield and St. Louis may easily be caught, likewise the 2.15 train on the Michigan Central for Kalamazoo, Jackson and Detroit.

By coming through the city to Twelfth Street, Chicago, all the depots are served within easy walking distance, and by stopping only at necessary points it is possible to make the entire trip from Milwaukee to Twelfth Street in two hours and thirty miuntes. An average of 200 passengers are hauled out of Milwaukee every night.

Monongahela Has a Slogan

"Service" Is the Word—In Its Own Paper the Company Tells What It Means

The Monongahela Valley Traction Company, Fairmont, W. Va., has adopted as the design for a slogan and trademark a circle in which is lettered about a monogram of the letters "M. V. T., Railway Gas — Electric—Service." Of the design the company says in part in an editorial in its magazine for the employees: "The design is just a little thing; there are but four words of the inscription, but to the company and to the men it is one of the biggest things the past year has brought forth. How much it will come to mean to the public that rides on the street cars, that uses power, that consumes gas, will depend on us, individually and collectively.



"It is to be noticed that the dominating word in the design is *service*. Railway—Gas—Electric—*service*. Here are summed up the policies of the company; the aim and inspiration of every man in the organization.

"In introducing this slogan to the public, in making it familiar through the medium of advertising, the company realizes the responsibility it is assuming. To make such a promise to the public and then fail in any particular of living up to its highest conception would be an ignoble defeat. It now rests squarely on the shoulders of every man bearing allegiance to the Monongahela Valley Traction Company standard to see that it is not only kept but surpassed.

"In the railway department it means that safety and courtesy have risen to an even higher importance. The public will be alert to notice to what extent the company's men are imbued with the spirit of the slogan; quick to perceive their attitude toward it either in the breach or the observance.

FROM CUSTOMER TO CLIENT

"In the gas department it means that every employee will further extend himself to make every patron a booster, will further work with the company in doing everything possible toward maintaining irreproachable service. It means that henceforward every person contracting for gas from this company is raised from a customer to a client.

"In the power department it means that the problem of every consumer of power is our problem. Service, expressed concretely in the form of the services of our engineers, in the full cooperation of our organization with the plans of the consumer company, is to be given a new significance.

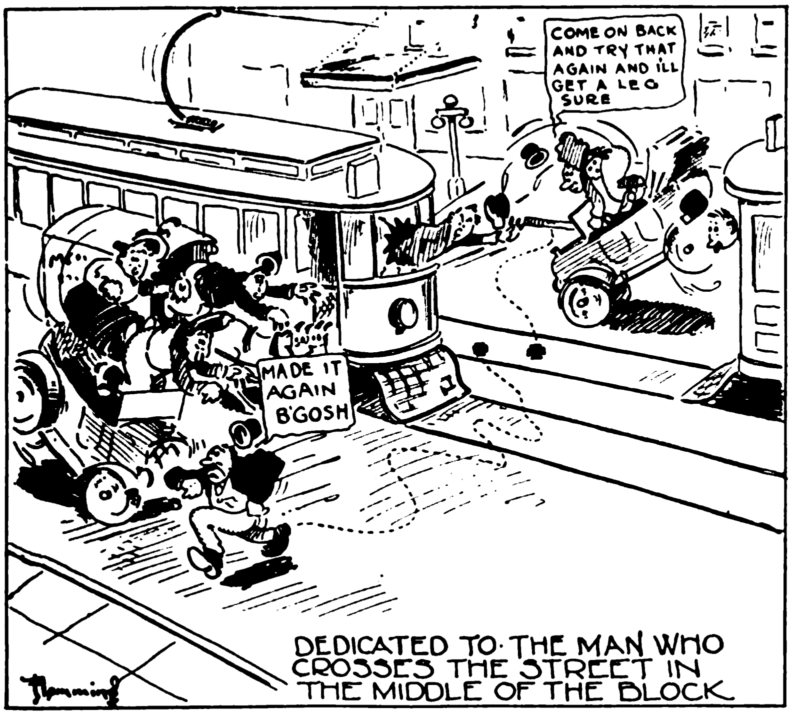
"Our slogan, carrying with it such obligations, would never have been adopted had we not felt confident that we could deliver the goods.

"We've promised something. Now it is for all of us to make it good."

Jay Walker in Cartoon

Well-Known Terror of the Transportation Department Has His Usual Narrow Escape

Jay Walker, the man or woman who crosses the street in the center of the block, has in the past inspired considerable prose and some verse, in addition to much profanity on the part of railway operators. Now the artist has turned his pen on the careless wretch. The accompanying picture shows how Jay Walker appeared to Flemming, the cartoonist of the Puget Sound Traction Light & Power Company, whose drawings are a feature of *Electrogram*, issued by the company. Jay Walker may escape physical hurt time and again, but unless he is absolutely indifferent to his physical welfare it would seem well-nigh impossible for him not to take to heart the lesson which the cartoon carries.


COME ON BACK AND TRY THAT AGAIN AND I'LL GET A LEG SURE
MADE IT AGAIN B'GOSH
DEDICATED TO THE MAN WHO CROSSES THE STREET IN THE MIDDLE OF THE BLOCK
Flemming

AN "ELECTROGRIN" IN "ELECTROGRAM"

Census of All Freight Cars

Interstate Commerce Commission Has Issued An Order to All Carriers to Report Their Equipment

The Interstate Commerce Commission, Bureau of Car Service, on Jan. 5 issued an order to all railroads and private car lines as follows:

"The commission desires to determine accuratęly what freight-loading equipment is actually available for service throughout the country; also that not available for service. To this end you are directed to fill in the information called for by blank space below as of Dec. 31, 1917, and to return this report to the Interstate Commerce Commission, Bureau of Car Service, on or before Jan. 25, 1918.

"Private car lines which have leased cars to other carriers which operate same should show such cars separately, as to individual lessees, as 'cars leased by reporting carrier,' reducing by such number of cars the total number in operation.

"Three copies of this blank are inclosed, one to be returned not later than date mentioned.

"The form, which applies to common box and furniture, ventilated, refrigerator, stock, single and doubel deck; flat, drop-bottom, gondola, automobile, solid-bottom gondola, hopper-bottom, tank, and all other freight equipment cars is to be filled out as follows:

Name of carrier.................. .....
Number owned ....
Number leased to reporting carrier ......

Total number in operation...... ......
Number in actual service......... ......
Number in bad order, divided—
(*a*) Not to be repaired.. ......
(*b*) Heavy repair cars which will not be repaired within 30 days ....
(*c*) Heavy repair cars which will be repaired and in service within 30 days ......
(*d*) Light repair cars.. ......
Total number bad order cars...... ......

Total number in operation...... ......

"Define carefully the basis which determines whether bad-order cars are classified as heavy or light repair cars."

Agreement on Electrolysis

The City Commission of Trenton, N. J., will sign an agreement with the Trenton & Mercer County Traction Corporation looking toward the elimination of electrolysis from the police and fire cable system throughout the city. The agreement was drawn by E. E. Brownell, who was engaged as arbiter of the dispute.

Rate Case Decided

City the Agent of the State, Which May Change Its Agent, Indiana Supreme Court Holds

The Supreme Court of Indiana on Jan. 11 handed down a decision in the case of the city of Logansport, Ind., versus the Public Service Commission of Indiana and the Logansport Home Telephone Company which is of great importance to all public utilities of the State. Briefly this case was the result of an appeal about a year and a half ago from a case in the Cass Circuit Court, alleging that the Public Service Commission had no authority to increase the rates of the telephone company over those specified in franchise contract with the city, although the company had surrendered its franchise and taken an indeterminate permit.

RATES OF STATE-WIDE INTEREST

The Supreme Court in a lengthy opinion ruled that rates are of statewide interest and not of local interest; that the city in letting a contract, in so far as rates are concerned, acts as the agent of the State and that the State may change its agency and has done so by establishing the Public Service Commission; and that a city and the inhabitants of a city have no rights in a franchise contract fixing rates which cannot be changed or modified by the Public Service Commission which in that respect acts as the representative of all the people. The court further ruled that the powers of the commission are not limited by the provision of Sec. 7 of the Utility Commission Act regarding maximum rates under existing franchises and that this provision simply prevents the company that holds a franchise from increasing rates beyond those fixed in the contract without first obtaining the consent of the commission.

COMPANY WANTS FARE CASE RECONSIDERED

The Indianapolis Traction & Terminal Company as a result of this decision of the Supreme Court appealed to the Public Service Commission on Jan. 15 to reconsider its decision which was upheld by the Circuit Court on Jan. 2 and assume jurisdiction in the petition of the company for a straight 5-cent fare in Indianapolis. The commission states that as the Indianapolis fare matter has been taken to the courts it will wait for a decision of the Supreme Court in that case, but that it will request the Attorney General of the State to assist in having the court reach an early decision.

Chairman Lewis of the commission stated that he believed the Indianapolis and the Logansport cases were not parallel, as the Logansport Home Telephone Company was operating under the general act of the State Legislature while the Indianapolis Traction & Terminal Company was operating under the special act passed in 1899 applying specifically to that company.

The Circuit Court decision in the Indianapolis case was referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 5, page 59.

Transportation News Notes

Flat Rate for Rockford Line.—The Public Utilities Commission of Illinois has granted the Rockford & Interurban Railway authority to increase passenger rates to 2 cents a mile straight.

Five-Cent Fare Sought in Lynchburg.—The Lynchburg Traction & Light Company, Lynchburg, Va., has asked the State Corporation Commission to discontinue the sale of six tickets for 25 cents and sixteen school tickets for 50 cents and to establish a straight 5-cent fare.

New Freight Station at Worcester.—The Worcester (Mass.) Consolidated Street Railway has started a freight service from its new freight house on Shrewsbury Street. The Green Street station will continue to be maintained for freight from Boston, Marlboro, Hudson and intermediate places over the lines of the Bay State Street Railway, Boston.

Women Conductors for Long Island Line.—W. W. Lowe, superintendent of the Manhattan & Queens Traction Company, New York, N. Y., has announced that the company will employ young women as conductors on its line running from Long Island City to Jamaica and on an industrial line from Manhattan to the heart of the factory section of Long Island City.

Six-Cent Fare Bill Introduced.—A bill authorizing the Boston (Mass.) Elevated Railway to charge 6-cent fares has been filed in the House by Representative Rowley of Brookline. The bill stipulated that the extra cent shall be paid to the city of Boston in lieu of other taxes, the city to utilize the funds for maintenance of subways, tunnels and other ways along the lines of the company.

Wholesale Jitney Arrests in Houston.—More than forty jitney drivers in Houston, Tex., were arrested by the city police, and the jitney line operating to Camp Logan, the National Guard Cantonment, was put out of business on Jan. 2. The jitney drivers were arrested for not having paid the license fee and obtained license for the new year. They had been notified that new licenses would be required.

Women Guards for Another Line.—C. S. Klumpp, general superintendent of the Hudson & Manhattan Railroad, operating the tubes under the Hudson River between New York and New Jersey, has announced that the company proposes to use women guards. It is not the intention of the company to displace any men now working, but simply to substitute women as it becomes necessary to do so when men leave for military service or other causes.

Fenders Approved.—George B. La Barre, director of public safety of Trenton, N. J., has made an investigation of the fenders in use on the cars of the New Jersey & Pennsylvania Traction Company and the Public Service Railway and reports that he found them to be the proper kind. It had been reported to the City Commission that the fenders were not of the kind approved by the Mayor under an old ordinance.

Fare Hearing Postponed.—The hearing on the petition of George Bullock as receiver for the Buffalo & Lake Erie Traction Company for permission to increase the rate of fare charged passengers on interurban cars of that raliroad to 2½ cents per mile has been postponed to a date to be hereafter fixed. The hearing was originally scheduled to be held before the Public Service Commission of the Second District on Jan. 2.

New York Streets More Dangerous.—According to figures given out by the Police Bureau of Statistics of New York City 26,145 persons were injured in the Greater City last year against 24,464 for the year previous. Of the victims, 480 were killed or injured last year as compared with 406 the year before. Electric railway cars were credited with injuring 1940, eighty-four of them fatally, last year, against 1811 injured and seventy-four dead the year before.

Reduction in Owl Service Sanctioned.—Both branches of the City Council of Providence, R. I., on Jan. 8 passed a resolution which, if signed by the Mayor, will practically wipe out all-night car service on the lines of the Rhode Island Company in Providence. It calls for the removal of seventy-seven cars running after 12.30 o'clock in the morning. Cars running from Providence to Pawtucket via Main Street and Pawtucket Avenue will be affected if the measure becomes effective.

Increase in Fare in Oklahoma.—The Oklahoma Corporation Commission has authorized the Shawnee-Tecumseh Traction Company to charge a fare of 15 cents each way between Shawnee and Tecumseh. The fare heretofore has been 25 cents for one round-trip passage. The company showed to the satisfaction of the commission that it could not operate at a profit with a fare of 12½ cents each way. The company has also been authorized to abandon and take up certain portions of its tracks in the outlying districts.

Flat Five-Cent Fare in Salt Lake.—The Public Utilities Commission of Utah handed down a decision recently authorizing the Utah Light & Traction Company, Salt Lake City, Utah, to discontinue on Jan. 1 the sale of 4-cent commutation tickets and to charge a straight 5-cent fare. There will be no change in the conditions governing the issuance of transfers. Provision is made for the redemption of outstanding tickets upon presentation at the office of the company on or before Feb. 28. Slight modifications were also authorized by the commission in the Sandy-Midvale and the Centerville interurban zone charges.

Fare Increase Authorized.—The Public Service Commission of New Hampshire has granted permission to the Dover, Somersworth & Rochester Street Railway to increase rates for each fare section from 5 cents to 6 cents. A request for the withdrawal of the transfer privilege in the Blackwater section was refused by the commission. The commission, however, has approved a tariff which provides a 9-cent fare for regular passengers, an increase of 4 cents, and a 4½-cent fare in lieu of the present 2½-cent fare for school children.

Loose-Fingered Conductors Sentenced.—Six conductors employed on the Jamestown (N. Y.) Street Railway have been arrested charged with conspiracy to rob the company. When arraigned in court all except one entered pleas of guilty. Three were fined $50 each and sentenced to the penitentiary for three months. The cases against the other three are still pending. It is charged the conductors exchanged transfers, enabling them to keep the cash fares and register transfers. It is alleged that the men were holding out more than $25 a week.

Flat Fare in Greensboro.—With the consent of the City Commissioners of Greensboro, N. C., the North Carolina Public Service Company has discontinued the sale of tickets at reduced rates and now charges a flat 5-cent fare for each passenger more than five years old. The company has been selling tickets at the rate of ten for 25 cents for children, eight for 25 cents for college students and others engaged at college, eight for 25 cents for workmen, and six for 25 cents good at all hours. The company will continue to give transfers under the system that has been in use.

Company Loses Owl Fare Case.—The Supreme Court of Pennsylvania in a decision handed down at Philadelphia on Jan. 7, upheld the Superior Court, which recently decided that the Pittsburgh Railways had not given sufficient time before inaugurating a 10-cent night fare. The Superior Court upheld the Public Service Commission in its decision that the company could not increase its fares at night on the ground that it had not given the public proper notice of the proposed change. No opinion was expressed either by the commission or the court in regard to the authorization of an increase in rates.

New Elevated Cars in Use in Brooklyn.—The Brooklyn (N. Y.) Rapid Transit Company has placed fifty new steel 67-ft. passenger cars in service on the Broadway elevated line in Brooklyn for operation between Chambers Street, Manhattan, and Manhattan Junction in Brooklyn. The new cars are longer than the cars in the subway operated by the Interborough Rapid Transit Company. They have three side entrances, but no end entrances. Cars of the same type which have been in service for some time in the Fourth Avenue subway in Brooklyn have been described in detail in the ELECTRIC RAILWAY JOURNAL.

North Kankakee Lines Cleared Snow.—W. H. Baker, president of the village board of Bradley, Ill., writes to this paper under date of Jan. 9: "A heavy fall of snow and sleet struck our village Sunday night and continued until Monday afternoon. The steam roads were greatly behind schedule. But we have to take our hats off to Mr. Windal, manager of the North Kankakee Electric Light & Railway Company, for the good service rendered with a snowplow of C. G. Windal's invention. The tracks were kept open during the storm. Mr. Windal has been with this company for the last eighteen years, and shows he is fully competent to take care of his work under all conditions."

Ordinance to Increase Speed Limits.—As a protection to the railways against damage suits growing out of collisions with vehicles, Supervisor of Public Utilities N. M. Baker of Dallas, Tex., has recommended to the City Commission that an ordinance be enacted limiting electric railway cars to a maximum speed of 15 m.p.h. on the downtown business streets and to a maximum of 25 m.p.h. in the residence district. An old ordinance in Dallas limits cars to a speed of 8 m.p.h. in the business district and 12 m.p.h. in the residence sections of the city, but on account of the absurdity of holding cars to this schedule this ordinance is not enforced. As a result of this ordinance many verdicts in actions for damages against the company have been rendered for the plaintiffs in the courts, where no judgment could be secured under the proposed new ordinance.

Live Stock Haul Increased.—A very large increase in the volume of livestock hauled to the city by the Louisville & Interurban Railroad has resulted from an extension by the company of a line into the Bourbon stockyards, the livestock market in Louisville. The company began to handle a considerable amount of livestock several years ago when the foot and mouth epidemic was being combated. It was then necessary to unload at the freight station or transfer to wagons 2 miles or more from the stockyards. The line into the stockyards increased the company's facilities and has been appreciated by the shippers. Many of them drive their stock overland to the terminal points of the lines out of the city and there load on the cars. The growers are enabled to rush their stock to the market rapidly and do not chance the losses in condition otherwise possible. Two hours from farm to market is the maximum on any of the company lines. The Louisville & Interurban Railroad is controlled by the Louisville Railway, operating in the city proper. It operates railway lines totalling 100 miles of road.

Personal Mention

D. B. Harcus has resigned from the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., to become assistant traffic manager of the Mitchell Motor Car Company, Racine, Wis.

John F. Brill, a dispatcher with the Public Service Railway, Newark, N. J., has been appointed supervisor of the Trenton-Newark line of the company to succeed Thomas P. Burke, resigned.

Sidney Withington is acting electrical engineer of the New York, New Haven & Hartford Railroad, New Haven, Conn., succeeding P. J. Kearny, who resigned to enter government service.

William Musgrave, superintendent of transportation of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has been appointed superintendent of buildings and grounds of the company.

Guy E. Tripp, heretofore chairman of the Westinghouse Electric & Manufacturing Company, has been appointed head of the division of production in the ordnance department of the United States Army. He has already entered upon his duties, and the board of directors of the Westinghouse company has given him a leave of absence for the duration of the war.

G. E. TRIPP

F. D. Hain, who has been superintendent of construction of the Altoona & Logan Valley Electric Railway, Altoona, Pa., has been elected engineer of the city of Altoona by the new City Commissioners.

Max Thelen was re-elected president of the Railroad Commission of California at the annual meeting of the commission on Jan. 2. This will be President Thelen's fourth term as head of the commission.

L. C. Mims, formerly city dispatcher for the Northern Texas Traction Company at Fort Worth, Tex., has been promoted to the position of assistant to the superintendent of transportation at the central offices of the company.

Clyde Taylor, who has been acting as president of the Kansas City (Mo.) Railways in the absence of Philip J. Kealy on military duty, has resumed his work as general counsel for the company. Mr. Taylor is also vice-president of the company.

Charles E. Walmer has taken over the work of Henry M. Stine as secretary and treasurer of the Pennsylvania Street Railway Association during the absence of Mr. Stine in the service of the government as captain of Company L, 112th Infantry.

Frank P. Hudson has been appointed superintendent of transportation of the Omaha & Council Bluffs Street Railway. Mr. Hudson has been connected with the company since 1892. He was formerly division superintendent in charge of the lines of the company in Council Bluffs.

C. A. Jefts has resigned as assistant superintendent of the Concord, Maynard & Hudson Street Railway, Maynard, Mass. Mr. Jefts has been with the company for four years. Before that he was division superintendent of the Worcester Consolidated Street Railway and of the Warren, Brookfield & Spencer Street Railway at Clinton.

P. J. Kearny resigned recently as electrical engineer of the New York, New Haven & Hartford Railroad, New Haven, Conn., to become connected with the ordnance department at Washington. Mr. Kearny was graduated from the Massachusetts Institute of Technology in 1903. He entered the service of the New York, New Haven & Hartford Railroad in 1906 as assistant to the electrical engineer.

H. B. Sewall, who has long been connected with Stone & Webster properties in the Central West and in the South and Southwest, has been appointed manager of the Whatcom County division of the Puget Sound Traction, Light & Power Company, with offices at Bellingham, Wash. He succeeds Leslie R. Coffin, who, as noted in the ELECTRIC RAILWAY JOURNAL for Nov. 24, was ordered to report for duty at Philadelphia.

Thomas P. Burke, who resigned on Jan. 1 as supervisor of the Trenton-Newark line of the Public Service Railway, was tendered a banquet at the Hotel Klein, New Brunswick, N. J., recently, by the members of the Public Service Railway Company Club. One hundred guests were present, including several officials of the railway. Inspector Patrick Creamer, of Perth Amboy, acted as toastmaster. He presented Mr. Burke with a handsome diamond ring on behalf of the employees. Division Superintendent J. J. Gettings and General Superintendent Newton W. Bolen were among those who addressed the diners.

Charles N. Black of Ford, Bacon & Davis, New York, N. Y., has gone to Washington to become assistant manager of the procurement division of the ordnance department, under Col. Samuel McRoberts, recently of the National City Bank. Mr. Black is a past-president of the American Electric Railway Association, and up to about a year and a half ago was vice-president and general manager of the United Railroads, San Francisco, Cal.

T. J. Day has been appointed general freight agent of the Pacific Electric Railway, Los Angeles, Cal., succeeding to part of the duties performed previously by D. W. Pontius. Mr. Day has been in the service of the Pacific Electric Railway for ten years, and has had twenty-eight years of railroad experience, beginning with the Denver & Rio Grande Railroad. He was formerly assistant in charge of freight operation of the Pacific Electric Railway.

Henry M. Stine, secretary and treasurer of the Pennsylvania Street Railway Association, has been appointed captain of Company L, 112th Infantry, United States Army. He was stationed at Camp Hancock, Augusta, Ga., but has recently been transferred to Camp Wadsworth, S. C. During his absence in the service, his work as secretary and treasurer of the Pennsylvania Street Railway Association has been taken over by Charles E. Walmer.

O. A. Smith has been appointed general passenger agent of the Pacific Electric Railway, Los Angeles, Cal., succeeding to part of the duties performed previously by D. W. Pontius, now general manager of the San Diego & Arizona Railroad. Mr. Smith was formerly assistant to Mr. Pontius. He is thirty-two years old. He became connected with the Pacific Electric Railway nine years ago, going to that company from the Missouri, Kansas & Texas Railroad.

Col. Philip J. Kealy, president of the Kansas City (Mo.) Railways, returned to Kansas City from Camp Doniphan on Jan. 5. It is possible that after a few weeks in a hospital he may remain in Kansas City, in active charge of the railway system. Colonel Kealy is and has been active, but his physical condition is such that he may not be able now to pass the necessary physical tests for continuation in the army service. He has been at the head of the 138th Infantry at Camp Doniphan. At a recent meeting of the company's directors Clyde Taylor, acting president, asked permission to resume his work as counsel for the company as soon as President Kealy could return.

O. R. Sturzinger, formerly superintendent of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, has been appointed general manager of the Lakeside & Marblehead Railroad, to succeed A. B. Mack. Mr. Sturzinger entered electric railway work during the construction of the Sandusky, Milan & Norwalk Electric Railway. Later he was made assistant general manager of the company. When that property was included in the system of the Lake Shore Electric Railway Mr. Sturzinger became assistant to the superintendent of motive power. In 1903 he entered the service of the Toledo, Port Clinton & Lakeside Railway. Four years later he was made general superintendent of the company and later superintendent of the Northwestern Ohio Railway & Power Company, the successor.

T. F. MULLANEY

Thomas F. Mullaney, chief engineer of the Third Avenue Railway, New York, N. Y., since 1907, has resigned from that company and will take a short vacation before making any plans for future work. Mr. Mullaney is one of the pioneers of the electric railway industry and has been actively connected with it since 1888, when he joined the Thomson-Houston Electric Company, Lynn, Mass. He began his engineering career as a machinist, and while so engaged installed, in Lynn, Mass., what was probably the first line of shafting with friction clutches for the driving of dynamos in an industrial plant. This experience brought him in touch with electrical developments and he decided to engage in the new industry. He remained with the Thomson-Houston Electric Company and its successor, the General Electric Company, for the next twenty years, or until 1907, and during this time had charge of the installation of a great many of the first electric railways in this country. Among them was the Lenox Avenue line in New York, the first underground conduit system in that city, and also the Union Railway in Bronx Borough, the first road in New York to be equipped with the overhead trolley. In May, 1907, he accepted the offer of the late F. W. Whitridge, then receiver of the Third Avenue Railway, to become chief engineer of that company. Mr. Mullaney has presented several papers on topics connected with railway operation before engineering organizations.

Samuel E. Smith, who has been superintendent of railways of the Reading Transit & Light Company, Reading, Pa., was made general manager of railways of the company on Jan. 1. Mr. Smith was born at Womelsdorf, Pa., in 1877. He entered business as a cash boy in a department store in Reading. He next became connected with the dispatching and storehouse departments of the Philadelphia & Reading Railroad. He left railroad work to enter the service of the Holophane Glass Company in New York. About a year later he joined the forces of the Atlantic Refining Company. His next position was with the Monticello Company at Reading and Trenton, dealers in brick. His connection with the Reading Transit & Light Company followed six years later. His first work for the company was as purchasing agent. Subsequently he became claim agent of the company. With the change in control of the railway and light properties at Reading Mr. Smith was made superintendent of railways.

Obituary

Thomas T. Robinson, vice-president and general manager of the Dayton, Covington & Piqua Railway, died at his home in West Milton, Ohio, on Dec. 15. Mr. Robinson has been in charge of this property since it was built and owned the controlling interest in it.

W. I. James, traveling auditor of the Detroit (Mich.) United Lines, died on Jan. 3 while in Redford. Mr. James had been in the employ of the company for eleven years. He began as agent at Orion, Mich., and was steadily advanced until in February, 1916, he was made traveling auditor. Mr. James is survived by his widow and one child.

Joseph S. Baecher, who was formerly secretary and treasurer of the Buffalo (N. Y.) Street Railway, now part of the International Railway, died on Jan. 2 after a short illness. Mr. Baecher became connected with the company in 1868, and continued with it for more than thirty years, occupying various positions until he became secretary and treasurer. He resigned in 1900. He then became secretary and treasurer of the Bell Telephone Company, and held that position until six years ago, when the company was merged in the New York Telephone Company.

George R. Tripp, who was connected with the Boston (Mass.) Elevated Railway for more than forty years, died at his home in Arlington, Mass., on Jan. 7. For eleven years Mr. Tripp was superintendent of surface transportation of the company. He was born in Kennebunk, Me., in 1858. He entered the employ of the railway when he was twenty-two years old. He served successively as conductor, starter, superintendent of the carhouse, purchasing agent, superintendent of the South Boston division, superintendent of the Charleston division, and then as superintendent of surface transportation of the company.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Home Electric Company, Hendersonville, N. C.**—Incorporated to construct and operate interurban railways. Capital stock, $50,000. Incorporators: Anne Oates, William H. Oates and Claudia H. Oates, all of Hendersonville.

Franchises

Auburn, Wash.—An ordinance has passed its first reading granting the Chicago, Milwaukee & St. Paul Railway a franchise to erect, maintain and operate poles and wires for the electrification of its line within the city limits.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company has applied to the City Council for a franchise across the Ballard Bridge at Fifteenth Avenue, N.W. The application has been referred to the city utilities and franchise committees. That the Ballard Bridge is to figure in a settlement of all differences between the city of Seattle and the Puget Sound Traction, Light & Power Company was indicated at a recent meeting of the city utilities committee, when these Councilmen voted to recommend to the franchise committee that no new franchise be granted to the company until all provisions of present franchise were complied with.

Track and Roadway

Visalia Electric Railroad, Exeter, Cal.—A report from the Visalia Electric Railroad states that its extension of the line from Exeter to Strathmore, 20.9 miles, will be placed in operation this year, and that gas-electric power will be used.

Pacific Electric Railway, Los Angeles, Cal.—Three applications have been filed by the Pacific Electric Railway with the Railroad Commission of California for authority to build tracks across streets in Los Angeles as follows: A third railroad track at grade across Montana Street, Scott Avenue, Berkeley Avenue and Alvarado Street; a turn-out in Sixteenth Street, which will be an extension of the present turnout in the south half of that street just west of Arlington Street; an additional track at grade across East Eighth Street, East Ninth Street and a portion of Long Beach Avenue.

Municipal Railway, San Francisco, Cal.—A trial run was made on the Twin Peaks Tunnel line of the Municipal Railway on Dec. 31. The line is approximately 3 miles long. It was announced that regular service through the tunnel would begin about Jan. 15, with cars running to Sloat Boulevard and Junipero Serro Boulevard. As soon as arrangements with the United Railroads are completed, service will be provided on Ocean Avenue and to the beach. The company reports that its Market Street extension from Van Ness to Kearny will be opened about May 1.

Des Moines (Ia.) City Railway.—The City Council has granted to the Des Moines City Railway an extension of one year in which to complete the construction work provided for in the franchise which was voted the company three years ago. The company has plans made for sixty-four blocks of construction work during 1918 and expects to complete the work if able to secure labor.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—This company is installing two blocks of automatic signals, one at Shipleys and the other at Ardmore, Md. The material is furnished by the Union Switch & Signal Company, Swissvale, Pa.

Kansas City, Mo.—The Boards of Public Works has rejected bids for the construction of the Twenty-third Street viaduct from a connection with the east end of the Kansas Avenue bridge across West Bottoms to and connecting with the west line of New Brook Street at the intersection of Twenty-third Street. New bids are invited. The plans call for two approaches, one from Wyoming Street and the other from Frisco Yards, all of reinforced concrete and steel and main viaduct 1726 ft. long, with sidewalk, roadway and separate space for double street car tracks.

Manhattan & Queens Traction Corporation, New York, N. Y.—The transit committee of the Queens Chamber of Commerce has taken up with the Manhattan & Queens Traction Corporation the suggestion of Borough President Connolly that its trolley line be extended into the Ridgewood section of the borough in order to give that territory better means of transit communication with other parts of the borough. A trip of inspection was recently made to study the condition of the streets and the present residential and industrial developments along the proposed rout. The officials of the Manhattan & Queens Traction Corporation have agreed to give immediate consideration to this proposed line.

Sand Springs (Okla.) Railroad.—Announcement has been made by the Sand Springs Railroad that it will not build the line from Tulsa to Pawhuska, projected more than a year ago. It had been announced that work on this line would begin soon. The reason assigned for not going ahead with construction is that the Sand Spring Railroad is included in the lines now under government control, it being recognized both as a steam and electric railway.

Union Railway, Tulsa, Okla.—The Union Railway, which is building an interurban electric railway between Tulsa and Sapulpa, announces that the line will probably be completed and cars in operation by Feb. 1.

Shops and Buildings

Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala.—A new carhouse 44 ft. x 167 ft. and an engine room, 60 ft. x 95 ft., is being built by the Tuscaloosa Railway & Utilities Company.

Illinois Traction System, Peoria, Ill.—The carhouse and repair shops of the Illinois Traction System were partly destroyed by fire recently, the loss being about $35,000.

Kansas City, Mo.—The Upper House of the Common Council has passed over the Mayor's veto, the ordinance previously passed by the Lower House, granting permission to the Interurban Central Station Company, Kansas City, to build a union passenger terminal station at Tenth and McGee Streets. The structure will be 208 x 132 ft., six stories, the construction to permit of the erection of four additional stories. The site and building will cost about $2,000,000.

Texas Electric Railway, Dallas, Tex.—The Texas Electric Railway, the consolidated Strickland lines, has announced that it will soon begin erection of a large passenger station in Waxahachie. Two lots have been purchased as a site for the depot and for terminal tracks.

Power Houses and Substations

Fort Smith Light & Traction Company, Fort Smith, Ark.—This company reports that it is now installing one 3000-kw. two-phase, 2300-volt Parsons horizontal turbine and two 600-hp. B. & W. boilers in addition to its previous equipment.

Georgia Railway & Power Company, Atlanta, Ga.—A report from the Georgia Railway & Power Company states that it contemplates completing its Tullulah Falls power station by November, 1918, by installing one 12,000-kw. G.E. generator, driven by an 18,000-hp. Smith water turbine.

Northern Illinois Light & Traction Company, Ottawa, Ill.—It is reported that extensive improvements are to be made in the Marseilles plant of the Northern Illinois Light & Traction Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Why Purchasing Agents Are Not Buying Equipment

Financial and Natural Conditions Difficult to Overcome—Still Optimistic for the Future

Perhaps it is too early to say just what, if any, benefits have accrued to shippers and consignees from "Freight Moving Week," just closing. The unprecedented snowstorms in the Middle West, the disastrous effects of which have seriously interfered with the clearing up of the freight congestion, was an unexpected handicap. Some progress, evidently, was made, though the railway purchasing agents are pessimistically inclined regarding deliveries of equipment and track maintenance when the need is most pressing.

Buying on the part of the traction roads still remains at a low level. The disposition to reduce the essential purchases still further is recognized on all sides. The purchasing agent of one of the leading roads controlling and operating a number of important electric lines, in reviewing the situation for the ELECTRIC RAILWAY JOURNAL, stated that if the companies were in market for such cars or equipment as their usual requirements under ordinary conditions they would be unable to have their orders filled or shipments made on a guaranteed dating. He said no matter what one would like to get, and which is sometimes imperative to have, it would be so far behind in the delivery as to about nullify its usefulness.

Turbines and transformers are almost impossible to obtain, the agent added, especially if of special design and construction. Locomotives—whether steam or electric; cars—passenger, freight or trailers, and pretty nearly everything that could be enumerated in the railway accessory list, were all under foreign requisition. Therefore, car builders, manufacturers and sales agencies of supplies, etc., apparently are in no position to meet demands of any magnitude. Consequently equipment, rolling stock and track requirements are being closely guarded and used to the limit of endurance. The most serious drawback in domestic business is the uncertainty of shipments. Even such an item as time switches, a minor necessity, perhaps, declared the purchasing agent, is six months behind on delivery. The delays on essentials that absolutely control the operation of electric lines may be more easily imagined than described.

An engineer connected with a system of traction roads in various parts of the country took the other side of the question. He maintained that the difficulty of renewing equipment, rolling stock, making extensions and desirable developments, was due entirely to lack of funds. The engineer said he did not advance this as a new proposition, as so many electric railway companies had and are yet making every effort to gain permission from the state authorities or public service commissions to raise rates. A few had been successful in their contention, namely, that a very much curtailed income interfered seriously with the proper maintenance of the properties at their fullest efficiency and greatest safety.

Securities of the traction roads were not marketable, unless at a disadvantage, just now, argued the engineer. He believed the government would eventually be obliged to follow the example of Great Britain and appoint a special branch of the war board to pass upon and indorse with its approval securities that could be negotiated without interfering with or antagonizing the sale of the national bond issues. The government is now utilizing about all of the investment money in the country, he contended, and to go out and attempt to sell railway issues now is little short of folly. The public is giving freely of its means for the great war loans, and the floating of any kind of certificate for the purpose of raising funds to keep public utilities in effective condition is not regarded favorably either in official or private financial circles. It conflicts with the overshadowing purpose before the whole country.

In England the sale of any securities, other than government bonds or securities, not having an official indorsement is illegal. So it should be here, continued the engineer, who further stated that, in his opinion, some such step will be taken. Public utilities must be kept up, consequently were essential to the community. Their maintenance, however, required money, the lack of which is being realized by traction roads everywhere. If the government will approve their securities the issues can be sold readily and the necessary capital raised to finance the acquirement of needed rolling stock and other improvements.

Worthington Company Elects President

C. P. Coleman was elected president of the Worthington Pump & Machinery Corporation, New York, N. Y., at a recent meeting of the board of directors.

Observation of Government Metal Prices

Eastern Dealers in Scrap Pledge Not to Deal in Above Standard and to Report Any Violation

At the present time when scrap metal is much more valuable than ever before electric railway managers and purchasing agents will be interested in the following resolution adopted by the Eastern division of the American Board of Scrap Iron Dealers at its meeting in Philadelphia on Jan. 11:

Resolved, That the members of the Eastern division of the American Board of Scrap Iron Dealers pledge themselves that they will neither buy nor sell any scrap iron or steel either by direct transaction or by the use of any subterfuge at a price in excess of that fixed by the government through the committee on steel and steel products of the American Iron and Steel Institute.

It is further resolved that each and every member of this division pledges himself to report promptly to an officer of this division any violation of the price agreement on the part of any one member, or non-member, mill or consumer, who is a party to such violation.

No Change in Railroad Purchasing

Financial Condition of Roads Not to Curtail Orders—Deliveries Likely to Become Large

In answer to the question regarding the method to be followed in railroad purchasing now that the roads are under government control it has been reported from Washington that Director General of Railroads McAdoo will permit the various roads and systems to purchase cars, locomotives, rails, etc., as formerly.

One point is made which is not without significance, namely, that the present financial condition of the roads need not deter them from placing orders. Furthermore, it is stated, car builders will have sufficient steel available to take care of the orders as placed. In this way freight car builders who for some time have been working at about 25 per cent of capacity will be able, provided of course the labor can be had, to greatly increase the output of freight cars.

Already a few of the roads are in the market for additional rolling stock and for rails.

The effect of this upon electric railway properties, unless taken over by the government, is obvious. Deliveries are very poor on many products already

Standardizing on Supplies

Situation in Supply and Demand Causes Manufacturers to Specialize in Certain Types and Sizes

At various times efforts toward standardization of electric railway supplies have received more than usual attention. To-day without any special effort on the part of the traction companies standardization is becoming more and more apparent.

Prevalent conditions of supply and demand have generally brought about this situation in a practical manner. Not that the electric railway purchases have been so heavy, but general buying has been good. A large number of products used by railways are not peculiar to that field. Manufacturers engaged in the production of these items are unusually busy.

In many instances where formerly a considerable stock of many different sizes and types was kept on hand, goods are now being delivered from production. In order, therefore, to hasten manufacture it has become necessary to standardize on a few sizes and types. In this way many items have for the time being been practically discarded. Of course, other sizes and types can in most instances be had, but then only at a sacrifice in delivery and at a higher price.

In addition there is a movement on foot to reduce fuel consumption through the curtailment of special equipment orders.

It is well known that electric railways have in the past bought largely of special equipment. To a certain extent, therefore, it has been necessary to buy special-maintenance equipment.

At this time, however, the purchasing agent has the opportunity to confer with the engineering department with the aim of minimizing special equipment requirements.

By such action it is evident that stocks on hand can be reduced with the consequent investment saving to the property. With a less varied stock to be maintained it is equally evident that less labor and effort will be involved.

While at the present time standardization has largely been the result of circumstances that could not be altered, it is generally considered as a purely temporary measure. The longer this situation continues, however, the more the utilities will become used to purchasing the standard sizes and types only. For that reason the standardization of many products is now going on that under normal conditions could be accomplished only after a long time spent in discussion.

(*Concluded from page* 162)

and while traction companies are not buying very much it becomes more evident each day that future requirements must be anticipated earlier than ever.

Car wheels, rails, spikes and other road supplies, bridge materials and freight cars will undoubtedly be in greater demand by the steam roads, and while there is not the likelihood that prices will greatly increase it does seem almost certain that deliveries will be longer.

Ford, Bacon & Davis Incorporated

Ford, Bacon & Davis, engineers, announce the formation of the Ford, Bacon & Davis Corporation, organized for the purpose of conducting a general contracting business, with particular reference to industrial, public utility and power plants, steam and street railroads, docks, steamship and railway terminal facilities, subways, tunnels, hydroelectric and irrigation projects. In effect this means the continuance in corporate form of construction work which heretofore has been handled by the firm direct.

The corporation's organization comprises men skilled and experienced in engineering and contracting work by the most modern and economical methods. It is provided with ample capital to insure the successful completion of any work which it may undertake, and starts business with important work already entrusted to it. Its headquarters are at 115 Broadway, New York, with offices at New Orleans and San Francisco.

The facilities available to the new corporation from the firm of Ford, Bacon & Davis, now in its twenty-fourth year, which continues as heretofore, assure a continuance of this firm's standard of both engineering and construction efficiency and enable both design and construction to be carried on with a degree of co-ordination which should make for economy.

Prices Thought to Be at Peak

The Government's Action in the Matter of Price Fixing Is the Controlling Factor

While a few spasmodic increases in price are surely to be expected during the coming year, all present signs point to lower prices generally at the opening of 1919 than were in force at the opening of the current year. The action of the government in the matter of price fixing is held as the controlling factor.

The government price of 23½ cents for copper is undoubtedly being reflected in the readjustment of copper wire prices now taking place. In the past few months wire base has dropped from 36 to 30 cents and there are no indications that lower levels may not be reached. In fact, certain producers are already quoting lower.

At the same time brass is following the wire market. The government price did not immediately cause the brass price to break any more than it did wire base. As higher price stock, however, was used up and lower-priced material purchased prices were readjusted. Finished brass products have not yet responded to this situation in any noticeable degree.

In iron and steel the government has continued the prices now in effect until March 31, when a further readjustment may take place. In other commodities it has been expected the government may establish standard prices.

The natural result, of course, is to reduce the tendency toward higher prices, for there is no doubt but that in certain instances higher prices were quoted with no other justification than that they could be obtained.

The trade generally, therefore, is of the opinion that prices are now at a peak. Copper wire, which in normal times is considered to be a good market barometer for prices, is still expected to stick to its reputation to a certain degree.

New Service Station for Wagner Company

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the opening of a service station in Seattle, Wash., to take care of service in the State of Washington and the Northwest.

RAILWAY MATERIALS PRICES

	Jan 9	Jan. 16
Rubber-covered wire base, New York, cents per lb.	30	30
Wire, weatherproof (100 lb. lots), cents per lb., New York	34½-35¼	28¼-34¼
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38-38.35	33½-38.35
Rails, heavy, Bessemer, Pittsburgh	$38.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$40.00	$57.50
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl	$2.22	$2.22
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.63	$2.63
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.29	$1.29
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.30	$1.20
White lead (100 lb. keg), New York, cents per gal.	10	10
Turpentine (bbl. lots), New York, cents per gal.	48	48½

NEW YORK METAL MARKET PRICES

	Jan. 9	Jan 16
Copper, ingot, cents per lb	23½	23½
Electrolytic, cents per lb	23½	23½
Lead, cents per lb	6½	7
Nickel, cents per lb	50	50
Spelter, cents per lb	7.87½	8
Tin, Straits, cents per lb	85.00	85.00
Aluminum, 98 to 99 per cent, cents per lb	36	35-37

OLD METAL PRICES—NEW YORK

	Jan. 9	Jan 16
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	14¼	13½
Lead, heavy, cents per lb	5¾	5¾
Zinc, cents per lb	5¼	5½
Steel car axles, Chicago, per net ton	$43.42	$42.42
Old carwheels, Chicago, per gross ton	$35.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$33.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.50	$17.50

Rolling Stock

Tidewater Southern Railway Company, Stockton, Cal., is having constructed at its shops an all-steel gasoline motor car for service between Stockton and Modest. It is expected to be ready Jan. 20. The car will carry forty-four seated passengers. There is a ladies' compartment and a smoker in opposite ends of the car in addition to the main body of the car. It will weigh ten tons when fully equipped, is capable of making a speed of fifty miles an hour with a 90 hp. engine. The total cost is about $7,000. If successful this type of car will displace the old equipment.

Trade Notes

Meyer Safety Guard Company, Omaha, Neb., has removed its offices to 314 Brown Block.

John D. Stout has been appointed Chicago representative for the Terry Steam Turbine Company, Hartford, Conn. Mr. Stout was formerly assistant engineer of the Terry company, and was recently transferred from the New York office, where he was assistant manager.

American Car & Foundry Company, St. Louis, Mo., on Jan. 2 removed its purchasing and auditing departments to New York, where the main offices are located. About 100 employees of the two departments, with the office records and furniture, went east on a special train.

P. C. Gunion has just been made advertising manager of the industrial bearings division of the Hyatt Roller Bearing Company, Newark, N. J. He has been in the sales department of the Hyatt Company for two years. Previous to his recent appointment he was manager of the Pittsburgh office.

Holden & White, Inc., Chicago, Ill., has received from the Philadelphia (Pa.) Rapid Transit Company the largest order for brake slack adjusters ever recorded. This order is for 4298 Anderson slack adjusters, a complete equipment for all double-truck cars operated by the Philadelphia company. These adjusters are being shipped at present to Philadelphia, and are being installed as rapidly as possible.

Hess Bright Company, Philadelphia, Pa., has closed its retail office at 934 North Broad Street, owing to the enlistment of Rush S. Whiteside, the local manager, and G. L. Jenks, his assistant, in the aviation section of the United States Army. The Ahlberg Bearing Company of Chicago will open a branch house at the same address, and will represent the Hess Bright Company as local distributers for the retail trade.

George S. Thompson, representative in Paris, France, of the Vulcan Steel Products Company, New York, N. Y., was recently appointed to the purchasing board of the American Expeditionary Forces in France. Mr. Thompson has been assigned particularly to the handling of steel matters. This board is composed of American civilians living in France, and its duties consist of passing upon all purchases made in Europe by the American army.

L. E. Van Norman, chief of the division of information, Washington, D. C., has compiled a war trade manual for shippers. Since some of the data in the "Rules and Regulations of the War Trade Board," which has been distributed very widely throughout the country, have now been superseded by new rulings and lists, the division of information of the board is preparing a "War Trade Board Manual for Shippers," which will contain only data in force at the time of its publication. Copies may be had by writing.

Thodarson Electric Manufacturing Company, Chicago, Ill., has recently undergone a reorganization in all departments. A. S. Lindstrom is now general manager, A. Johnson is the new sales manager, C. B. Olson is purchasing agent and C. R. Oschgar is production manager. The company has also appointed Mr. Alumbough as central Western representative and Mr. Gibson as Eastern representative. W. I. Otis and the Western Engineering Sales Company continue to represent the Thordarson company on the Pacific Coast.

Milton Rupert was recently elected vice-president and assistant treasurer of the R. D. Nuttall Company of Pittsburgh, Pa., manufacturer of gears, pinions and trolleys. Mr. Rupert has been with the Nuttall Company since March 4, 1893, holding various positions. In 1903 he was appointed head of the general offices, being directly in touch with all office matters and also manufacturing operations. During the latter part of this period Mr. Rupert was assistant to the president and general manager. In his new position Mr. Rupert will have charge of sales and manufacturing activities.

Hale & Kilburn Company, New York, N. Y., is making arrangements to reorganize on a plan submitted by the committee having it in charge. They have agreed on the major terms, and Jan. 16 was settled upon as the last day when stock may be deposited under the agreement. It is proposed to form a new company with $4,000,000 preferred stock, which will be exchanged for the old preferred on the basis of $66 2/3 new for each $100 of old stock. Present common stock owners will have the privilege of exchanging their shares for new common on the basis of $25 new for $100 old common. The plan calls for the sale of $1,000,000 6 per cent serial gold notes, the first lot of $100,000 maturing July 1, 1922. The notes are to be offered for subscription by stockholders at 95, with a bonus of new common stock equal at par with the principal of the notes. It is proposed to trustee all the new stock for five years.

Chicago Fuse Manufacturing Company, Chicago, Ill., announces that it has purchased the entire renewable-fuse business of the Multi Refillable Fuse Company, makers of the well-known line of multi-refillable fuses. This transaction includes the conveyance of all merchandise, materials, machinery, tools, designs, patents, good will and unfilled orders, and hereafter these fuses will be manufactured and marketed solely by the Chicago Fuse Manufacturing Company under its trade name "Union." The Chicago Fuse Manufacturing Company will still continue with its line of non-refillable fuses, thereby being in a position to furnish either type of fuse as desired by the trade.

New Advertising Literature

Manistee Iron Works, Manistee, Mich.: Bulletin No. 53 is descriptive of its single-stage centrifugal pumps.

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletin No. 230 lists and briefly describes various articles, machines, etc., in which it specializes. Copies may be had by writing.

War Trade Board, Washington, D. C.: Is ready to distribute bulletin No. 1, entitled "Trading with the Enemy." The pamphlet includes the full text of the Act of Congress prohibiting American manufacturers and merchants, under penalties, from "trading with the enemy, or ally of enemy, without first obtaining a license from the War Trade Board." Besides notes on the enemy trading list a complete index of the names by countries is also supplied.

Carnegie Steel Company, Pittsburgh, Pa.: In the form of a letter from a retired steel man to a friend, which is embodied in an illustrated pamphlet entitled "My Dear Jim," the Carnegie Steel Company of Pittsburgh, Pa., has printed a description, in non-technical language, of its chief products. Not only is the vast plant's long list of products dealt with in an interesting manner by the writer of this admirable compilation, but the personnel and development of the great business is also touched upon in the same easy-going style. Copies may be had on application.

Merchants' Association, New York, N. Y.: A valuable summary of the readjustments made by English manufacturers on account of the war, as explained in the conferences between American manufacturers and a commission sent to this country by the British Ministry of Munitions. No publicity as to what took place at these conferences, which in this city were held at the headquarters of the Merchants' Association, was permitted until after the British commission had concluded its work. The discussions at the conferences are of great interest and importance to all American manufacturers, whether they are engaged in the production of war material or not.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, January 26, 1918 *Number 4*

This, if It Exists, Is a Baseless Fear

ELECTRIC railway equipment and operation are not perfect, and never will be for that matter. Improvement is always possible and ought to be, for the general good. And the best way to improve is to discuss shortcomings and methods of removing them. In some quarters there seems to exist a fear that if the electric railway's limitations are "aired" and discussed, such discussion will act as a boomerang when justice at the hands of the public is requested. In other words, the idea is that the commissions will refuse the boon of higher fares and relief from unjust burdens until the railways can show that their operation is perfect and their managers are altogether omniscient. Now the whole theory of regulation is based upon the supposition that the commissions know all of the facts, pro and con. If they do not get the operating limitations of the electric railways from the latter, who understand these limitations, they will get the information in roundabout ways, and possibly in distorted form. Any suggestion that is constructive and practical should be freely and openly discussed, as also should every advance in electric railway design, construction and operation.

Why Water Power Is Not More Extensively Used in This Country

IN THESE strenuous days of fuel shortage the problem of effectively using our enormous water-power resources naturally becomes more than usually a live one. The perennial nature of this power makes it especially attractive because we all realize that, once exhausted, our coal and oil resources can never be replaced. Viewed in the abstract it would appear to be only ordinary common-sense to use the water and make the coal and oil last as long as possible. In the concrete, however, this does not work out as an economic possibility, certainly not under present restrictions as to the use of government-controlled water powers.

Some water power is used in supplying electric energy on electric railways, from 10 to 15 per cent of the total generating capacity being in water turbines. Electric railway companies also purchase water-generated energy to a considerable extent. Railway managers should therefore be familiar with the technical and statutory limitations which handicap water power in competition with steam. These are clearly set forth in a report just presented by Calvert Townley, as the representative of the Engineering Council, to the United States Chamber of Commerce, and abstracted in the present issue of the JOURNAL.

The fact is that, considering the inherent inferiority of water power, the great cost of utilizing it (including the necessary provision of a steam reserve), and the remarkable advances made in the art of producing energy from steam, the latter is in general the cheaper power. No unnecessary restrictions should, therefore, be permitted to hamper the application of water power in such fields as are open to it. Mr. Townley's report, while condensed, is an admirable and readable presentation of a vital subject which is ordinarily enshrouded in verbiage or fenced in with technical formulas.

Five Cents No Longer Pays for Chicago Elevated Ride

THE first mention in Chicago of a plan to appeal to the State utilities commission for additional revenue for the elevated roads has stirred up a whirlwind of opposition. The people of the country's second largest city have not yet awakened to the fact that times have changed and that other state commissions have been trying to put public utilities on a paying basis. President Budd of the Elevated says in a public statement: "You have grown so accustomed to being carried all over town for a nickel that you never gave a thought to whether you were being carried for less than cost."

This is a rude awakening for Chicago's 2,500,000 people. They have become used to advanced prices on everything else. They know the nickel is not as big as it used to be for purchasing any commodity or even for steam road travel. But they have been raised on a bottle labeled "One city—One fare—Five cents," and they believe their growth will be stunted if that label is changed. That same bottle was used in 1860 when the first car lines were built and the city's area was only 20 square miles. It is still being used when the city has developed into an infant spread over 200 square miles. These people have heard with pride from an expert traction commission that the average length of journey is greater than that of other cities. They boast that it is possible to ride some twenty miles on the elevated or thirty-three miles on the surface lines for a nickel with transfers. What a shock therefore to be told that they have been getting more than their money's worth!

Action on the proposed petition of the elevated roads will be awaited with interest. The Illinois State commission will have a chance to show whether it measures up to the standard of other state bodies which have acted without fear of popular clamor. Already the Illinois commissioners have given limited relief to certain roads, but it remains to be seen whether the "one city—one fare" fetish is held too sacred to be broken in the case of Chicago. The elevated roads are in a different position from the surface lines. They are organized under the "steam road act," which does not have a twenty-year limit for franchises. The surface lines have ordinances which expire in 1927. Both surface and elevated roads have offered to surrender their present franchises on a basis which will permit of their consolidation.

The proposed plan involves a "new deal" with a protected rate of return in accordance with the principles of modern partnership agreements. However, the working out of a settlement on this basis is still remote, and in the meantime it is not surprising that President Budd has given notice that some relief must be had at once if the people are to have efficient service and the stockholders are to receive a return on their investment which they have not been able to obtain for some years.

The Cities Desire Regulation by Confiscation

THE politicians in charge of the affairs of the municipalities in the State of New York have boasted that they would not abide by the decisions of the Second District Public Service Commission in the 6-cent fare cases, but would undertake political reprisals. The first step in this direction is the introduction in the Senate of two bills which would work a radical revision in the public service commission law. In these, Senator G. F. Thompson revives the old proposal to have only one commission for the State, but he has added the provision that the chairman shall be elected by popular vote. The animosity of the associated city attorneys is thus clearly evident. The cities want a commission that will fix rates regardless of justice and reasonableness. They desire a presiding officer who will consider the political consequences of his every utterance rather than enforce the law as he finds it.

The worst feature of Senator Thompson's bill, however, concerns the proposed restriction of the rate-making power of the commission. The law which he proposes would contain these retrogressive clauses: "Nothing in this chapter contained shall be deemed to permit the commission or any court to increase any rate which has been heretofore, or may be hereafter, authorized by statute; nor shall anything in this chapter contained be construed to permit the commission, or any court, to make a determination or decision that the rates established in, or as the consideration for, the grant to any public service company of any charter, franchise or privilege are unjust, unreasonable, unjustly discriminatory or unduly preferential."

Such legislation would be expected from a Bolshevik party intent upon the destruction of property. The certainty that the right of the courts to examine statutory rates for confiscatory features cannot be impaired; the fact that rates fixed by franchises make no allowance for future development, or even existence under increasing burdens; the fact that the proposed law would mean a total paralysis of utilities—these are matters of no concern to the cities' representatives.

The passage of such a bill would mean a decade or more of poor service in the State of New York. It is hardly conceivable that the people will sit quiet while false friends inflict such an incalculable injury upon them. It is the duty of every public-spirited citizen to be alert to block such legislation and to disseminate as widely as possible information concerning the lamentable shortsightedness of such proposals.

A Reaction in Electric Railway Affairs Is Due Soon

SOME diagrams of the present economic status of the electric railway, printed elsewhere in this issue, might discourage even those inclined to be most optimistic if considered, without reference to the wider outlook, as reflecting a permanent condition. No doubt the industry is having "hard sledding" during these war days in which many industries are prospering hugely. No doubt, again, it is almost impossible to get new money for necessary improvements and to earn money enough to keep property in repair. But granting that the business is essentially sound, and that a vital service is supplied by the electric railway, there is just cause for an expectation of a turn in the tide.

There is a law of nature which requires that every force shall produce a reaction. For example, we start a car, and its inertia imposes a reactive force which requires power to overcome. The same inertia is the cause of resistance to stopping when the brakes are applied. The present low ebb in electric railway affairs, aside from the transient effect of the war, is due to two things. First, the public has expected too much in return for what it has been willing to allow. Second, railway transportation is not up with the times.

The reaction against the present conditions will correspondingly appear, it is in fact already beginning to appear, in two ways. On one hand burdens will be lightened and fare limits raised; on the other the lessons taught by the jitney and the private automobile will be applied in the furnishing of better transportation. The men who are laboring intelligently to bring about these changed conditions see a bright future for the industry. The pessimists are those who either are doing nothing constructive, or have failed to look at the matter in a large way.

Philadelphia Lease Lays Good Basis for Future

PERHAPS Philadelphia is slow. Sometimes, however, slowness is simply the result of deliberation, of hunting for the right, of trying to use all the foresight possible. That seems to be the case in connection with the new rapid transit agreement, just approved by Councils, signed by the Mayor and now awaiting the signature of the Philadelphia Rapid Transit Company. After a long period an unusually flexible plan has been evolved for unified operation of city and company lines.

The foresight shown in preparing the lease is evident from a glance at the underlying principles. These are that such unified service as the people desire should be furnished at minimum cost; that the cost of that service should be supplied by the users, and that the authority of the Public Service Commission to regulate service and fares should be fully recognized. To put it another way, the fundamental idea is to secure and maintain the desired service, and to make the fare fit the service. Philadelphia thus desires to avoid the economic error, prevalent in the past, of imposing burdens which may later become unbearable under fixed fare and operating regulations. The Philadelphia lease is in accord with modern ideas and the joint interests of all parties in transportation development.

The lease provides, of course, for ultimate recapture if the city so desires. Other detailed provisions also deserve mention. The use of a Supervising Board is not novel, but it is rather unusual to have its place in the general regulatory scheme defined with such an exact recognition of the larger interests involved. This board, for example, will have no power to alter, postpone or delay the building or operation of any line desired by Councils. Furthermore, it must not usurp any power vested in the Public Service Commission. It is expected that matters relative to maintenance and service will be heard more expeditiously by the board than by original application to the commission, but appeals can be made to the latter body or applications made directly to it on matters where it has jurisdiction. This seems a proper definition of powers for a local body of experts under state regulation.

In regard to the flexible fare and the position of the return to the company the Philadelphia lease makes a marked departure from preceding partnership agreements. The basic ideas of the others have been the maintenance of a 5-cent fare, the protection of the return on the company's old investment by means of preferentials, and the meeting of deficits in the city's return by taxation. This question of the division of the financial risk was debated long in Philadelphia. In December, 1916, the company submitted a proposal for a guaranteed 5 per cent return on its stock with a further share in surplus earnings, all future risks being substantially assumed by the city. In the following August representatives of the city and the company reached an agreement under which the company assumed the risks, its return being dependent upon action by the Public Service Commission as to rates of fare. The city representatives agreed that a dividend of 4 per cent would be reasonable, and that the city would join with the company in an appeal for a fare increase if the rate of return on stock fell below this percentage. Under the present lease, however, the business risk is shared alike by the city and the company (*i. e.*, in proportion to their investments), and the latter's dividend is limited to 5 per cent.

This division of risk, of course, is permissible only because of the protection afforded to the company's return by the adjustable fare. Under a carefully worked-out plan, the Supervising Board must under certain conditions file a new schedule of "fares and charges" with the Public Service Commission. Although the lease is not explicit on the point, we assume that such terminology would permit a zone system if this were desired. While it is stipulated that the rates must always be sufficient to meet the requirements of the lease, the final approval is left where it belongs—with the commission. Whether the rates are revised upward or downward, however, the city must share the results equally with the company. Thus, although the equal division of the business risk is a novel provision, it seems to be so arranged for as to insure co-operation between city and company in securing rate adjustments.

While, as stated above, the lease contemplates that the car-rider will pay for the service, the future of this point is not fixed. A definite provision is inserted to enable the municipality at its option to reduce the fare requirements by relinquishing, to the amount and the length of time desired, the rental for the city-owned high-speed lines. This again is a clause written for the future. Preceding partnership agreements have generally recognized that rapid-transit development is a civic improvement that is bound to result in early years in deficits which the taxpayer and not the car-rider should pay. The Philadelphia negotiations have begun with the assumption that the car-rider will be able, perhaps with fare adjustments, to carry the burden. If not, the way to overcome the difficulty is open. Only the future can determine what the taxpayer will be called upon to meet. The experiment, however, will be useful in giving some indication of what the car-rider is capable of financing.

The prime requisite of a good partnership agreement is that it shall be fair in abnormal as well as normal times. This the Philadelphia lease seems to have secured. Over a long period of time—until 1957—it permits a reasonable adjustment of service and fare, and a comprehensive transit development. It represents a great advance in constructive and far-visioned franchise drafting.

A Rail-Wear Test of Unexpectedly Long Duration

THERE seems to be an increasing sentiment among many engineers in favor of adopting the tram girder rail under certain circumstances when the uses of the preferred T-rail is not permitted. The subject has been under discussion in these columns for some weeks past and is still open for discussion. As a result of the discussion to date we suggest that the Engineering Association committees on way matters and standards consider the inclusion of a tram rail section among the standards when next the *Engineering Manual* is revised.

The fact that under changed conditions of street traffic the tram rail is coming back into its own renders even more interesting than it otherwise would be the article on "An Experimental Study of Rail Wear" which R. C. Cram has prepared for this issue of the JOURNAL. The rails covered by this study were tram rails. They were laid more than twenty years ago, and still have some life in them in spite of the fact that nearly 10,000,000 car wheels have passed over them. It is not often that engineers have opportunity to continue a test for more than two decades. The circumstances which made such a long test possible in this case were accidental, but by following up such clues as remained Mr. Cram was able to make at least partial scientific use of them. By so doing he has considerably increased the value of A. J. Moxham's famous A. S. R. A. paper on "Rails—Their Construction from a Scientific Standpoint," read in 1898.

When Mr. Moxham read his paper nearly twenty years ago he believed that the life of rail was determined by the joints. At that date the welded joint was new and joint design generally was in a primitive state. Since then much progress has been made in mechanical as well as welded joints, and this progress still continues. In fact, there has never been a time when the importance of keeping the track in the best possible repair was so keenly appreciated as now, when it is almost impossible to buy new rails and the old must be made to do. Broadly speaking, then, it can hardly be said in these days that rail life is determined by the joints, providing suitable joints are employed.

An Early Experimental Study of Rail Wear

First Use of Electric Weld Joints—Original Experiment Brought Down to Date—Abstract of Paper on Original Study on This Subject

BY R. C. CRAM
Assistant Engineer Way and Structure Department
Brooklyn Rapid Transit System

THE subject of rail wear and its relation to the composition of the steel in the rail has had considerable attention in the last few years, partly through the discussion which has led to the general adoption of high carbon open-hearth steel for rails and standard specifications therefor, and partly through the study of rail designs by the American Electric Railway Engineering Association. Added interest has also been created through the study of corrugation and curved-head rail design. All this recent attention to the subject of rails has led us to the belief that the study of rails and rail wear, at least as it concerns electric railways, is quite modern and up to date, but it may cause some surprise to many to learn that this subject was one of much importance to street railway men even at a time when the electric railway was in its infancy, some twenty-two years ago.

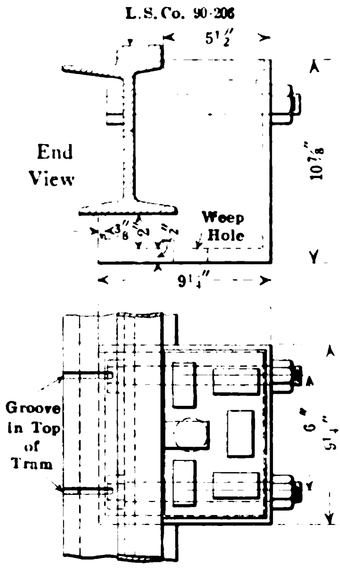


FIG. 1—DETAILS OF BOX FOR USE IN MAKING RAIL MEASUREMENTS

The details of what is thought to be the earliest experiment ever made to obtain data on rail wear came to light this fall when the tracks of the old Nassau Electric Railroad in South Eighth Street, Brooklyn, were opened for the purposes of overhaul and repavement. Upon examining the tracks carefully, preparatory to starting work, attention was called to a number of cast-iron boxes having removable covers and somewhat similar to boxes now used for protecting heel-tightening devices at switches. (See Figs. 1, 2 and 4.) They were attached to the outsides of the rails of one track and located at fairly regular intervals. Inquiry among those long in the track division service failed to elicit information as to their purpose, but there was an impression that they had been installed for some experimental purpose by the late Tom Johnson, who was interested in both the Nassau Company and the Johnson Company (now the Lorain Steel Company).

A sketch of the boxes was prepared and sent to the Lorain Steel Company with a request for information, with the result that the details and a very interesting report on a rail wear experiment made over the period from 1895 to 1898 came to light again. The steel company forwarded a copy of a paper on "Rails: Their Construction from a Scientific Standpoint," by A. J. Moxham, read before the American Street Railway Association at its seventeenth annual meeting in Boston in 1898, together with blueprints of the box design and also a special steel micrometer-caliper measuring instrument (see Fig. 3) which had been made especially for the experiment by Brown & Sharpe. The accompanying correspondence indicated that the boxes had been installed as a part of the arrangements made by Mr. Moxham to obtain data relating to rail wear on special test rails, and that the data thus obtained formed the basis of the paper above mentioned.

A little later the chief engineer of the Lorain Steel Company, E. B. Entwisle, and the writer went to South Eighth Street, taking along the instrument with the intention of trying to get new measurements, but it was found impracticable to obtain them as was originally done because of the corrosion of the rail bases. The former measurements had been over-all height measurements, and it was evident that no results even reasonably accurate could now be had. However, a section of one of the rails was cut out, scribings were made from it and impressions were taken of others. These have been plotted over drawings of the original sections.

The paper read by Mr. Moxham does not state the rail sections used, although their heights are given. Neither does it give the relative position of the rails; but the box design, checked against street conditions, indicated two of the sections and the fact that only one half-groove rail was found led to the identification of the third rail section as well as to a reasonably safe conclusion as to their relative position. The two principal sections were L. S. Co. 85-268, 7 3/16-in. and 90-206, 8 25/32-in. tram girder rail. The third section was P. S. Co. 90½-222, half-groove girder. There were two of the latter originally installed while but one now remains in service.

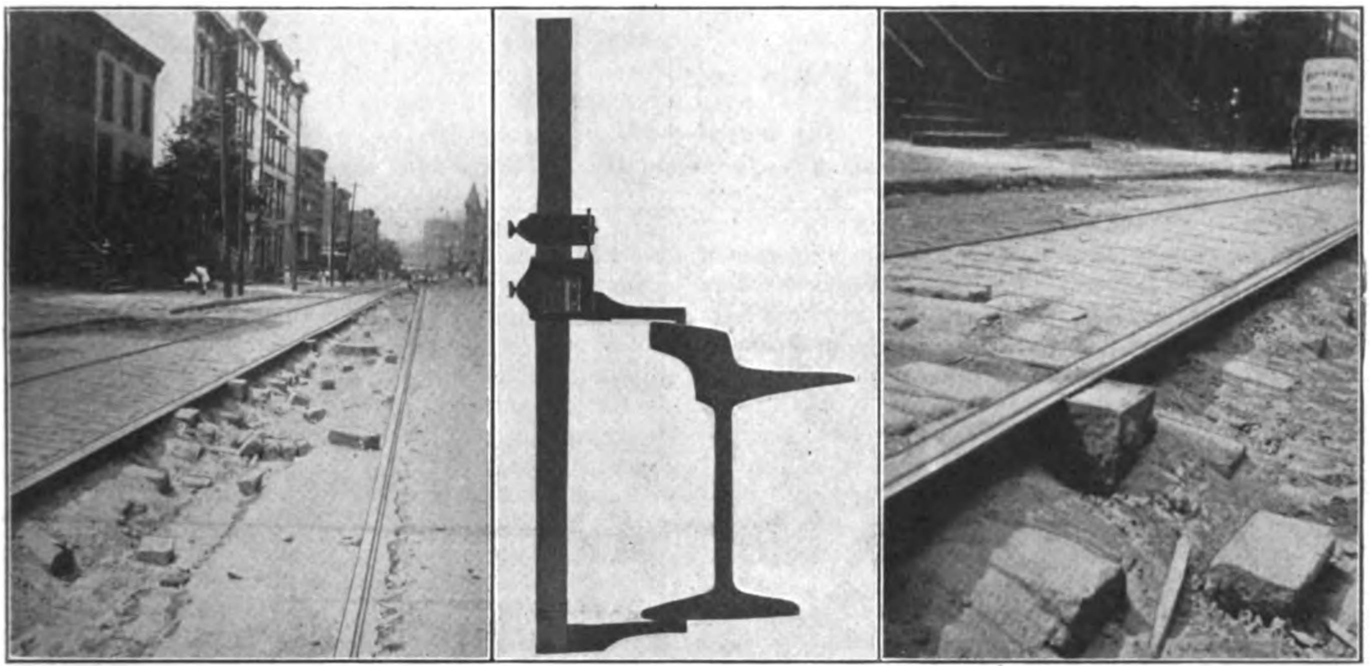
The head wear in cross-section to date on the three sections is approximately as follows:

Section	Height	Original Head Area, Sq. In.	Amount Worn Sq. In.	Per Cent Worn
85 -268......	7 3/16 in.	1.88	0.56	29
90 -206......	8 25/32 in.	2.05	0.58	28
90½-222......	8 25/32 in.	2.05	0.56	27

The original head areas include only the areas above a line connecting the top of the tram with the under side of the back of the head, thus excluding wear on trams. The maximum vertical wear at a point ¼ in. back from the original gage line on all three rails was found to have been substantially at the rate of 1/64 in. per year.

Accurate statements of the car traffic sustained during this time are not available. It is known that the two-minute headway which obtained during the three years of the experiment was probably continued until about 1904, when it became somewhat less due to rerouting of cars caused by the opening of the Williamsburg Bridge. It is estimated that at least 9,631,000 wheels have passed over each of the rails if a four-minute headway of eight-wheel cars be assumed for twenty hours per day.

It will be of interest to state that we left the 9-in. rails in place, as they should last more than five years longer. The 7-in. rails having a base originally 4 in. wide had to be removed, not because of head wear or joint conditions, but because the base was so badly corroded, particularly on the gage side, as to prevent respiking. On that side the base was of less width than on the head side, the rails having been designed primarily for use on cable roads whose special yoke construction required the eccentric base. It is also to be noted that the 7-in. rail section 85-268 had a curved head originally.



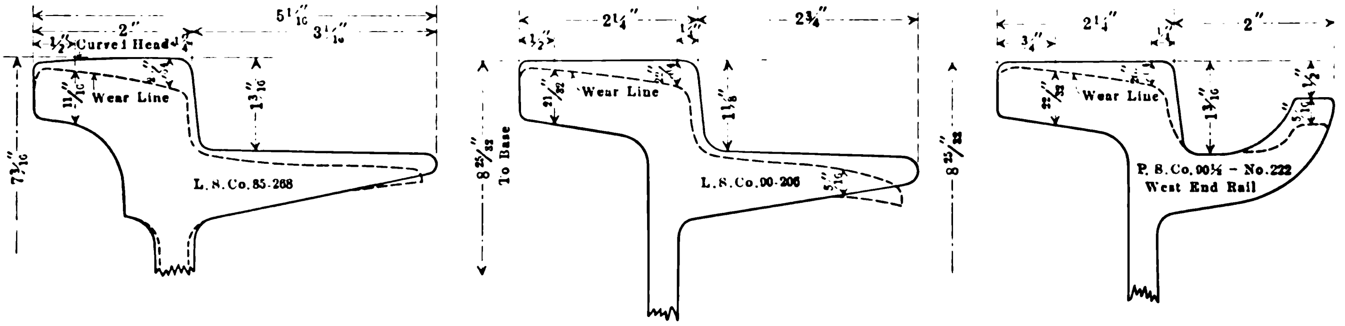
FIGS. 2 AND 4—RAIL MEASUREMENT BOXES IN PLACE; FIG. 3—MICROMETER CALIPER FOR USE IN MAKING RAIL MEASUREMENTS

As a matter of some historical interest it is worth recording that the tracks in South Eighth Street were found to have electrically welded joints of the "bar-weld" type which were installed by the Lorain Steel Company in 1898, three years after the rails were laid. When first put down, the regular bolted joints had been used. The steel company advises that this was the first practical application of its "bar-weld" process, using pressed steel bars having raised bosses, and that the only substantial changes since made in the process have covered the use of the new shape of bar providing head support directly at the joint and the increase of the time the bars are held under pressure from one and one-half to two minutes then used to four or five minutes now considered essential. The major portion of these joints are still good and were left undisturbed. A fair idea of their present condition may be gained from Fig. 9, on page 171.

Mr. Moxham's paper on "Rails" previously referred to was an important contribution to the sum of our knowledge on the subject and parts will bear repetition here, as many of his observations and conclusions then reached are quite as pertinent to-day. Following is a general description of the object of the experiment and the plan for obtaining rail-wear measurements.

> The experiments have lasted for three years. The first endeavor was to take broadly a "soft" steel and a "hard" steel for the rails to be tested, securing the difference by carbon alone, leaving all other ingredients as nearly as possible the same. The experiment with these started in October, 1895, and has been continuous ever since. In June, 1896, additional rails were added to the experiment, supplied by the West End Street Railway Company of Boston, which at that time had determined (with wisdom, as will be seen subsequently) upon a steel both hard and ductile. The conclusions, therefore, are based upon what may be termed soft, hard, and hard and ductile steels.
>
> The rails (some thirty-three in all) were laid in the South Eighth Street tracks of the Nassau Electric Railroad of Brooklyn. They were laid continuously, so that the same car is obliged to pass over every rail, and therefore each rail is subject to the same wear, and the wear on the head only is considered. Street traffic is ignored. The point was selected as one that would give great wear in a short time, in order to reach early conclusions, as the cars pass this point at extremely short intervals.
>
> Every rail has been measured at two points, taken about 10 ft. from each end, in order to eliminate the special wear at the joints. Each rail has two cast-iron boxes bolted to the outside, at the points to be measured, to permit access for purpose of measurement without disturbing the roadbed. Originally the wear was registered both by actual measurement and by taking an impression of the head of the rail by means of type-metal castings. Two slots were provided in the tram of the rail to guide the type-metal mold. Notwithstanding the great care that was exercised in taking the impressions, this method of measurement was quickly given up as the results were far from being as accurate as those taken by micrometer calipers. With these calipers, measurements of each rail are taken at three points across the head of the rail; No. 1 being at a point near the gage line, No. 2 being nearly in the center of the head, and No. 3 being nearer the outside of the head. Speaking accurately, No. 1 is 2 in., No. 2 is 1⅝ in. and No. 3 is ⅞ in., all from the outside of a head 2¼ in. wide. Methods were adopted for accurately locating the same line, so that the comparisons in the different measurements of wear are to be relied upon.

The paper then states that "soft" rails having low carbon, 0.28 per cent, and "hard" rails containing what was then considered high carbon, namely 0.59 per cent, were used, and that an effort was made in their manufacture to keep the other ingredients exactly the same so that any difference between the two classes of steel as far as chemical differences were concerned could safely be laid to the carbon. Careful comparisons were also made covering specific gravity and physical tests both in tension and compression. After the experiment had proceeded about a year, a third class of rails was added. These were furnished by the West End Street Railway of Boston and had been made to its specification. They had practically the same carbon content as the "hard" rails but with silicon considerably higher. Phosphorus was lower and manganese higher than in the "hard" rails. The object of the West End company was to combine hardness with ductility.



FIGS. 5, 6 AND 7—TRAM AND GROOVED GIRDER RAIL SECTIONS, NEW AND AFTER MORE THAN TWENTY YEARS' WEAR

Table I gives the averages of the physical tests as they appear in the paper. In commenting on these tests Mr. Moxham says in regard to specific gravity: "It will be found a law that where specific gravity is referred arbitrarily to the iron and the metalloids deducted, the specific gravity will tally closely with what is to be expected from the actual use of the metal, . . . and it is interesting to note the very close relation of this arbitrary specific gravity to the relative wear shown in the test. . . . The analysis shows that what is needed is the densest steel." Referring to ultimate strength in tension, he notes that this closely follows the determined wear, but that the elastic limit in tension does not, the indication being that having reached a given amount of hardness and consequently strength, the more ductile rail will give better wear. In commenting on the elastic limit in compression, he notes that "while it would appear that the rail compressed the least would wear longest, where the difference in compression is indicative of greater elasticity without sacrifice of ultimate strength, it is within reason to the good."

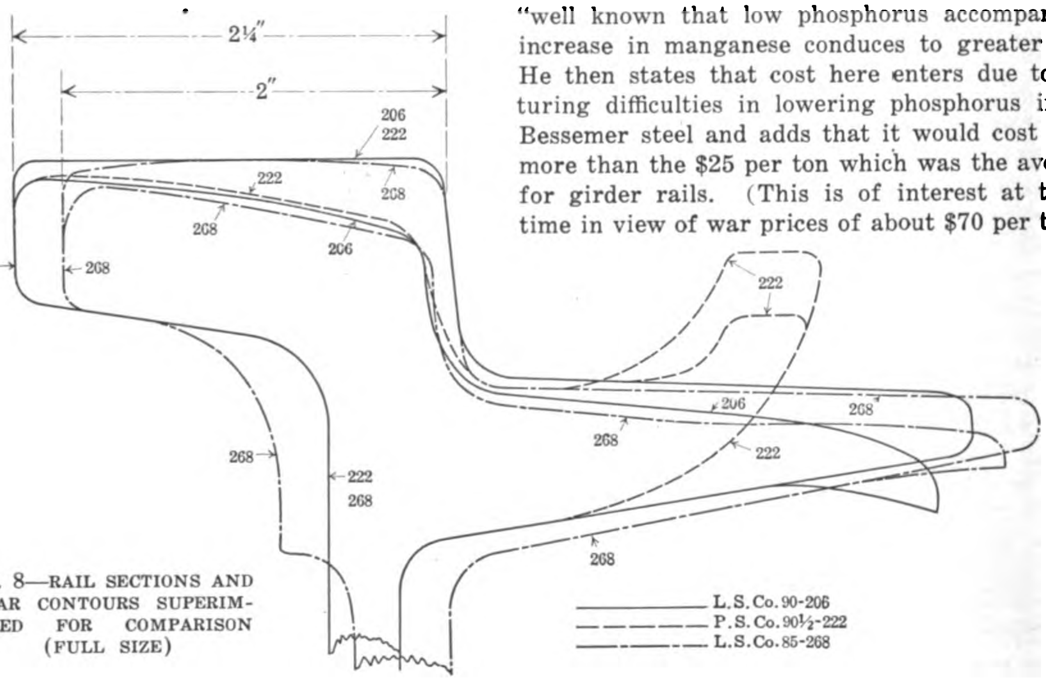


FIG. 8—RAIL SECTIONS AND WEAR CONTOURS SUPERIMPOSED FOR COMPARISON (FULL SIZE)

In speaking of chemical compositions, he notes that "the greater durability of the hard rail as compared with the soft, speaks for higher carbon," and that carbon is practically the same in the West End rail as in the hard rail, the real point of difference here being in lower phosphorus and higher manganese, it being "well known that low phosphorus accompanied by an increase in manganese conduces to greater ductility." He then states that cost here enters due to manufacturing difficulties in lowering phosphorus in standard Bessemer steel and adds that it would cost $2 per ton more than the $25 per ton which was the average price for girder rails. (This is of interest at the present time in view of war prices of about $70 per ton with no delivery promise.) The low phosphorus question is now apparently well settled in present practice, due to the use of open-hearth steel, and it is also to be noted that present specifications generally ignore sulphur, probably because it runs under 0.05 per cent in basic open-hearth pig iron.

TABLE I—AVERAGES OF TESTS OF RAIL STEEL TAKEN FROM MR. MOXHAM'S PAPER OF 1898

Specific Gravity at 60 Deg. F.	Tension Test: Elastic Limit Lb. per Sq. in.	Tension Test: Ultimate Strength Lb. per Sq. in.	Tension Test: Elong. in 8 in.—per cent	Tension Test: Reduction of Area—per cent	Compression Test: Elastic limit—Lb. per Sq. in.	Compression Test: Modulus of Elasticity	Class of Steel	Specific Gravity, Iron only, deducting "Metalloids"
7.855	45730	75860	24.3	51.6	35,000	30,000,000	Soft	7.958
7.841	62500	118100	11.9	18.4	50,300	31,900,000	Hard	7.971
7.825	53160	121380	11.5	20.0	47,100	28,100,000	Hard & Ductile	7.977

TABLE II—AVERAGES OF CHEMICAL ANALYSES FROM MR. MOXHAM'S PAPER, COMPARED WITH AM. EL. RY. ASSO. STD. CLASS B.

	Soft	Hard	Hard & Ductile	Analysis suggested by Mr. Moxham	Am. El. Ry. Asso. Std.—1913 Spec.
Carbon	0.280	0.590	0.570	0.550	0.70—0.85
Silicon	0.026	0.056	0.234	0.100 or under	0.20 not over
Phosphorus	0.106	0.097	0.050	0.080 or under	0.04 not over
Sulphur	0.066	0.059	0.078	0.060 or under	Not Stated
Manganese	0.790	0.830	0.980	0.830 or over, not to exceed 1.00	0.60—0.90
	1.268	1.632	1.912		
Iron	98.732	98.368	98.088		
	100.000	100.000	100.000		

Table II gives a comparison of the chemical analyses of the test rails as well as an analysis suggested by Mr. Moxham and the analysis now given in the American Electric Railway Engineering Association standard specification for open-hearth girder rails, Class B.

Mr. Moxham closes his paper with some quite prophetic comments upon the rail joint question and four conclusions, saying:

> During later years we have heard less of this joint question, for as compared with earlier joints (of the bolted type) the track is comparatively smooth. Nevertheless, the evil still exists, and a few years from now (1898) those who are to-day deluding themselves in the belief that they have a long life for their existing tracks will awake to find out that even the construction of to-day is wasteful and extravagant in this respect. The joint which is accepted now as being passably fair is reducing the life of the rail to one-half or perhaps even one-third of what it should be.
>
> The conclusions we are led to seem to me to be as follows: 1. That for street railway use a "hard" rail will give the best results. 2. That the most economical way to secure this hardness is by increase of carbon, accepting the manufacturers' standard specifications for the other ingredients. 3. That the next step should be toward an improvement of the joints.
>
> As is well known, the writer has pinned his faith to the electrically welded joint as settling the question once for all by making the union homogeneous with the rail and possessing an advantage from an electrical standpoint in the matter of conductivity. Nevertheless, the cast-welded method also demands careful consideration. It is certainly preferable to anything in the nature of splice bars that we know of, provided one glaring fault can be overcome, viz., the softening of the steel that occurs from the large body of hot cast metal located at that point, and it would appear that some means could be devised to overcome this evil.
>
> 4. After making the joints perfect, what we have termed the "West End rail" would certainly justify its extra cost. As the analysis of each rail is embodied in this paper, I need not here refer to it.
>
> The great lesson I would once more emphasize is that until you get the joints perfect you need not worry about the quality of your steel; anything in the shape of steel—the very cheapest you can buy—will last longer than the joints will permit you to keep your rails in the track.

Table III gives the average monthly wear of the test rails as reported by Mr. Moxham. It also indicates the estimated wear of the rails at the same rate for twenty-two years of service for the soft and hard rails and twenty-one years and two months for the West End rail. The actual wear as found from the scribings taken last fall have been added and the contours obtained are shown in Figs. 5, 6 and 7, while a composite drawing of the three rails and wear contours appears full size in Fig. 8.

It will be noted from Table III that the actual vertical wear now found on the hard and soft rails agrees fairly well with the estimated wear at the original reported rate, but that the rate of wear on the West End rail has increased and is very close to that of the hard rail, so close that it is a question as to whether the "hard" rail has worn more than the West End if allowance is made for ten months' less service. The question also arises as to whether Mr. Moxham did not overlook an important point in comparing the wear of the hard and soft rails in neglecting to account for the difference in width of heads and the curved head, the "soft" rail head being only 2 in. wide, so that the soft rail presents about 12 per cent less width of wearing surface, which in turn would no doubt increase the rate of wear through load concentration. There is some substantiation for this view also in the fact that the actual cross-section area in the head of the "soft" rail is about 9 per cent less than that of the "hard" rail. Meanwhile there seems to be no definite reason assignable to the increased rate of wear found in the West End rail, which is now worn substantially as much as the "hard" rail, if allowance be made for the difference in length of service.

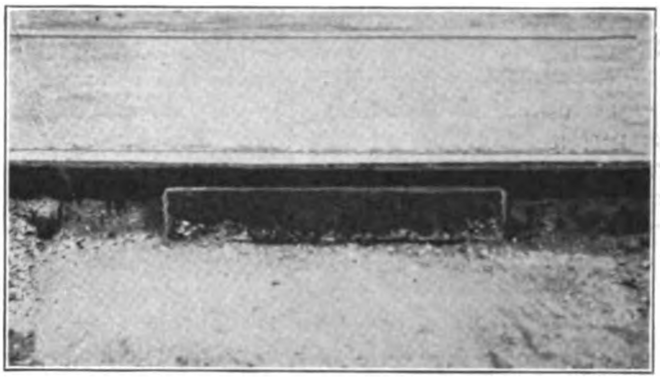


FIG. 9—BAR WELD INSTALLED IN BROOKLYN MORE THAN TWENTY YEARS AGO

The conclusions now reached as a result of the in-

TABLE III—AVERAGE MONTHLY WEAR ON TEST RAILS REPORTED BY MR. MOXHAM IN 1898 COMPARED WITH WEAR FOUND AT END OF TWENTY-TWO YEARS

Kind of Steel	Monthly Wear reported by Mr. Moxham inches	Length of Service	Estimated Wear at same rates inches	Estimated Wear at same rate, expressed in fractions inches	Length of Service	Approx. Wears Found inches	Wears found expressed in fractions inches	Rate per year found
Soft	0.0017	34 Months	0.4488	[illegible]—	264 Months	0.4063	[illegible]	[illegible] in. strong
Hard	0.0012	34 Months	0.3168	[illegible]+	264 Months	0.3437	[illegible]	[illegible] in. exact.
West End	0.0007	26 Months	0.01778	[illegible]+	254 Months	0.3125	[illegible]	[illegible] in. scant.

Railways Agree on Need of Publicity

Doherty Properties Answer Questionnaire By Saying That Public Must Be Kept Informed of Conditions —Important Views on Methods and Means

THE electric railways operated by H. L. Doherty & Company, New York, N. Y., are almost unanimously of the opinion that publicity, and lots of it, is the surest way to make the public sympathize with the difficulties of electric railway operation.

This expression of opinion is the result of a recent canvas by means of a questionnaire. When it was decided last autumn that in view of the war and other conditions the annual convention of the Doherty railway department should be abandoned, a questionnaire was sent out to the managers with the idea of having the answers circulated.

The list of the questions regarding the publicity end of the business was prepared by E. R. Kelsey of the Toledo Railways & Light Company, and the answers have been compiled by R. F. Carbutt, railway engineer of the organization. The main points of the report have been printed and are now being circulated under the direction of the committee in charge, which consists of E. R. Kelsey, R. L. Baker and J. H. Van Brunt.

The properties were unanimous in the belief that a central publicity department for the Doherty traction properties would be advantageous. Furthermore, the managers believed that publicity should be handled also by local publicity departments in order to meet local requirements. Several properties were in favor of distributing pamphlets in the cars, and they also favored meetings and talks with employees in order to educate them in the matter of explaining things on which the patrons seek information.

In regard to the local press and its relations with the company, all answers agreed that the newspapers should be taken into the confidence of the company, and that all the newspapers should be made to feel that all the news would be given to them promptly and accurately. It was also stated that news of accidents should not be suppressed. The experience of Mr. Doherty and Mr. Coates in Toledo in regard to publicity was pointed to by many managers as being proof that complete frankness with the newspapers was the one and only way of making friends with them.

COURTESY ON PART OF EMPLOYEES IS DEEMED ESSENTIAL

Courteous employees was another point emphatically emphasized as essential to a successful publicity campaign. It was pointed out that discourtesy on the part of employees can destroy all the benefits which are gained through printed and other publicity. Commenting on the courtesy part of the problem, C. D. Flanigen of the Athens Railway & Electric Company, Athens, Ga., said: "The most effective way is to have it (courtesy) in the atmosphere like ozone, to kill automatically all germs of discourtesy."

Regarding the points about the operation of electric railways which the public should know, all the managers agreed that the most important fact which the patrons should realize is the increased cost of everything that goes into the make-up of a car ride. In this same category of publicity was included the general ignorance of the origin of the paving charge. It was pointed out that if the patrons knew that it was a relic of the old days of the horse car there would be little difficulty in having the clause taken out of franchises.

It was agreed that the best way to get this sort of information before the public was by newspaper advertising and posters in the cars, and by officers taking advantage of every opportunity to talk to clubs and civic organizations about it.

COST AND OTHER POINTS

In answer to the question, "What portion of the company's gross receipts should properly be set aside for the purpose of advertising and publicity?" the answers varied. Most of the managers said 1 per cent, but some went as high as 2 or 3 per cent.

There was a question regarding the best means of handling the advertising space sold in cars. Many believed that more revenue could be obtained by handling the advertising directly than by having it attended to by an agency. There were several suggestions that the matter could be handled best through the central advertising department at the New York office.

Among the other suggestions made were several recommendations in favor of publicity regarding the financial condition of the companies; illuminated schedules on business corners; better car marking; explicit printed directions to guide patrons, and similar items to contribute to the comfort and convenience of passengers in order that they might become entirely satisfied with the service rendered.

(*Concluded from page* 171)

vestigation of this early rail wear experiment are as follows:

1. There is still some question as to the effect of the chemical composition on the wear of rails, as it is believed that the experiment as originally reported failed to account for the important factor of head width.
2. Nevertheless, it is thought that the high carbon now incorporated in the standard analyses should be maintained, notwithstanding the rather peculiar performance of the West End rails.
3. It is quite true that, while perfection of joints considered as most essential by Mr. Moxham has not been reached, there are several methods of joining rails now in use which are giving excellent results with very small percentages of failure. We are, therefore, justified in a reasonably high expenditure for a good quality of rail steel.
4. The result of this twenty-two-year-old experiment indicates a rate of vertical wear on old Bessemer steel rails of substantially 1/64 in. per year, for rails leaving a carbon content of under 0.60 per cent, with a traffic headway averaging four minutes with double-truck cars.
5. It is to be regretted that this original experiment did not include a method of measurement which would now admit of duplication with greater accuracy. Hence the results now obtained are subject to a number of factors which permit much more variation than is desirable in obtaining information of this character, and the data now reported must be considered with this in mind.

Light-Weight Safety Cars Best for All[*]

The Public, Company and Employee All Benefit from Their Introduction—Advantages to Each Analyzed

BY W. G. KAYLOR
Westinghouse Traction Brake Company

THE advent of the light-weight, quick-service safety car handled by a single operator marks a most important epoch in the development of the street railway industry. In the operation of electric railways we must recognize three factors, as follows:

1. *The Public.*—It is the community that gives the street railway its excuse for existence. It is their patronage that pays our bills.
2. *The Investor.*—It is the financier on whom we depend to furnish the capital to run our road.
3. *The Employee.*—It is the officers of the company—the clerks, the shopmen and the platform men—on whom the investor and the public alike depend to properly handle their investment and to sell their service.

To prove the success of the safety car we must show that the three parties referred to are benefited thereby. Likewise, the corollary is true. The benefits derived from the operation of safety cars must be divided equitably among these three parties or its success will not be assured.

The public gets more frequent and faster service and more comfortable and safer riding.

The investor gets reduced track and car maintenance, accident charges and platform expense with more riding, as well as a car which appeals to the short-haul passenger.

The employee gets a car which is easy to operate and usually an increase in wages.

To the public the safety car offers more frequent and faster service and more comfortable and safer riding. Three safety cars will displace two ordinary cars and cut the weight in two, yet provide seats for 10 per cent more passengers. Equipped with modern motors and ball bearings on the axles, the safety car accelerates at 2½ to 3 m.p.h.p.s., or faster than the average jitney can get started. Therefore, in actual competition with jitneys, the safety car gets away ahead of them, picks up the passengers at the next corner and is off again before the jitney can pass the car. As has been proved in jitney infested centers, the safety car has driven them off the street.

The fact that the safety car carries fewer passengers than the ordinary car simply means a reduction in the number of stops, thereby contributing to an increased schedule speed. For instance, if the schedule speed of the ordinary car were 8½ m.p.h., the safety car under the same conditions would make approximately 10½ m.p.h.—an increase of 25 per cent. The car is mounted on 24-in. wheels on an 8-ft. wheelbase. Lost motion between car body and truck has been eliminated, thereby doing away with the undesirable pendulum motion of car body under rapid acceleration and braking. Furthermore, the car body is so suspended on the trucks as to provide for a natural swing or lateral movement when it takes curves or sidings. In addition to this there are a low step and cross seats, all of which contribute to the comfort of the riding public.

The safety of the passengers is cared for by automatic devices interlocked with the control of the car. Although the car is operated by one man, it is safer than a two-man car not equipped with these automatic devices. The standard safety car has straight air brakes with emergency feature. Any collision or other accident that breaks the air pipes will stop the car in emergency. Furthermore, the operator cannot leave his post unless the brakes are applied, and if he becomes incapacitated the brakes go into emergency. An emergency application may be obtained by the operator; first, by removing his hand from the controller handle (if the brakes are not already applied in service); second, by removing his foot from a foot valve (used for cutting out the emergency feature in the controller when the operator wants his left hand free to make change or issue transfers without getting an emergency application) and, third, in the usual manner by the brake valve.

An emergency application not only applies the brake with full force as quickly as air can be passed direct to the brake cylinder, but it first shuts off the power and applies sand to the rail. The use of sand on a bad rail will shorten the stop by 20 per cent. At the same time the front and rear doors are unlatched, so that they may be opened by passengers pressing against them. This is made possible by the fact that the doors are operated by air, and is one of the most important safety features of the car. Otherwise imagine the panic that would arise in case of an accident if the passengers found themselves locked in the car, as they would be if the operation of the doors were not interlocked with the control of the car.

The safe passage of cars at steam railroad grade crossings is well taken care of by the Public Service Commission of Pennsylvania in General Order No. 5, dated Feb. 4, 1914. In the absence of a conductor it provides for

> "a watchman, stationed and maintained at the crossing . . . except that at crossings of electric railway tracks by railroad sidings leading to railroad yards, or to industrial plants, where by agreement between the companies operating their cars, trains and engines over the same, it is provided specifically that a brakeman, flagman or employee of the railroad company shall proceed to crossing ahead of the passage of any car, train or engine of the railroad company over said crossing and flag the crossing and warn the

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[*] Abstract of paper prepared for Jan. 4, 1918, special meeting of Pennsylvania Street Railway Association, Harrisburg, but not read owing to delay of Mr. Kaylor's train in reaching Harrisburg.

public of the approach and passage of such railroad car, train or engine."

This means that at main-line crossings the street railway company may maintain a flagman instead of having the conductor flag the car, whereas at sidings the steam railroad will flag its own train movements.

In none of the many cities operating safety cars has the public objected to their use. On the contrary, in many ways they have evinced their approval. Whereas on a two-man car 50 per cent of the passengers ask the conductor for change, on safety cars only 10 or 15 per cent call for change. There is an explanation for this. Safety cars have no "riding" platform or reservoir capacity. As a result passengers unconsciously get their exact fare ready as they board the car.

On a two-man car passengers feel that the conductor is there for the sole purpose of collecting fares, and they are inclined to take their time about it. On the other hand, as passengers board a safety car they realize that the operator's primary duty is to run the car rather than collect fares, so they feel it is their duty not to take up any more of his time than necessary so that the car can get under way without delay. Transfers are on a rack at the side of the fare box. They are punched at the end of the run, so that no time is lost in issuing them.

The operator sits far over on the left side of the platform, thereby allowing for as much space as possible for passengers entering and leaving the car. The fact that the passengers board the car at the forward end, right at the side of the operator, enables him to "spot" his car when stopping to pick up passengers. This saves the passengers a few steps, a particularly desirable accommodation at muddy crossings. It also cuts a little time off the length of stop.

WHY THE CAR APPEALS TO THE INVESTOR

To the investor, representing the capital invested in street railways, the safety car offers unusual opportunities. A 65 per cent reduction in weight on rails means a material reduction in maintenance of track and roadway, estimated by some engineers as directly in proportion to the reduction in weight. It also means a proportionate saving in power. The saving in platform expense is more than 50 per cent, even if the operator is paid 10 per cent more in wages than he received as a motorman. This is due to the 25 per cent additional mileage made by the safety car. The maintenance of car and equipment is less—due to the reduction in number of wheels, motors, square feet of car surface to be cleaned and painted, etc.

Shorter headways and faster schedules encourage riding, as for instance, a 40 per cent increase in service has occasioned a 60 per cent increase in number of passengers. The safety car operating on a shorter headway caters to the short-haul passenger, the one that it costs the least to handle. The elimination of jitneys brought about by higher acceleration and schedule speed and more frequent service contributes largely to the increase in passenger traffic, as does also the diminution in the use of privately-owned automobiles, enhanced to some extent by war conditions. To summarize it may be said that when the cost per car-mile for operating the ordinary car is 15 cents, the cost per car-mile for the safety car is 8 cents—a saving of 7 cents. Three cents of this represents the saving in platform expense and the balance in the economies resulting from the operation of a lighter car on a faster schedule.

To the employee, particularly the platform man, the safety car also offers unusual opportunities. A greater exercise of mentality encouraged by additional responsibility is usually rewarded by a 10 per cent increase in wages. Furthermore, the former platform man is advanced in title from a motorman or a conductor to an operator.

No man need lose his job on account of the introduction of safety cars. The change cannot be brought about rapidly enough for that. For a time, it might cause a falling off in the number of "turnovers," but during the war there is such a demand for men no objection has been raised against the safety car on account of its saving labor. On the contrary, employees like the safety car. In cities where they are being introduced there is always a long list of applications from motormen and conductors waiting to be assigned to safety-car runs.

The car is easy to operate. It is controlled by two handles, that of the controller and the brake valve. Sand may be applied in any position by pressure on the brake-valve handle. The control of the doors is also incorporated in the brake valve so that after the brake is applied the operator may open the front door by simply moving the brake-valve handle to the door-opening position. The operator is seated in a comfortable swivel chair and handles the safety car in much the same way as a chauffeur runs an automobile. The elimination of physical strains makes the operator more alert by increasing his mental efficiency. This is reflected in the reduction of accidents.

Furthermore, the ease of operation makes the safety car adaptable to the use of women operators. At this time this point is particularly worthy of consideration. As more men are called into the service, women will take their places, and it will be a long time after the war is over before they leave the various lines of endeavor that they are now entering. The economic and social fabric that is being woven by this war will not be unravelled over night.

THE CAR IS NOT AN EXPERIMENT

Safety-car service is not an experiment—it is an established institution. It was on Nov. 1, 1916, that the Summit Avenue line in Fort Worth, Tex., was changed over to safety-car operation. Since then 1000 safety cars have been placed in service or contracted for by sixty different cities of this country. Furthermore, 98 per cent of the one-man cars built in this country during the last two years have been the standard safety car. This fact alone should have an important bearing on the financing of new safety cars, as the question as to whether or not the proposed new cars are of a standard type is one of the first questions asked by the banker. Furthermore, it is just what the industry has been longing for—a standard car and equipment for electric street railway service.

The electric railway manager who says that the safety car may be all right for New Mexico or Texas but that it would never do in his town and that the people would not stand for it, has not made a thorough investigation of this subject. Furthermore, it is not a small-town proposition. In fact, there are some lines in our largest cities that could be operated to advantage with safety cars. The only limit is track congestion. Where this exists, as it does on Manhattan Island, an attempt to operate more units would have no other effect than to slow down the schedule.

However, in the average city, where the main street only is congested, and that only because most of the car lines converge on it, the movement of cars through that street might be slowed down. But when the safety cars entered the outlying districts their higher average speed would more than compensate for the time lost on the congested street. Very often also congestion can be relieved by rerouting. Vehicular traffic also should be regulated. On some lines it is a menace to operation. Therefore, wherever possible, through co operation with the municipality, such traffic should be routed over other streets where it will not interfere with the operation of cars.

WHAT CAN BE DONE NOW?

What has been said so far may be good food for thought, but it does not offer immediate relief. Old equipment cannot be scrapped and replaced at once by safety cars. Furthermore, with the government competing with private enterprises for the use of capital, there is not much of it available for the purchase of new cars and equipment. We must conserve what we have and operate it as efficiently as possible.

Undoubtedly many existing cars could be converted into safety cars and operated advantageously by one man. If the cars are too large for one man to handle during rush hours a conductor could be employed at that time. The question then arises as to what to do with him the balance of the day. Why not employ him in the shop or office? Select the work he is best fitted for and teach him how to do it and so schedule the shop and office routine as to allot certain work to these extra men. This would certainly be conserving man power to the greatest extent and would be a material benefit to the men themselves.

On the other hand, why not consider women as conductors during rush hours? There are many of them who have the time and who are willing to work on a part-time job.

The handling of factory crowds by large cars operated by one man could readily be taken care of by the prepayment method. Arrange to have the factory employees pay their fare before they enter the car. The operator could handle the additional passengers picked up en route. A car seating thirty-two to thirty-six passengers is as large a car as can be handled properly by one man when loaded to capacity.

The safety car also readily adapts itself to the zone system of fares; in fact, it is the exponent of economy and efficiency in operation—the agent that will restore confidence in the electric railway industry.

Several subscribers have written that the leaf containing reading pages 43 and 44 was not included in their bound copies of the issue of this paper for Jan. 5, 1918. The publishers regret this omission and will supply a duplicate of this leaf to anyone whose copy is defective in this way and who will advise them of the fact. The leaf can then be inserted in its proper place.

A New Association with a Definite Purpose

Freight Agents of New England Electric Railway Properties Have Organized the New England Electric Freight Association

ON Jan. 15, in the offices of the Connecticut Company, New Haven, Conn., the recently formed New England Electric Freight Association held its second regular meeting. The principal feature of the program was the paper by V. S. Curtis, secretary and general traffic agent of the Connecticut Company, on the ruling of the Public Utilities Commission of Connecticut with regard to the rates which may be charged by the Connecticut Company for trolley express service. Mr. Curtis first abstracted the finding of the commission, a report of which was printed on page 1153 of the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 29, 1917. He then explained the fundamental principles for which the company had contended, and which were agreed to by the commission. Mr. Curtis distributed samples of printed matter used in the express department of his company, as well as reprints of the descriptive article printed on page 802 of the issue of this paper for Nov. 3, 1917.

Following Mr. Curtis' address those present discussed the principles with relation to their own properties, and from the discussion it was evident that conditions differ materially with the jurisdiction under which an electric railway does trolley express and freight business. Where the jurisdiction is that of the Interstate Commerce Commission it is more difficult to differentiate between steam railroad and general express traffic and the facilities furnished by the electric railways than where the traffic is entirely intrastate. The burden of the discussion seemed to be that the value of trolley express service should be recognized by the provision of reasonable tariffs.

The New England Electric Freight Association was formed last fall for the purpose of promoting co-operation among the freight departments of the electric railways in this territory. Its membership is limited to one representative from each of the railways. The plan is to meet at frequent intervals at different railway centers in the territory, thus incidentally familiarizing the members with the facilities of each. Pursuant to this policy, an earlier meeting, largely for the purpose of organization, was held at Boston, and the third meeting will be held at Providence on Feb. 21.

At present R. E. Cosgrove, Springfield (Mass.) Street Railway, is president of the association and F. C. Lewis, Boston & Worcester Street Railway, Framingham, Mass., is secretary. The other members are C. T. Battey, Union Street Railway, New Bedford, Mass.; Leon Bolster, Connecticut Valley Street Railway, Greenfield, Mass.; V. S. Curtis, the Connecticut Company, New Haven; T. E. Leland, Bay State Street Railway, Boston, Mass.; H. R. La Montague, Worcester (Mass.) Consolidated Street Railway; A. E. Paddock, Rhode Island Company, Providence; D. C. Peck, Shore Line Electric Railway, New London, Conn.; A. Pollard, Fitchburg & Leominster Street Railway, Fitchburg, Mass.; H. B. Potter, Boston Elevated Railway, and F. E. Wood, Cumberland County Power & Light Company, Portland, Me.

Annual Meeting of Central Electric Traffic Association

Chairman Neereamer Describes the Work of the Different Committees and Calls the Year a Successful One

THE annual meeting of the Central Electric Traffic Association was held on Jan. 15, at which time A. L. Neereamer, chairman, presented his annual report, which covered the year ended Dec. 31, 1917. There was no election of officers because, under the constitution, the presiding officer of the association is the secretary of the Central Electric Railway Association. An abstract of Chairman Neereamer's report for the year follows:

ABSTRACT OF ANNUAL REPORT

Although the year just passed has been a very strenuous and busy one, yet this association has held six meetings as follows: Indianapolis, Jan. 16-18, and Feb. 20-22; Fort Wayne, April 3, May 15 and Nov. 20, and Dayton, Sept. 18. The two held at Indianapolis were for the purpose of completing the checking of the rates in Joint Passenger Tariff No. 18. The other four were regular business meetings.

There has been very little change in the membership of this association, although a slight increase. We now have fifty-one lines (members of the Central Electric Railway Association), representing 4334 miles. This is an increase of two lines and of 101 miles. Only such lines members of the Central Electric Railway Association as have furnished the chairman with power of attorney are considered members of the Traffic Association.

Joint and Local Baggage Tariff No. 9, canceling No. 8, was issued on March 28, 1917, and has had one supplement, which was issued to take in the Northern Ohio Traction & Light Company.

Joint and Local Passenger Tariff No. 17 was issued on March 29, 1917, canceling Joint and Local Passenger Tariff No. 16, and covers the Central Electric Traffic interchangeable 1000-mile ticket. This tariff is still in effect, and, like its predecessor, covers thirty-five lines, representing 3550 miles. During the year just ended 4600 of these tickets were ordered and placed in the hands of agents for selling, making a total since the inception of the mileage ticket of 43,400 tickets. At the meeting held in Fort Wayne on Nov. 20 it was decided to cancel this tariff, withdrawing the mileage ticket from the market. Before this cancellation was made, the matter was taken up by the executive committee of the Central Electric Railway Association at its meeting held in Toledo on Dec. 4, 1917, where it was decided to issue an interchangeable penny-coupon book, covering 2000 1-cent coupons to be sold for $17.50. Your chairman is now trying to ascertain from the members just what lines desire to participate in this new publication so that an application may be filed with the various commissions asking for permission to cancel the mileage ticket tariff and replace it with a tariff of this kind. This will be done as soon as the information is received from all of the member lines.

Official Classification No. 43, covered by our I. C. C. No. 17, and effective the first part of 1916, has had four supplements issued during the year, either on special permission or on orders of the Interstate Commerce Commission, while Official Classification No. 44, which was filed by R. N. Collyer, agent for the interurban lines, has been in effect for a year. It is to be hoped that the commission will very shortly make final decisions which will allow for the complete cancellation of this issue.

Joint Freight Tariff No. 13, covering exceptions to the official classification and issued on Aug. 1, 1916, with its two supplements, is still in effect, although the question of reissuing this publication has been up for consideration during the past year. Pending the settlement of certain applications, the committee having it in charge has been instructed to hold it until further notice.

Official Interurban Equipment Register No. 4 was issued on April 30, 1917, and covered the correct dimensions of cars of the participating carriers up to and including that date. As some of the member lines have purchased new equipment since that time it is suggested that such lines furnish the chairman with the information regarding this new equipment, so that a supplement may be issued or if necessary the tariff reissued to cover all of the changes.

Our official map committee completed its work on the revision of the map and the map was corrected during the first part of the year and a new copyright secured. There has been considerable demand for this map from all over the territory as well as from various government and state officials, and from the number of requests which the chairman has been receiving recently it would appear as if our member companies had exhausted their supply. It is to be hoped that our members will continue to distribute this map, which is one of the best advertisements put on the market by any transportation company in this or any other territory.

Joint Passenger Tariff No. 18, which canceled Joint Passenger Tariff No. 14, was issued on April 25, 1917, and has had one supplement, which was issued at the request of the Interstate Commerce Commission. We now have pending with that commission two applications to supplement this tariff, and the necessary supplements will be issued just as soon as permission is granted. Owing to the recent increases in rates granted the Ohio lines and the various applications for increases which are now pending in Indiana and Ohio, it will be but a short time when this publication will have to be reissued.

Joint and Local Demurrage Tariff No. 3, issued on Aug. 10, 1916, has had five supplements issued to it, not including the one supplement issued to cover Indiana conditions. There is now in the hands of our committee on demurrage and storage the question of issuing another supplement to conform with the recent regulations put in effect by the steam railroads. Owing to a number of changes that have been made in the demurrage rates, the chairman would not recommend the reissuing of this tariff until matters have settled down and some permanent basis agreed upon.

The attention of the association is called particularly to the work of two of our committees during the past year. One was a committee appointed for conference with the Central Freight and Central Passenger Associations. The other was a committee on military traffic. These two committees have accom-

Economics of Hydroelectric Power Development*

The Author Compares the Status of Water Power and Steam Power, Showing How the Former Is Handicapped In Its Competition with the Latter Both Economically and by Virtue of Statute

BY CALVERT TOWNLEY
Assistant to the President Westinghouse Electric & Manufacturing Company, New York City

THE introduction of electricity as a means for transmitting power over considerable distances and its subsequent rapid development completely changed the status of hydraulic power. Previously such power could only be used near falling water. Now it is commercially available in convenient form within a radius, in some instances, up to 200 miles.

Along with improvements in the art of electrical transmission have come equally rapid developments in the application of electricity. Electric light has become almost the universal illuminant. Electric motors largely drive our factories and propel all our street cars. They have made substantial progress in replacing steam locomotives on some large railroads.

In an endeavor to supply the demand for electric current thus created large central generating stations have been established in or near all large centers of population.

LIMITATIONS OF WATER POWER

In the light of the foregoing, it might seem reasonable to suppose that a large proportion of the modern demand for electric current would be supplied from the energy in falling water. Such, however, is not the case. It has been estimated by a careful engineer that in 1911 there were over 26,000,000 steam engine horsepower capacity in use, including railroad locomotives, in the United States. The aggregate water horsepower developed and undeveloped has been computed as around 60,000,000. Of this latter the United States Census of 1912 gives 4,870,000 as developed, and in a report of January, 1916, the Secretary of Agriculture estimates this total to have been increased to 6,500,000. Making liberal allowances for correction in these several figures it seems probable that there is in service from four to five times as much steam as water horsepower and that there is still undeveloped water horsepower equal to at least twice that of all the steam capacity in service.

There are two fundamental causes which have militated against the substitution of hydroelectric for steam-electric power. One is economic and permanent; the other is statutory and therefore subject to modification. Both reasons apply to some powers but neither, fortunately, to all. The economic and permanent reason is high cost of development due to natural conditions. Electric power generated by falling water is inferior to that generated by steam in every particular except cost and, therefore, water-driven service must be cheaper than steam-driven in order to justify its existence. The price for service depends primarily on cost, and cost divides itself naturally into two main items, namely, operation (including maintenance) and fixed charges. As a hydroelectric plant consumes no fuel its operating cost is less than that of an equivalent steam-driven plant. On the other hand, a steam plant costs usually only from one-fifth to one-half as much per unit of capacity as a hydroelectric plant, so that the latter must carry very much heavier fixed charges. Therefore, when steam is to be the motive power, only such capacity is installed as initial demands require and the cost per unit is fairly proportional to that of the ultimate development. On the contrary, in a water development, a large part of the cost is for riparian rights, for the dam, impounding reservoir, flume, forebay, etc., and for the transmission right-of-way, towers, etc., which must be largely provided and constructed at the start for the complete installation. The obvious result is a greater fixed charge per unit of capacity and a higher cost per horsepower delivered for sale.

SITUATION NOT SERIOUSLY AFFECTED BY RISE IN COST OF COAL

It has been frequently pointed out that as the nation's coal supply is depleted the cost of coal must rise, thus increasing the cost of steam-electric power as a competitor and raising the market value of hydroelectric power accordingly. The rising price of coal is a matter of record, but it is not so generally known that the improved efficiency of steam-producing machinery (boilers, engines, generators and auxiliaries) has more than kept pace, so that the net cost of producing electric power from coal has steadily declined. As applied

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(*Concluded from page* 176)

plished a great deal of good for the member lines of this association, a large part of which can be termed an intangible benefit, and the results are the attainment of certain progressive policies for which the association has been working a number of years.

This has been a very successful year, and, while the Central Electric Railway Association and the Central Electric Railway Accountants' Association have held no meetings other than the annual meeting of the Railway Association in March, this association has worked in unity and has been the means of keeping together the interurban lines in this territory. A large percentage of the credit for this work is due to the untiring efforts of the members of various committees to whom have been referred matters of vital importance to the lines in this territory. In conclusion the chairman desires to extend to all of the committees and to the members, both individually and collectively, his sincere thanks for the hearty support and co-operation given during the year passed.

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*Abstract of a statement submitted on Jan. 14, 1918, to a special committee of the United States Chamber of Commerce on behalf of the Engineering Council, by whose executive committee it was duly approved.

to the pre-war period it may be stated that over a period of ten years the cost of coal has risen on an average 1 per cent per year while the cost of electric power produced from coal has fallen on an average 2½ per cent per year. It is a reasonable assumption that further advances in the art will cut down both the fixed charges and the operating cost of steam power as a competitor of water. The cost of a steam-electric plant per unit of capacity just before the war was about one-third what it was fifteen years previous, while the energy it produces per pound of coal had increased 50 per cent.

Many sites which fifteen years ago might have been developed to sell energy in successful competition with steam at its then cost could not now be so developed, and in consequence their development is no longer commercially possible. The cost of producing power from either water or steam is a function of load. Fixed charges remain practically unchanged in both instances whether the output in energy be large or small, but with a steam plant increased output means increased fuel consumption, while a water plant operates either with or without load with but little variation in expense. To illustrate: assume a steam plant using 2½ lb. of coal per kilowatt-hour at a price of $3 per short ton and having a plant or output factor of 35 per cent—that is to say, an output equal to 35 per cent of its theoretical output if every unit were loaded to capacity twenty-four hours each day of the year. Under these assumptions the cost of fuel per unit of installed capacity per year would be $11.50, and if the other operating and maintenance charges be assumed to fairly offset those of a water installation of equivalent size $11.50 represents the additional fixed charges which the hydroelectric plant could carry and produce power at an equal cost. If the fixed charges (interest, taxes, insurance and amortization) total 11½ per cent, therefore, the hydroelectric investment per killowatt capacity could exceed that of steam by $100. Many hydroelectric developments exceed the cost of equivalent steam-driven systems by much greater amounts.

WATER POWER IS HANDICAPPED IN COMPETITION WITH STEAM

Further, as has been previously stated, hydroelectric power is inferior to steam-electric power. The reasons are elementary. Stream flow is subject to seasonal variation, and therefore to complete or partial interruption by drought in summer and by ice in winter. Floods are a menace. Long transmission lines may break from wind or sleet or the service be disarranged by lightning. The losses on such lines vary with load and are frequently responsible for annoying pressure variations. On account of these and other reasons hydroelectric power cannot prevail against steam competition at the same or a slightly lower price. It must be materially lower.

We do not mean to imply that water power may not be a commercially practicable competitor of steam. We do wish, however, most emphatically to combat the widely held but mistaken view that any water-driven plant will produce power at lower cost than steam can and that the margin is so large that investors generally are eagerly seeking a chance to put money into hydroelectric projects.

The second condition which vitally affects development is statutory. After ten years or more of discussion it has come to be generally agreed that our federal laws discourage the development of a large proportion of the nation's water powers, and remedial legislation has been considered at every session of Congress for many years. The legal obstacles are quite distinct and separate from the economic facts which have been previously described and are in addition thereto.

Of the estimated 55,000,000 undeveloped water horsepower in the entire country, approximately 40,000,000 is located within the boundaries of the thirteen so-called Western water-power states. In order to develop power in that section it is nearly always necessary to use some part of the public domain, if not for the dam site itself, at least for flowage, for transmission right-of-way or for some other purpose. Existing law forbids such use except under permit issued by the Secretary of the Interior and revocable without cause, at any time, by himself or his successor in office. As funds for hydroelectric development must come from private sources, the unstable tenure imposed by this condition has constituted so great a hazard of loss that the private investor has been loath to assume it. The unfortunate—almost disastrous—result has been practical stagnation in water-power development for many years. Many available power sites not in the Western states, or not on the public domain, are on navigable streams. For each such project a special act of Congress is necessary.

ENCOURAGEMENT OF WATER-POWER DEVELOPMENT

The Engineering Council does not consider itself expert in legal matters and will not undertake to discuss the relative merits of the different plans proposed to improve conditions. It should be pointed out, however, that a hydroelectric enterprise being once successfully established, it is alike to the interest of the owners, of the government and of the public that it should continue indefinitely without interruption. Further, there will never come a time when it may be said to have been completed and subject to no further expansion. This continuing growth makes burdensome and usually abortive any attempt to amortize the investment, while the investment in other water powers or in steam plants or both, interconnected with, and generally dependent for their economic operation on, the original development renders the right of the government to recapture that development only very onerous and one which constitutes a serious impediment to the free and full development of an enterprise which is otherwise most desirable from all standpoints. With respect to power sites on the public domain and on navigable streams the government is in the position of seeking to have its resources developed without assuming any business hazard and without contributing either capital or credit. It would be unfortunate, in the light of past experience, if any new laws which may be enacted should put the government in the position of bargaining with capital and of offering just sufficient incentive not to induce capital to undertake the developments desired, thereby, while apparently providing a remedy, in reality assuring a continuance of the present undesirable condition. Hydroelectric enterprises must compete with the demands of other industries for capital.

Philadelphia Partnership Plan Shows Foresight

New Contract for Unified Operation of City High-Speed Lines and P. R. T. System Provides for 5 Per Cent Return on Stock, Protected by Adjustable Fare—Places Company and City Investments Side by Side—Recognizes Authority of State Commission

The lease which has just been approved by the city of Philadelphia for the operation of new city-owned rapid transit lines by the Philadelphia Rapid Transit Company is worthy of notice not only because it is an important addition to the list of partnership agreements in this country but also because it has several decidedly novel features. The novelty lies not so much in mere details as in the various fundaments of the new contract. The lease definitely recognizes these three principles: 1. Such unified service as the people desire should be furnished at a minimum cost. 2. The cost of this service should be met by the car riders. 3. The authority of the Public Service Commission to regulate service and fares should be fully recognized.

After two years of negotiation the new lease was approved by Councils and signed by the Mayor on Jan. 3. The only steps now remaining to be taken are the approval by the company's stockholders, who are to vote on the matter at a special meeting on Feb. 8, and approval by the Public Service Commission. The course of the negotiations and the various changes and different proposals made have been described in the ELECTRIC RAILWAY JOURNAL from time to time, and the present article will discuss only the main points of the latest and approved contract.

The lease contemplates the unified operation of the new city-owned rapid transit lines and the system of the Philadelphia Rapid Transit Company. The city lines, authorized by Councils on July 20, 1916, include the Broad Street subway with branches, the Frankford elevated line, the Thirty-fifth Ward-Bustleton and Byberry surface line, the Darby elevated line, the Parkway-Northwest subway-elevated line and the delivery loop subway. The city system at present also includes the Chestnut Street subway, approved on April 2, 1917.

The company agrees to provide such additions to its system within Philadelphia as the Public Service Commission upon recommendation of the Supervising Board, later described, shall determine to be reasonable and necessary. The company waives any objection to the jurisdiction of the commission to issue orders in such matters, and it agrees to obey any such order in the premises, or if the commission refuses to take jurisdiction, it will obey the recommendation of the Supervising Board and construct or procure the new property, subject only to its ability to sell securities upon terms approved by Councils.

It is anticipated that for several years the gross revenue of the unified system, with the exception of a comparatively small amount from the Frankford line, will be secured from the company's system. Even throughout the entire term of the contract, unless the city extends its system far beyond the lines now authorized, the greater part of the gross revenue will come from the operation of the company's system. It is estimated that the city's high-speed lines, as planned, will earn not more than 25 per cent of the gross earnings of the unified system.

The lease provides that the company, for the city-owned lines, shall furnish low-tension feeders, high-tension cables and other necessary appurtenances, power stations, telephones, lighting fixtures and wiring, station equipment and such shop tools, machinery and other miscellaneous items as may be specified by the Supervising Board. The city can supply facilities at the company's expense if the latter causes any delay. Furthermore, at the request of the city with the approval of Councils, the company may be required to furnish storage yards, shops, carhouses and real estate necessary therefor, and rolling stock for any individual operating section except the first section of the Frankford line, to the extent that the city is unable to complete such equipment owing to its lack of borrowing capacity at the time.

It is provided, however, that the company shall do this if it can secure the money upon terms to be approved by Councils, and that the city shall, if it can legally do so, agree to purchase such equipment at cost out of the first money it can borrow for transit facilities. The company's investment under this provision is limited to $3,000,000 for any one individual operating section, it being necessary to retire the investment in any one section before the company can be called upon

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(Continued from page 178)

Experience has shown that even without the imposition of additional financial burdens many of them are not sufficiently attractive to secure development, and as the attractive prospects grade by imperceptible degrees into the unattractive ones, it is perhaps self-evident that every additional burden, however small, transfers a percentage of such projects from commercial into uncommercial prospects,

It is our belief that the benefits afforded the communities served by cheap power, and to the nation by the conservation of coal resulting from the substitution of a self-renewing for a non-renewable natural resource are far more valuable than is the exact solution of the question of restricting the returns to capital to their irreducible minimum. The present emergency due to the progress of the war has forcibly illustrated the importance of having developed the greatest possible number of water powers as a source of industrial power supply. As it consumes no fuel, the substitution of water for steam power would release to other uses all the extensive railroad and water facilities now engaged in transporting coal. It would similarly release a corresponding volume of labor now occupied in mining this coal and in operating such transportation agencies as well and the boiler room forces of the steam-power plants themselves.

to furnish facilities in this manner for a subsequent section.

The method of procuring capital to meet the requirements for the expansion of the company's system, for refunding and other capital expenditures and for the transit facilities to be furnished to the city, the rate of interest or dividend and the program of amortization or retirement must be approved by Councils.

HOW GROSS REVENUE WILL BE USED

The gross revenue of the unified system will consist of the revenue from transportation and the revenue from operations other than transportation, including income from securities of underlying companies and all direct or indirect income from the operation of the system. Reports certified by the Supervising Board must be delivered to the City Controller for each quarter of the calendar year.

In outlining the disposition of the gross revenue, the lease provides for eight deductions, payment being in the order of the items. The first six items include (1) all expenses for operation and maintenance; (2) taxes; (3) existing fixed charges of the company; (4) interest, dividends and sinking fund payments on new securities of the company; (5) payments to the various depreciation reserve funds, and (6) payments to the city under the 1907 contract.

The balance is called the current net revenue, out of which items 7 and 8 must be paid, as follows:

"7. Payments to the city and the company in proportion to the relative investment of each equal to a return of 5 per cent per annum on such investment.

"8. Payment to the city equal to the difference between the payment to the city under item 7 and the gross amount of interest and sinking fund charges upon the city's investment."

The company's investment is fixed at the par value of its capital stock now authorized and issued, $30,000,000, less any instalments remaining unpaid. The city's investment is to be computed under explicit provisions. The return on the investment in any individual operating section is not chargeable against current net revenue until one year from the date after operation begins.

PAYMENTS ARE TO BE CUMULATIVE

The payments under the various items are cumulative in the order of the items, except that a deficit in former years under item 7—the 5 per cent return on the investments of the city and the company—must be made up before a deficit under the preceding item, covering payments made to the city under the 1907 contract. It is important to note, however, that a deficit under an item does not occur until after the application of all the current gross revenue, all the new surplus and $2,000,000 of the initial surplus.

HOW THE INITIAL SURPLUS AND NEW SURPLUS WILL BE USED

The "initial surplus" is the accumulated surplus of the company when the contract becomes effective. When payments under all the eight items referred to above are made, any surplus remaining is called "new surplus." The accumulation of the new surplus is made in order to provide an equalizing fund for stabilizing fares and assuring future payments as provided.

The disposition of these surplus funds is provided as follows:

"If, in any year, the gross revenue shall not be sufficient to provide in full for all the deductions and payments specified, the new surplus shall be applied to the deficit in the order of the items and to the extent it may be necessary to make full payments thereof, and thereafter the company's available initial surplus to the extent of $2,000,000 shall be applied to any remaining deficit in the same manner."

It is, however, stipulated that in the case of the destruction of or serious damage to a substantial part of the unified system, or a continuous interruption of normal operation resulting in suspension or curtailment of payments under the last four items in the schedule, the company shall not be required to make use of the initial surplus if this has been depleted $500,000 or more and not restored. Nor shall the company at any time be required to make up any deficits occasioned by any of the above-mentioned causes by payments from initial surplus which will cause the total depletion of this to exceed $500,000. The lease provides that it shall not be incumbent upon the Supervising Board to file a schedule of fares to make up for such deficits, and these shall not be made up unless the board shall sanction payments on their account out of after-acquired new surplus resulting from normal and reasonable fares.

In respect to the two surplus funds two points should be noted:

1. Neither the initial nor the new surplus can ever be used by the company in payment of any dividends in excess of 5 per cent per annum from the date on which the contract becomes effective.

2. The new surplus accumulated under the contract can never be much in excess of $2,000,000, because when it reaches that sum fares are adjusted downward.

RATE OF FARE IS FLEXIBLE

The new lease provides for an adjustable fare. The initial fare is 5 cents, with universal free transfers. The company is not obliged to issue a transfer on a transfer on the surface lines, except where the use of a high-speed line intervenes. The 3-cent exchange tickets are to be abolished outside the delivery district around the City Hall within sixty days of the effective date of the contract and inside of this district on the initial operation of the first section of the Frankford line.

It is expressly stated in the contract that the understanding of the parties in the making of the agreement is that "the fares shall be such as will provide current net revenue sufficient for a cumulative return of 5 per cent upon the company's capital stock and 5 per cent upon the city's investment, and the cumulative payments under item 8."

The lease stipulates that in case at any time there is a shortage of current net revenue for the designated payments and the new surplus is exhausted and the initial surplus depleted to the extent of $500,000, there shall be such a revision of fares upwards as will produce gross revenue sufficient to meet all requirements and make up within a reasonable time the initial surplus and any deficit in payments of various items in former years.

Within thirty days after the initial surplus at any time has been depleted to the extent of $500,000, the Supervising Board is required to prepare and file with the Public Service Commission a schedule of "fares and charges," which, in its opinion, will produce the necessary amount of gross revenue.

Whenever the result of operation for two successive quarterly periods under any new schedule revising fares upward fails to produce sufficient gross revenue to meet all requirements and a surplus over and above the current payments of items 1 to 8 inclusive at such rate as will make up within a reasonable time the initial surplus and any shortage in payments of various items in former years; or, whenever at any time after the initial surplus has been restored it becomes again depleted to the extent of $500,000 in making up current payments, the Supervising Board must within thirty days prepare and file with the commission a new schedule of fares and charges effective within thirty days.

Furthermore, should the results for any year during which there has been added any individual operating section indicate to the board that the existing schedule of fares will not produce sufficient revenue to meet the requirements when the cost of this individual operating section is entitled to a return under the lease, the board may in anticipation file a new schedule of fares and charges to take effect on the date when such cost will be entitled to a return.

There is one contingency under which the company may withhold payments under the 1907 contract to the extent necessary to pay the city's interest and sinking fund charges and the company's dividends. If the Supervising Board files a schedule increasing fares under the public service company law, the fares go into effect in thirty days. If for any reason the new fares do not become effective within this period or are suspended, the company may, until rates are effective sufficient to meet the requirements, suspend its current payments to the city under the 1907 contract to such an extent as may be necessary to make the net revenue sufficient to meet the current payments under items 5, 7 and 8.

REVISION OF FARES DOWNWARD

Under the lease the fares must be revised downward whenever the reports for two consecutive years show a surplus increasing in a substantial amount annually and equalling or exceeding at the time $2,000,000.

The change of fare is to be effected in this manner. The Supervising Board must, within thirty days after the amount of the new surplus and the increasing tendency have been shown by the reports, prepare and file with the commission a schedule of fares and charges which will reduce the gross revenue. This must be done, however, without impairing the ability of the company to meet the first eight items out of the current gross revenue after the application to the items in each year of not exceeding one-third of the new surplus accumulated at the time of the filing of the schedule. Any schedule so filed shall take effect within thirty days.

It is possible, however, for the city to reduce its rental for the high-speed lines and thus bring about a reduction in the fare. The rental payable to the city is the amount of the interest and sinking fund charges on the bonds issued to acquire its transit facilities. The city reserves the right to determine "what portion of the interest and sinking fund charges on its investment in transit facilities shall be borne by the car rider and what portion shall be borne by the taxpayer," and it may from time to time by ordinance specify that "any or all of the city's investment in the transit facilities shall be withdrawn from the rental requirements under the contract." If the city thus withdraws any portion and the results of operation in the preceding year indicate to the board that the existing schedule of fares will produce more revenue than necessary, the board must prepare and file a schedule of fares and charges to reduce the gross revenue accordingly, though not below the point necessary to meet the other requirements.

DEPRECIATION RESERVE FUNDS AUTHORIZED

The lease provides for three separate depreciation reserve funds to be set aside out of gross revenue quarterly in amounts and according to a classification to be determined from time to time by the Supervising Board. These funds are for: (1) The city's transit facilities; (2) the transit facilities furnished by the company for the city, and (3) the company's system. The company's present reserve is to be funded, if not so now, for the last one. The first payment into that portion of Fund 1 which shall be set aside for permanent structures of the city's system is to be made ten years after the date upon which such facilities are first operated, and at no time is the annual appropriation to this portion of the fund to exceed one-half of 1 per cent of the cost. The first two funds will be in the control of the board, the latter in the custody of the company. Investment of funds not currently needed is subject to the approval of the board.

RIGHT OF RECAPTURE RESERVED

The new lease will expire on July 1, 1957. Upon six months' notice the contract can be renewed for successive periods of ten years. After July 1, 1927, however, the city may upon six months' notice recapture its own property and acquire all of the company's property by paying to the company a sum equal to the amount paid in upon its outstanding capital stock, the dividends on new capital stock unpaid and the accumulated unpaid portion of the protected 5 per cent dividend, and by assuming all due and accruing current liabilities of the company.

If the city dissolves the unified system at the expiration of the lease in 1957, it must pay to the company the original cost of the facilities furnished by the latter, less any repaid or amortized amounts. Under this condition the initial surplus would be retained by the company and the new surplus would be prorated according to the respective investments in the unified system.

ORGANIZATION OF THE SUPERVISING BOARD

The unified system is to be under the control of a Supervising Board, consisting of three members. The city's representative is the director of the Department of City Transit. The company's representative may be appointed from time to time and be removed at the option of the company. The chairman of the board is to be appointed for four years by the Mayor and the president of the company. He can be removed at any time by joint action of these two officers.

If the Mayor and the president fail to agree upon a

Electric Railways Co-operate in Carrying Out Garfield Order

Telegraphic Reports as to Its Effect in a Number of Cities Are Reproduced Below

THE ELECTRIC RAILWAY JOURNAL arranged to receive by wire reports from a number of cities as to the effects upon the electric railways of the order of the United States Fuel Administrator restricting the consumption of fuel. These cities were selected on account of their relation to manufacturing or shipping activities, and it was not the intention to cover the country systematically. Abstracts of the telegrams received are given below, and information received directly from companies operating in New York City is included:

Boston, Mass.

On Friday, Jan. 18, the revenue of the Boston Elevated Railway was less than on normal Fridays, service being in about the usual volume. The Thursday and Friday power station load curves overlapped and there was no difference in coal consumption apparently due to industrial curtailment. On Monday a typical Sunday schedule was at first operated, but curtailment of suburban steam railroad service overburdened the lines on the west side of the city. This with heavy traffic caused by the theater patronage, all day and evening, forced considerable increase in service. This had the approval of Fuel Administrator Storrow, who gave electric railway managers throughout the State much latitude in carrying out the spirit of the Garfield order. It is doubtful if the company was able to save coal in view of the above-mentioned circumstances and of the exemption of many establishments. Employees were paid full wages, not a man losing compensation through curtailment.

The Bay State Street Railway furnished regular weekday service on Friday, Saturday and Tuesday with extra cars and some regular cars cut out on account of the closing of certain factories. On Monday a Sunday schedule was operated on about two-thirds of the system. The saving in fuel is difficult to determine on account of the variation in the quality of coal. Thus on two recent days with the same service the consumption was 220 and 170 tons respectively. On one day ten boilers were required for the normal work of six.

Trenton, N. J.

The first Monday under the Garfield fuel order caused a serious congestion on the trolley lines in and near this city. More passengers were carried than on days when the usual number of cars are in service. The Trenton & Mercer County Traction Corporation established a Sunday service for that day and operated with 30 per cent fewer cars. Seventeen trailers and thirteen regular cars were taken from the service. The New Jersey & Pennsylvania Traction Company, which runs fewer cars in winter, only removed one car from the Morrisville, Pa., line. The Public Service Railroad Company curtailed service on the Trenton-Newark and Trenton-Camden divisions. On account of a shutdown of all the plants and the keeping open of the theaters the traffic was greatly increased and the electric railway companies had difficulty in handling the crowds during the afternoon and early evening. For that day the Trenton & Mercer County Traction Corporation adopted a new method of collecting fares and saving time in loading the cars. Some of the passengers were allowed to enter by the front door and the motormen, who were provided with change, collected the fares and later turned them over to the conductors. There was considerable discomfort in riding in the congested cars.

Louisville, Ky.

A normal Sunday mileage served fairly well to meet a the demands on the Louisville Railway on Monday. Several large industrial plants continued in operation but were taken care of, Sunday headway being established on week-

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(*Concluded from page* 181)

chairman, the duties of the board are to be performed by the two members. In case any question arises on which they differ, they may agree upon a temporary arbitrator. If they fail to agree, either may, on five days' notice to the other, apply to the commission, which shall then make the appointment.

The board has a supervisory power over the service of the company. This power is conferred as follows: "To pass upon, adopt and alter, from time to time as may be necessary, rules and standards as to maintenance, service, routing, adequacy and suitability of equipment as in its opinion may be necessary or appropriate for securing to the people the best practicable transportation service." The board also has the power to approve power contracts and contracts for advertising privileges, and it may establish and change stations and stopping points. It has the power to approve plans and specifications and to inspect work and materials. It cannot, however, alter or postpone the construction of any line authorized by vote of the people or by Councils. Under the lease, it may be added, the company, under such restrictions as the city may impose, may carry or be required to carry freight, mail, express and other unobjectionable matter, provided this does not interfere with passenger transportation.

It is provided that the company has a right of appeal to the Public Service Commission from orders of the Supervising Board, but it must obey the order of the board pending the appeal. The board has no power which is vested by law in the director of the Department of City Transit or the Public Service Commission. This is clearly set forth in the following language:

"Nothing in this article shall deprive the company's officers and directors from the management of the property, nor shall anything herein be deemed a delegation to the board of any power vested by law in the director or the commission. It is the intention of this contract to enable rules and regulations for governing maintenance and service to be made and complaints and petitions of patrons to be heard more expeditiously than by original application to the commission; but nothing herein shall prevent any person from bringing before the commission in the first instance any matter within its jurisdiction."

day time. Between 6 and 8 a. m. Sunday service was increased by extra cars with normal service to noon, and a curtailed Sunday service until 5.30, with a supplemented service for the next half hour. After 6 o'clock the normal Sunday time was observed.

People generally appear to have remained at home, although there was some crowding in the early afternoon. Public schools were dismissed for the week on account of weather and fuel conditions, and this traffic was lacking. Theater-going crowds were comparable to Sunday afternoon crowds. Monday morning saw new zero temperature which tended further to keep people at home, and receipts showed 5 per cent reduction from Sunday, Jan. 20.

St. Louis, Mo., and East St. Louis, Ill.

Electric railways in St. Louis were not much affected by the Garfield order. They operated on regular schedule, as there was not a 5-day suspension of business on the west side of the Mississippi River. However, as the State Fuel Administrator does not allow business to begin before 7 a. m. nor to continue after 7 p. m. the traffic before and after these hours is very light. The East St. Louis & Suburban was ordered to operate on a Sunday schedule. General Manager Parsons on Tuesday wired G. E. Williams, Illinois State Fuel Administrator at Chicago, that while the railway company was in accord with the order it must operate its service to accommodate workmen to and from exempted plants, such as packing houses and mines. For that reason regular daily service was necessary. He asked permission to do this and Mr. Williams replied that Mr. Parsons must use his own best judgment and give the service required. Owing to snowstorms and zero weather that prevailed many cars of this company were out of service, but with moderating weather they are now operating better.

Chicago, Ill.

In this city the several roads were affected in a similar manner as follows: The elevated roads ran a normal schedule on all days except Monday, and a holiday schedule on this day with provision for small peaks. The Monday traffic was greater than that of a normal Sunday, which is about 60 per cent of a usual week day. The surface lines started on Monday on a holiday schedule but had to add cars due to an unexpected demand. This will be rectified next Monday. The Chicago & North Shore ran a holiday schedule on Monday, with normal service other days. The Chicago & West Towns reduced service on Monday to slightly less than Sunday schedule and could have used more cars to advantage at some points.

Indianapolis, Ind.

Owing to unprecedented snowstorms and extreme cold during the past two weeks all street railway travel in this city has been below normal. Approximately regular Sunday schedules were operated on Monday except that extra cars were used morning and night to take care of employees of some factories working on government orders. Travel during the day was about equal to usual Sunday travel under similar weather conditions. The extreme cold weather and the closing of all theaters, picture shows, saloons, etc., for several days last week by the local fuel administrator has tended to keep the people at home.

Cleveland, Ohio.

The Cleveland Railway operated under definite order from the Fuel Administration to maintain Sunday schedules only on Monday and it obeyed the order explicitly. However, forty large manufacturing industries were exempted from the closing order without notice to the railway and thousands of workmen found it impossible to board cars in the morning. They were left standing at the corners, and eventually they reached their places of employment. They found the same conditions on the return trip in the evening, as additional cars could not be furnished. In addition thousands of men went to cold offices to look over their mail and others took advantage of the opportunity to visit, thus putting up to the railway a burden that was not expected. Big crowds gathered at every important stop, and in some instances crews were threatened when they passed the stops with cars already heavily loaded. In one place the trolley wheel was pulled from the wire in an attempt to prevent a car from proceeding. All theaters did a big business but the people found no extra cars to carry them home in the evening. The crowds were fairly well cleared by 6.30 p. m. with the regular cars, since the Sunday schedule provides for many more cars in the afternoon than in the morning. The use of this schedule resulted in confusion in many places and railway officials had their hands full in taking care of the work. The company has received permission to furnish a sufficient number of cars next Monday in addition to regular cars to carry workmen to and from exempted factories.

Buffalo, N. Y.

With the exception of providing usual tripper extras for more than 35,000 employees of war industries exempted by the Garfield order the International Railway maintained a curtailed week-day schedule of cars on all local lines on Monday. The interurban schedule on the Niagara Falls, Lockport, Olcott and Lancaster divisions remained unchanged. About 85 per cent of the regular week-day service of regular runs was given, but no tripper extras were sent from the carhouses for the usual evening rush period. Almost a score of the largest industries which are working almost exclusively on government orders worked full time, and there was no change in the service provided for these employees. The Buffalo & Lake Erie Traction Company maintained a slightly curtailed week-day schedule with the exception of providing usual extras for employees of the Lackawanna Steel Company.

New York City

The Interborough Rapid Transit Company on Monday saved about 600 tons of coal by strict application of the order. The Sunday mileage was furnished on Monday, and it was distributed so as to correspond with the expected density of traffic. Taking the elevated, subway and surface lines together, the mileage operated was from 70 to 75 per cent of the usual week-day mileage.

The Third Avenue Railway ran about 80 per cent of normal mileage on Monday, and the fuel saving was proportionate to the reduction in service. The traffic was handled without difficulty, although there was congestion because the demand for service was not reduced appreciably.

The Brooklyn Rapid Transit Company ran about 20 per cent less than regular week-day service on Monday, spacing the cars with special reference to the theater crowds. Everything went smoothly with the exception of the crowding of a few cars in the evening rush. The traffic was somewhat heavier than on an ordinary Sunday.

Furnace Savings at Portland

THE Cumberland County Power & Light Company, Portland, Me., has posted the following notice in the boiler rooms of its power stations:

SAVE COAL

Why

The President requests it.

Saving is both necessary and fashionable.

Economy means efficiency, which spells victory.

Every shovel of coal (20 lb.) is worth 10 cents, the war price of a loaf of bread.

How

Heat only the space actually used, but do not sacrifice ventilation.

Accustom yourself to a room temperature below 70 deg. Use a thermometer.

Start with a clean heater free from air cracks, a whole grate that shakes well and a well-insulated heater and pipes.

Keep a deep fire; shake down the ashes only as the draft makes it necessary. Use chimney cold air inlet and smoke pipe damper to reduce draft. Opening the firedoor chills the fire and the heater.

Gas from freshly fired coal should be burned by leaving a small portion of fire exposed.

Clean all heating surfaces thoroughly every week and keep the ash pit empty.

Issued to all our employees to aid them in supporting the work of our fuel administrator.

CUMBERLAND COUNTY POWER AND LIGHT COMPANY.

Hang Up by the Furnace

Six-Cent Fare Granted to Portland Line

Oregon Commission Meets Imperative Need of Company Due to Increased Costs—Refuses Petition of City to Suspend Increase Pending Litigation, but Authorizes Excess Fare Receipts with Tickets

FINDING that the present revenues of the Portland Railway, Light & Power Company are inadequate and that the practices and economies begun under a recent order are not productive of a sufficient return to protect the integrity of the company, the Oregon Public Service Commission has authorized a 6-cent fare for the company, effective Jan. 15. This method of fare increase for Portland the commission prefers to a zone system or a transfer charge.

The company applied for a 6-cent fare on Sept. 6, 1917, and on Oct. 5, 1917, received partial relief. The commission, as described in the ELECTRIC RAILWAY JOURNAL of Oct. 27, authorized an increase in rates for unlimited tickets and limited school-children's tickets, and it gave moral support to the ideas of relief from taxation, commission recognition of wage demands, public co-operation in spreading rush-hour traffic, and one-man car operation.

The commission announced that it would keep in touch with the company's operations and take any further action deemed necessary. The report of the company for the period from Oct. 15 to Nov. 30 having been filed, supplemental hearings were held, at which it was shown that the remedies proposed by the commission had resulted in an increase of net revenue of $20,000 per month. The extent to which the utility had been able to comply with the order and suggestions of the commission were discussed separately. The results, as stated by the commission, are shown in the following paragraphs.

COMPLIANCE WITH PREVIOUS ORDER

Following the issuance of the commission's order, the company resumed wage negotiations with its employees, the parties meeting in a commendable spirit of fairness and moderation and finally entering into an agreement for arbitration. The result was the granting of the demands of the men in full, but with the right reserved to the company to set aside the award, if the commission should not, by Jan. 1, 1918, grant sufficient increase of rates to enable it to pay the new scale of wages. The men now, the commission says, express entire satisfaction with both hours and pay.

The company requested from the Council an explanation as to its power and inclination to remove the unjust public burdens. In reply there was presented to the commission a copy of an opinion of the city attorney directed to the Council and dated Oct. 29, 1917, in which the city attorney held that relief from the burdens of hard surface paving and maintenance thereof and also from bridge tolls can only be granted by an amendment to the charter.

Considerable progress, the commission notes, was made in the spreading of peak loads by changes in the hours of beginning and quitting work in large industrial establishments, but much remains to be done. Office employees and professional men may also vary their hours in some degree so as to avoid traveling at times when the cars are crowded with those in other occupations.

In the matter of operating one-man cars, it is said, the company feels that under the conditions prevailing in Portland considerations of safety prevent this idea being put into effect, except to a very limited extent.

The first months of the fiscal year have shown a large increase in traffic over the previous year, but the rate of increase is falling off each month. Now at the end of the first half of the year it is evident that the actual increase will be very close to the estimated amount of 15 per cent over 1916-1917.

By a reduction of the number of cars on many lines, the average service in proportion to traffic being now somewhat less than in 1916-1917, a material saving in operating expenses has been effected.

The company's report for November covers the period when the curtailment of service recommended by the commission and the new wage scale of all employees were in effect. For five years the gross revenues for November have averaged 8.33 per cent of the total for the year. Assuming the same ratio for this year, the commission calculates a rate of return of 1¼ per cent on the value of the railway property. This return represents the total amount available for both interest and dividends.

In order to bring clearly before the public the relation of the commission to the situation still remaining, the commission describes its three functions as follows:

1. *Administrative.*—"The commission must see that the public gets what it pays for and no less. It must determine both the quality and the extent of the service to be rendered by the utility. Just rates cannot be established except with reference to definite standards of frequency and adequacy of service. In fixing these, the right medium must be found between service which is good, but more costly than the car rider can afford, and that which is cheap, but insufficient to meet his needs. The service must fit both the convenience and the pocketbook of the patron."

2. *Judicial.*—"The commission must see that the public pays for what it gets and no more. The rates charged must be reasonable to the consumer, and so far as this limitation will permit, the rate of return on investment must be fair to the utility. A rate of return which is fair and just for times of industrial stagnation may be entirely inadequate for periods of expansion. Even under fixed conditions these terms are indefinite; there are in every case both upper and lower limits within which any rate of charge or return is fair and reasonable. Within these limits the determination of rates cannot be based on considerations of justice alone."

3. *Financial.*—"If the rates fixed by the commission, while sufficiently high to escape condemnation by the

courts as confiscatory, yield only a return insufficient to attract capital into needed public service, it is the public and not the investor who will suffer. The commission cannot perform this function directly. If any commission should make a practise of enforcing rates which would not attract free capital, it is certain that the community would eventually lose more than it would gain."

Summing up, the commission says that in the consideration of any case justice, of course, takes precedence over profit, but within the limits of reasonableness the commission will be governed by considerations of public policy, bearing in mind the constant need for the investment of new capital in order that the public may be properly served.

Turning then to the case in hand, the commission states that if the Portland company is denied relief, it must inevitably go into the hands of a receiver, for on its interurban lines operating expenses equal receipts, and the earnings of the light and power department are insufficient to meet the bonded interest of the whole system or even to make a fair return upon the investment in that branch of the utility. The primary duty of the receiver would be to conserve the property, and the public would receive service only so far as the interests of the property would permit. Having no means at his command other than the revenue from operations, and no power to increase the fares without the consent of the commission, he would be compelled to cut the service to the point where receipts would equal expenses. Such a reduction of service, the commission asserts, would be intolerable. The commission believes that it would be derelict in its duty if it should refuse the proper amount of relief.

A Few Pointed Remarks

IT is time for the public to realize that the powers conferred upon public service commissions, thoroughly tested and upheld by the courts, are ample for the protection of the public against all the evils from which they have suffered in the past.

It is time, also, to realize that good service can be obtained only by just and equitable treatment. No starved horse ever pulled a heavy load.

The utilities have been deprived of the power to make unjust profits. They must also be protected against unjust losses.

If a utility is driven into a position where its credit is impaired and it can obtain money for operations and extensions only at unreasonable cost, the public must share the loss.—OREGON PUBLIC SERVICE COMMISSION.

REDUCTION OF SERVICE CANNOT SOLVE PROBLEM

In discussing various methods of relief, the commission says that further curtailment of service has been suggested. At first thought this seems feasible. Operating expenses and bonded interest exceed receipts by only about 12 per cent. If this difference could be overcome, interest on the balance of the investment might wait for better times.

The commission calculates that any saving in cost of transportation must be made out of 81 per cent of the operating expenses. These are estimated at $2,349,700, excluding deferred maintenance, taxes and depreciation. Of this 81 per cent, or $1,903,300, will vary with the amount of service.

An increase in net revenue of $412,000 has been shown to be necessary to cover bonded interest alone. If this is all to be gained by reducing service, a reduction of 22 per cent would be needed. To cover 6 per cent interest on the entire investment of $18,233,371, as determined by the commission, would require $789,000 more net revenue, to gain which service must be cut 41 per cent below the present standard. Such a reduction is said to be utterly impracticable.

Nor would the cost of service be less if the city should take over the system and operate it. With the present service and equal efficiency of management, the operating expenses would be the same as at present, while power instead of being furnished as now at cost would have to be paid for at commercial rates.

Under condemnation, it is not likely that the property could be bought for any less than the commission's valuation, and if the courts took account of the present scale of prices, of materials and labor, the cost would be increased at least 25 per cent. Money for such purpose could not be obtained for less than 6 per cent, so that the interest charge would be at least as large as now.

Under city management service could be maintained only by a resort to one or more of the following expedients: Reducing service, cutting wages, raising fares or making up the deficit by taxation.

If the zone system were adopted in Portland, it would permit low rates to be maintained in a great part of the city and would compel the long and now unprofitable lines to pay at least the cost of operation. It would also enable the company to meet jitney competition by making low but still profitable rates on the lines of heavy traffic, where alone the jitneys operate.

The commission believes, however, that the adoption of the zone system is inexpedient at this time. It is estimated, from a study of traffic records for November, 1917, that one-fourth of the travel originates more than 3½ miles from the center of the city. If this distance be adopted as the zone boundary, and a transfer charge added, the additional rate for each zone necessary to make up the deficiency in revenue will be 2 cents. Many riders would thus be compelled to pay 9 cents and some 11 in place of the present single fare. The resulting disturbance in property and rental values would be very great. Many working people would find it necessary to give up their homes in distant suburbs and live nearer their work.

The commission alleges that the satisfactory results of the zone system in European cities are largely due to the fact that there the rich live at a distance and the poor in tenement districts at the heart of the city. In Portland the working classes live at the greatest distances and the extra charges of the zone system would fall almost entirely on them. While the effects of the additional cost of transportation would not alone be sufficient to bring about the formation of a slum district, it would, joined with other causes, tend to do so, and the resultant injury to comfort, health and safety would more than offset the advantages of an ideal system of imposing charges.

Closely connected with the zone system, the commission observes, is the idea of a charge for transfers. There are now about 22,000,000 transfers used per year in Portland. It would require a 4-cent charge on this number to produce the revenue now needed, in addition to the 5-cent fare, but such charge would result in a very great reduction in the use of transfers, making it necessary to raise the price to at least 5 cents, which would be equivalent to abolishing transfers entirely.

The commission states that it hopes to bring about a state of affairs wherein the interests of all shall be properly guarded. The employees are now well cared for. Whenever the revenues reach an amount sufficient to give the owners the minimum fair return on their investment, it will be the policy of this commission so to regulate rates that, with the co-operation of the company, any further profits may be equally divided between the three parties, the employees receiving more wages, the company more revenue and the public better or cheaper service. Efficient management will then be rewarded by increased dividends, and faithful service by higher wages, while the public will profit from both by reduced fares.

SIX-CENT FARE AUTHORIZED

The commission concludes as follows:

1. The practices and economies inaugurated by the utility, pursuant to the former order of the commission, are not productive of an adequate return to protect the integrity of the company.
2. The present revenues derived by the utility from the operation of its railway system are inadequate.
3. The service now afforded is not in excess of the reasonable requirements of the traffic handled.
4. The rates charged and collected as cash fares and for unlimited ticket books are unjust, unreasonable and inadequate.
5. Just, reasonable and adequate rates, effective Jan. 15, are:

Cash fares, 6 cents each.

Unlimited tickets, five tickets for 30 cents, tickets to be on sale by all conductors.

Unlimited tickets in books, fifty tickets for $2.75.

Limited school children's tickets, 4 cents each.

All tickets and cash fares shall include transfer privileges.

COMMISSION DENIES SUSPENSION OF ITS ORDER

The commission on Jan. 14 denied the petition of the city of Portland asking that the 6-cent fare order be suspended, or its operation postponed pending litigation in the courts. The commission, however, carried out the suggestion of Commissioner Corey that receipt slips be attached to tickets sold by the company, these receipts to be redeemed for the amount of the excess fare charged, in event the courts declare the order invalid.

The order says in part:

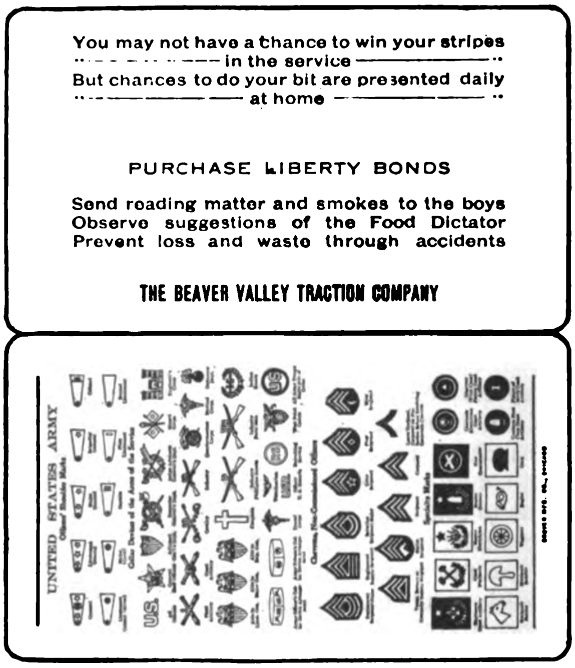
"Our investigation discloses that the need for additional revenue is imperative and cannot be delayed without serious consequences.

"If the effective date of our order be postponed until the matter is finally determined by the courts, the incentive for speedy action will be removed and the case might be allowed to drag along indefinitely, depriving the company of much needed revenue.

Pointed Hints—and Useful Data

THE Beaver Valley Traction Company, New Brighton, Pa., has just issued to its patrons some cleverly devised celluloid cards, 2⅜ in. x 4⅛ in. One of the cards is reproduced herewith.

The front of the card reminds patrons that although they may not have a chance to win their stripes in the service, there are chances for them to do their share at home. Then follow these pointed suggestions: "Purchase Liberty bonds. Send reading matter and smokes to the boys. Observe suggestions of the food dictator. Prevent loss and waste through accidents."



You may not have a chance to win your stripes
in the service
But chances to do your bit are presented daily
at home

PURCHASE LIBERTY BONDS

Send reading matter and smokes to the boys
Observe suggestions of the Food Dictator
Prevent loss and waste through accidents

THE BEAVER VALLEY TRACTION COMPANY

UNITED STATES ARMY

FRONT AND BACK VIEWS OF PATRIOTIC CARDS BEARING TIMELY SUGGESTIONS AND INFORMATION

The reverse side of the card contains the various insignia of the United States Army—information of great interest to those who have friends or relatives in the service and to laymen generally. Small reproductions are made of the shoulder marks for officers, collar devices, the chevrons for non-commissioned officers and the various specialty marks.

Union Scale of Wages and Hours

THE union scales of wages and hours of labor for 101 of the principal trades in forty-eight of the leading cities in the United States prevailing in May, 1916, are published in Bulletin 214, just issued by the bureau of labor statistics of the United States Department of Labor.

Reports of weekly wages were received from ninety-nine trades. In eighty of these the average rate of wages, taken collectively, was higher on May 15, 1916, than on May 1, 1915. In nineteen trades there was no change, and in no trade was the average rate lower. As regards the rates of wages per hour, as distinguished from rates per week, eighty-three trades showed an increase, eighteen showed no change, and for none was the rate lower. Taken collectively, rates per hour in 1916 were 4 per cent higher than in 1915, 5 per cent higher than in 1914, 14 per cent higher than in 1910, and 19 per cent higher than in 1907.

American Association News

War Board Work Summarized in Pamphlet Form.

Dr. Conway Presents Data Showing How Electric Railway Profits Have Decreased in Recent Years.

Work of War Board Reviewed

THE New York Electric Railway Association has reprinted in pamphlet form the address which Director Allen gave at a meeting of executives of the association on Dec. 13 on the work of the War Board. It outlines, among other things, the program for fuel saving on the Washington (D. C.) lines recommended by the fuel conservation committee of the Electric Railway War Board. This includes staggered hours of opening and closing some of the departments, skip stops, reduction of heating in rush hours, co-operation by the platform men, etc. This report was to be reviewed by the engineering committee of the National Research Council, of which Dr. Durand, Gano Dunn and L. B. Stillwell are members, and then submitted to Dr. Garfield. It also says that similar studies were to be made in Baltimore and Cleveland.

Some Diagrams Showing the Need for Higher Fares

BEFORE the Connecticut Company section on Jan. 15 Dr. Thomas Conway, Jr., summarized the present economic status of the electric railway industry. This was done for the purpose of furnishing ammunition to the employees for use in discussing with the public the need of the company for higher fares. A brief report of the meeting was printed in last week's issue of this paper. This week a number of diagrams selected from those shown on the screen by the speaker are reproduced. These diagrams make graphic a situation already quite familiar, which has been covered from all angles in many articles in the JOURNAL. It is convenient, however, to have them in form for easy reference, and their publication is timely, as they were prepared for use in the higher fare case pending at Hartford, Conn. The diagrams tell their own story.

In introducing the diagrams Dr. Conway reminded his hearers that in appealing for protection of electric railway interests it is not only the investment for

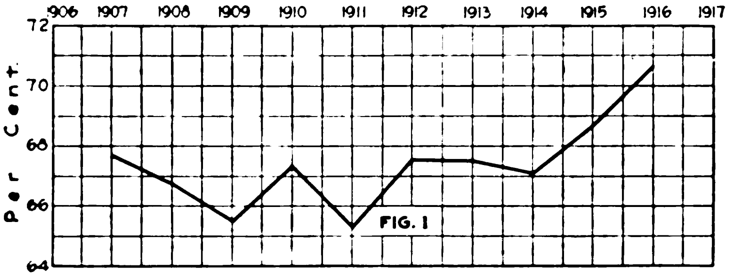


FIG. 1

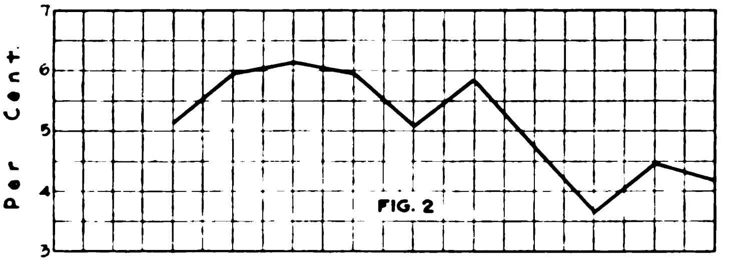


FIG. 2

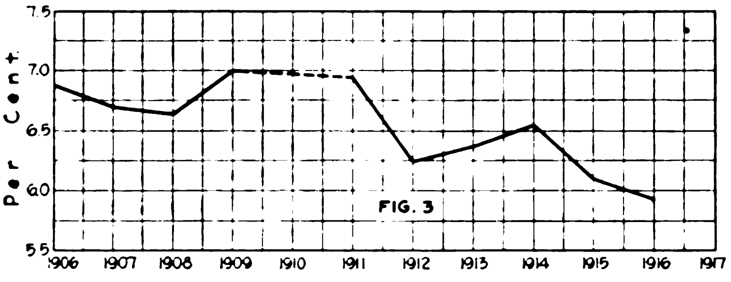


FIG. 3

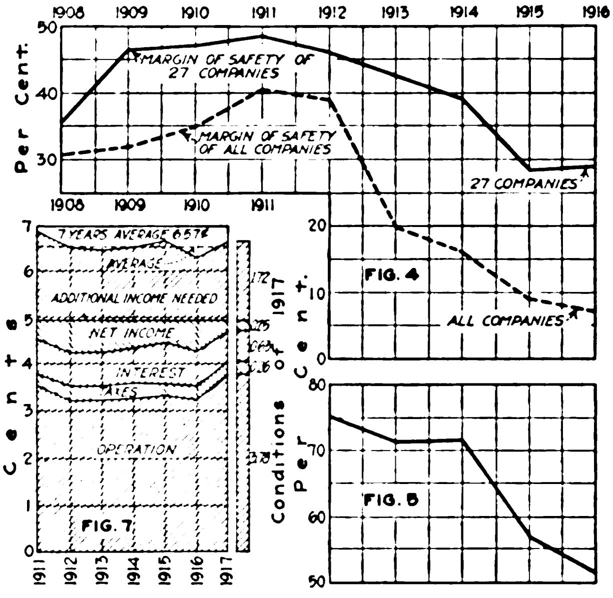


FIG. 4

FIG. 7

FIG. 5

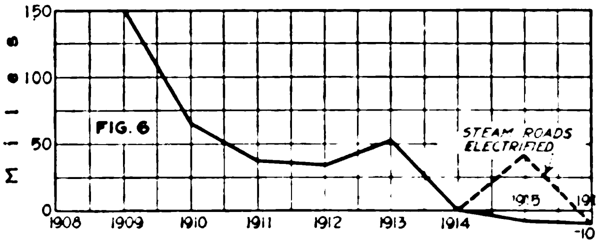


FIG. 6

Fig. 1—Ratio of Operating Expenses to Gross Earnings of Massachusetts Electric Railways from 1907 to 1916

Fig. 2—Net Earnings of the Rhode Island Company from 1908 to 1917 in Percentage of Reproduction Value

Fig. 3—Net Earnings Per Mile of Track from 1906 to 1916 in Percentage of Cost of Main Track of Massachusetts Railways

Fig. 4—Margin of Safety of Bonds of Twenty-seven Companies in New York State Petitioning for Higher Fares and for All Electric Railways in the Second Public Service District. Roads Included in Both Cases Are Those Having Bonds Outstanding

Fig. 5—Comparison of Margin of Safety for Funded Debt of Massachusetts Electric Railways from 1912 to 1916

Fig. 6—New Electric Railway Mileage Put Into Operation in Each Year from 1909 to 1916 in the Second Public Service District of New York

Fig. 7—Chart Showing Average Rate of Fare Per Passenger Which Would Have Been Necessary to Cover Operating Expenses, Taxes and 8 Per Cent Upon the Book Value of the Property Used and Useful in Railway Service, Connecticut Company, 1911 to 1917

DIAGRAMS SHOWING WHY ELECTRIC RAILWAYS NEED MORE INCOME

Publicity Fermenting in the Electric Railway Situation

Recent Instances Are Quoted to Prove This Statement —Commissions and Newspapers Are Beginning to Recognize Serious Condition of Railways

BY IVY LEE

THE policy of full publicity for things relating to the electric railways is proving itself. It is having a most noteworthy effect in expressions of fair-mindedness toward the companies that not so many months ago were almost uniformly expressions of intolerance.

Public service commissions are becoming more and more appreciative of the real relationship of the public to public services. Recent evidences on this point are numerous. The latest manifestation is to be found in the opinion just rendered by Commissioner Travis H. Whitney of the First District of New York. While the important point in this opinion is its conclusion (as fully told in the columns of the JOURNAL last week) that the commission is without power to grant the petition of the New York & North Shore Traction Company for an increase of fare from 5 to 7 cents, it is of great interest to note that the commissioner does not stop there. Having stated, as one of the logical steps in the development of his opinion, that the company has fully established the necessity of a greater income and that the public service is threatened by a state of facts that condemns the company "to a slow but ignominious extinction," he then goes into a field he is not called upon, for the purpose of the decision, to explore. He discusses other ways of meeting the company's problem, moralizing in detail and at length on the responsibilities of the public.

Taking the North Shore case as typical, he boldly places a share of the responsibility for such instances on the shoulders of city and State authorities in having encompassed the railways with onerous restrictions certain, in time, to put the company and the public's service in jeopardy.

The up-State commission has been just as frank in its acknowledgment of the true bearings of similar problems. Chairman Van Santvoord was, at first, frankly in line with the view that the commission had no power to raise street car fares above the maximum stipulated in its franchise, but just as frankly announced, in view of the public need, his change of viewpoint.

Commissioner Emmet took, as the foundation stone of his concurring opinion, the view that the public service is the paramount consideration.

The public press, too, shows a similar spirit. At first the up-State papers viewed coldly—to say the very least—the proposition of increasing fares. But when the companies had exhibited their figures, such journals as the Syracuse *Post-Standard* and Utica *Observer* led many others in agreeing that the companies—to preserve service, and that was the ruling consideration—must be relieved, if not by higher fares, then by charges for transfers or remission of franchise taxes, paving taxes, etc.

OTHER INSTANCES FROM NEIGHBORING STATES

In Massachusetts the commission at first increased many fares, and later, on finding even the increase granted insufficient to meet the rising costs of operation, permitted the installation of zone systems. The action in Holyoke, Mass., is the latest in that respect. And the whole situation was intelligently reviewed and accepted by powerful Massachusetts papers.

In Trenton, N. J., Peter Witt, formerly street car commissioner of the city of Cleveland, when called in to report on the local traction situation, was expected, apparently, to put all the blame on the electric railway company. But, while making many suggestions for improvement of the company's service, he just as frankly reported to the City Commission that the responsibility of the city and the citizens of Trenton must be frankly recognized.

Peter Witt's blunt recognition of responsibility of the city's and citizen's interest in the welfare of the public's service cannot but have its effect far beyond Trenton's limits.

H. B. Weatherwax, vice-president of the United Traction Company of Albany, in an article recently printed in *The Commercial and Financial Chronicle,* says, in his review of public opinion as a result of a year's policy of publicity on the affairs of New York companies:

"The first idea was one of antagonism. The present idea is one of co-operation. . . . There is an enormously better appreciation of the facts bearing on the industry, both on the part of the public and on the part of public service commissions, not only in this State but throughout the country. . . . The present situation looks distinctly forward, not backward. A year ago this could not have been said."

Plainly, the policy of publicity is educating the public that its interests and the public's are one. The policy is proving itself.

(*Concluded from page* 187)

which protection is sought, but also the welfare of an enormous group of employees. This is a point which is often overlooked.

The public prejudice which employees are called upon to dispel is caused by conditions which have no bearing on the present situation. It is true that in the early days, under the inspiration of over-enthusiasm, roads were built which could never be profitable. Some were also built to sell. Due partly to the propaganda of muckraking magazines, an exaggerated idea of the profits of electric railways has become prevalent. There is a notion abroad also that the roads are greatly overcapitalized. Since 1907 public service commissions have been organized in forty-seven states. These will see that the capitalization of the railways is proper. The charts show the present situation with reference to income and actual costs.

Electrification of Swiss Railways

The Administrative Council of the Swiss Federal Railways has decided to install electric traction in the near future upon the branch railway lines between Scherzlingen and Berne, and between Brigue and Sion; and for this purpose a credit of 9,700,000 francs has been voted.

The main reason given for the above step is the increasing scarcity of coal, which, according to a report of the railway directorates, threatens to become a real calamity for Switzerland.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

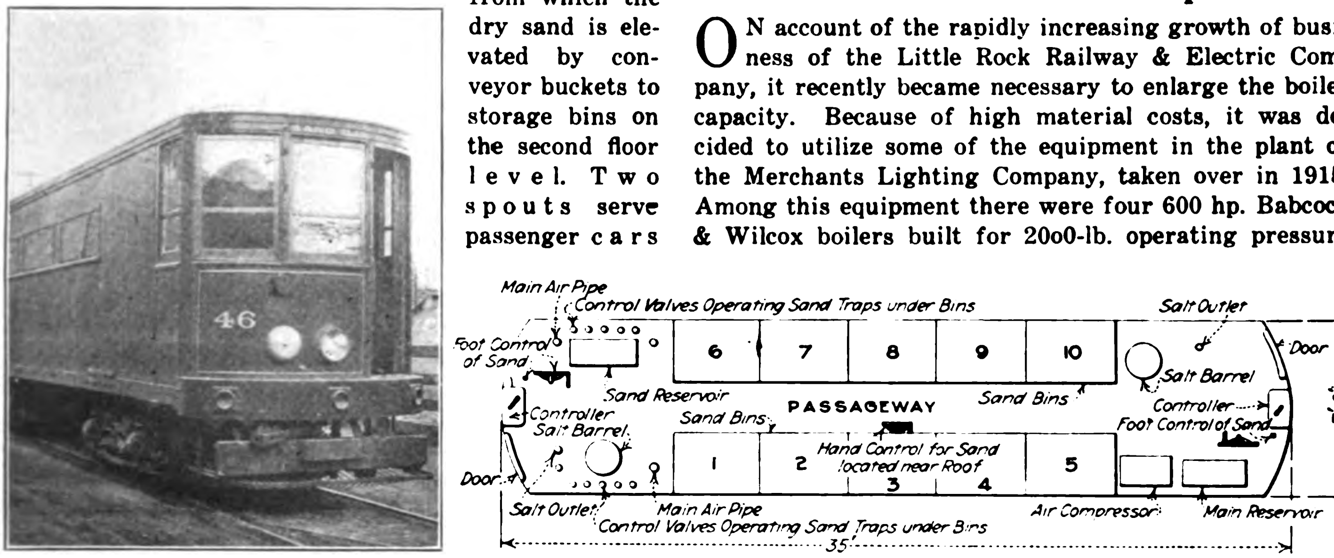
ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

New 20-Ton Sand Car Built in Railway Shops

By George C. Taber
Mechanical Engineer Union Street Railway, New Bedford, Mass.

THE Union Street Railway of New Bedford, Mass., has recently built in its own shops for local service a sand car of improved design, which is operated in connection with a 100-ton drying plant located at the Weld Street carhouse. The company owns sand banks 7 miles distant, and at present is hauling sand from this site in a 3-ton gasoline truck for storage and subsequent general use on the system. In the near future a steel flat car will be substituted in this service.

Upon being received at Weld Street the sand is elevated by Link Belt conveying equipment to bins on the second floor of the carhouse. From there it falls into the drier and thence to a receiving pit in the floor, from which the dry sand is elevated by conveyor buckets to storage bins on the second floor level. Two spouts serve passenger cars and the sand car from these bins as required. The drier is heated by steam coils connected with the carhouse boiler plant.



END VIEW OF HOME-MADE SAND CAR AND SKETCH OF INTERIOR ARRANGEMENT

The new sand car is 35 ft. long over all and 7½ ft. wide and is 12½ ft. high from rail to trolley base. It has a semi-steel underframe and weighs about 20 tons light, with capacity for 10 tons additional. It is equipped with four Westinghouse 101-B motors and two standard 0-50 trucks with 33-in. wheels, truck centers 17 ft. and 4 ft. 6-in. wheelbase. End doors are provided for the crew, and on each side are three hinged doors, each 6 ft. long and 2 ft. wide, which can be fastened open when loading the car at the carhouse. A Mosher arc headlight, Westinghouse straight air brakes and Jones hand brakes and a Westinghouse A-5 air compressor are used. The car carries a 3-in. manilla cable and a 4-in. x 6-in. x 8 ft. timber for use in emergencies, besides a number of small tools. The sand capacity of the car enables it to cover from 10 to 15 miles of track. For use at switches, frogs, etc., the car carries ½ ton of salt, which is scooped out of a storage barrel and discharged through a funnel upon the track as required.

The sand is stored within the car body in ten bins of 1-ton capacity each, the discharge being controlled by an air-operated valve, which facilitates sanding either track at the convenience of the operator. An automatic valve provides that the air pressure must rise to 50 lb. in the brake reservoir before any compressed air can be delivered into the air piping connected with the sand discharge valves. An air reservoir for sand valve operation is mounted beneath the roof of the car.

Efficient Boilers from Scrap Pile

ON account of the rapidly increasing growth of business of the Little Rock Railway & Electric Company, it recently became necessary to enlarge the boiler capacity. Because of high material costs, it was decided to utilize some of the equipment in the plant of the Merchants Lighting Company, taken over in 1915. Among this equipment there were four 600 hp. Babcock & Wilcox boilers built for 20o0-lb. operating pressure and two of these were moved to the plant of the Little Rock Company.

The installation was made with the boilers set at a sufficient height to provide a basement for handling the coal and in this basement was located three Buffalo Forge blowers direct connected to a Terry turbine. All the supports for these boilers were structural steel, each boiler being equipped with an individual stack 8 ft. in diameter by 150 ft. high with an individual hopper of 2-ton capacity. Coal is supplied and ashes are disposed of by means of carts and elevator.

The new equipment has proved exceedingly satisfactory, the boilers having been operated as high as 350 per cent rating. The use of blowers for these boilers, driven by Terry steam turbines, has also increased the temperature of the boiler feed water very materially.

Welded Rail Joints

Reasons for the Increasing Popularity of Arc Welding for This Purpose—Details Regarding Recently Introduced Method Are Given

By MARTIN SCHREIBER
Chief Engineer Public Service Railway, Newark, N. J.

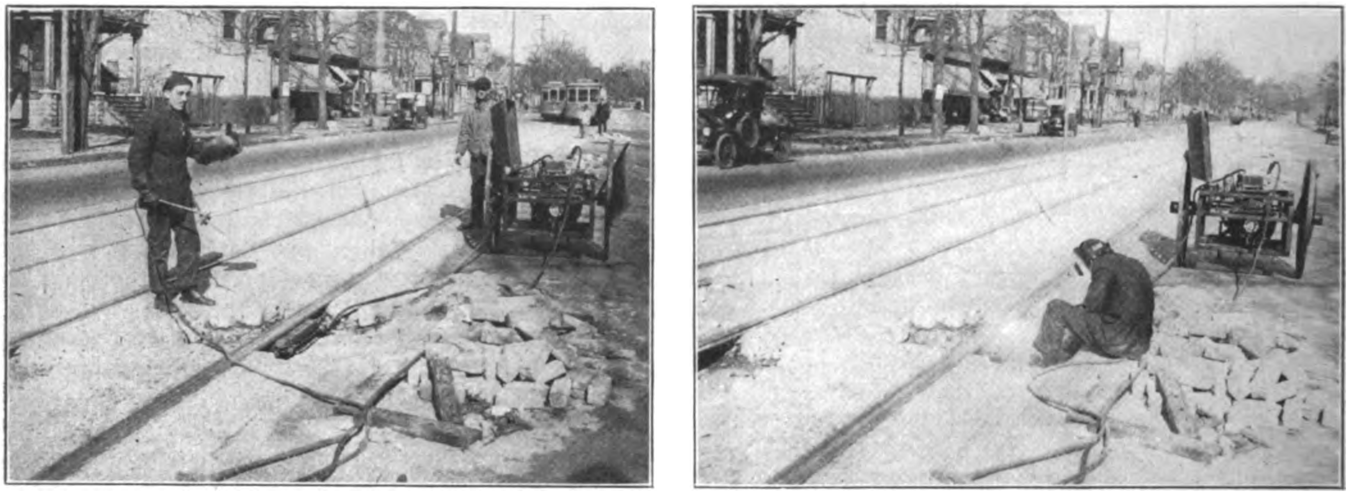
IT IS fairly well understood that joints, directly or indirectly, constitute the most important single item of construction and maintenance of electric railway track. Theoretically a properly welded joint has a decided advantage over a mechanical one, not only for giving a continuous rail for the operation of cars and a life presumably equal to the rail itself, but also an excellent return circuit for the electric current. These cardinal principles were recognized by track engineers over two decades ago. Then there was a general wave of interest in welded joints over the electric railway field, and many thousands of electric and cast welded joints were installed at that time. As with most new ideas, the first application of welded joints was doomed to failure. Any number of these welds broke soon after installation, or the rail ends cupped out so badly that it was necessary to cut out the joints and install short sections of rail, requiring two mechanical joints for each fracture. Otherwise the track had to be rebuilt and economical operation suspended.

So almost everyone who had anything to do with the installation of these joints was glad to be let alone long enough to get back to his "first love," the mechanical joint. There was then a vigorous revival of the mechanical joint. This, however, in spite of improvements and special designs that were introduced, was not perfected to a satisfactory degree. Even the joints with drilled holes and fitted bolts or rivets failed after a few years. And once a joint started to loosen and the rail ends moved, the deterioration of the rail ends was very rapid.

Long life of the joint is of the utmost importance. Joint repairs generally in these days involve expensive paving repairs, proper consideration of return circuit, and, incidentally, electrolysis cannot be overlooked. Electric railway engineers naturally turned again to the welded joint, appreciating that theoretically it is ideal, and that its failure in the past had been due to improper practical application. The failure of the welded joints was due to a variety of causes. The important ones were overheating and damaging of the metal in the rail ends, and failure to grind down the joint to a smooth surface after welding. Once the old troubles with the welding were thoroughly understood the faults were in a large way eradicated. The result was that the welded joints became popular.

Since 1908 the Public Service Railway alone has installed approximately 100,000 Lorain electrically welded joints, or joints for, say, 450 miles of single track. On the whole these joints have been satisfactory. Likewise a great many cast and thermit welds have been installed throughout the country with equal success.

In spite of the good results secured with the established methods of joint welding, the stress of these times in which greater efficiency and economy are demanded has caused many to give a great deal of thought to simplifying the present welding process. The object has been to find a method that will at least be as cheap and that can be applied under traffic. Back in 1909, with this thought uppermost in mind the writer caused certain experiments to be performed with the oxy-acetylene flame. Fig. 3 shows a piece of special work that was broken, and how it was repaired and joined up with the existing track in Montgomery Street, Jersey City, by this method.



FIGS. 1 AND 2—ELECTRIC ARC WELDING OF TRACK JOINTS ON PUBLIC SERVICE RAILWAY

Since 1912 considerable progress has been made with electric arc welding of joints, and it is the purpose of this article to call attention to some actual work performed along this line in connection with track work of the Public Service Railway. The ELECTRIC RAILWAY JOURNAL, in the Sept. 1, 1917, issue, page 362, gave a description of some experimental combination electric arc welded and continuous joints installed in Newark, N. J. The performance of these joints is still under observation.

We have just completed the reconstruction of some 3000 ft. of track on Washington Avenue, Newark, where the new methods of the Atlantic Welding Company were adopted. The track was laid with new grooved girder section, Lorain No. 116-434 rail. The plates used were old channel bars, planed at top and bottom to facilitate welding, as shown in Fig. 4. The apparatus used at the joint is seen in Fig. 7. It includes a special composition bar clamped along the full length of the plate. This bar has a powerful controlling effect on the arc and at the same time holds the welding metal in place, even when the actual weld occurs on a nearly vertical surface. The welding company claims basic patents on this feature. Suitable guide rods are attached to the joint apparatus, greatly facilitating the making of the weld, and the welder is able to secure fairly uniform results. The whole joint device is clamped to the rail in place, and does not interfere with the operation of cars in any way.

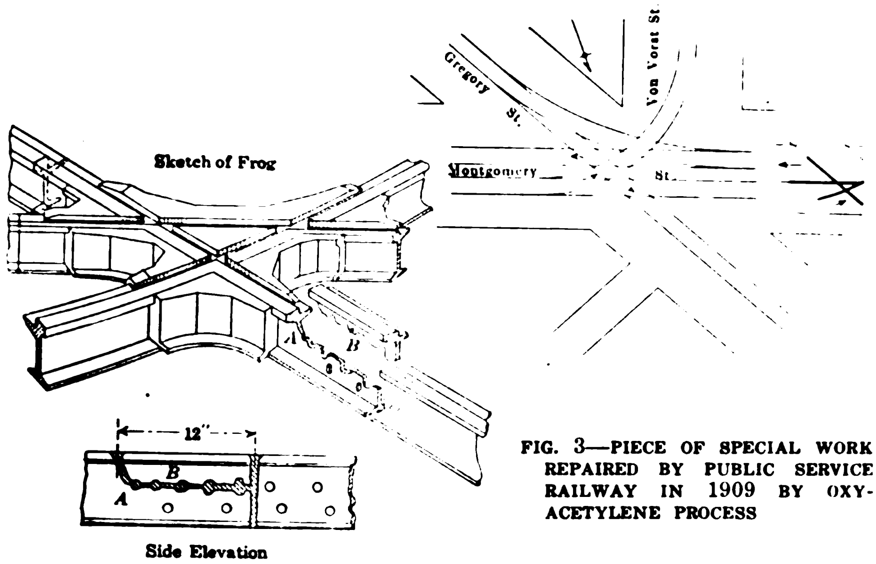


FIG. 3—PIECE OF SPECIAL WORK REPAIRED BY PUBLIC SERVICE RAILWAY IN 1909 BY OXY-ACETYLENE PROCESS

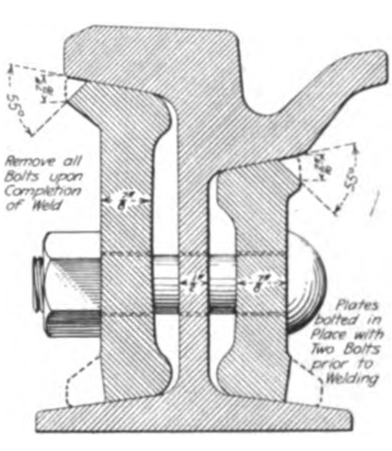

55°
55°
Remove all Bolts upon Completion of Weld
Plates bolted in Place with Two Bolts prior to Welding

FIG. 4—CROSS-SECTION JOINT READY FOR ARC WELDING

A view of the welding generator is shown in Fig. 5 The machine is really a direct-current dynamotor that supplies a suitable welding current of about 350 amp. at 60 volts. The current taken from the trolley wire is approximately 38 amp. The outfit weighs only 1100 lb. and can be moved about conveniently by the two operators. It is supplied with a weatherproof case that can be seen in Fig. 6. The whole arrangement is simple and substantial. It is the intention later to mount one of these generators on a Ford chassis, as the construction of the machine readily adjusts itself to this arrangement.

The fundamental principle of welding the plates to the rail applied with this equipment is not new. The method consists of drawing a carbon arc along the upper and lower edges of the plates, welding them to the head and base of the rail for the length of the joint. The necessary additional welding material is supplied in advance by laying a soft steel rod in the grooveway provided in the joint plate, as is clearly shown in Fig. 7. The amount of metal planed off the plate allows for the thorough and rapid fusing of the surfaces at that point, so the rod when welded in place fills the triangular groove, leaving a tough close-grained weld of good quality about ½ in. deep. The joint when complete thus forms a box girder and the plates when so attached support the rail where the strength is most needed. The joint is independent of the web, which after all is the weakest part. The web, of course, is not affected by heating or in any other way.

The actual time consumed in making the weld is about twenty minutes, so that track can be welded at the rate of two and one-half joints per hour, taking ordinary headway of cars into consideration. In the particular instance of Washington Avenue, Newark, there was a four-minute headway. The energy required per joint, at the rate of a joint in twenty minutes, is about 7 kw.-hr.

The writer was interested to ascertain the effect that the welding had on the original metal of the rail and

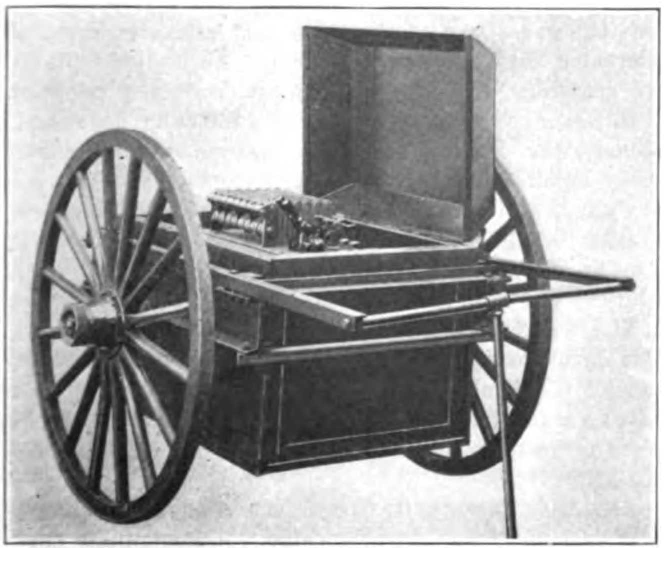


FIG. 5—GENERATOR FOR USE IN MAKING ELECTRIC ARC WELDS

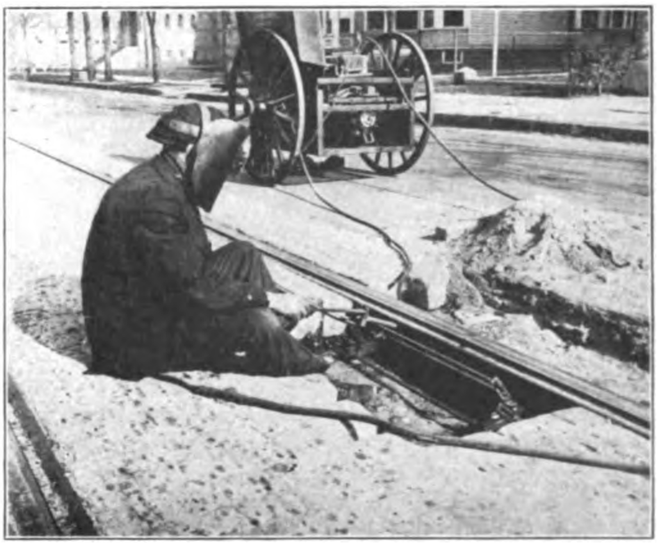


FIG. 6—WELDING RAIL JOINTS WITH THE ELECTRIC ARC

plates. It was found that the Brinell hardness test and the scleroscope test showed no material change. This is a matter of the utmost importance in obtaining a substantial joint.

In Fig. 8 are shown the results of the scleroscope test on one of these arc-welded joints. The result of a test made at the Watertown Arsenal was also examined, and it was found that the tensile strength of the joint was greater than the plates themselves. A transverse test made on a 4-ft. span and with a concentrated load of 50 tons at the center showed less than ¼ in. set.

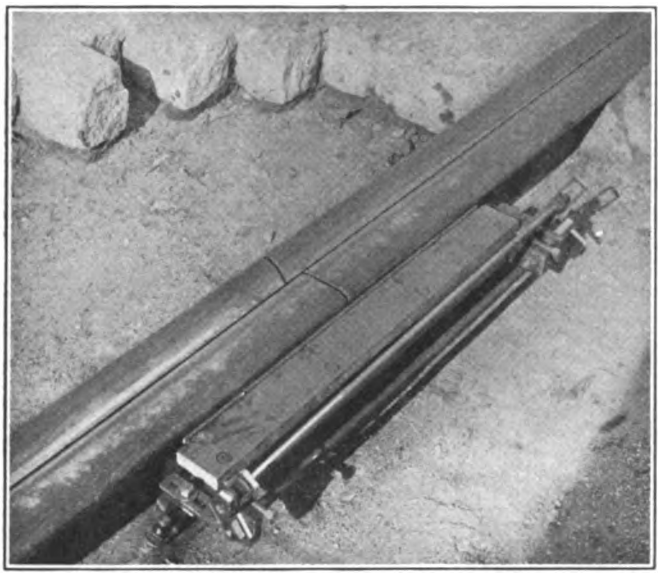


FIG. 7—APPARATUS FOR ARC WELDING OF JOINTS

The electrical conductance of these joints compares favorably with that of the solid rail. Up to date the Public Service Railway has installed about 1000 of the electric arc-weld joints of various kinds and considering the newness of the method the joints seem to be satisfactory. It is our intention to continue the installation of these joints, particularly when traffic cannot be held up.

It is the writer's opinion that these welds are not only apparently satisfactory but have two strong features in their favor; first, low cost; and, second, convenience of installation. Moreover, a minimum amount of pavement need be disturbed in order to install a joint. Then again, it is convenient to install joints as the rail is being laid so that the track work can be completed one small piece at a time, instead of paving the joints temporarily or leaving them open to be welded at some future date. Also when it is necessary to disturb the pavement a very small amount of paving material is required to be removed and replaced.

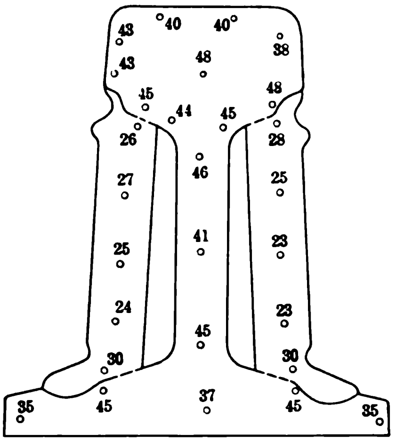


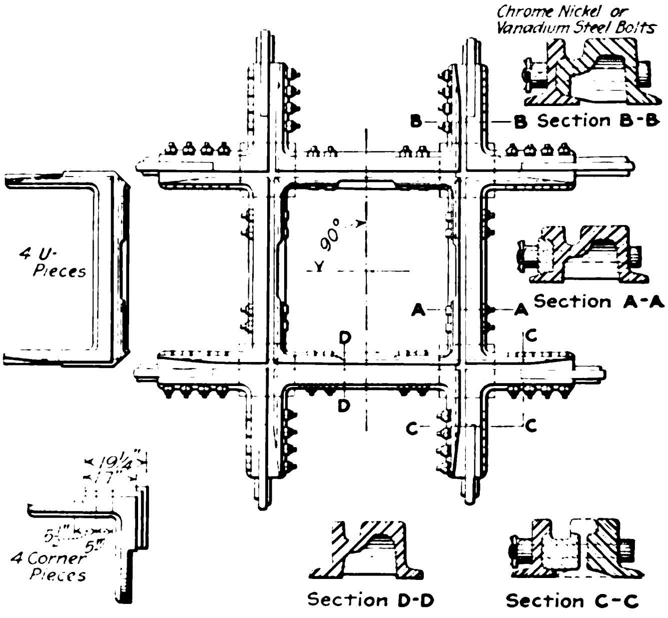
FIG. 8—DIAGRAM SHOWING THE RESULTS OF A HARDNESS TEST ON ELECTRIC ARC-WELDED JOINT

Articulating Manganese Crossings for Longer Life

How the Articulated Crossing Avoids the Objection to a Solidly Cast Intersection and Retains the Qualities of Cast Manganese Steel

THE history of the design of rail crossings for heavy service is one of constant effort to overcome the effect of heavy wear and shock with improved methods of construction.

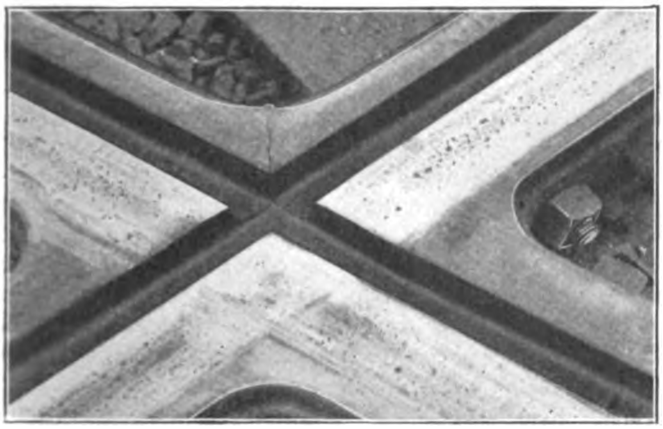
In the days of rail crossings made successively of Bessemer, open-hearth and rolled manganese steel the great difficulty in maintenance was due to loosening and breakage of the main filling or backbone of the crossings under the increasingly heavier loads and higher speeds. The next step was the introduction of a manganese insert in these crossings, but this too failed in time because the bolts could not hold the structure together, as there were too many small parts wearing one against the other. The next step was the use of cast manganese crossings having the intersections or corners cast solid, and made in one, two or four pieces, spliced together with fishplates and joints inside the gage lines of the track. This was expected to overcome the objections raised by the use of bolts in the crossings, as bolts were almost entirely eliminated.



DETAILS OF ARTICULATED RIGHT-ANGLE CROSSING

However, an entirely unforeseen difficulty developed, namely, the occurrence of segregation and infinitesimally small hair cracks in the bottom of the grooves at flangeway intersections. These led rapidly to a separation of the corners from the rest of the casting, due to the weaving action when trains passed over, whereby the thin, already-weakened metal in the bottom of the flangeways was rapidly fatigued and ruptured. The development of the lines of rupture along the bottom of the flangeways would practically break up the casting and make it useless despite the fact that the tread or wearing surface itself might still be in perfect condition.

According to experts, this defect of the solid manganese casting cannot be eradicated. A manganese casting resembles an ingot such as is used in making rolled rail, in that the larger the piece the larger will be the void or pipe therein. Consequently, no casting having unequal sections is of equal density throughout, the masses around the pipe being much spongier than the thinner sections and in a manganese crossing with the intersections cast solid the greatest amount of spongy metal would be at the points of double wear adjacent to the flangeway intersections. Another cause of failure is that the metal in the bottom of the flangeway at the intersections, which also tends to have a spongy structure, fails to amalgamate properly at the time the molten metal is poured into the mold. This failure to amalgamate is caused by a ridge of sand which forms the flangeway intersection in the mold, the casting being poured in an inverted position. To overcome this manufacturers have removed the ridge at the intersection so that the casting can be poured as one piece, the idea being to machine out the groove desired. This practice, however, increases the mass of the casting and so tends to aggravate rather than ameliorate the troubles due to sponginess.



CLOSE VIEW OF RAIL INTERSECTION IN ARTICULATED CROSSING

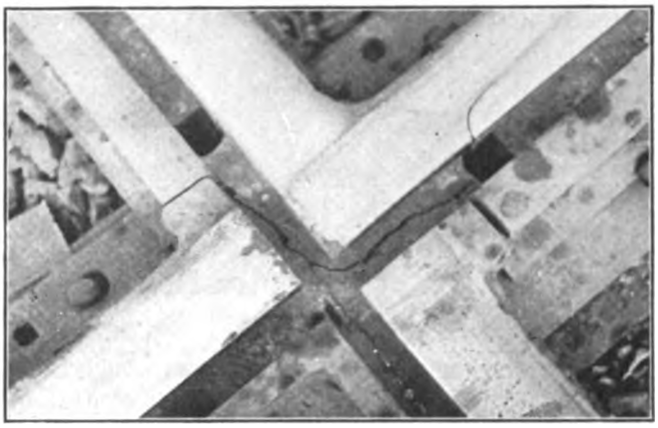
Another argument against the use of this form of construction is the liability of the splices or fishplates at the interior joints to breakage.

The problem, therefore, resolves itself to this: How can we obtain the wonderful wearing qualities of manganese steel at the points where most needed, inasmuch as crossings made with the intersections cast solid tend to have the poorest metal located at the most critical point?

A solution of this question has been offered by Stephen Balkwill, an experienced maker of special work. Mr. Balkwill applies the principle that the smaller the casting the less it is subject to blemish and imperfection, as strains and stresses set up in large castings are much greater and more liable to breakage due to shrinkage in the cooling than in small castings. Hence he has developed a type built up of sections, known as the Balkwill articulated cast-manganese crossing. In this crossing the joints are mechanically made and placed at the very locations where cracks previously occurred, thus securing absolute control as to where the separation should occur. Consequently it is expected that the crossing will be just flexible enough to yield under loads instead of resisting until the usual cracks develop in the flangeway intersections.

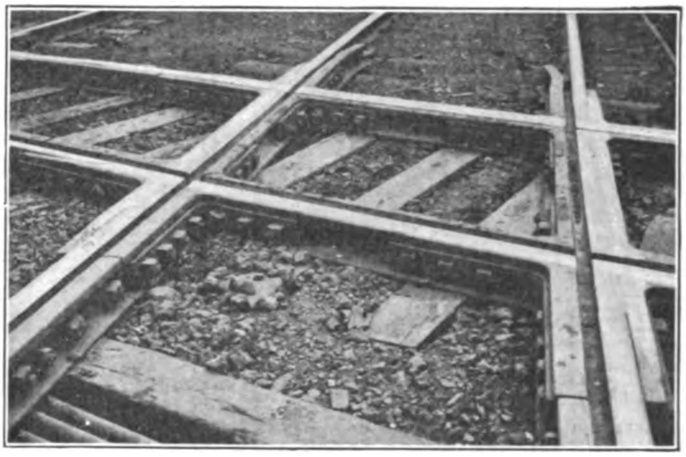
A Balkwill articulated cast-manganese crossing consists of eight castings, comprising four corner pieces and four U-pieces. These eight parts are held in place by high-grade heat-treated steel bolts of the largest diameter practicable and angle bars or knees to connect the U-pieces at the interior corners. The wings are so designed that, together with a filler, they clamp the end of the running rail tightly in position in each of the crossing arms. An easer is also provided at the extremity of each corner piece.

In this form of construction the interior splices or fishplates are entirely eliminated in crossings of 90 deg. to approximately 45 deg.



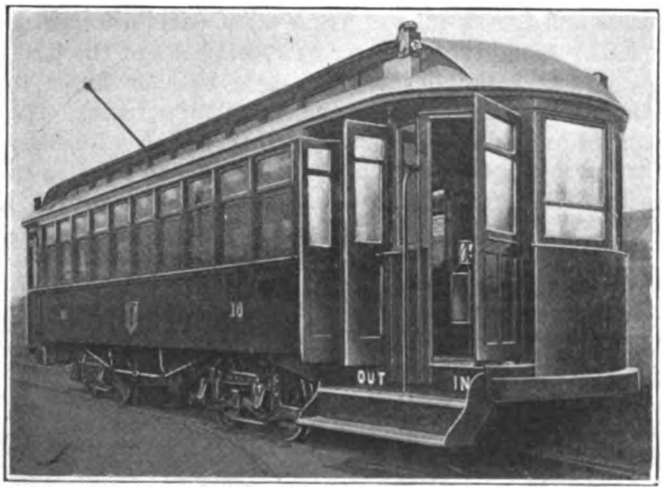
TYPICAL FAILURE IN SOLID CASTING AT RAIL INTERSECTION IN CROSSING

The first of these crossings was installed in June, 1915, where the service conditions soon proved that it was as correct in practice as in theory. This particular crossing, which is 90 deg., is at an intersection of the New York Central main line and the Baltimore & Ohio's ore and coal carrying line at Painesville, Ohio. The service at this intersection is so severe that crossings of Bessemer or open-hearth rolled rails average only a fraction of the life already obtained with the articulated design, and the latter after two and one-half years of service is only half worn out. After resurfacing, this crossing will be in position to give at least two or more years' service at this location. Since the installation on this pioneer crossing several score have been installed throughout the Central and Western States at points with particularly severe service.



AN ARTICULATED MANGANESE ANGLE CROSSING

In order to make this type of crossing and other special work inventions immediately accessible to railways throughout the United States and Canada, the Balkwill



TYPE OF ONE-MAN CAR OPERATED IN EDMONTON

One-Man Cars at Edmonton Have Novel Entrance Door

THE accompanying photograph shows the type of one-man car in operation by the Edmonton (Canada) Radial Railway. At the present time, seventeen of these cars are in operation and six more are to be placed in service in the near future.

J. H. Moir, superintendent, reports that the result of one-man operation has been gratifying and satisfactory and that since this operation began on Oct. 17 not a step accident has been experienced. He also states that the same schedule time is being made as with the two-man cars and that the patrons are well satisfied with the one-man operation.

(Concluded from page 193)

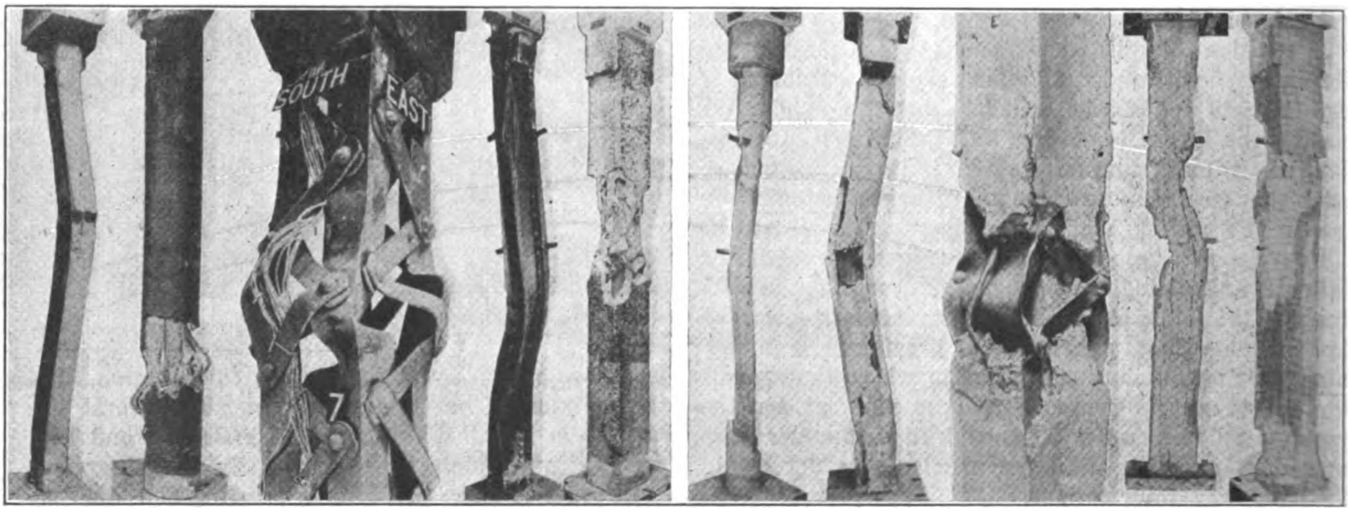
Manganese Crossing Company of Cleveland has been formed to license any manufacturer of special work, or any railway which makes its own special work, to apply the features described. A number of prominent manufacturers are licensed to make these crossings and are prepared to furnish them with reasonable promptness. Mr. Balkwill is prepared to help any frog maker who has no foundry of his own to secure the necessary manganese castings which can be done on very short notice.

Fire Test of Building Columns

A SERIES of 100 tests to determine the strength of building columns in case of fire, which are being conducted jointly by the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters, and the Federal Bureau of Standards at Underwriters' Laboratories, Chicago, are expected to develop data of great interest to engineers, architects, and others interested in building construction. These are the first tests ever made employing modern forms of columns and methods of protection. They were preceded by several years' work preparing the testing apparatus and test specimens. The work was begun last summer, and a year's time will be required to complete the series.

The tests are made on full-size columns of various steel sections, 12 ft. 8 in. effective length, and protected by concrete, tile and other coverings. One unprotected column of each type is also tested. Pressure is applied by means of a hydraulic ram, while the test pieces are heated in a gas furnace, the temperature of which is increased according to a specified standard temperature curve up to 2300 deg. Fahr. at the end of eight hours. The temperature of the furnace is measured with platinum and base-metal thermo-couples supported in porcelain tubes at two elevations, and that of the columns is measured by means of base-metal thermocouples attached to the metal of the columns at four elevations. An automatic potentiometer recorder is connected so that graphic records of temperature can be obtained.

The compression and expansion are measured by means of wire attached to the column at each end of a gage length of 37 in. Readings of vertical movements are taken by means of microscopes mounted in micrometer slides. The tests are continued to a breakdown of the sample, and hence no inferences as to the comparative merits of the different column designs shown in the accompanying illustration can be drawn. The time to obtain failure for the columns tested thus far varies from seventeen minutes for the unprotected columns to more than eight hours for those heavily protected. Differences of 100 per cent in effectiveness of fire-resistive materials have already been found between concrete of different aggregates. The figure below shows several columns after failure.



TEST SPECIMENS OF BUILDING COLUMNS BROKEN DOWN IN FIRE TESTS TO DETERMINE EFFECTIVENESS OF COVERINGS

Cost Data on Special Work Construction—II

By M. BERNARD

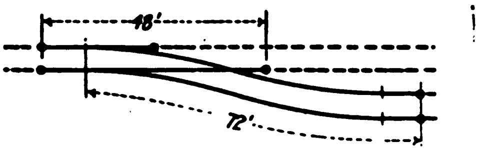
Assistant Engineer Way & Structures Department,
Brooklyn (N. Y.) Rapid Transit System

This is the second plate of the series of Cost Data on Special Work Construction supplementing the series of plates giving Cost Data on Special Work Renewals. The following four units are of the same types as those covered in the issues of Dec. 8, page 1043, Figs. 28, 29 and 30; Nov. 10, page 871, Fig. 21.

Fig. 5—Side Turnout

Length—120 ft. single track

New construction—7-in. girder rail*—5-in. granite on concrete
Old construction—street graded, unpaved

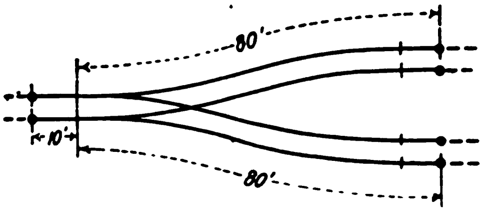


	No Traffic
Labor	$144.00
Handling	66 00
Miscellaneous	16.00
Total (except materials)	$226.00
Cost per single track foot	1.89

Fig. 6—Equilateral Turnout

Length—170 ft. single track

New construction—7-in. girder rail*—5-in. granite on concrete
Old construction—street graded, unpaved

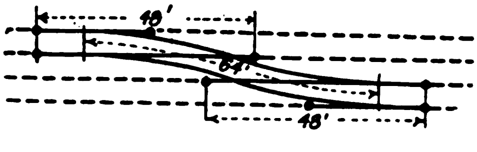


	No Traffic
Labor	$215.00
Handling	95.00
Miscellaneous	25.00
Total (except materials)	$335.00
Cost per single track foot	1.97

Fig. 7—Right Hand Cross-over

Length—160 ft. single track

New construction—7-in. girder rail*—5-in. granite on concrete
Old construction—street graded, unpaved

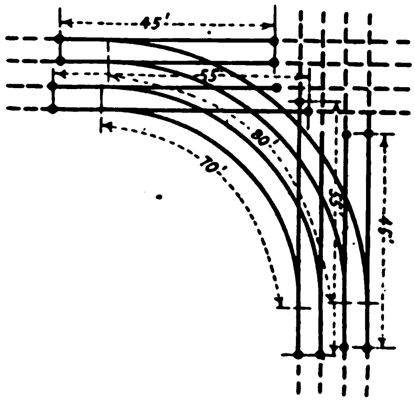


	No Traffic
Labor	$230.00
Handling	60.00
Miscellaneous	30.00
Total (except materials)	$320.00
Cost per single track foot	2.00

Fig. 8—D.T. Connecting Curve (90 Deg.)

Length—350 ft. single track

Construction removed—9-in. girder rail*—8-in. granite on sand
New construction—9-in. girder rail*—8-in. granite on concrete



	Light Traffic	Average Traffic	Heavy Traffic
Labor	$570.00	$640.00	$710.00
Handling	180.00	190.00	200.00
Miscellaneous	100.00	120.00	140.00
Total (except materials)	$850.00	$950.00	$1,050.00
Cost per single track foot	2.43	2.72	3.00

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*Hard-center construction. *Explanation:* By "light traffic" is meant either the divergence of cars during progress of work or a traffic of not more than 150 cars per day of twenty-four hours. "Average traffic" denotes the passage of about 325 cars per day of twenty-four hours, and "heavy traffic" that of 750 or more.

By "labor" is meant the labor cost of tearing out the old paving and special work and installing the new at the location where the work is done. "Handling" signifies the cost of loading the necessary materials at the various storage yards as well as the unloading of same at the place of renewal. It also includes the cost of transportation and the cost of removal of old or left-over material. Since the transportation is done by a subsidiary company, which adds profit and overhead expense to the net cost, this item may differ considerably from that obtained on other railways. Under "miscellaneous" are included the expense of city inspectors, expense incurred when portable crossovers are used for divergence of cars during renewal, watchmen's wages, and incidental engineering expense. The total of these three items—labor, handling and miscellaneous—therefore includes everything except the cost of materials.

On account of the unsettled labor conditions prevailing since the beginning of the war, the costs given are based on pre-war wages, the average track labor on which these costs are based is 20 cents per hour, including the foreman's wages.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Statement by Arbitrators

Majority of Puget Sound Board Urge a Physical Valuation and Relief for the Railway

A supplementary statement with recommendations was issued on Jan. 5 by Dr. Henry Suzzallo and C. J. Franklin, comprising a majority of the arbitration board which recently settled the differences between the Puget Sound Traction, Light & Power Company and the Tacoma Railway & Power Company and their employees. A separate statement with recommendations was also issued by James A. Duncan, the third member of the board, representing the men.

Dr. Suzzallo and Mr. Franklin, besides urging a valuation of the property of the Puget Sound Traction, Light & Power Company by the State Public Service Commission, as has already been done in the case of the Tacoma Railway & Power Company, recommended an increase in the fares, a charge for transfers, relief to the company from certain franchise obligations, such as maintaining crossing police, paving between tracks and the 2 per cent gross income tax.

Mr. Duncan said that it was not fair to deny to the company's employees an eight-hour day and a reasonable wage because of war conditions, and to grant an eight-hour day to other workers at wages that come near meeting increased costs.

Tinkering St. Louis Grant

Disorder Prevents Aldermanic Committee From Completing Its Franchise Program

The public utilities committee of the Board of Aldermen of St. Louis, Mo., on Jan. 8 postponed action on the substitute for the two bills looking toward the settlement of the United Railways franchise matter. They took no action because it was felt that the section of the ordinance governing the so-called mill tax was indefinite. Chairman Barney L. Schwartz and the other members of the committee wanted to confer with C. E. Smith, consulting engineer for the city, and the law department, before agreeing to report the substitute. The substitute provides for the payment of all due portions of the mill tax within one year after the proposed franchise is accepted by the United Railways. The committee was concerned about the matter of the interest payments. The discussion lasted three hours.

On Jan. 10 the committee decided by a vote of six to one to require the United Railways to pay 6 per cent interest on deferred payments of the mill tax and to require it to be paid in not more than five years. The committee voted to reject a proposed amendment eliminating a board of control and transferring its duties to the board of public service. The board of control clauses will be retained in the bill. The bill virtually was completed on Jan. 10 except for clauses providing extensions and betterments in service.

OTHER MEETINGS NECESSARY

It appeared likely on Jan. 10 that the bill would be completed by the committee in time for reference on Jan. 14 to the board of public service for its recommendations. The program was upset, however, by the turmoil that prevailed at the adjourned hearing. Among those who attended the session was a delegation from the Central Trades and Labor Union. Denials were made by the union men of any attempt on their part to storm the meeting, but the confusion was so great that the committee failed to agree on the amendments, and other meetings will have to be held. It was expected that the committee would convene again on Jan. 18.

Montreal Report Ready

The Montreal Tramways Commission, appointed by the Provincial government a year ago to draft a new franchise between the city of Montreal and the Montreal Tramways, will place its findings before the Quebec Legislature in a few days.

The commission values the investment in the tramways company at $38,000,000 and will allow 6¼ per cent on that amount as earnings. The city of Montreal is to receive $500,000 annually when returns are made. From profits left over, the commission suggests that after the 6¼ per cent dividend and the city's $500,000 have been deducted, the remaining profits be divided as follows: City of Montreal one-third and the company one-third and the remaining third to go to a fund to reduce the cost of transportation to the public. Instead of selling tickets to passengers at six for 25 cents, a straight 5-cent fare will be charged with full transfer privileges to any part of the city, a ride of 13 miles.

An allowance of 6¼ per cent on the $38,000,000 valuation will net the company $2,375,000 clear, and net earnings after taxes, worked out on the basis of the commission's report, would be $3,025,327, the company's percentage $2,375,000, and the city of Montreal's share $500,000, which would leave a balance of $150,327.

Chicago Suffered

Papers Pay Tribute to Surface Lines, But Deplore the Lack of Subway Accommodations

Renewed interest in subways for Chicago is a development of the great snow storm and blizzard which for more than a week demoralized surface transportation and threw an unusual burden on the elevated roads. Almost without exception the local newspapers paid editorial tribute to the ceaseless activity of the Chicago surface lines which by use of sweepers and plows provided highways for the relief of a storm-bound people. Following this comment were other editorials pointing to an object lesson of Chicago's experience, namely, that subways would make the city independent of blizzards.

NEWSPAPER COMMENT

The *Tribune* said:

"It is safe to say that 50 or even 75 per cent of this interference would not have occurred if Chicago had a subway system, and we are not speaking of a comprehensive system, but a few main line tubes extending 2 or 3 miles outside of the loop. And a like improvement, even though not so great, could be accomplished in normal times.

"Straphangers should reflect that we could have such a subway now except for one thing. That thing was the opposition of misguided civic organizations and self-appointed watchdogs of the treasury. They were so fearful that the traction companies might get a nickel to which they were not entitled or even an extra nickel beyond bare subsistence, that they defeated every project so far submitted."

The *Examiner* said:

"Once more the citizens of Chicago have had an object lesson of what they are losing by putting off the construction of city-owned rapid transit subways . . . Chicago will never know what real transportation means—in speed, in regularity, in comfort, at all seasons of the year, and under all weather conditions—until it builds and operates rapid transit subways."

A pending plan for transportation improvement in Chicago includes building of subways and extension of elevated lines. This program was halted in the State Legislature last summer through a difference of opinion over the character of enabling legislation that should be provided. Negotiations were reopened recently in the City Council, and while all parties realize the impossibility of raising the necessary millions of dollars during war times, it is expected that discussions will continue so that an agreed plan will be ready for popular vote when conditions improve.

Brazilian Electrification

Representative of Government Favors Immediate Work on Rio de Janeiro Suburban Lines

Dr. Cezar Rabello, a Brazilian engineer, member of the American Society of Civil Engineers and the American Institute of Electrical Engineers, and director of the Cia Brazilaira de Energia Electrica, sailed recently for his home in Rio de Janeiro.

The Cia Brazilaira de Energia Electrica is one of the most important central station holdings in Brazil. It operates hydroelectric plants in the states of Rio de Janeiro and Bahia. Dr. Rabello has been the leader of both projects, and while in the United States placed the final order for the Bahia project with the General Electric Company. This plant will have an ultimate capacity of 30,000 kva. The Rio de Janeiro plant has equipment for 15,000 kva. installed.

The Brazilian government chose Dr. Rabello chairman of a commission to report on the electrification of the Estrada de Ferro Central do Brazil, the most important steam railroad of Brazil owned by the federal government. At present the project is to electrify only the suburban district of Rio de Janeiro. At the end of this district the road goes over a range of mountains with heavy grades, very sharp curves and many tunnels. Dr. Rabello visited the Chicago, Milwaukee & St. Paul; Butte, Anaconda & Pacific; New York Central; New York, New Haven & Hartford and Pennsylvania Railroad electrifications. He is returning to Brazil very much impressed with what he saw and learned and enthusiastic about the courtesies he received from the different men he came to know.

Emphasis is laid by Dr. Rabello on the fact that the system of propulsion selected for Brazil should be the simplest, due to the distance from the manufacturer or the source of repair parts. He feels that the time to begin the work in Brazil is now because successful operation is assured by the results in the United States, and even with the present abnormal prices of material a large saving could be effected, due to the high price of coal. Dr. Rabello inclines to the opinion that the railroads in Brazil should follow the lead of the Chicago, Milwaukee & St. Paul Railway and buy power rather than attempt to generate it.

Colonel Kealy Raps Industrial Slacker

Philip J. Kealy, for several months on leave of absence from his position of president of the Kansas City (Mo.) Railways, returned to active management on Jan. 14. Colonel Kealy issued a statement to the employees and to the public in part as follows:

"These are abnormal times. Our nation's existence is threatened. Extraordinary economic situations exist. Our business is seriously affected, for the reason that no business has escaped. But the more abnormal the situation, the greater should be our efforts and resolutions to overcome it.

"To bring this about, it is necessary that every man do his duty. We are all public servants, our company is a public service corporation. Service cannot be given the public unless every employee is on the job regularly. He must not be a fair weather servant of the public, or a fair weather employee of this company.

"He who fails to report for duty, unless actually sick is a slacker, a worthless, disloyal employee—a faithless public servant.

"This company wants no slackers; it will not tolerate them. If there be those in the service of this company who feel they cannot co-operate toward this end, the time for them to get out is now. The man who sticks to his post of duty is a valuable public servant and will be so treated.

"This is no time for agitators or trouble makers. The kaiser's allies have no place in this country. The vast majority of the employees are loyal but a few disgruntled ones are placing all of us in a bad light.

"Those of us who are not permitted to join the men in the trenches should be soldiers at home, and the only way we can fulfil this obligation is by doing our work regularly as civilians whether that work be on the street cars or in some industrial institution."

Debate M. O. Plan

East San Francisco Bay Cities Plan to Study the Matter of Taking Over Electric Railways

The formation of a public utilities district for the acquisition of the electric railway system which serves the several cities on the east side of San Francisco Bay was the subject of discussion at a meeting in Berkeley on Jan. 14, attended by 200 citizens of Alameda and Contra Costa Counties. The sentiment of the meeting is reported to have been very strongly in favor of public ownership of the railway system and there was hearty indorsement of the plan to investigate the matter.

Mayor Samuel C. Irving of Berkeley was named chairman of the committee, and he was empowered to appoint five other members representing the entire East Bay region, to study the plan in further detail and lay out the formal organization. E. W. Wilson, secretary Alameda County Tax Payers' Association, was elected secretary of the committee. The other members were to be selected later.

$1,000,000 Fire in Buffalo

The Forest station of the International Railway, Buffalo, N. Y., together with 100 cars, was destroyed by fire on the night of Jan. 23. The total loss is unofficially estimated at $1,000,000. The company operates about 400 miles of electric railway. Its equipment as reported in the last edition of the "McGraw Electric Railway List" consisted of 945 motor cars and 93 other cars.

Toledo Men Insistent

Apparently Unwilling to Accept Anything Less Than a Ten-Cent Advance in Wages

At a recent conference between Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio, and representatives of the motormen and conductors the unwillingness of the men to accept an increase in wages of less than 10 cents an hour was brought out. Mr. Coates said that the company could not afford to increase the wages of its men under the present rate of fare. He promised to consider the matter and give an answer later.

H. K. Apple, representing A. L. Faulkner of the Federal Department of Labor, and Mayor Cornell Schreiber were present at the conference. Henry L. Doherty could not attend. Mayor Schreiber stated that the dispute would have to be settled speedily. He had formulated a plan for a complete government investigation. Mr. Apple said the government would probably not furnish the expert accountants needed for such an investigation. President Coates could not say at the time whether the company would be willing to bear the expense.

Mr. Coates asked the representatives of the men what would be the smallest increase they would accept. The reply was "nothing less than 10 cents an hour." Mayor Schreiber then said:

"Owing to the fact that you have a contract, it should be observed as much as possible. If the present wage is insufficient it should be increased only so much as is necessary for a living wage. We are here representing three interests. Mr. Coates represents the company; you men represent the union and I represent the public who use the cars. My chief purpose is to see that the public does not suffer through this controversy. I should like to see it settled as quickly as possible and will do everything I can to make a settlement that is agreeable to both parties."

A communication is expected from Mr. Doherty, chairman of the board of directors of the company, stating when he can meet with the representatives of the men and the government to discuss the matter.

AUDIT DECIDED UPON

On Jan. 16 it was decided to audit the books of the company to learn whether it will be possible to increase wages. Nau, Rusk & Sweringen, Cleveland, were selected to do the work. The arrangement, however, is still subject to the approval of Mr. Doherty.

Mr. Coates told those who attended the conference on Jan. 16 that the days of 3-cent fare were past. Where the rates are increased to meet abnormal conditions, however, they may be lowered when these conditions no longer exist.

Nau, Rusk & Sweringin began an examination of the books of the company on Jan. 21 to determine the increase in the cost of operation.

Freight Tunnels for Hudson

They Provide Only Efficient Solution of Congestion Problem, According to Improvement Commission

The construction of at least one tunnel under the Hudson River for railroad and vehicle traffic will undoubtedly be urged upon the State of New York at the present session of the Legislature. This was indicated by remarks made on Jan. 19 by William M. Van Benschoten, chairman of the Commission on West Side Improvement. Mr. Van Benschoten said that the people of Greater New York were now paying a severe penalty for "having permitted politics, prejudice, personalities, indifference and incapacity to prevent in the past the development of adequate and efficient freight terminals, as well as up-to-date and progressive transportation facilities between New York and the New Jersey shore." He said further:

"We must have adequate freight terminals and adequate and efficient transportation facilities between the city and the lines at the Jersey shore which reaches out to the source of supplies for the city. Connecting bridges have been advocated. The railroad companies cling to their lighters and barges and car floats, but I believe that the only efficient, at all times adequate and proper solution of the Jersey-Manhattan transportation problem is the tunnel, free as it would be from the fiercest storm or the coldest weather.

"With such under-river connections a proper development of terminal facilities in our own Manhattan, and with, perhaps, as the time goes on, a further extension to the other boroughs of the city, would guarantee the people against repetition of the conditions which now exist. In this connection it should not be forgotten that the inadequate terminal facilities in the city are a burden on all the railroads stretching across the continent."

War Committee

National Body Organizes So Commissions Can Work Together to Help the Government

James Blaine Walker, secretary of the National Association of Railway and Utility Commissioners and of the Public Service Commission for the First District of New York, on Jan. 19 said that part of the program of the association for assisting the government to co-ordinate the work of the public service corporations and insure maximum co-operation provided:

"To obtain and transmit to each state commission from official sources information in general war matters affecting the commissions.

"To answer inquiries and ascertain the facts for the state commissions in matters of general war interest affecting them.

"To advise with the various commissions as to how they can give the most effective assistance to their states and the nation during the war."

A special war committee has been appointed which will serve as a link between the federal and state governments. This committee consists of Max Thelen, California; Ralph W. E. Donges, New Jersey; Joseph B. Eastman, Massachusetts; Frank H. Funk, Illinois; Travis H. Whitney, New York, and Edward C. Niles, New Hampshire.

Mr. Walker said:

"The movement includes the railway commissions, and these have been working with public service commissions. There have been many conferences to learn what can be done in a constructive way to help the states and the nation. In these conferences consultations have been had with Governors, the State Council of Defense, and other officials and organizations.

"Much of the work done so far has been of a confidential character, and all of it, in fact, is so bound up with matters under national control that a revelation of our activities must not be made at this time. Just what each state commission should do in the matter of helping the government has been carefully set forth and transmitted to the chairman of each of the commissions. This assures uniform activities, and the danger of some of us working at cross purposes is thus removed."

Motor-Bus Petitions Decided

Dissenting Opinion Draws Distinction Between Regulation for Jitneys and Electric Roads

The Public Utilities Commission of Illinois has granted the Chicago Stage Company a certificate of convenience and necessity to operate motor buses upon the boulevards and streets of the South Side and denied a certificate to the Chicago Motor Bus Company on the ground that the Stage Company is in a position to render adequate service. Commissioner Shaw dissents from the majority opinion, saying:

"In general, I believe it may be said that regulation contemplates that, as long as a utility renders adequate service at reasonable rates, it should not be subject to competition for the reason that when adequate service is rendered at reasonable rates a duplication of plant and facilities is an economic waste which, in the end, the general public must suffer. However, there is a vast difference between a public utility operating motor buses and a public utility operating an electric railway, a gas plant, an electric plant, a water plant, or a steam railway. The equipment of a motor bus company consists in the main of individual buses to the number required, general offices, and a place to house and repair the buses. It has no large investment in generating plants, distribution systems, tracks, etc.

"Therefore, in my mind, a public utility operating motor buses is not comparable with other utilities subject to regulation. It appears to me that the motor-bus business is more nearly comparable with the taxicab business, over which this commission has heretofore held it had no jurisdiction."

News Notes

Water-Power Bill Already Drafted.—Representative Sims, chairman of the new water-power committee of the House, intends to call a meeting of the committee within the next day or two. The bill which the committee will consider is already drafted and embodies the administration's program for developing and conserving the water-power resources of the country.

Commission Functions Unchanged by Federal Order.—It was decided at a conference in Washington between representatives of the National Association of Railways and Public Utility Commissioners and Director-General McAdoo that the functions of the state railway and the public utility commissions throughout the country before the government operation of the railroads will remain unchanged.

Cleveland Commission Meets.—A meeting of the Cleveland Street Railway Commission was held in the office of Otis & Company on Jan. 8. Data were submitted by City Engineer Hoffman and Street Railway Commissioner Sanders. Chairman Charles A. Otis said that the members of the commission would probably visit other cities to make a study of the subway problem. It will be some time before any definite recommendation can be made.

M. O. Bond Bill Recommended for Passage.—The utilities committee of the City Council of Seattle, Wash., has recommended for passage a bill submitting a general bond issue to the voters at the general election on March 5 for the construction of an elevated railway on Washington Street, Railroad Avenue, Whatcom Avenue and Spokane Street, extending from First Avenue south to the west waterway. Twenty-year bonds, bearing interest of not more than 5½ per cent, are provided for in the bill. Interest on the bonds is to be provided for in each annual tax levy, and provision is to be made at the beginning of the fifteenth year for the retirement of the bonds at maturity.

Severe Snow in Texas.—The recent heavy snowfall in Texas caused great inconvenience and in some cases total interruption to city and interurban railway traffic. The Dallas Railways was forced to suspend traffic on some of its lines on account of snow and ice on the tracks, and the Texas Electric Railway, the consolidated Strickland lines, was forced to suspend operation over an 8-mile stretch of its track near Milford. Cars were operated from Dallas to the impassible snow drifts and also from Corsicana to the snow barrier. Traffic was interrupted for nearly forty-eight hours before the line was opened. The company did not attempt to transfer passengers and freight over the break.

Accident to Power Plant.—A gooseneck in a high-pressure steam line connected to four boilers in the plant of the Kansas City (Mo.) Railways, burst on Sunday, Jan. 13. The entire plant was filled with steam. Two men who could not escape were killed. Firemen and engineers cut the fires and ran. The steam was reduced sufficiently after two hours for the workmen to return, make the repairs and restore operation. The engineers who investigated the accident reported that the piping had adequate flexibility, but that the immediate filling of the boiler room with steam prevented those on duty from ascertaining the source of the trouble and closing the broken valve. Electric railway service was suspended for three hours. Electric lights outside the business district of the city were cut off for three hours longer.

M. O. Bill Again Referred.—The bill providing for municipal ownership of public utilities which was introduced into the Legislature of New York by Democratic Leader Wagner with the approval of Mayor Hylan of New York City was taken on Jan. 17 from the public service committee and sent to the cities committee. When the Wagner bill was introduced in the Senate it was referred to the public service committee, of which Senator George F. Thompson, Niagara, who conducted the investigation into the Public Service Commissions, is the chairman. Senator Brown was absent when the bill went to Senator Thompson's committee, so he moved on his return to have the Wagner bill taken from the committee on public service and sent to the committee on cities, of which Senator George F. Argetsinger of Rochester is the chairman.

Advised Against Acceptance of Valuation Contract.—City Attorney Callaway, of Dallas, Texas, has advised the City Commissioner not to accept the contract entered into between the Dallas Railway and the Northern Texas Traction Company for the valuation of the Stone & Webster properties in Oak Cliff. The city attorney says that if the city accepts the contract it becomes irrevocably bound by the findings of the engineers employed to make the valuation. It is maintained that under the contract the Dallas Railways could add any expense incurred in connection with the valuation to the property value to be used as a basis for rate-fixing under the service-at-cost franchises. It is desired that a contract be framed providing that such expense shall be submitted to the Supervisor of Public Utilities of the city of Dallas for revision and approved before being added to the values.

Association Meeting Program

Central Electric Railway Association

The annual meeting of the Central Electric Railway Association will be held in the city of Dayton, Ohio, on Feb. 28.

Financial and Corporate

Depreciation Fund Case

New York Commission Upheld in Requiring 20 Per Cent Fund for Maintenance and Depreciation

An order issued by the First District Public Service Commission in February, 1912, directing the New York Railways to set aside each month 20 per cent of its gross operating revenues to provide for maintenance and depreciation must be obeyed. The company objected to the order and obtained a writ of certiorari from the Supreme Court, but the Appellate Division dismissed the writ on Jan. 18 and affirmed the order.

The order was made after the reorganization of the old Metropolitan Street Railway. The new company, the New York Railways, objected to the 20 per cent requirement on the ground that it was not always necessary to use so much for the purposes designated. The company also insisted that its directors were the proper persons to determine the amount of the depreciation reserve fund and not the commission.

The present decision, besides sustaining the commission in this particular case, makes it clear that the law has vested the commission with full powers to regulate the methods of public service corporations. Part of the opinion of the court reads:

"If this power be denied the directors are at liberty to divert this fund, necessary for the maintenance of the value of the security and also necessary for adequate service to the traveling public, to the payment of the interest on the income bonds. When, therefore, in the course of time it becomes necessary to replace obsolescent and depreciated equipment, what is the situation created? No fund will have been created for that purpose. The commission is not authorized to assent to the issuance of new securities therefor. The necessary replacement cannot be made for lack of funds and of ability to procure them. The corporation becomes unable to perform its public functions, and corporate death is inevitable. Another reorganization becomes necessary, with the consequent material impairment of securities.

"Even if power existed to raise money for replacement by the issue of new securities the fatal ending is only postponed. If the Legislature has left this loop-hole in its scheme for the protection of the security holders, it has made a serious blunder. Such a fate has befallen too many of these corporations, and it was largely to prevent just such catastrophes that this commission was created. The court should not so construe the powers given as to permit the very evils which the Legislature has sought to remedy."

Seeking to Save Road

Residents Along Line Sold for Junk Voluntarily Pay Seven-Cent Fare to Increase Revenues

Efforts are being made to save the Taunton & Pawtucket Street Railway (Bristol County Street Railway), Taunton, Mass., from the scrap heap. The road was sold recently under foreclosure to Swift, McNutt & Company for junk. In the interim between the sale and its confirmation by the court the people who would be discommoded by the removal of the line have injected themselves into the situation in an effort to continue the property as a going concern. Confirmation by the court was set for Jan. 21.

As a first move to prevent abandonment the Superior Court on Jan. 11 refused to allow the petition of the receiver to discontinue operation. It was promptly arranged, however, that all trips regarded as unnecessary be abandoned at once. Then an appeal was made that patrons of the line voluntarily pay a 7-cent fare. At Attleboro on Jan. 15 general committees met to discuss the future of the road. At that time Attorney Burke presented figures to show that the fare increase during the last five days had netted 37 per cent increase, and he figured that the increase in revenues under the new fare would be $10,000 for the year. Plans were discussed for a reorganization of the company by having the residents along the line take stock.

The advance in the fare unit from 5 cents to 7 cents makes the fare between Attleboro and Taunton 28 cents instead of 20 cents. In the new schedule 2 cents is charged for transfers.

Gary Issues Approved

The Indiana Public Service Commission has authorized the Gary Street Railway, the successor to the Gary & Interurban Railway and the East Chicago Street Railway, to issue $365,000 of 6 per cent non-cumulative preferred stock at 90; a like amount of common stock at 75; $125,000 of 5 per cent first mortgage bonds at 85 to pay for proposed extensions, and $800,000 of 5 per cent second mortgage bonds at 75. The company asked permission to issue $437,500 of preferred stock, $1,500,000 of common stock, $350,000 of first mortgage bonds as part of a proposed issue of $2,500,000 and $800,000 of debenture bonds. It was represented in the company's petition that the stock, the debentures and $125,000 of the first mortgage bonds were to be used in paying for the city railway systems and the interurban lines operating between Gary, East Chicago and Hammond. The interurban system consists of 33 miles of track.

War Direction of Security Issues Asked

Investment Bankers Favor the Creation of Semi-Official Board—Corporate Financing Cut, But No City and State Retrenchment

The Board of Governors of the Investment Bankers' Association of America has formally approved a report of a special committee which had been studying the question of supervising security issues. The committee suggested that a semi-official board be created and charged with supervision of the issuance of corporate, state and municipal securities for the duration of the war and the period immediately following its conclusion.

The special committee, which was appointed at the October convention of the association, consisted of Allen B. Forbes, New York, chairman; William R. Compton, St. Louis; M. P. Hallowell, Boston; H. C. McEldowney, Pittsburgh, and H. L. Stuart, Chicago. Copies of the committee's report have been forwarded to William G. McAdoo, Secretary of the Treasury, and Paul M. Warburg, Governor of the Federal Reserve Board.

WAR FINANCING DIFFERENT HERE

After surveying war financing in England, France and Germany, the committee said:

"Our situation is different. The United States, to speak financially, is called upon to be self-containing and self-sustaining from the start. Our own people must take a practically continuous issuance of federal government securities. In addition, we must finance such corporate, state and municipal needs as are essential. This, then, seems clearly to require the handling of the situation on a broader basis than has been necessary in England."

The accompanying data were presented by the committee to indicate the amount of financing in the United States for 1916 and 1917. Totals were also given for the last three-quarters of each year, approximately including the time since the entry of the United States into the war. Foreign government issues were excluded.

RECORD OF FINANCING IN 1916 AND 1917

	1916	1917
Railroads		
April:		
Twelve months.	$368,800,000	$440,800,000
Nine months, April-Dec....	192,500,000	157,900,000
Industrials		
Twelve months.	$951,400,000	$728,500,000
Nine months, April-Dec. ...	655,000,000	457,000,000
Public Utilities		
Twelve months.	$541,200,000	$406,800,000
Nine months, April-Dec....	400,400,000	218,600,000
Total Corporate Financing		
Twelve months.	$1,861,600,000	$1,576,300,000
Nine months, April-Dec....	1,248,100,000	833,600,000
State and Municipal (Permanent Loans.)		
Twelve months.	$497,400,000	$475,800,000
Nine months, April-Dec. ...	376,900,000	371,600,000

The figures compiled, the committee said, indicate the extent of the decline in corporate financing since the United States' entry into the war. Of the amount of financing accomplished, a large part represented the refunding of maturing obligations or financing which would be considered essential under present circumstances.

In the committee's opinion, this record clearly reflects the strong regulatory power of the securities market upon new flotations. Although the cost of materials and labor has had a restraining influence, the market difficulties have been by all odds the most important factor in the decline of the total amount of these issues during the last three-quarters of 1917. It seems a fair inference that this factor will continue to have its regulatory effect, perhaps as time goes on, to an increasing extent.

The report states that it is apparent that there has been no material decrease in the issuance of state and municipal securities since this country's entrance into the war. In this connection, it was suggested that the President or the Secretary of the Treasury call the attention of the states and municipalities to the urgency of issuing securities only to meet the most pressing demands.

SUPERVISORY BOARD NEEDED

The report says in regard to the recommendation for a board to supervise the issuance of securities:

"The moving thought in this recommendation is, first, that the financial activities of corporations, states and municipalities could be better limited and directed by a board than could be accomplished through market conditions alone or through individual or decentralized effort. Secondly, there are urgently needed results to be attained through the constructive as well as the regulative and restrictive work of such a board.

"It is recommended that the membership of this board consist of two classes, namely, (1) representatives of that department or departments of the government most directly concerned in the handling of this situation, and, (2) business men and bankers from private life who are experienced in dealing in a comprehensive way with matters of industry and finance—especially in respect to the issuance of securities. The board should be closely associated with the Treasury Department—in particular with the Federal Reserve Board—and appropriate appointments should be made from these quarters. It may prove advisable, on account of the scope of the board's duties as finally determined, to have among its membership a representative of that branch of the government then in control of war supplies, and also a representative of the federal agency in charge of corporations engaged in interstate commerce.

"The board at Washington should be assisted by appropriate local boards appointed with especial reference to geographical considerations. Familiarity with local conditions would be essential to the proper handling of the subject. It is believed that the Federal Reserve Districts would form advantageous subdivisions for this purpose.

"In respect to the powers and duties of the central and local boards, it is the view of this committee that not only the general policy should be directed by the central board at Washington, but that sufficient central control should be exercised to see that decisions on applications arising in the various local districts are governed by a uniform policy. Moreover, it might be advisable, or even necessary, in respect to some classes of corporate financing, to have the central board decide if the needs of the government, in connection with war supplies, for instance, would make it advisable to allow the concern in question to do new financing.

"It is believed by this committee to be more consonant with conditions existing in the United States that such a board should act under informal rather than formal statutory authority. Undoubtedly, under an informal plan, the board could more readily meet changing conditions."

Financial News Notes

Rehearing Asked in Suspension Order.—The Commonwealth Trust Company, St. Louis, Mo., has asked the Public Utilities Commission of Illinois for a rehearing in the case of the Alton & Jerseyville Railway, Alton, Ill., authorized by the commission to suspend service on Feb. 1 between Alton and Jerseyville and to dismantle the railway property.

Receiver Sought for Aurora-DeKalb Line.—Application has been made to the Circuit Court of Kane County, Ill., by a Chicago bank for the appointment of receivers for the Chicago, Aurora & De Kalb Railroad, operating about 30 miles of track between Aurora and DeKalb. It is reported that interest is in default on a mortgage covering the property of the railway, of which the Chicago institution is trustee.

Time for Bay Sate Deposits Extended.—The protective committee, representing the holders of the 4 per cent bonds due on July 1, 1954, both of the Boston & Northern Street Railway and the Old Colony Street Railway, has extended to Feb. 15 the time for depositing the bonds with the Boston Safe Deposit & Trust Company, depositary. The chairman of the committee is John R. Macomber.

Bondholders Organize.—A committee consisting of John McCarthy, Danbury, Conn.; Charles E. Graham, New Haven, Conn., and P. LeRoy Harwood, New London, Conn., has been formed with Mr. McCarthy as chairman to represent the holders of the first and refunding bonds of the Danbury & Bethel Street Railway, placed in the hands of Judge J. Moss Ives as receiver late last year.

No Dividend on Common Stock.—The directors of the Columbus Railway, Power & Light Company have declared the usual quarterly dividend of 1¼ per cent on the "B" preferred stock, payable on Feb. 1, but determined that the conditions do not warrant the declaration of a dividend on the common stock. The reasons for this action are principally excessive costs of fuel, supplies, metal and practically everything used.

Hearing Jan. 28 on Receivership Plea.—The application for the appointment of receivers for the United Railways, St. Louis, Mo., filed recently by Ephraim Caplan, attorney for John W. Seaman, New York, N. Y., has been docketed for a hearing on Jan. 28 by Judge Dyer in the United States Circuit Court. Mr. Caplan visited Judge Dyer a few days ago and requested a temporary injunction to prevent legal action on the part of the directors and the bondholders of the company until after the hearing. The Judge refused to act until after the hearing.

Cancellation of Mortgages Sought.—Former Governor Judson Harmon, on behalf of J. M. Hutton, Leo J. Van Lahr, Otto Armleder, Claude Ashbrook and Edgar Friedlander, has asked the Ohio Public Utilities Commission to authorize the Cincinnati & Dayton Traction Company, which recently took over the old Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio, to issue $1,250,000 of common stock, and $4,500,000 of twenty-year 5 per cent bonds to be sold to cancel mortgages on the property acquired by the new company.

Deposit Time Extended.—The committee representing the holders of the Lafayette & Logansport Traction Company's first mortgage 5 per cent bonds of 1936 announces that the limit for the deposit of bonds under the protective agreement, which expired on Jan. 15, has been extended, with the understanding that it may be terminated at any time. The Logan Trust Company, Philadelphia, Pa., is the depositary. The Lafayette & Logansport Traction Company is included in the system of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

Petition for Receiver Filed.—A petition for a receiver for the Seattle, Renton & Southern Railway has been filed in the United States District Court in Seattle, Wash., by Charles M. Cook, Boston, Mass., who represents that he is the holder of $10,000 of first mortgage bonds of the railway. He alleges conspiracy to deprive him of his rightful share in the reorganization of the company. The defendants named in the petition are the Seattle, Renton & Southern Railway, the First Trust & Savings Bank, Chicago; William R. Stirling, Burton Thoms and Louis K. Boisot, Chicago; William L. Elkins and Arthur Morton, Philadelphia, and the Seattle & Rainier Railway.

Spokane Valuations Compiled.—The Public Service Commission of the State of Washington has completed a valuation of the Washington Water Power Company's city railway property in Spokane and its interurban lines, and also of the Spokane Inland Empire Railroad, including northern Idaho. Hearings for the taking of testimony will begin at Spokane on Feb. 4, the Idaho Commission sitting jointly with the Washington body. As compiled by the engineers of the Public Service Commission, but not adopted and authorized by the commission, the Washington Water Power Company's system is valued at $21,624,495 in Washington, and $2,491,823 in Idaho, or a total of $24,116,418. These figures are based on the cost of reproduction, and do not include valuation of power sites. When the official valuation is adopted, it will be used as a base for rate-making.

Dan Patch Line Awaits Washington Advices.—C. T. Jaffray, president of the First & Security National Bank, Minneapolis, Minn., who is chairman of the committee representing the holders of the bonds of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, and one of the purchasers of the 14-mile cut-off of the road, said on Jan. 16 that nothing more could be done, either to scrap or reorganize the road, until a decision has been obtained from Washington with respect to the disposition to be made by the government of the so-called short-line railroads. He is quoted as follows: "If the short-line railroads are to be left out of it and concentration made on long lines, obviously the 'Dan Patch' will have little business. Mr. Marchand and Mr. Bratnober are in Washington and may be able to learn whether the 'Dan Patch' comes under the Director of Railways and what may be done with it."

Electric Railway Monthly Earnings

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BATON ROUGE (LA.) ELECTRIC COMPANY					
1m., Nov., '18	$20,518	•$9,907	$10,611	$3,611	$7,000
1 " " '17	18,680	•8,527	10,153	3,540	6,613
12 " " '18	230,584	•115,717	114,867	42,662	72,205
12 " " '17	209,545	•102,128	107,417	41,623	65,794
BROCKTON-PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.					
1m., Nov., '18	$8,511	•$9,858	$1,347	$1,286	†$2,633
1 " " '17	8,507	•9,769	1,262	1,116	†2,378
12 " " '18	124,194	•123,927	267	14,556	†14,289
12 " " '17	121,971	•108,246	13,725	13,278	447
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.					
1m., Nov., '18	$42,612	•$28,256	$14,356	$6,468	$7,888
1 " " '17	34,904	•19,084	15,820	6,484	9,336
12 " " '18	458,245	•293,237	165,008	78,668	86,340
12 " " '17	389,650	•228,545	161,105	78,312	82,793
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Nov., '18	$106,369	•$37,508	$68,861	$31,729	$37,132
1 " " '17	87,021	•31,903	55,118	28,521	26,597
12 " " '18	1,076,629	•408,472	668,157	355,848	312,309
12 " " '17	867,196	•347,933	519,263	343,726	175,537
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Nov., '17	$75,990	•$39,308	$36,682	$12,119	‡$27,465
1 " " '16	78,859	•38,362	35,197	9,622	25,875
12 " " '17	928,068	•512,588	415,480	134,441	‡297,874
12 " " '16	820,296	•440,086	380,210	107,245	272,965
EL PASO (TEX.) ELECTRIC COMPANY					
1m., Nov., '17	$108,205	•$68,005	•$40,199	$6,503	$33,696
1 " " '16	99,883	•56,104	43,779	5,269	38,510
12 " " '17	1,292,396	•789,758	502,638	65,835	436,803
12 " " '16	1,094,844	•645,869	448,975	57,974	391,001
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.					
1m., Nov., '17	$196,272	•$122,876	$73,396	$38,328	$35,068
1 " " '16	170,144	•106,885	63,259	36,824	26,435
12 " " '17	2,055,027	•1,365,078	689,949	449,166	240,783
12 " " '16	1,931,555	•1,232,696	698,859	438,731	260,128

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
NEW YORK (N. Y.) RAILWAYS					
1m., Nov., '17	$998,423	•$745,715	$252,708	$281,139	‡$19,691
1 " " '16	837,383	•697,405	139,978	278,824	‡†76,272
12 " " '17	5,387,330	•3,935,109	1,452,221	1,408,747	‡292,486
12 " " '16	4,447,489	•3,386,508	1,060,981	1,410,686	‡†80,416
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Nov., '17	$25,696	•$19,223	$6,473	$7,927	†$1,454
1 " " '16	26,100	•19,883	6,217	7,246	1,029
12 " " '17	303,661	•231,561	72,100	89,478	†17,378
12 " " '16	311,625	•208,633	102,992	86,845	16,147
PENSACOLA (FLA.) ELECTRIC COMPANY					
1m., Nov., '17	$32,129	•$18,647	$13,482	$7,825	$5,657
1 " " '16	21,151	•13,698	7,453	7,726	†273
12 " " '17	342,220	•198,055	144,165	93,503	50,662
12 " " '16	277,192	•155,688	121,504	91,894	29,610
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1m., Nov., '17	$899,903	•$580,598	$319,305	$203,436	$115,869
1 " " '16	731,630	•432,984	298,646	184,682	113,964
12 " " '17	9,272,611	•5,686,271	3,586,340	2,332,492	1,253,848
12 " " '16	8,018,193	•5,092,698	2,925,495	2,210,477	715,018
RHODE ISLAND COMPANY, PROVIDENCE, R. I.					
1m., Nov., '17	$466,603	•$540,981	†$74,378	$122,376	†‡$195,941
1 " " '16	450,652	•346,949	103,703	119,161	†‡11,499
11 " " '17	5,502,349	•4,695,192	807,157	1,332,299	†‡410,501
11 " " '16	5,330,357	•3,837,225	1,493,132	1,281,775	‡329,426
SAVANNAH (GA.) ELECTRIC COMPANY					
1m., Nov., '17	$88,104	•$57,690	$30,414	$24,451	$5,963
1 " " '16	74,794	•46,031	28,763	23,706	5,057
12 " " '17	955,658	•636,924	318,734	289,703	29,031
12 " " '16	814,900	•548,318	266,582	282,098	†15,516
TAMPA (FLA.) ELECTRIC COMPANY					
1m., Nov., '17	$78,087	•$45,153	$32,934	$5,334	$27,600
1 " " '16	80,779	•44,027	36,752	4,464	32,288
12 " " '17	1,004,802	•559,024	445,778	55,401	390,377
12 " " '16	961,411	•526,540	434,871	52,391	382,480

•Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Commission Against Women

Opposes Their Employment in Seattle—Favors Fare Increases to Provide Proper Help

The Public Service Commission of the State of Washington on Jan. 7 ruled that the Puget Sound Traction, Light & Power Company would not be permitted to employ women to take the places of men as conductors on Seattle cars at this time. The commission also ruled, however, that the company may have a hearing at once on a petition to advance its fares in Seattle from 5 cents to 6 cents. The commission said in part:

"The company, as other similar utilities, is limited in its income to certain sources. In our opinion, the only adequate source by which this revenue can be obtained is through an increase in fares. Eastern commissions, impelled by the increased cost of labor and material, have granted increased rates. In some instances these increases have been to 6 cents and in other instances to 7 cents. Only recently the Oregon commission, for similar reasons, increased the rate in Portland from 5 cents to 6 cents.

"We are satisfied that the women are willing to do their full share in the prosecution of the great conflict now pending. There is, however, some danger that their enthusiasm will lead them into certain callings inimical to the best interests of the State. There is much light manufacturing and many clerkships where they can be employed, and which are not at all harmful to their womanhood, and in many instances, in these lines, they can replace able-bodied men, who can become useful in the more public lines of employment.

"The highest attribute of woman is motherhood. This, in its fullness, includes health. If necessary to the preservation of these things we do not believe that anyone would question the propriety, if need be, of granting to the Puget Sound Traction, Light & Power Company a sufficient income by the increase of rates to make it possible for them to hire proper help.

"That the troublesome question of pay and working conditions may be overcome and an efficient service be maintained, we will entertain from the company an application for an increase of rates, and upon such application being made, will forthwith investigate to determine its condition that a proper order in the premises may be entered."

A. L. Kempster, general manager of the company, had asked the right to employ women on the cars, saying that it was becoming increasingly difficult to retain the men already in the employ of his company, and that it was a financial impossibility for a company to compete with the wage scales paid in the shipyards. Protest against the employment of women was made by organized labor, through the Central Labor Council.

The officials of the company announced at the conclusion of the hearing that they would take no further steps looking to the employment of women on the cars. They would not say that the company at this time would take advantage of the other alternative offered, that of asking for a 6-cent fare.

Fare Request Put Off

Des Moines City Railway Will Not Ask for a Straight Five-Cent Fare at This Time

The Des Moines (Iowa) City Railway has temporarily, at least, dropped its plan to petition the City Council for a rate increase. The company desired to put fares on a straight 5-cent basis instead of six tickets for a quarter, as provided in the franchise. As a preliminary step in the campaign the company offered a wage increase to its employees averaging 2 cents an hour, with the inferred understanding that the men would work for the increase in fare when the matter was submitted to a vote of the people.

The present agreement between the company and the men does not expire until March 1, 1919, and while the men had no desire to break the agreement they felt that in view of the greatly increased cost of living since the contract was signed they were entitled to an increase. Emil G. Schmidt, president of the company, was inclined to agree with them, but advised that it was impossible for the company to assume the additional $60,000 which the wage increase would entail without an increase in fare. The company's proposition was submitted to the men for a referendum vote and was defeated, so for the present at least no steps will be taken on either request for an increase.

Women Conductors for St. Louis

The United Railways, St. Louis, Mo., has its first women conductors in training at the Newstead carhouse, where special quarters have been fitted up for them, along with a rear platform and trailer entrance and vestibule in the school room. George Hart, instructor of conductors, is teaching the class. A majority of the twenty-odd students are wives or relatives of employees. The training course will cover sixteen days, dating from Jan. 7. Before the students began to receive instruction they were addressed by President McCulloch, Superintendent Cameron and Mr. Crafton. It was made clear that their employment was distinctly a war measure. They will be called conductors and not "conductresses" and, receiving the same pay per hour as the men, they will live up to the same rules and receive the same consideration as the sterner sex. The members of the first class will be put on trailers on the Page line.

New Orleans Report Discussed

Antiquated Franchises Result in Waste of Service—Company Operates Best When Free of Restriction

The report on railway operation in New Orleans, La., made last year by James E. Allison, St. Louis, Mo., has been discussed recently before the transportation committee of officials and citizens. Mr. Allison said that he found a great waste of service due to antiquated franchises, dating back to the days of competing city railways, each of which was obliged to traverse the business section. He repeated verbally his formal recommendations that this waste be eliminated, and the resulting economies divided between the traveling public and the railway, giving the former better service at rush hours.

Mr. Allison modified his recommendation to the New Orleans Railway & Light Company to buy fifty cars. He doubted whether the company could get the cars now—or if it could, whether it could get fifty at present prices of steel, for the amount the company had agreed to spend—between $250,000 and $500,000—on betterments of service.

In response to questions, Mr. Allison said he had made no attempt to decide on what basis division of any savings should be made between the company and the public. He had made no study to determine whether the company was getting a proper return on its investment, nor any valuation of its property. Nor had he made any study of the present transfer system. He said that a passenger should be able to reach any point in the city from any other point without paying two fares. The company should be safeguarded against the use of a transfer to make two trips.

FORMER MANAGER SLOAN'S IDEAS

M. S. Sloan, former manager of the railway department of the New Orleans Railway & Light Company, was another of those who appeared before the committee. Mr. Sloan agreed with Mr. Allison that no headway requirements should be placed in the new "blanket franchise" if one was obtained from the Legislature in place of the present collection of overlapping and obsolete franchises. Mr. Sloan said that Mardi Gras was the only day in the year when the railway system of New Orleans was operated as it should be. On that day the company was able to handle the crowds expeditiously because it could ignore the franchises and route cars in the interest of efficiency and service alone.

Buffalo Traffic Recommendations Accepted

International Railway and City Expert Work Together to Better Service

Many of the recommendations embodied in the first two reports of John C. Brackenridge, New York, who has been engaged by the City Council of Buffalo, N. Y., to make a survey of traffic conditions on the lines of the International Railway, have already been put into effect by the company. Ten lines have been rerouted, and E. G. Connette, president of the International Railway, has agreed to cooperate with Mr. Brackenridge and the municipal electric railway committee with the view of carrying out additional recommendations made by them.

Among the most important recommendations made by Mr. Brackenridge are the staggering of the hours of employment at the large industries; the immediate development of the passenger service of the belt line of the New York Central Railroad around the city; the continued co-operation of the police department in keeping vehicular traffic off the electric railway tracks and prevent overcrowding; construction of parallel lines in streets through congested districts and reorganization of the company's car repair and maintenance departments.

STAGGERED WORKING HOURS SUGGESTED

Mr. Brackenridge considers the staggering of hours of employment at the large industries in the Hertel-Elmwood Avenue section would be an important factor in reducing much of the present congestion, but says that the employment of almost 45,000 workers in this industrial section is a very great transportation problem, and he therefore recommends that the New York Central Railroad be required to increase its belt-line service between 5 a.m. and 7 a.m. and 4 p.m. and 6 p.m. He believes that an increased belt-line service on two railroad tracks now lying idle would greatly relieve the traffic problem from the industrial district. Mr. Brackenridge said that the double belt line operating for a distance of 15 miles around the city would afford permanent relief that could be obtained in no other way.

By staggering the hours of employment, Mr. Brackenridge believes that the morning and evening peak loads of power consumed by the company would be very greatly reduced for both the morning and the evening rush period. He also said that the tripper cars instead of making one trip as at present could make two or three trips, depending upon the length of the run, making available about 130 cars for additional service.

Telegrams were sent by Mr. Brackenridge to electric railway presidents and managers in more than a score of cities asking for information as to steps they had taken to have large industries stagger the hours of employment. John J. Stanley, president of the Cleveland (Ohio) Railway, replied that in general the hours of labor were one-half hour or one hour in advance of commercial hours, and that the city railway commissioner in co-operation with the Chamber of Commerce, was working on a plan to stagger by sections or line or employment. M. C. Brush, president of the Boston (Mass.) Elevated Railway, replied at considerable length. He had evidently given the subject much study. Replies were also received from the American Electric Railway Association and electric railway companies in Pittsburgh, Baltimore, Philadelphia, Kansas City, St. Louis and Cincinnati. In each instance efforts were being made by the railways to secure the co-operation of local commercial associations to stagger the hours of employment.

INDUSTRIES ASKED TO HELP

President Connette of the International Railway and Vice-President Dickson are now making efforts to secure the co-operation of the Pierce-Arrow Motor Car Company, the Curtiss Aeroplane Company and other large war industries to stagger the hours of their employees. The Chamber of Commerce has started to investigate the problem and the municipal electric railway committee appointed by the Mayor has secured the co-operation of some factories.

Accepting the recommendation which urged the police department to keep vehicular traffic from the company's tracks, the chief of police has detailed more than two score policemen to patrol the company's tracks on various lines and keep them clear for the quick operation of cars. Traffic officers have also been stationed at congested intersections to prevent overcrowding and to keep the cars moving and prevent congestion and bunching. This movement on the part of the police has reduced to a minimum traffic delays due to "track-hogs."

Before presenting his second report, Mr. Brackenridge made an investigation of conditions in the company's car repair departments, and in his report covering this condition he praised the efficiency of the reorganized departments. He described in detail the company's efforts at the various carhouses to make quick repairs on cars, and told of the manner in which the company had improved its facilities for the quick repair of cars. Mr. Brackenridge declared that the company was now equipped to repair cars faster than they become crippled. He recommended that the company make daily reports to the Mayor of the number of disabled cars and of the progress made in repairing them, and that the repair gangs be kept at work in at least two eight-hour shifts, if not in three.

Serious Traffic Situation in Seattle

Chairman of Emergency Fleet Corporation Appeals to State Council of Defense to Bring All Agencies Together

W. R. Crawford, attorney for Seattle jitneymen, appeared before the State Public Service Commission in session in Seattle, Wash., recently, and stated that if the Puget Sound Traction, Light & Power Company would drop its federal court suit, and allow the jitneys to operate, the transportation situation in the city of Seattle would be practically cleared up.

Dr. Henry Suzzallo, chairman of the State Council of Defense, stated at the hearing that he was in receipt of a telegram from Chairman E. M. Hurley of the Emergency Fleet Corporation, asking the Council to take hold of the transportation situation in Seattle. Dr. Suzzallo said:

"I shall probably go ahead at once, and hope to have a series of conferences with the different agencies involved, namely, the steam railroads, the traction company, the ferries of the Port Commission, and the shipyards. It is my plan at the outset to consult with individuals, and get a thorough understanding of the situation from men who know all about it, before calling organizations to the Council table."

The Puget Sound Traction, Light & Power Company, through A. L. Kempster, general manager, has expressed a desire for steam road transportation aid, and a willingness on the part of the company to go into conference to improve the situation.

Mr. Kempster said:

"We shall be more than glad to meet the city authorities, the heads of the shipbuilding plants, the Seattle commercial bodies, steam railroad officials, the Port Commission and federal representatives in a conference or a series of conferences. The shipyard situation has grown up so rapidly that the transportation system is taxed to the limit.

"The matter of revenue has no weight with us. The sole question is one of transportation. It has been suggested that the railroads have no legal right to enter into local passenger traffic. Our answer is that as the only corporation affected, we will enter no objections on legal grounds to anything the railroads do in this respect. The steam lines very likely would make no money on such traffic at a 5-cent fare, but that is not material. They are under federal control, and the revenues guaranteed."

A. L. Valentine, superintendent of public utilities of Seattle, in an effort to help to solve the transportation problem in the city, wired to Chairman Hurley of the Emergency Fleet Corporation, urging him to assist in obtaining the steam tracks for use.

Increase in Fare in Effect in Pittsburgh

Beset by Operating and Financial Problems Pittsburgh Railways Saw This the Only Way Out

Like most of the other electric lines operating in industrial centers the Pittsburgh (Pa.) Railways has been called upon since the beginning of the war to meet extraordinary demands for service. These demands were severe enough before the entrance of the United States into the fight for liberty, but they have become more burdensome since that time. Owing to the topography of the city there were natural problems enough to meet in normal times. With the strain that has been added within the last few months and with the coming of winter interruptions to service that ordinarily would pass with only scant notice have taken on for many riders what appears as a serious aspect. The result has been that the company has been charged of late with everything from indifference to the needs of the community to gross incompetence.

The Public Service Commission has projected itself into the situation, and has under way a series of public hearings looking toward a measure of relief. As a preliminary move the commission has already ordered the rerouting of certain lines in the downtown district, has changed some of the stops previously in use, has ordered a consolidation of the freight depots of the suburban lines on the Monongahela wharf and has set forth a standard for heating and cleaning the cars. The company has given public notice that it will endeavor in every way possible to co-operate with the city to improve service in compliance with the recommendations of the commission.

The situation for the company has been made more difficult by the need which arose for not meeting the interest on the bonds of some of the underlying companies. The rumor-mongers at once got busy and many dire things were predicted. It finally became necessary for J. H. Reed, vice-president of the company, to make a flat denial that there was any intention to apply for a receiver for the company in the immediate future.

The company is in need of more revenue. No secret has been made of this fact for some time past. It is now going after this in the direct way followed by other companies throughout the United States beset by the same need. A new tariff was filed with the Public Service Commission in December calling for 5½-cent and 6-cent charges for day traffic. This new tariff was to go into effect on Jan. 22.

The city was quick to jump into the increased-fare fray. After an executive session of the City Council, Assistant City Solicitor C. K. Robinson made a statement in which he said that the city would resist vigorously any attempt on the part of the company to increase its fares.

In a statement which it made the company said in part:

"The respondent denies that the proposed rates, prices and changes as set forth in the tariff and schedule filed on Dec. 22, 1917, to become effective Jan. 22, 1918, are unjust, unreasonable and excessive, and discriminatory, in violation of the public service commission law. Such rates and fares are fair, just and reasonable, and an increase in fares is absolutely necessary at this time unless the service of the respondent is to suffer serious loss and deterioration, as respondent is unable to compete against the high prices of all material and labor without increasing its price on its own product, which is electric railway service.

"A passenger of the company can ride for 5½ cents if he purchases ten tickets, but not otherwise. It is a customary and reasonable way to sell tickets in quantities at a reduced price.

"The respondent denies that the proposal that the night fares shall be 10 cents and that the transfer privileges shall be suspended at that time, are unjust and unreasonable.

"It does not believe that the proposed increase in fares will furnish it with enough money to secure all the labor necessary to operate its system as it was operated in times of peace, but it knows no other way in which to meet the situation except to increase its revenues so that it may have additional funds with which to purchase labor and material and supplies for the operation of its railway. None of the money secured from this increased fare will be used to pay dividends on the stock of the respondent, but will be used to pay the necessary expenses of operating the electric railway lines included in the system of the company."

INJUNCTION REFUSED

Judge John D. Shafer, in Common Pleas Court, on Jan. 21 refused to grant the temporary injunction sought by the city of McKeesport and five boroughs through which the company operates to prevent the Pittsburgh Railways from putting the proposed fare increase into effect. Judge Shafer said that the matter of the change in rates was one for the Public Service Commission to decide.

Under the new tariff the cash fare is 6 cents, but two tickets are sold for 11 cents, or ten tickets for 55 cents. In order to facilitate the making of change when cash fare is tendered the company is offering a 4-cent paper change slip in place of 4 cents. These slips it redeems with cash at par or accepts as part payment for another fare.

Commission Makes Suggestions

Offers Advice to the Boston Elevated on How to Meet Some of the Problems Before It

The Public Service Commission of Massachusetts, through Chairman Frederick J. Macleod, has offered certain suggestions to the Boston Elevated Railway for improving its service. The commission says that it recognizes the difficulties under which the company is operating at present, and that the suggestions are made with the hope that they may prove helpful to the company. Among other things the commission suggests the following:

SOME OF THE SUGGESTIONS

"That the terms of employment during the period of instruction be made more liberal.

"That the assistance of State and federal employment bureaus be freely sought.

"That the company accept as employees men subject to the draft but not likely to be called for some months.

"That posters be placed in cars and stations stating an imperative need for additional help of various kinds.

"That the union be urged to co-operate in securing additional men.

"That consideration be given to the employment of young men more than eighteen years of age attending schools and colleges.

"That the company's employees be urged to help out, so far as possible, by overtime.

"That patrons, particularly shoppers, be urged to avoid rush hours.

"That theaters and other places of entertainment be induced to close at 4 o'clock.

"That eight-car trains be run morning and evening in the tunnel from Forest Hills to Sullivan Square."

Fare of 2.5 Cents Allowed

The Indianapolis & Cincinnati Traction Company, in an order issued by the Public Service Commission of Indiana on Jan. 19, has received authority to increase its passenger rates to a basis of 2.5 cents a mile. The action is to be understood as a war emergency measure, and the order may be revoked at the pleasure of the commission and the former rates re-established. The company must report quarterly. The increase was to go into effect on Jan. 23.

A summary of the findings of the commission in the petition of the company shows that there will be a reduction of 5 per cent for round trip tickets; the issuance of the C.E.T.A. commutation books, containing 2000 1-cent coupons, which shall sell for $17.50, and the coupons shall be accepted at face value for passenger fares.

At the same time, the commission authorized the Union Traction Company of Indiana to charge a minimum fare of 10 cents on its interurban lines, outside of cities and towns, in place of the former minimum fare of 5 cents. This particular phase of the petition of the Union Traction Company had been previously denied when the recent order of the commission was made granting increases in certain interurban and city passenger rates.

Commission to Study Kansas City Situation

Power, Traffic, Coal, Labor and Revenue Matters All Receive Attention at Hearing Before State Commission

The Public Service Commission of Missouri, following a hearing in Kansas City on Jan. 10 to 12 on complaint of inadequate service by the Kansas City Railways, included in its order to the company this feature:

"In order that the commission may know that the service is installed as promptly as possible, it will be ordered by the commission that Commissioner Flad, with the aid of employees of the commission, shall come to Kansas City and personally observe and see that the defendant company takes all possible steps to secure the necessary labor, power and fuel to install and operate this schedule, and to assist the company in securing the same."

SIX-CENT FARE APPEAL LIKELY

The company, during the hearing, introduced evidence that it could not afford to improve service without an increase in fare. The commission declared that, under the franchise, the duty of giving adequate service was paramount, and the question of revenues could not be taken up at the hearing. The company will soon, it is said, ask that a 6-cent fare be allowed.

The commission's investigator reported that the Kansas City Light & Power Company, which buys energy from the Kansas City Railways, was not supplying any current for street railway operation on the peak loads. He reported that the power company could render help at the times of maximum loads of the railway sufficient to give exactly the total amount of current needed for operating full schedules. In its preliminary order the commission did not touch on this point.

The commission's appearance in the question of service followed a long period of attacks on the company. The evidence that the company introduced showed that it had been hampered since last summer by labor troubles, rising prices, inadequate revenues, coal shortage, and inability to secure needed equipment. A few days before the hearing the Council adopted an ordinance calling on the company to reestablish the schedule adopted by it last July. The commission sent investigators who prepared reports on the schedules maintained showing naturally that last summer's service was not now being given.

Into this situation the hearing of the commission injected several favorable elements. Col. Philip J. Kealy, who had for several months been with his regiment, had returned a few days before, and he was examined by Clyde Taylor, vice-president and counsel of the company, who acted as president during Colonel Kealy's absence. Colonel Kealy was able to get into the record statements of the situation that seemed to make an impression. On the fuel question, he pointed out that the company had contracted for coal from Illinois, the base price being gaged by the labor costs, f. o. b. mines—labor and freight both having risen. He added that the Illinois coal did not have the B.t.u. values of the Kansas Cherokee coal—but that coal could not be bought on the B.t.u. basis in the Kansas City district, the company having, indeed, to subsidize two mines recently to get them into operation for adding to its coal resources. The increased cost of fuel to the company this year was $500,000. Many other increases in costs were mentioned. Colonel Kealy pointed out that the company had tried earnestly to reduce expenses to meet each increased cost. He mentioned as an instance of improvisation the manufacture of trolley poles in the company's shops, because of the many months of delay in securing delivery from companies making them.

WAGES INCREASED $361,000 A YEAR

Colonel Kealy said that the direct increase in operating expense due to higher wages was $361,000 a year. Labor costs for work other than platform service also were responsible for increases other than those that appeared in the records under different headings. In this connection he referred specifically to costs for track work.

Colonel Kealy made it clear to the commission that the problem of getting labor, and keeping it at work, was a very real one. After mentioning the many ways in which trainmen's tasks had been lightened, he added that there were ten times as many complaints from trainmen as formerly; that many who were financially able to do so took the same course as coal miners and worked only when they felt like it. The day Colonel Kealy testified the temperature was 15 deg. below zero, and ninety-four runs were without men that morning, because the men had not showed up for work.

WOMEN EMPLOYEES CONSIDERED

The company has been arranging to put women on trailers, as collectors, and this matter was gone into by the commission. E. F. Michael, president of the local trainmen's union, had declared that there were plenty of men willing to work for the company, and that it was unnecessary for it to employ women. He said that if the company did hire women, he would advise the men to quit work; that if the commission's investigators found it was necessary for the company to employ women and so recommended, and if the war department of the federal government found that the company should employ women on cars, he still would advise the men to quit work in case the women were actually employed.

Colonel Kealy said:

"Unless the company has credit it cannot borrow, and if it does not earn, it cannot spend."

Colonel Kealy went into the present financial situation of public utilities. He said that in a growing community like Kansas City the yearly expenditures for capital account must continue, as a community could no more stand still than could an individual.

Toward the end of the session Mr. Taylor suggested to the commission that it appoint a representative to observe the operation of the system and aid the company in overcoming the obstacles. The commission did so.

The result apparently puts the matter of service, and all other matters that have been harassing the company, into the hands of the commission, removing them from the immediate control of the City Council.

Interurban Station for Kansas City

$1,750,000 Involved in Plan to Establish Terminal at Tenth and McGee Streets

An ordinance locating a union interurban station at Tenth and McGee Streets, Kansas City, Mo., and granting a franchise to the Interurban Station Company, which will erect and manage the station, on Jan. 7 was passed by the City Council of Kansas City over the Mayor's veto. The ordinance had been pending in the Council for nearly three years.

C. C. Peters, secretary of the Emery-Bird-Thayer Dry Goods Company, is president of the Interurban Station Company. Dr. W. E. Minor is treasurer and Scaritt, Scaritt, Jones & Miller are counsel. Other directors are R. A. Long, C. A. Braley and W. C. Scarritt. It is proposed to issue $250,000 of preferred stock and $900,000 of bonds. These amounts, with $600,000 already pledged, will bring the total up to $1,750,000, the amount that the project is expected to involve.

The terminal will occupy a block between Ninth and Tenth Streets, extending through from McGee Street to Oak Street. The tracks will occupy the north half, and a six-story office building, with two-story lobby, will fill the other half. The lobby will be 65 ft. x 200 ft.

Decision in Milwaukee Coupon Case

Judge E. Ray Stevens of the Dane County (Wis.) Circuit Court decided on Jan. 22 that the order of the Railroad Commission of Wisconsin of Aug. 23, 1912, requiring the Milwaukee Electric Railway & Light Company to sell thirteen tickets for 50 cents was unreasonable. The order was rescinded by the commission in 1915, and the matter under litigation involved the validity of coupons issued with tickets during the time the order was in effect. The face value of these coupons originally issued amounts to $193,000. Officials of the Milwaukee Electric Railway & Light Company are unable to state whether or not the commission will appeal to the Supreme Court.

Freight Advance Allowed

Indiana Public Service Commission Passes Favorably on Appeal of Interurban Railways

The Public Service Commission of Indiana has granted the petition of the interurban railways to be permitted to increase intrastate freight rates to a point commensurate with the new rate basis of the steam railroads recently authorized by the commission. Hearings were held before the Public Service Commission on Jan. 4 and 5. The electric railways stated that the hauling of freight on their cars was a more expensive proceeding than on the steam railroads, because of varying conditions.

The average increase in freight rates granted by the order of the commission will be 20 per cent. In many instances the rates will be increased, but in some cases they will be decreased. Uniformity of existing rates and the abolishing of certain rate discriminations are also covered in the action of the commission, as was the case with the steam roads. The freight tariffs in effect on the interurban roads were, in general, the same as those which had been in effect on the steam roads prior to the increase granted them by the commission. The commission, in its findings, makes several references to the advantages of shipment by the interurban electric railways as compared with the steam railroads.

Transportation News Notes

Chicago "L" Traffic Increases.—For the six months ended Dec. 31, 1917, the Chicago elevated railroads transported 95,906,970 passengers as compared with 93,167,170 for the corresponding period of 1916, or an increase of 4.1 per cent.

Appeals Fare Increase Order.—Commissioners of Cuyahoga County, Ohio, have appealed to the Supreme Court an order of the Public Utilities Commission, allowing the Cleveland & Eastern Traction Company an increase of rates.

Rate Increase Suspended Until June.—The Public Utilities Commission of Illinois has suspended until June 1, 1918, a proposed increase in rates by the Central Illinois Public Service Company operating 15 miles of electric railway between Anna and Jonesboro.

Skip-Stop Plan Adopted at Dayton.—The City Commission at Dayton, Ohio, has adopted an ordinance providing for the elimination of a number of stops on each line and allowing cars to run at greater speed. The measure was viewed in the light of fuel conservation.

Commutation Books for Rockford.—The Rockford & Interurban Railway, Rockford, Ill., which has been authorized by the Public Utilities Commission of Illinois to raise its passenger fares to 2 cents a mile, will place on sale commutation books in the denominations of $2.50, $5 and $10.

Ohio Electric Seeks Higher Rates.—The Ohio Electric Railway, Cincinnati, Ohio, has filed a new schedule of rates with the Public Utilities Commission. It provides for an increase to 2 cents a mile between certain points and 2½ cents between other points. Feb. 1 is the date set for the new rates to go into effect.

Owl Service Not Needed.—The experiment of two months with owl car operation on an hourly schedule all night on the West Fourth Street and Delaware Avenue lines of the Wilmington & Philadelphia Traction Company in Wilmington, Del., has convinced the company that there is no real need for the service and it will be discontinued.

Freight Rate Increase Allowed.—The Public Service Commission of Oregon has issued an order granting the Portland Railway, Light & Power Company a 15 per cent increase in its freight rates, with the exception of wood. Tariffs asking for the increase were filed in October, but they were suspended pending an investigation by the commission.

Freight Hearing Postponed.—The Railroad Commission of Texas has postponed to Feb. 13 the hearing which was ordered to be held at Austin relative to charges that have been made before the commission alleging that the interurban electric railways of Texas are now engaged in a freight carrying business. The hearing was ordered following a recent increase in express rates by the interurban lines.

State Against City in Utah.—The attorney-general of Utah has announced that he will contest the application made by Salt Lake City to the Supreme Court for a ruling on an order of the Public Utilities Commission of Utah suspending the sale of fifty commutation tickets for $2. The attorney-general contends that the State law gives the Public Utilities Commission the right to set aside the provisions of a franchise.

Women in Training in Kansas City.—The Kansas City (Mo.) Railways has received uniforms ordered for women conductors and is training about twenty women for such jobs. It is understood, however, that at least for the present the government representatives who are loking after labor problems are not encouraging the employment of women. The Public Service Commission of the State is also said to be opposed at present to the employment of women. The applicants for positions will be trained, however, so that if a serious emergency arises they may be ready to go to work.

Women Proposed for Little Rock.—In the course of an interview in which he reviewed the strain under which the railway department of the company had been placed on account of the location of a cantonment near Little Rock, the taking of men for war work and increased activity generally, C. J. Griffith, general manager of the Little Rock Railway & Electric Company said: "I have decided the only way out is to get women. I have planned to employ about forty young women and begin educating them as conductors. I believe they will make it possible for us to give better service anyway."

Some of Mr. Witt's Suggestions Adopted.—Acting upon the suggestions of Peter Witt, Cleveland, who reported recently to the City Commission of Trenton, N. J., the Trenton & Mercer County Traction Corporation will make a number of changes to its routes through Trenton and build new lines on certain streets and discontinue service on other thoroughfares. The Olden Avenue branch will be discontinued, a line will be built through Bridge Street to the Municipal dock, the line of South Clinton Avenue, from Hamilton to Stanton Street, will be torn up and a new line built on Washington Street to Cedar Lane, a portion of the Market Street division abandoned, the line to Trenton Junction, a distance of 3 miles, abandoned, and loops built at the Clinton Street station and at Cadwalader Park.

Another Dallas Jitney Ordinance.—Jitneys in Dallas, Tex., appear to be doomed. Although the Court of Civil Appeals recently decided two cases adversely to the jitneys, they have continued to operate pending appeal to the State Supreme Court in these two cases. The City Commission, however, spurred to action by several serious accidents by jitneys in which one person was killed and several others seriously injured, declared an emergency and enacted an ordinance directed primarily against the jitneys, yet it is all-inclusive and affects private cars as well as jitneys. The ordinance is very stringent in its regulations. It limits the carrying capacity of autos to the seating capacity. The jitney men claim they cannot operate and pay expenses if limited to four passengers per trip, unless they charge a 10-cent fare, and that if they do this they will not be able to compete with the electric railways.

Government Control Does Not Affect Rate Cases.—In reply to an inquiry as to whether the Railroad Commission of California would hear on Jan. 24, as scheduled, the applications of the Southern Pacific Company and the San Francisco-Oakland Terminal Railways for authority to raise their ferry and suburban passenger rates at San Francisco, the commission replied in the affirmative. The commission said: "This inquiry is apparently prompted by President Wilson's proclamation of Dec. 26. We have given careful consideration to this proclamation and find nothing therein or in any order issued by the federal government which persuades us that any course other than that originally mapped out should be pursued. Unless developments should make another course necessary, the adjourned hearings in these proceedings will be held on Jan. 24."

Personal Mention

W. H. McAloney, superintendent of rolling stock of the Denver (Col.) Tramway since 1902, has resigned, effective on Feb. 1.

J. Hulme has been appointed superintendent of equipment of the International Railway, Buffalo, N. Y., to succeed George Kuhns, transferred.

Guy E. Tripp, whose appointment to the ordnance department of the U. S. Army was noted in the ELECTRIC RAILWAY JOURNAL for Jan. 19, has received a commission as colonel.

George Kuhns, superintendent of equipment of the International Railway, Buffalo, N. Y., has been transferred to the position of master mechanic, a place formerly held by him.

Emory L. Coblentz, president of the Hagerstown & Frederick Railway, Frederick, Md., has also been elected president of the Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.

Edward Schlant, assistant superintendent of the city lines of the International Railway, Buffalo, N. Y., has been appointed acting city superintendent to succeed T. W. Connette, now in government service.

Allen G. Hoyt, New York, N. Y., has been elected chairman of the executive committee of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., and a director of the company to succeed Thomas A. Reynolds, resigned.

W. C. Davidson, treasurer of the Spokane & Inland Empire Railroad, the United Railways, the Oregon Electric Railway, Portland, Ore., and affiliated lines, will hereafter act as tax agent and all tax matters of the companies will be under his jurisdiction.

J. P. Morton, formerly with the Northern Texas Traction Company, Dallas, Tex., will serve as superintendent of transportation of the Eastern Texas Electric Company, Beaumont, Tex., succeeding to part of the duties performed previously by W. V. Neal, resigned.

E. J. Davis, local purchasing and claim agent of the Eastern Texas Electric Company, Beaumont, Tex., will hereafter have general supervision over the city and the interurban lines of the company, succeeding to part of the duties heretofore performed by W. V. Neal, resigned.

W. V. Neal has resigned as superintendent of the Beaumont (Tex.) Traction Company and the Jefferson County Traction Company, included in the system of the Eastern Texas Electric Company, controlled by Stone & Webster, Boston, Mass., to accept service on one of the firm's other properties. Mr. Neal has been at Beaumont four years. He has served with Stone & Webster since 1902, with the exception of the time he spent in Europe, China and Japan.

Thomas W. Connette, superintendent of the city lines of the International Railway, Buffalo, N. Y., and son of E. G. Connette, president of the company, has been granted a leave of absence and has gone to Washington, where he has received a commission as first lieutenant in the Ordnance Reserve Corps.

J. C. Daries, right-of-way and tax agent of the Spokane & Inland Empire Railroad, the United Railways, the Oregon Electric Railway, Portland, Ore., and affiliated lines, will be relieved of his duties as tax agent but will perform, in addition to his duties as right-of-way agent, the duties of sales manager of the Ruth Realty Company.

H. A. Cowgill, formerly engineer of maintenance of way of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has been appointed general superintendent of the Mansfield Electric Light & Power Company, Mansfield, Ohio, and will assume charge of the electric railways of the company. Both properties are controlled by Henry L. Doherty & Company.

Alexander Lightstone, supervisor of the United Railways, St. Louis, Mo., has gone on the inactive list of the company through a nervous breakdown. Mr. Lightstone was born in St. Louis. His first work for the company was as a "hill" boy. After some years of service he left the company and was out of railway work for several years. He became a conductor on the Page line in 1892 and was promoted to supervisor in 1900.

A. C. Woehler, master mechanic of the El Paso (Tex.) Electric Railway for the last eleven years, has resigned to go into the automobile business for himself. Mr. Woehler has been with Stone & Webster, who control the El Paso property, for more than twenty-four years. He started as a boy in the shops at Houston, and was an engineer at the power house there for some years until he was promoted and sent to El Paso as master mechanic. The employees at the carhouse of the El Paso Electric Company presented Mr. Woehler with a gold watch, chain and charm as a token of their appreciation.

Edward J. Neary, electrical engineer with the Public Service Commission for the First District of New York, engaged on rate and capitalization cases, has been granted a leave of absence to accept an appointment as an electrical officer on board the *U. S. S. Utah* with a commission as lieutenant. Mr. Neary was graduated from Pennsylvania State College and has been in the electrical field for the last ten years. Since he was graduated he has been with the American Gas & Electric Company, the University of Pennsylvania, Henry L. Doherty & Company and the Public Service Commission for the First District of New York.

William Howard Davis has been advanced to the rank of supervisor of the United Railways, St. Louis, Mo., in place of Alexander Lightstone, who has gone on the inactive list through a nervous breakdown. Mr. Davis was born in St. Louis forty-four years ago. He went to work for the old Missouri Railway in 1888. When the lines in St. Louis were equipped with electricity Mr. Davis was taken into the Thomson-Houston shops. In 1893 Governor (now Senator) Stone put Mr. Davis on the police force, where he remained until 1905, being promoted in the Mounted District. Preferring electric railway work, he returned to the front platform, and for the last twelve years has been in the third division.

John J. Dempsey, who was elected vice-president of the Brooklyn (N. Y.) Rapid Transit Company on Dec. 27, was the guest of honor at a dinner given to him by a number of his friends on Jan. 18 at Delmonico's, New York. About seventy were present and Mr. Dempsey received many congratulations on his elevation to his present office, which completed a number of promotions, beginning with that of advancement from telegraph operator to assistant dispatcher. Joseph K. Choate acted as toastmaster. The first speaker was Colonel Williams, president of the Brooklyn Rapid Transit Company. He referred to Mr. Dempsey as being a "constant cheer, constant inspiration, constant reliance." Others who spoke included H. H. Vreeland, B. A. Hegeman, Jr., E. A. Maher, Jr., H. C. Donecker, Dr. E. A. Brennan, LeRoy T. Harkness, attorney for the Public Service Commission, and W. O. Wood.

Obituary

William Earle died recently in St. John, N. B. He was at one time manager of the St. John Street Railway, although latterly he was engaged in engineering work for the Dominion government and the Canadian Pacific Railway.

B. Frank Hires, formerly general manager of the Bridgeton & Millville Electric Company and the Millville, (N. J.) Traction Company, died at his home, Bridgeton, N. J., recently. Mr. Hires was connected with the company for eighteen years.

F. L. Brown, one of the pioneer merchants of Portland, Ore., and for many years secretary of the Portland Traction Company, now included in the system of the Portland Railway, Light & Power Company, is dead. The Portland Traction Company was a California corporation and during his service of ten years as secretary of the company Mr. Brown made his home in California. He also represented the Washburn & Moen Manufacturing Company and the American Steel & Wire Company in San Francisco.

Lieut. Gordon D. Cooke, formerly with the McGraw-Hill Publishing Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, died at the base hospital at Fort Bliss on Jan. 10 from pneumonia. Lieut. Cooke was graduated from the University of Michigan in 1916. As a preliminary training for his work in the field service department of the McGraw-Hill Company he served on the editorial staff of the *Engineering News-Record* for a short period and later took up quarters at his home city, Detroit, Mich. On Sept. 1, 1917, Lieut. Cooke entered the service of the United States at the age of twenty-four, with the commission of second lieutenant in the Engineer Corps. He was temporarily stationed 75 miles from a railroad in New Mexico doing military mapping for the United States Geological Survey.

W. F. Carr, engineer of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., was instantly killed on Saturday night, Jan. 12, while operating a snowplow on the lines of the Southern Michigan Railway. During the blizzard on Saturday a car containing about fifteen people was snowbound between Niles, Mich., and South Bend, Ind., and Mr. Carr and a crew of men volunteered to rescue these passengers. This they succeeded in doing, after the car had been snowbound for about nine hours. The car was pulled back to a siding and allowed to proceed to South Bend, after which Mr. Carr and his crew returned to the point where the car was stalled to remove the obstruction. A large bank of snow and ice had evidently formed back of the stalled car, so that the snowplow in striking it was thrown from the track and upset. Mr. Carr in falling seemingly struck some part of the car or machinery on his head and shoulders, as the indications were that his neck was broken. The other members of the crew escaped unhurt. Mr. Carr had been in the employ of the company only a few months, but during this time all his associates had learned to admire and love him. He was a man of fine character and exceptional ability as a maintenance engineer. He was always considerate of the welfare of others, as is shown by his willingness at this time to risk his own life for their comfort. Previous to his last connection Mr. Carr was for seven and a half years engineer of maintenance of way of the Chicago, Ottawa & Peoria Railway at Ottawa, Ill., which is a part of the Illinois Traction System. As engineer of the Chicago, South Bend & Northern Indiana Railway he had supervision of all roadway, track, bridges and buildings, and also acted as consulting engineer for all departments. A biography and a portrait of Mr. Carr were published in the ELECTRIC RAILWAY JOURNAL for Nov. 10, 1917, page 883.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Montgomery Transit & Light Company, Norristown, Pa.**—Incorporated under the laws of the State of Delaware to construct and operate railways and light plants. Capital stock, $1,000,000. It is understood that the new company is organized to take over the Montgomery Transit Company which operates a line from Norristown to Harleysville, 13 miles.

Franchises

Los Angeles, Cal.—The Railroad Commission of California has authorized the Pacific Electric Railway to construct a track across East Ninth Street, East Eighth Street and a part of Long Beach Avenue. The company was also authorized to build a turnout in Sixteenth Street between Arlington Street and Second Avenue and a track in Lake Shore Avenue and across Montana Street, Berkeley Avenue and Alvarado Street.

Venice, Cal.—An ordinance will be prepared by the City Trustees of Venice offering for sale the franchise to operate cars along the Ocean Front in Venice.

Track and Roadway

Muscle Shoals Traction Company, Florence, Ala.—It is reported that Frank L. Davies, Danville, Ill., has become interested in the plan to construct an electric railway from Huntsville to Florence, about 64 miles, and will undertake its promotion. [Aug. 11, '17.]

Clear Lake Suspended Monorail Company, Hopland, Cal.—It is reported that the Clear Lake Suspended Monorail Company has awarded a contract to G. L. Hardison, San Francisco, for grading, bridging, track-laying, buildings, fencing and installing equipment on its proposed line from Hopland to Lakeport at $532,000. [Dec. 1, '17.]

Municipal Railway, San Francisco, Cal.—Bids will be received by the Board of Public Works until Jan. 10 for the double-tracking of Market Street, from Van Ness Avenue to Third Street. It is estimated that the cost will be about $120,000.

Miami, Fla.—Bids are being asked by the commissioners of Dade County for the construction of two steel bascule bridges in Miami Causeway, one on the east and one on the west side of Biscayne Bay. Each bridge will be 140 ft. long and consist of double-leaf bascule span providing a 60-ft. clear waterway and steel approach span on each end. The bridge will provide for roadways 20 ft. wide, sidewalk 5 ft. wide and electric railway track outside of roadway. Klyce & Kackley, Townley Building, Miami, engineers.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—The Board of Public Works of Indianapolis has rescinded an order requiring the Indianapolis Traction & Terminal Company to build and maintain a crosstown line from Virginia Avenue across South Street to Kentucky Avenue to the Union Stock Yards.

Southwest Missouri Railroad, Webb City, Mo.—It is reported that the Southwest Missouri Railroad has taken over the Oklahoma, Kansas & Missouri Railroad, which operates 14 miles of road, and will electrify the line. Work on the company's line into Baxter Springs, Kan., is being rushed, while the grading of the line from Baxter to the connection with the Oklahoma, Kansas & Missouri Railroad is being hurried along. It is expected that by May 1 cars will be making hourly trips between Miami, Okla., and Carthage, Mo.

Butte (Mont.) Electric Railway.—City Attorney George Toole has been asked to decide whether it will be legal for the Butte Electric Railway to double-track its line on Main Street, from Quartz to Park Street. A petition to lay double-track was presented to the City Council recently by the company, with the object in view of better service between Butte and Walkerville and Butte and Centerville.

Manchester Traction, Light & Power Company, Manchester, N. H.—This company has purchased the water rights connected with the United States Bobbin & Shuttle Company, giving the company all the water privileges that are desirable from the mouth of the river in Manchester, where it empties into the Merrimac River and the village of Goffstown.

New York Municipal Railway Corporation, Brooklyn, N. Y.—A contract has been awarded by the New York Municipal Railway Corporation to the Federal Signal Company, Albany, for the installation of an a.c. electric interlocking plant with a.c. track circuits at the Jamaica terminal of its elevated system.

Manila Electric Railroad & Light Corporation, Manila, P. I.—Extensive improvements are being contemplated by the Manila Electric Railroad &

Light Corporation during the next five years, including the construction of new tracks, new track terminals, reconstruction of old tracks and the reconstruction of the overhead system.

Chattanooga (Tenn.) Traction Company.—A contract has been accepted by the Chattanooga Traction Company to operate cars over the new bridge at Chattanooga for five years.

Dallas (Tex.) Railway.—Two hundred and fifty tons of rails to be used in the improvements and extensions of the Dallas Railway Company's tracks in the city of Dallas have been shipped from Lorain, Ohio, on Jan. 2. The shipment is expected to arrive in Dallas by Feb. 1, according to Richard Meriwether, general superintendent and general manager. The total of 1200 tons of rails was ordered, but the mills at Lorain could not fill the entire order at one time. The rails now en route to Dallas will be used in double-tracking the Colonial Avenue line, and work will begin as soon as the rails arrive.

El Paso (Tex.) Electric Railway.—This company will double-track its line between Cotton Avenue and Piedras Street, putting in one switch between the El Paso and Southwestern crossing and Cotton Avenue and two more between the El Paso & Southwestern rails and Piedras Street at a cost of $25,000.

***Houston, Tex.**—It is reported that the City Council of Houston has prepared specifications for the construction of a municipal belt line in Houston. E. E. Sands, city engineer.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—In order to obtain better transportation facilities for the thousands of workmen in the shipyards and other industrial plants in the Harbor Island District of Seattle, the West Side Commercial Club of West Seattle is starting a campaign to secure increased street car service. One of the first moves will be to endeavor to induce the Puget Sound Traction, Light & Power Company to build a line from the present Alki line over Avalon Way to relieve some of the congestion on the single-track Fauntleroy line through Youngstown. An experiment with a jitney bus is being tried on the Alki Avenue line, and in the event that other means to solve the transportation problem fail, it is possible that jitneys may be installed on the other lines to supplement the street car service.

Seattle (Wash.) Municipal Railway.—Before Feb. 1 cars will be operated by the Seattle Municipal Railway, from Third Avenue and Pine Street across the Salmon Bay bridge at Fifteenth Avenue N. W. to the north city limits at Thirty-second Avenue N. W. and West Eighty-fifth Street, a distance of about 6 miles. Operation from Twenty-third Avenue N. W. and West Sixty-seventh Street will be over the old Loyal Heights line, which will form a link with the downtown line known as Division A. The Central Labor Council plans a celebration on the occasion of the opening of the city car line.

Shops and Buildings

Georgia Railway & Power Company, Atlanta, Ga.—An interurban passenger station will be built by the Georgia Railway & Power Company at Camp Gordon.

Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.—The construction of freight house at Roundup, Mont., is being contemplated by the Chicago, Milwaukee & St. Paul Railway next spring, to cost approximately $40,000.

Galesburg Railway, Lighting & Power Company, Galesburg, Ill.—Stables owned by the Galesburg Railway, Lighting & Power Company at Galesburg were recently destroyed by fire. The loss is estimated at about $6,000.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation is having its carhouse, recently damaged by fire, rebuilt. Repair parts for the cars that were burned are slow in arriving owing to transportation conditions.

Lawton Railway & Lighting Company, Lawton, Okla.—A new carhouse is being built by the Lawton Railway & Lighting Company on North Second Street.

Texas Electric Railway, Dallas, Tex.—It is reported that the Texas Electric Railway will construct a passenger station and repair shop at Denison.

Power Houses and Substations

Fort Smith Light & Traction Company, Fort Smith, Ark.—A contract has been awarded the Fort Smith Light & Traction Company for furnishing an ornamental lighting system on Garrison Avenue for a period of ten years.

Arkansas Valley Railway, Light & Power Company, Pueblo, Col.—Work has been begun by the Arkansas Valley Railway, Light & Power Company on the construction of a transmission line to serve Penrose.

Shore Line Electric Railway, Norwich, Conn.—A new power house will be built by the Shore Line Electric Railway in Thamesville. Orders have been placed for two 10,000-kw. turbines. The contract calls for the delivery of one turbine in May and the other in June, and it is expected that the plant will be in operation by Oct. 1.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation is erecting foundations at its Lincoln Avenue powerhouse for the installation of a new 2000-hp. engine and generator.

Manila Electric Railroad & Light Corporation, Manila, P. I.—Among the improvements contemplated by the Manila Electric Railroad & Light Corporation is the installation of a new 5000-kw. turbo-generator and other special power plant equipment which will increase the electric generating capacity of the plant about 50 per cent, or from approximately 10,000 kw. to approximately 15,000 kw.

Montreal (Que.) Tramways.—A new 1500-kw. motor-generator set has been installed by the Montreal Tramways in its William Street power house. This is the last of four units ordered from the Canadian General Electric Company. One of these units has been installed at the St. Henry substation and two others at the St. Denis substation.

Dallas (Tex.) Railway.—The contract providing for the exchange of power between the Dallas Power & Light Company and the Texas Power & Light Company, has been approved by the City Commission. The contract as originally submitted to the supervisor of Utilities called for an expenditure of $350,000 for transmission lines and transforming apparatus, but concessions have been made which will save the local company a total of $130,000. The contract covers the purchase of 3000 kw. with an increase to 5000 kw. Under the agreement the Dallas company will furnish energy to the Dallas Railway Company for the Oak Cliff and East Dallas lines, which is now supplied by the Northern Texas Traction Company.

Virginia Railway & Power Company, Richmond, Va.—This company will construct an electric transmission system from Petersburg to Suffolk.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The Puget Sound Traction, Light & Power Company, has under way additions to its White River or Lake Tapps hydro-electric generating station and its Georgetown steam plant that will permit of a total increase of 36,400 additional horsepower with which to serve the industrial needs of Tacoma and Seattle. Last April construction was begun on the installation of a 23,000 hp. generating unit at White River in addition to the two generators already in operation there, each of which has a capacity of 20,000 hp. This new unit will be in operation by March 1, next, giving the White River plant a total capacity of 63,000 hp. at that time. In addition to this a 13,000 hp. generator will be installed at the Georgetown steam plant and this additional capacity will be in operation by summer. When this development is completed the company's hydro-electric plants supplying Tacoma and Seattle with power for industrial needs will have a combined capacity of 107,997 hp.

Appalachian Power Company, Bluefield, W. Va.—Details have been decided upon by the Appalachian Power Company for its proposed steam-driven electric generating plant at Glen Lyn, Va. The building will be 150 ft. x 150 ft., of concrete, brick and tile, with provision for an extension to provide an ultimate capacity of 75,000 kw. The initial installation will be 18,750 kw. The power house and equipment will cost about $2,000,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Condition of Pacific Coast Roads Improving Slightly

Freight Traffic Has Not as Yet Created Demand for Equipment—Deliveries Longer Except Steel Products

The condition of electric railways on the Pacific Coast seems to be slightly improved with the advent of the new year. At least there are more encouraging aspects on several of the matters of vital importance to the industry. In Portland a six-cent fare has been allowed by the Public Utility Commission and there are indications that a similar move may materialize in the Puget Sound district. The freight business continues to grow and passenger traffic keeps up in splendid shape considering the fact that it is wartime and winter season. Some roads have been able to cut operating costs by rearranged schedules or different equipment, and war conditions have helped materially in the fight against the jitney.

On the other hand, the municipal ownership idea is not only growing rapidly, but is continually spreading into new quarters, and the financial conditions of the roads has been so long depressed that the freight business or other revenue sources must continue for some time before there can be anything like retrenchment. Even those roads which are enjoying the most of the freight business have not placed orders for any considerable amount of equipment or materials on account of it, although dealers say they still hope for such action.

Since the new year, the demand for such supplies and materials as are used in maintenance and replacements has strengthened notably, but in these lines the demand is spasmodic, so that no special significance attaches. The first California one-man cars to be put in regular city service have been received at Sacramento and four are to be put in operation this month. The Oakland, Antioch & Eastern Railway is reconstructing a few miles of track, and several companies are rehabilitating portions of the system where extensive maintenance has for some time been deferred, but in general little construction work is being done—practically none on new lines.

The Pacific Coast tendency is to order direct from Eastern stocks and immediate delivery from Coast warehouses is not expected. There are so many different electric railway standards that carrying Coast stocks is expensive, and, in some cases, adds 5 to 20 per cent. to cost on account of charges incurred in handling twice, storing and carrying overhead on unsold stock. Thus at least the larger purchasers foresee needs sufficiently to place orders in advance long enough to allow for Eastern delivery. On consignments less than 100 lb. by express shipment, delivery is made within a week, and ordinarily freight has required only thirteen to seventeen days. This has now increased to three to four weeks, however.

Deliveries are in fairly good shape except for certain steel products. It is pointed out that many firms which manufacture certain electric railway specialties have only small plants not engaged in government work and have, consequently, not been affected by war orders. About six weeks is the factory time now quoted on a large part of the railway supplies, although three to four months is the average for railway motors; seamless trolley poles are indefinitely delayed, and gears and pinions are rated at nine to ten months.

Prices have shown a tendency to fluctuate, but only a few actual advances have been listed in the past month. Among these are trolley rope and car seats. A slight decrease in car wheels is expected in different quarters of the trade.

Certain Line Materials Advance in Price

One Hardware Line, However, is Lower by 10 Per Cent Because of Stock Accumulation

Prices on line material, which have been abnormally high, have been reduced by an Eastern producer 10 per cent, effective Jan. 15. This manufacturer of hardware had accumulated a surplus stock, and reports say he was obliged to lower his figures to reach a market.

This reduction does not apply generally, and quotations are still high in other directions. Locust pins are still scarce, with prices $2.50 a thousand higher than previously quoted, effective as of Jan. 15; but this, too, is an exceptional case. Different mills name varying prices, according to location and stock on hand. Rock elm pins are being mentioned as coming into use as a substitute for locust, on account of the scarcity and cost of the latter.

High voltage porcelain insulators have been marked up 10 to 12 per cent within a few weeks, but the low-voltage type remains untouched. Stocks appear to be none too plentiful, while deliveries are slow. High-voltage grades are back four months, caused by slowness of production and delivery, but low-voltage insulators are in a slightly better position.

Effect of the War on Safety Device Market

Trend of Events Indicates that Greater Precautions Will Be Taken to Protect Workers

As the result of the knowledge of the vast sacrifices of human life in the war the minds of business men in this country have undoubtedly become accustomed to and inured against shocks from reports of sudden death or physical disablement. Such a transition in mental processes might reasonably be expected to harden the industrial executive against movements for greater safety in the conditions surrounding plant employees. The facts are, however, that this is not the case. The exact opposite appears to be true. Undoubtedly the reason for this condition is the belief, now practically established, that safety movements are not a matter of sentiment, but are a matter of good business judgment. It has been found a paying investment to spend money to prevent accidents.

That this is the case is evidenced by the increased business among concerns making safety appliances and concerns marketing consulting safety services. Likewise the increased interest in safety movements since the war brought about the present labor shortage is evident through the same channels. The safety device manufacturers generally are very busy. Some have more business than they can handle. When a group of these manufacturers recently met to discuss an annual convention and exposition for 1918 the interest in this event was intense. The National Safety Council of Chicago showed in its recent annual report that its membership had increased 68 per cent in the last year, which means that 1447 industrial and public utility concerns subscribed for consulting safety service in that fiscal year and that the workmen reached by this body then had reached a total of 4,500,000. Shipbuilding plants and others engaged in government business are among latest groups to study and apply accident prevention methods.

In spite of this increased effort, accidents in the last year have slightly increased. This has been caused by the immense labor turnover, necessitating the employment of many "green" men. Leading authorities in safety work say, however, that the number of accidents would have increased at a more marked rate under the existing conditions had it not been for the continued effort to prevent them. This growth in accidents is another factor which has contributed to make the safety-device manufacturer's business active.

Demand for Second-Hand Rolling Stock

Traction Companies All Over the Country Have Difficulty in Getting New Cars—Used Equipment Scarce and High

It is generally known that the builders of new cars are in no position to accept orders for rolling stock for quick shipment, and that deliveries are considerably longer than under normal conditions. In fact, instances have been reported where roads have decided not to place orders with deliveries so far off.

For this reason many traction roads, either because of increased traffic due to greater industrial activity, or being in the vicinity of an encampment or shipyard, or because of demands of the municipality, having found it absolutely necessary to obtain additional cars, have gone into the market for second-hand rolling stock. But now even this source is greatly restricted. This condition was recently revealed most emphatically by inquiries for second-hand cars coming from a number of traction companies. Some of these, it is known, had got in touch with the car builders, and ascertained the facilities of the plants for car construction were curtailed in almost every instance, by government work of one kind or another.

Much to the surprise of the inquirers it was found this description of rolling stock was none too plentiful. The Little Rock (Ark.) Railway and Electric Company is one of these companies. Charles L. Griffith, general manager, is reported as saying: "We have been trying to get cars from Philadelphia and St. Louis, but the car construction shops there are working for the government. I have been all over the country trying to purchase second-hand cars. I succeeded in 'roping in' six. These were only partly equipped."

Another instance is that of the Richmond Light & Railroad Company, operating on Staten Island, New York City. With the establishment of several large shipyards on the north shore engaged in Emergency Fleet Corporation contracts, the road was suddenly called upon to furnish transportation facilities, to and from their daily work in the yards, of a greatly augmented corps of workmen. This it was unable to do without acquiring more rolling stock and other equipment. It being out of the question, for various reasons, to obtain new cars the company scoured the country for second-hand passenger equipment. As a result of the search twenty cars were located in Boston. The price asked, however, rather astonished the prospective buyers, as the Boston people wanted $6,000 to $7,000 each, a figure the Staten Island company reported to the Public Service Commission of New York was 20 per cent higher than that of new steel cars when prices were normal.

It is clear, therefore, that with railway companies looking for second-hand rolling stock in lieu of new, because of the inability of car builders to make deliveries, the situation is referred to as serious. Apparently the supply of used cars is also limited, and this further emphasizes the critical condition. The demand for used stock is large and cars reported on the market find inquiries quickly.

The Brooklyn (N. Y.) Rapid Transit Company (New York Municipal Railway Corporation) a short time ago offered for sale, through a prominent railway equipment concern, a number of used wooden cars, suitable for interurban service. A great many inquiries were received from all over the country, and while none of these cars have been sold yet, because they are still in service, present indications are that they will be absorbed by other roads immediately on their release.

Government Copper Price Continued

President Extends 23½-Cent Price Until June 1 on Certain Conditions Making for Maximum Production

On recommendation of the War Industries Board President Wilson on Tuesday extended until June 1 the price of 23½ cents a pound for copper fixed on Sept. 21.

The maximum price was ordered continued on the following conditions: That wages be not reduced, that the producers sell to the Allies and the public copper at the price paid by the government, that necessary measures be taken under the direction of the War Industries Board to prevent copper from falling into the hands of speculators who would increase the price to the public, and that the producers exert every effort to keep up the production to the maximum of the past so long as the war lasts.

Method of Paying for Government Contracts

Under Certain Conditions Manufacturers Will Be Paid for Raw Materials Prior to Manufacture

It has not been particularly clear in the minds of some members of the manufacturing group how the government proposes to pay for the goods it buys. In a proposal recently issued for large quantities of electrical goods the General Engineer Depot made the following statement regarding payment:

"Payment will ordinarily be made for each item as soon as it has been inspected, accepted and delivered, properly packed, f.o.b. cars or boat) at place stated in proposal. Under certain conditions, in the case of standard products the sufficiency of which in their completed form is already known from previous use, partial payments to the extent of a previously agreed upon percentage of the total cost of each component part of the article to be furnished will be made when such component parts are known to be on hand in the factory ready for assembly. Such component parts will then become the property of the United States, and are to be safeguarded by the manufacturer in a way acceptable to the purchasing officer, in order to prevent loss to the United States through destruction or theft of same."

Rolling Stock

Little Rock Railway & Electric Company, Little Rock, Ark., has recently purchased six second-hand cars, partly equipped.

Tranvias de Oriente, Bogota, Colombia has ordered one five-bench open storage battery car from the Railway Storage Battery Car Company, New York, N. Y.

International Railway, Buffalo, N. Y., lost 100 cars in a fire on Jan. 23 that destroyed the Forest station of the company. The property loss is unofficially placed at $1,000,000.

Trenton & Mercer County Traction Corporation, Trenton, N. J., has been recommended by Peter Witt, in his report to the City Commission of Trenton, to purchase fifty one-man cars.

United Railways of Yucatan has ordered three 55-ft. all-steel passenger battery cars and two 27-ft. trail baggage and express cars from the Railway Storage Battery Car Company, New York, N. Y.

Illinois Traction System, Peoria, Ill., on Jan. 9 had another motor destroyed at Staunton by fire, its value being given at $7,000. This makes five cars lost by the company through the same cause in three weeks.

Valdosta (Ga.) Street Railway is reported as rebuilding a recent purchase of cars from the Waycross Street & Suburban Railway, Waycross, Ga., in its own shops, adding automatic air brakes and other improvements.

Compania de Tranvias de Merida, Merida, Mexico, has ordered one twenty-six-passenger, four-wheeled, city-type closed storage-battery car and one five-bench open storage-battery car from the Railway Storage Battery Car Company, New York, N. Y.

Richmond Light & Raillroad Company, Borough of Richmond, New York, N. Y., is reported to be in the market for second-hand cars, to increase its transportation facilities to the newly-established government shipyards on the north shore of Staten Island.

Union Traction Company of Indiana, Anderson, Ind., a few weeks ago had an interurban motor car destroyed by fire near Fairmont, Ind. The car caught fire from resistance coils while the motorman was endeavoring to run through a 4-ft. snow drift. Another car of the same description caught fire in the same manner on the same day near Pendleton, Ind., but the damage was limited to the destruction of the floor.

Manila Electric Railroad & Light Corporation, Manila, P. I., will build fifteen new cars and rebuild a number of old ones in its own shops. The trucks and equipment will be purchased in the United States. New tracks and terminals, with the reconstruction of the overhead trolley system, are further improvements decided upon as the result of a visit to Manila in November last of J. H. Pardee, president, and J. P. Ripley, engineer of the J. G. White Management Corporation, New York, N. Y., which controls the property.

Tri-City Railway Company, Davenport, Iowa, is remodeling four of its summer cars for use in the present winter season, on account of the increased traffic, due largely to the government's activity at the Rock Island (Ill.) arsenal. The company recently purchased twenty summer passenger cars from the Chicago surface lines, which will be rebuilt in Chicago and promised delivery within thirty days. The cars will be distributed among the cities of Davenport, Iowa; Rock Island, Moline, East Moline and Silvis, Ill. The Tri-City Railway Company is attempting to find other cars which may be for sale.

Trade Notes

Baldwin Locomotive Works, Philadelphia, Pa., has appointed A. P. Beuter, in place of A. William Hinger as its representative in Portland, Ore.

C. P. Coleman was elected president of the Worthington Pump & Machinery Company of New York City at a meeting of the board of directors on Dec. 31, 1917.

Johnson Coin Counting Machine Company, New York, N. Y., has moved its Eastern sales office, wrapper and repair departments to 237-239 Lafayette Street, New York.

J. C. Manchester is now district sales manager for the Economy Fuse & Manufacturing Company, San Francisco. Mr. Manchester was formerly connected with the Interstate Electric Novelty Company in that city.

The Esterline Company, Indianapolis, Ind., announces the appointment of J. S. Pandiani, Via Mario Pagano, 27 Milan, Italy, as trade representative for that country. Mr. Pandiani was until recently manager of the meter and supply department of the Italian Westinghouse Company and will in the future give his attention to the sale of Esterline instruments and permanent magnets throughout Italy.

Nelson P. Hall has taken up the duties of district sales manager for the Chicago territory of the Van Dorn & Dutton Company, gear specialist, of Cleveland, Ohio. His offices are at 14 East Jackson Boulevard.

H. H. Hoxie, sales manager of the Electric Railway Manufacturers' Supply Company, has resigned to become associated with the North Coast Electric Supply at Seattle, Wash., of which Harry Byrne is manager.

The Australian General Railway Signal Company, of Gates, N. Y., has been chartered with a capital stock of $10,000 by J. S. Fitch, H. Satterlee and L. A. Plumb of Rochester. The company proposes to manufacture railway signals, etc.

William F. Montavon, United States Commercial Attaché at Lima, Peru, advises the Department of Commerce that he has immediate use for catalogs of railway equipment and construction material, and requests that they be forwarded to his office at once.

Moloney Electric Company of Canada, Ltd., Toronto, Canada, announced that it opened a branch office and warehouse at Halifax, N. S., for the maritime provinces. E. A. Seath, who has been transferred from the Montreal office, will have charge of that territory.

Frank J. Foley, manager of the mining section of the industrial department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has taken a position as manager of the mining and traction department of the Edison Storage Battery Company, Orange, N. J. Mr. Foley, who is a graduate of Pratt Institute, Brooklyn, N. Y., has been with the Westinghouse company for twelve years, commencing with the service department in New York City and later being transferred to East Pittsburgh.

Frank W. Hall has been appointed commercial manager of the Sprague Electric Works of the General Electric Company, New York City. With the exception of a short period Mr. Hall has been connected with the Sprague Works continuously for twenty-two years in various engineering and sales capacities, and for the three years prior to his present appointment occupied the position of sales manager. D. C. Durland, former executive head of the Sprague Electric Works, has resigned to accept the presidency of the Mitchell Motors Company, Inc.

Western Electric Company, New York, N. Y., will remove the clerical force and heads of departments of its distributing staff from 483 West Street, its present location, to the sixteen-story building on the north side of Twenty-first street, running from Broadway to Fifth Avenue, about the middle of February. The company will occupy the thirteenth, fourteenth, fifteenth and sixteenth floors, comprising an area of about 45,000 sq. ft. The engineering staff requested more room in the West Street building, which necessitated the acquirement of additional quarters.

Cornell S. Hawley, past president of the American Electric Railway Manufacturers' Association, has returned to active connection with the electric railway field, having recently been elected managing director of the Consolidated Car Heating Company, New York, with headquarters at Albany. Mr. Hawley was recently treasurer of the Remington Arms & Ammunition Company, but has completed the work there for which he primarily took the position. Prior to that time he was president of the Laconia Car Company. For many years, however, he was very closely associated with the Consolidated Car Heating Company, whose sales organization might be said for a long time to have represented his active personality. Mr. Hawley's many friends will welcome his return to the electric railway industry.

New Advertising Literature

Vulcan Steel Products Company, New York, N. Y.: The company's illustrated house organ, *Vulcan*, published monthly, is a journal of co-operation and help. The topics discussed cover a wide field, referring more particularly to the export trade, in which it is strongly represented in all the leading centers of the world.

RAILWAY MATERIALS

	Jan. 16	Jan. 23
Rubber-covered wire base, New York, cents per lb.	30	30-33
Wire, weatherproof (100 lb. lots), cents per lb., New York	34½-35¼	34¼-38¼
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38-38.35	33½-38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.50	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.22	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.63	$2.63
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.29	$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.30	$1.32
White lead (100 lb. keg), New York, cents per gal.	10	10
Turpentine (bbl. lots), New York, cents per gal.	48½	51

NEW YORK METAL MARKET PRICES

	Jan. 16	Jan. 23
Copper, ingots, cents per lb.	23½	23½
Electrolytic, cents per lb.	23½	23½
Copper wire base, cents per lb.	6½	7
Lead, cents per lb.	50	50
Spelter, cents per lb.	8	7.87½
Tin, Straits, cents per lb.	85.00	*86.00
Aluminum, 98 to 99 per cent, cents per lb.	35-37	34-36

OLD METAL PRICES—NEW YORK

	Jan. 16	Jan. 23
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	17½	17½
Yellow brass, cents per lb.	13½	13½
Lead, heavy, cents per lb.	5¾	5¾
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.42	$42.42
Old carwheels, Chicago, per gross ton	$30.00	$35.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.50	$17.50

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*Nominal.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, February 2, 1918 *Number* 5

Experiences of British Managers Should Be Helpful to Americans

SEVERAL months ago the managers of two important English tramways were requested to contribute articles to this paper, giving information about the effect of the war on their management problems for the benefit of American electric railway managers. They kindly consented, and the first of these articles, that by J. M. McElroy, general manager, Birmingham Corporation Tramways, appeared on page 623 of the ELECTRIC RAILWAY JOURNAL for Oct. 6, 1917. The second article, written by T. B. Goodyer, manager of the Corporation Tramways of Croydon, which geographically is a part of London, appears in this issue. We are sure that the American readers, who are now facing almost identically the same problems of labor and material shortage as were encountered in Great Britain two or more years ago, will appreciate the value of the information contained in these experiences.

This Idea May Help Motormen to Save Coal

MENTAL assent on the part of motormen and others to the principle that coal ought to be saved will not bring results unless there is individual and strong conviction in regard to the matter. In these days it is easy for any man to realize what a shortage of coal there is in the line of domestic requirements, but it is not so easy for the same man, if running a car, to visualize the shrinking coal pile (if there still is a pile) at the power plant.

As he watches the long lines waiting for a dole of coal at the neighboring coal yard, or as he scrapes the floor of his own bin at home, he needs no prophet to tell him that coal is scarce, but somehow it is different on the front platform of a car. If, however, he tries to associate in his mind the power plant coal pile and the supply in his own cellar bin, possibly it will be easier for him to save coal in both places. In other words, he must learn in some way or other to think of car operation in terms of tons or pounds of coal.

Energy consumption in kilowatt-hours per car-mile, or per trip, furnishes a good basis for comparative purposes, but in the abstract a kilowatt-hour is about as nebulous in a motorman's mind as the nth power of x. However, in an editorial printed in the ELECTRIC RAILWAY JOURNAL for May 26, 1917, page 947, it was shown that a motorman controls the consumption of at least 1200 lb. of coal per day. A careless motorman may waste several hundred pounds in addition, particularly with coal of the poor quality now being sent out from the mines. In the average case, at least 10 per cent of this coal can be saved and in extreme cases two or three times this saving is possible. If we estimate that a moderate-sized house can be heated on 100 lb. of coal per day it follows that a careless motorman may waste enough fuel to warm two or more such dwelling houses. By wasteful action he is, therefore, causing suffering, directly or indirectly, to a dozen people more or less.

Fuel saving must result from voluntary as well as forced co-operation. The motorman's co-operation can only be of the voluntary character, and it seems to us that this co-operation is assured if he can come to realize that by operating his cars carefully he is keeping a dozen of his fellow citizens from freezing.

Why a Fair Rate of Return Is Necessary Now

NEVER has the question of a fair return on electric railway investment been more vital than now. The public does not altogether understand this point. A common idea is that as the financing of all new projects has been discontinued largely on account of the war, so that the government may sell its bonds more easily, the electric railway companies would not be in the market for new capital at this time in any event. Hence, the question of what would constitute a fair rate of return and one which would attract the investor to public utility securities is of abstract interest only.

Now, it may be true that no great amount of capital can be spared at present for new public utility construction, but this constitutes no reason why the existing utilities should be kept in a condition of near bankruptcy. Even if the companies do not expect to make new capital issues now, justice demands that they should be allowed to earn a fair and reasonable rate of return on the investment in their property, used and useful in public service, and that this rate should be one that would attract new capital if new capital was available.

But this is not all. Good financial credit is necessary even now for many electric railways. Some have maturing obligations which must be refunded. Others are being asked by the government to make certain extensions. Still others must buy cars and other equipment if they are to continue to give good service. Electric railways have been officially recognized as "essential industries," so that it is just as necessary that electric railway extensions or improvements should be financed as that any other allied part of the program of national defense should be undertaken.

Finally, a fair rate of return should be granted now so that when the war is over and the security market is open to all, electric railways will be able to put themselves promptly in an efficient and effective condition. There is no valid reason, therefore, why the grant of a fair rate of return should be postponed.

Making It Easy to Buy Thrift Stamps

THRIFT stamps to the right, thrift stamps to the left—their places of sale are almost countless. This is one sales compaign, however, that cannot be overdone. Even if there are local institutions by the score where such stamps can be purchased, every additional method for keeping them to the front in the public mind is a marked gain. Unfortunately, electric railways, unlike electric lighting and gas companies, cannot easily reach the individual patron. He can be approached in interurban stations and city terminals, of course, but, as a rule, he must be handled in his car-riding capacity. But conductors are generally too busy. Who, then, can act as salesmen?

An interesting answer to this question is given by the United Railways of St. Louis, which for the first time in its history recently granted the privilege of selling on its cars.

The plan is that on certain days volunteer speakers should board the cars at main transfer points, make one-minute speeches, distribute order cards for signatures, and then take the next returning cars to the transfer points. This is a way in which many city railways could co-operate with local committees, older Boy Scouts, and similar organizations, in helping the government. Letter carriers could follow up the cards, as they will do under a direct mail-order plan which the government is now completing.

Under such a plan as that used in St. Louis, the railway does not figure directly in the sales talk, but it furnishes the buyers and the opportunity. With such a commodity that's most of the sales battle.

Support the Committee on Increased Revenue

IT IS to be hoped that the subscriptions to the American Electric Railway Association for defraying the expenses of the Committee on Electric Railway Revenue, of which Joseph K. Choate is chairman, will be sufficient to enable the committee to carry through its very important work. The financial demands upon electric railways within the last few months have been unusual, but nothing can excuse the failure of any company to contribute to the work of the revenue committee. Important as are the other activities of the association, there can be no doubt that this committee has before it the greatest problem which has ever confronted the industry. We are afraid that a few companies are inclined to take a short-sighted view of the matter. They are asking how the work of the committee will redound to their own particular advantage. They argue that the same amount of money could be spent with greater profit in individual work at home. Experience shows that this view is fallacious. The electric railways in New York State struggled for years to solve the fare problem, each working individually. It was not until they combined and worked through a general committee that any progress was made.

The work of the committee involves not only organized publicity as to what is being done throughout the country, but, what is of much greater importance, comprehends the permanent solution of the entire fare question. The electric railway industry has a chance which will probably not be duplicated in the lifetime of this generation. The public is convinced, or can be convinced, that the industry needs larger revenues. This involves a revision of rates, and while this revision is being made, the opportunity is presented to solve the whole question permanently, by working out a system of fares which will be not only equitable to the rider, but will be sufficiently elastic to produce reasonable earnings for the company both in periods of rising and falling prices.

This constructive work is something which no single company can do. It must be done by a committee representing the entire industry. Prompt response on the part of the member companies will make it possible for the solution to be found in time to place the business upon a sound financial basis.

Traffic Reports in Digestible Quantities

CHAIRMAN BROWNLOW of the Public Utilities Commission for the District of Columbia used his newspaper experience in good stead when he suggested that John A. Beeler present his report on Washington traffic conditions in small, typewritten sections from time to time instead of waiting to deliver one ponderous tome from the printing press. This homeopathic plan has many advantages, such as:

Maximum publicity.—The effectiveness of the report will depend in large measure on how much of it gets to the public through the newspapers. It is easier to get 100 per cent publicity for each of a dozen weekly installments than 20 per cent publicity for the entire report.

Digestibility.—When the report is published in small units many readers will peruse each one from beginning to end instead of merely scanning the headlines.

Revelation of public opinion.—As each section is published, interested citizens will forward comments to the newspapers, thus giving the commission some inkling on how the recommendations appeal to the man in the car. The railways affected also have the opportunity to put themselves on record while the subject is fresh in the public mind.

Easier handling of objections.—It is easier to break one stick at a time than to dispose of a bundle of fagots. On the same principle, it is easier to deal with the few objections to each unit as they arise, whereas if all objections were presented at one time the commission would be in a quandary.

Timeliness aids acceptance.—By presenting the findings while the original data are still fresh the probability of their acceptance is far greater. For example, the Washington public is far more likely to favor certain plans while knee deep in winter than it would if the same suggestions were made in walk-inviting May!

One other literary feature of the Beeler unit reports may be mentioned. While accurate in technical expression, they are written and captioned in a way to appeal to the interest of layman and engineer alike. After all, as the commission and its consulting engineer wisely realize, the extent to which public service recommendations are put into practice depends upon how well the public itself appreciates their justness. Many a splendid traffic report of the past stands on a shelf, unwept, unhonored and unsung, because no one knew how to advertise it, and thereby sell it, to the people.

Essentials to Skip-Stop Success

A THOROUGH understanding by the public, the whole-hearted co-operation of the trainmen, and care as to the selection of the initial day of the trial installation, are among the more important aspects of the problem of introducing the highly desirable but for the most part unpopular skip-stop service. These three contingencies were particularly emphasized on a fairly large size Midwest property in a very recent experience with the skip-stop system, by the avalanche of criticism which was immediately manifested.

In the first place, it is difficult to bring the public to a full understanding that under the system the taking off of a few cars does not mean a reduction in the service or seats per hour, but rather that the result of the skip stop is a saving of ten or fifteen minutes in the time required to get home at night or down to work in the morning. The company in mind had talked to the public along this line, but there was still a general feeling, it afterward developed, that there had really been a great reduction in service. The principal cause of the complaints in this case, however, was a combination of antagonism on the part of the men and a very unfortunate weather condition with concurrent service interruptions and delays.

The experience of this company affords a good example of the importance of winning the trainmen over to the new scheme. Here they were nearly all opposed to the adoption of the skip-stop. And on the day selected for the initial installations the rails were extremely slippery. Also the progress of certain construction work suddenly made it imperative for the company to cut off service on a certain portion of one line in the downtown district, necessitating rerouting of cars and an abnormal congestion and retardation of service. After waiting considerable periods for cars, passengers would get on and ask the conductor the cause of the slow service. He naturally, because of his attitude, blamed it upon the installation of the skip stop, and thus this valuable economy was given a knockout blow, and most unjustly, at the very outset.

The rail conditions and emergency rerouting were excusable and unavoidable causes of slow service, but the skip stop received the full blame as the result of the unfortunate day and the trainmen's antagonism. Incidentally, the company learned also that on another installation, it would be better to reduce the number of cars gradually on succeeding days, thus leaving a surplus of cars on the line for the first day or so until the new system was working smoothly.

An interesting side light on this company's experience for the first month of skip-stop operation was the effect it had on the accident report. The claim departments have sometimes opposed vigorously the permanent skipping of certain streets as stops, as they held that this would tend to result in the cars crossing these streets at high speed, with consequent increase in the number of collisions.

The record for the first month in the case in mind, however, showed exactly an opposite tendency. The boarding and alighting accidents were reduced in number, as would be expected from the smaller number of stops. But the accidents with automobiles and other vehicles also, quite unexpectedly, showed a decided downward tendency. If the reports for one or two succeeding months continue to show the same tendency, the information will be released for publication in this paper. The various accidents are carefully classified and analyzed so that the results are quite conclusive and may serve to dispose of the apprehension which some managements have for the skip-stop service.

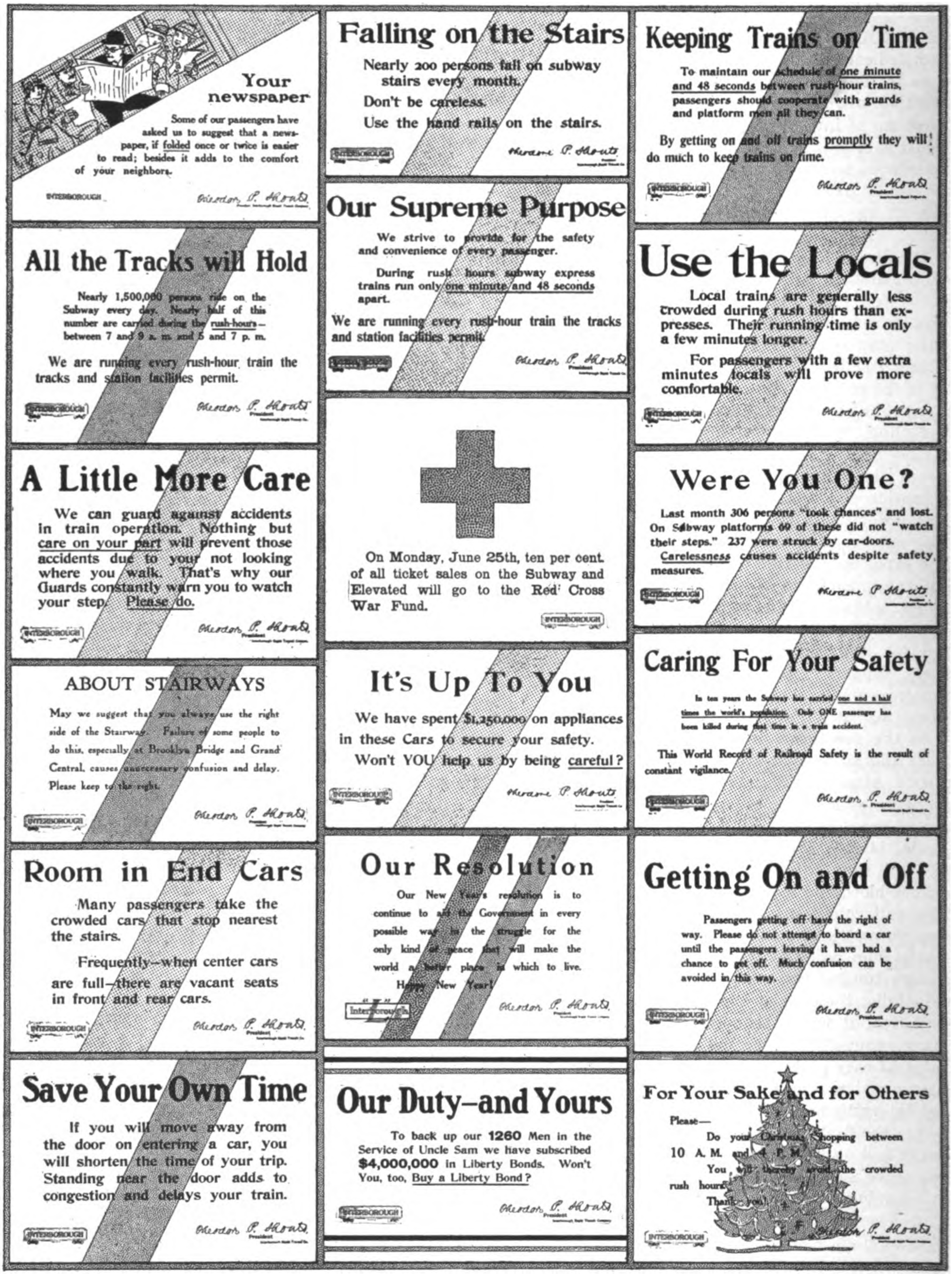
Now Is the Time to Act on Higher Fare Requests

ADDRESSING the recent convention of the Investment Bankers' Association, Orlando B. Willcox of New York made use of some figures as to rate decisions which should furnish a basis for thought on the part of those having the welfare of the industry at heart. An abstract from Mr. Willcox's report was printed in the Nov. 17 issue of this paper. Making the point that certain of the public service commissions are recognizing the necessity for increased rates to public utilities, the committee, of which Mr. Willcox was acting chairman, reported that in 462 rate applications announced up to date for the year 1917, increases were allowed in 401 cases. This meant that relief of some sort was given in 86 per cent of the cases presented.

To this extent the owners of such securities should feel encouraged. It develops, however, that the 462 cases referred to included only sixteen applications of electric railways, whereas the petitions from telephone companies numbered 184, and from electric lighting companies there were 145 cases. The further point is brought out that increases were granted in 91 per cent of the telephone cases, and in 82 per cent of the electric light cases, while electric railways were successful in only 68 per cent of the applications. It is probable that a study of decisions for the whole of 1917 would show that considerably more electric railways had sought and obtained higher rates. There is ground for suspicion, however, that this class of utilities has not yet fully awakened to the possibilities of getting financial relief through the public service commissions.

Surely the condition of the average electric railway is not more fortunate than that of the other utilities. The handicap imposed by fixed rates is everywhere apparent, and the injustice of allowing this to continue in the face of advancing costs cannot be questioned. Is it possible that we have men in this industry who, realizing the unhealthy condition of their properties, think the situation is hopeless and are too timid to apply for help? Or have they become disheartened at the unsuccessful outcome of other appeals for relief and abandoned themselves to despair?

This is not the time for timidity. War conditions have imposed unusual burdens, but they also offer unexpected opportunity to get the benefits of a changing public opinion. The people realize now if they never did before that the cost of everything has gone up—everything except electric railway fares and a few other items. Members of the public utility commissions, keeping their hand on the public pulse, are likely to realize more quickly than ever before the fairness of applications for a departure from fixed rates. Holders of such securities, of whom the "common people" constitute a considerable part, must arouse themselves and send for the doctor before it is too late.



Your newspaper

Some of our passengers have asked us to suggest that a newspaper, if folded once or twice is easier to read; besides it adds to the comfort of your neighbors.

INTERBOROUGH

Theodore P. Shonts

All the Tracks will Hold

Nearly 1,500,000 persons ride on the Subway every day. Nearly half of this number are carried during the rush-hours—between 7 and 9 a. m. and 5 and 7 p. m.

We are running every rush-hour train the tracks and station facilities permit.

INTERBOROUGH

Theodore P. Shonts, President

A Little More Care

We can guard against accidents in train operation. Nothing but care on your part will prevent those accidents due to your not looking where you walk. That's why our Guards constantly warn you to watch your step. Please do.

INTERBOROUGH

Theodore P. Shonts, President

ABOUT STAIRWAYS

May we suggest that you always use the right side of the Stairway. Failure of some people to do this, especially at Brooklyn Bridge and Grand Central, causes unnecessary confusion and delay. Please keep to the right.

INTERBOROUGH

Theodore P. Shonts, President

Room in End Cars

Many passengers take the crowded cars that stop nearest the stairs.

Frequently—when center cars are full—there are vacant seats in front and rear cars.

INTERBOROUGH

Theodore P. Shonts, President

Save Your Own Time

If you will move away from the door on entering a car, you will shorten the time of your trip. Standing near the door adds to congestion and delays your train.

INTERBOROUGH

Theodore P. Shonts, President

Falling on the Stairs

Nearly 200 persons fall on subway stairs every month.

Don't be careless.

Use the hand rails on the stairs.

INTERBOROUGH

Theodore P. Shonts, President

Our Supreme Purpose

We strive to provide for the safety and convenience of every passenger.

During rush hours subway express trains run only one minute and 48 seconds apart.

We are running every rush-hour train the tracks and station facilities permit.

INTERBOROUGH

Theodore P. Shonts, President

On Monday, June 25th, ten per cent of all ticket sales on the Subway and Elevated will go to the Red Cross War Fund.

INTERBOROUGH

It's Up To You

We have spent $1,250,000 on appliances in these Cars to secure your safety. Won't YOU help us by being careful?

INTERBOROUGH

Theodore P. Shonts, President

Our Resolution

Our New Year's resolution is to continue to aid the Government in every possible way in the struggle for the only kind of peace that will make the world a better place in which to live.

Happy New Year!

"L" Interborough

Theodore P. Shonts, President

Our Duty—and Yours

To back up our **1260** Men in the Service of Uncle Sam we have subscribed **$4,000,000** in Liberty Bonds. Won't You, too, Buy a Liberty Bond?

INTERBOROUGH

Theodore P. Shonts, President

Keeping Trains on Time

To maintain our schedule of one minute and 48 seconds between rush-hour trains, passengers should cooperate with guards and platform men all they can.

By getting on and off trains promptly they will do much to keep trains on time.

INTERBOROUGH

Theodore P. Shonts, President

Use the Locals

Local trains are generally less crowded during rush hours than expresses. Their running time is only a few minutes longer.

For passengers with a few extra minutes locals will prove more comfortable.

INTERBOROUGH

Theodore P. Shonts, President

Were You One?

Last month 306 persons "took chances" and lost. On Subway platforms 69 of these did not "watch their steps." 237 were struck by car-doors. Carelessness causes accidents despite safety measures.

INTERBOROUGH

Theodore P. Shonts, President

Caring For Your Safety

In ten years the Subway has carried one and a half times the world's population. Only ONE passenger has been killed during that time in a train accident.

This World Record of Railroad Safety is the result of constant vigilance.

INTERBOROUGH

Theodore P. Shonts, President

Getting On and Off

Passengers getting off have the right of way. Please do not attempt to board a car until the passengers leaving it have had a chance to get off. Much confusion can be avoided in this way.

INTERBOROUGH

Theodore P. Shonts, President

For Your Sake and for Others

Please—

Do your Christmas Shopping between 10 A. M. and 4 P. M.

You will thereby avoid the crowded rush hours.

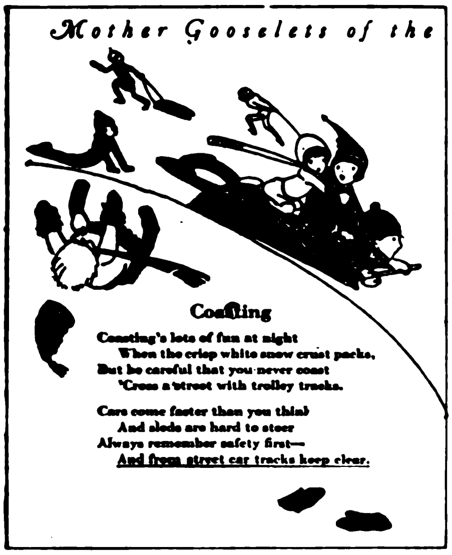
Thank you!

INTERBOROUGH

Theodore P. Shonts, President

Here Are Eighteen of the Twenty-six Interborough Car Posters Which in 1917 Made the New York Public Think

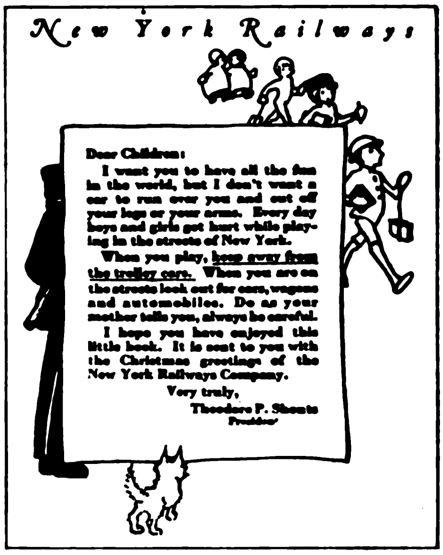
Interborough Publicity Sets Public to Thinking



Coasting

Coasting's lots of fun at night
When the crisp white snow crust packs,
But be careful that you never coast
'Cross a street with trolley tracks.

Cars come faster than you think
And sleds are hard to steer
Always remember safety first—
And from street car tracks keep clear.



Dear Children:

I want you to have all the fun in the world, but I don't want a car to run over you and cut off your legs or your arms. Every day boys and girls get hurt while playing in the streets of New York.

When you play, keep away from the trolley cars. When you are on the streets look out for cars, wagons and automobiles. Do as your mother tells you, always be careful.

I hope you have enjoyed this little book. It is sent to you with the Christmas greetings of the New York Railways Company.

Very truly,
Theodore P. Shonts
President

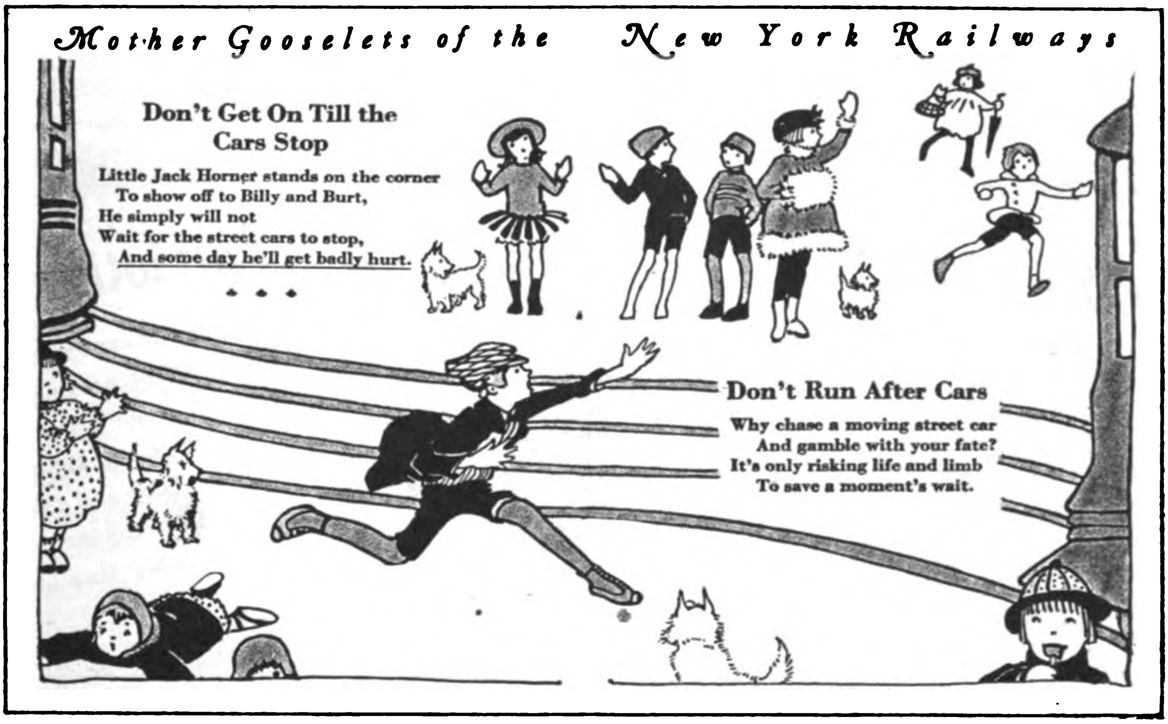
Result of Year's Work with Car Cards and Bulletins on the Rapid Transit and Surface Railway Lines Is Encouraging—Interest of Public Has Been Aroused

IT WAS just a year ago that the Interborough Rapid Transit Company, operating the subway and elevated lines in New York City, started its publicity campaign. In January the company placarded its cars with a poster asking the public for criticism. The company made a frank appeal for public assistance—the beginning of a definite campaign to secure an understanding of its problems by the public. The first few posters and the results of the complaint campaign were described in the issue of the ELECTRIC RAILWAY JOURNAL for April 7, 1917.

During the year twenty-six cards have been used. They have inspired thousands of letters to the management of the company, making it possible to develop a mailing list of people who are interested in local transportation. The cards used are reproduced in part with this article. Extensive as the campaign has been, it is really just starting.

It takes time to attract the public's interest. That the Interborough is making progress, its management is certain. These facts, in its opinion, so testify. In one musical comedy in New York the Interborough's cards are made the subject of a topical song. Every few days newspaper cartoonists work the cards into their drawings. Newspapers make the cards the subject of editorial comment that has proved exceptionally helpful. Moreover, "letters to the editor" by the dozens have resulted. These agencies always treat of things about which the people are thinking.

People differ as to the way to approach the New York


Mother Gooselets of the New York Railways

Don't Get On Till the Cars Stop

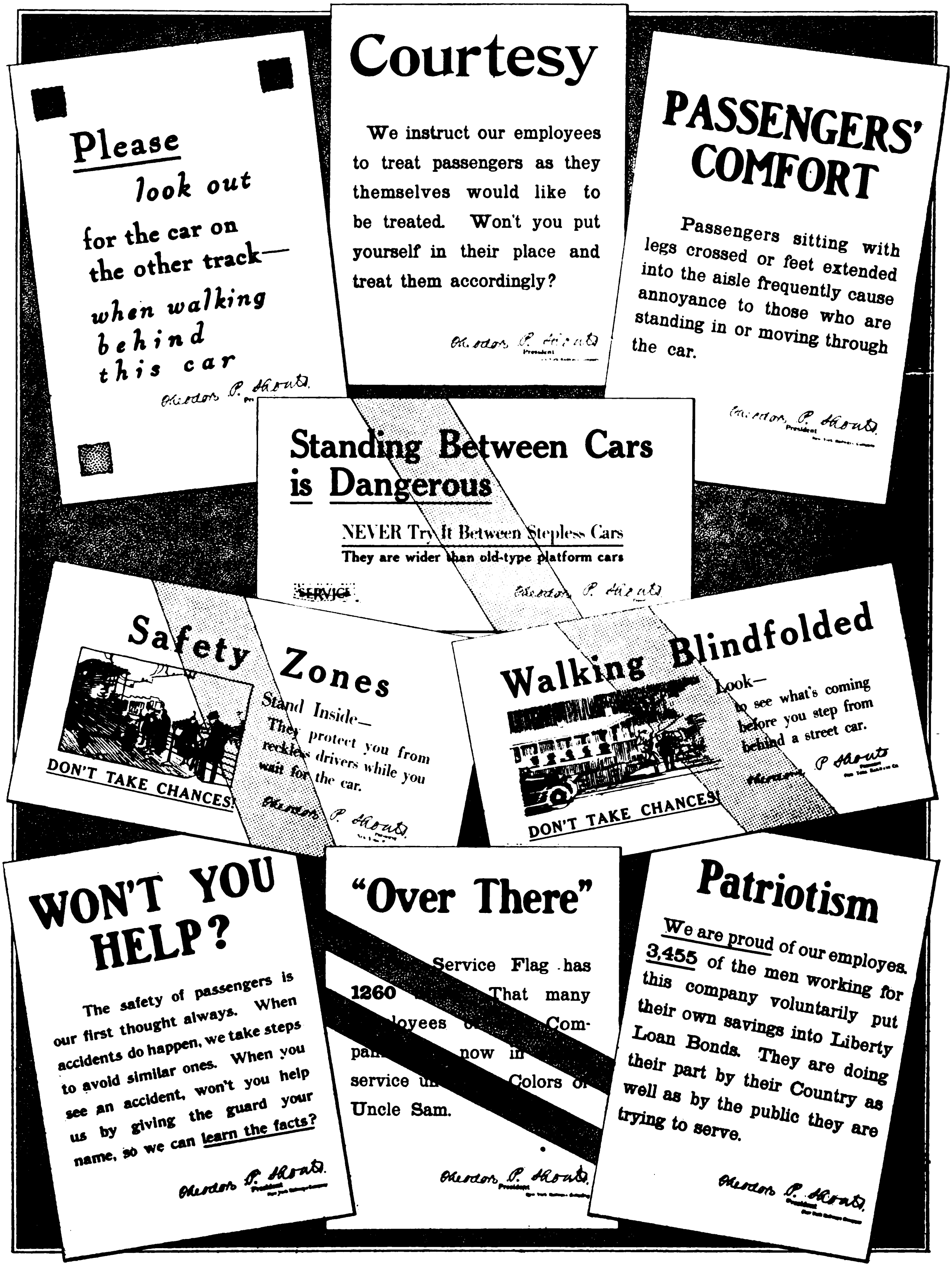
Little Jack Horner stands on the corner
To show off to Billy and Burt,
He simply will not
Wait for the street cars to stop,
And some day he'll get badly hurt.

* * *

Don't Run After Cars

Why chase a moving street car
And gamble with your fate?
It's only risking life and limb
To save a moment's wait.

PAGES FROM BOOKLET OF SAFETY RHYMES, A CHRISTMAS GREETING TO NEW YORK CHILDREN



Please look out for the car on the other track— when walking behind this car

Theodore P. Shonts

Courtesy

We instruct our employees to treat passengers as they themselves would like to be treated. Won't you put yourself in their place and treat them accordingly?

Theodore P. Shonts
President

PASSENGERS' COMFORT

Passengers sitting with legs crossed or feet extended into the aisle frequently cause annoyance to those who are standing in or moving through the car.

Theodore P. Shonts
President

Standing Between Cars is Dangerous

NEVER Try It Between Stepless Cars

They are wider than old-type platform cars

SERVICE

Theodore P. Shonts

Safety Zones

Stand Inside—

They protect you from reckless drivers while you wait for the car.

DON'T TAKE CHANCES!

Theodore P. Shonts

Walking Blindfolded

Look—

to see what's coming before you step from behind a street car.

DON'T TAKE CHANCES!

Theodore P. Shonts

WON'T YOU HELP?

The safety of passengers is our first thought always. When accidents do happen, we take steps to avoid similar ones. When you see an accident, won't you help us by giving the guard your name, so we can learn the facts?

Theodore P. Shonts
President

"Over There"

Service Flag has 1260 That many loyees Com- pa now in service u Colors of Uncle Sam.

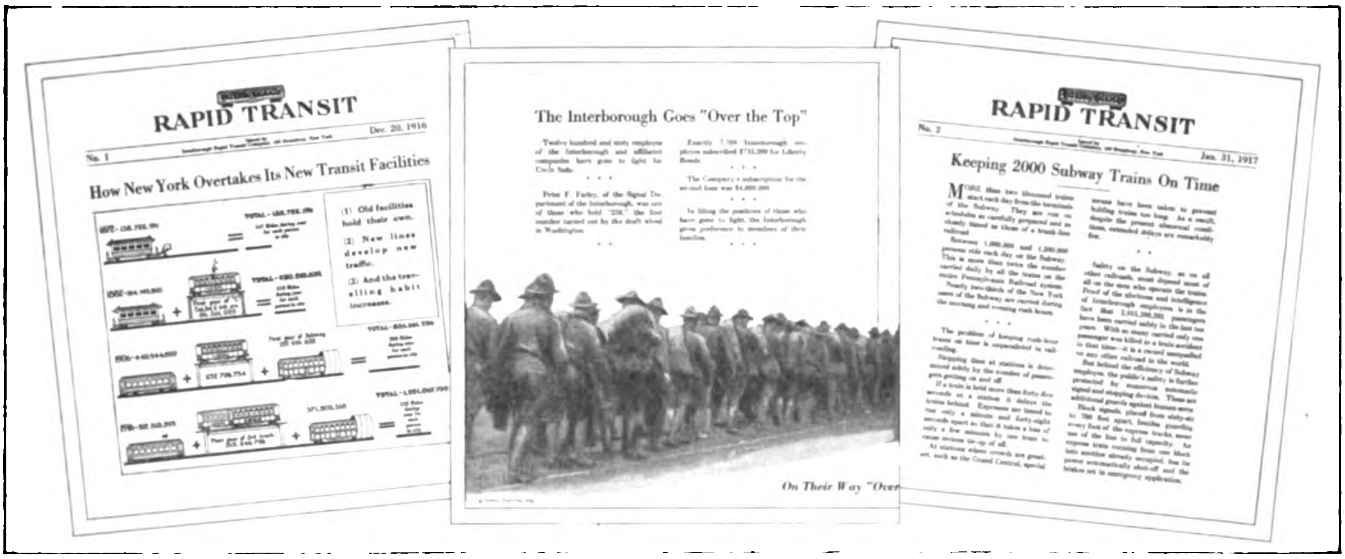
Theodore P. Shonts
President

Patriotism

We are proud of our employes. 3,455 of the men working for this company voluntarily put their own savings into Liberty Loan Bonds. They are doing their part by their Country as well as by the public they are trying to serve.

Theodore P. Shonts
President

The Surface Line or New York Railways' Posters Also Had Messages Written to Awaken and Hold Public Interest



RAPID TRANSIT

No. 1 Dec. 20, 1916

How New York Overtakes Its New Transit Facilities

(1) Old facilities hold their own.

(2) New lines develop new traffic.

(3) And the travelling habit increases.

The Interborough Goes "Over the Top"

On Their Way "Over

RAPID TRANSIT

No. 2 Jan. 31, 1917

Keeping 2000 Subway Trains On Time

HOW FACTS WERE PUT ACROSS IN SPECIAL RAPID TRANSIT BULLETINS

public, and the Interborough's riders are giving their views to T. P. Shonts. One critic says that the cards would be more effective if they were more forceful. Others say that Mr. Shonts should inject a little more "please" into them. Some people want to know why the colored band is used on the cards. Some suggest that the cards be used to encourage knitting for the soldiers and sailors. Others say that they do not like the cards at all.

The main thing about all this is that the people are thinking about what Mr. Shonts is telling them. No man could do a thing in a way to please all of New York. If he can get the city to think about his company's problems, he will have accomplished much. That's what Mr. Shonts is trying to do.

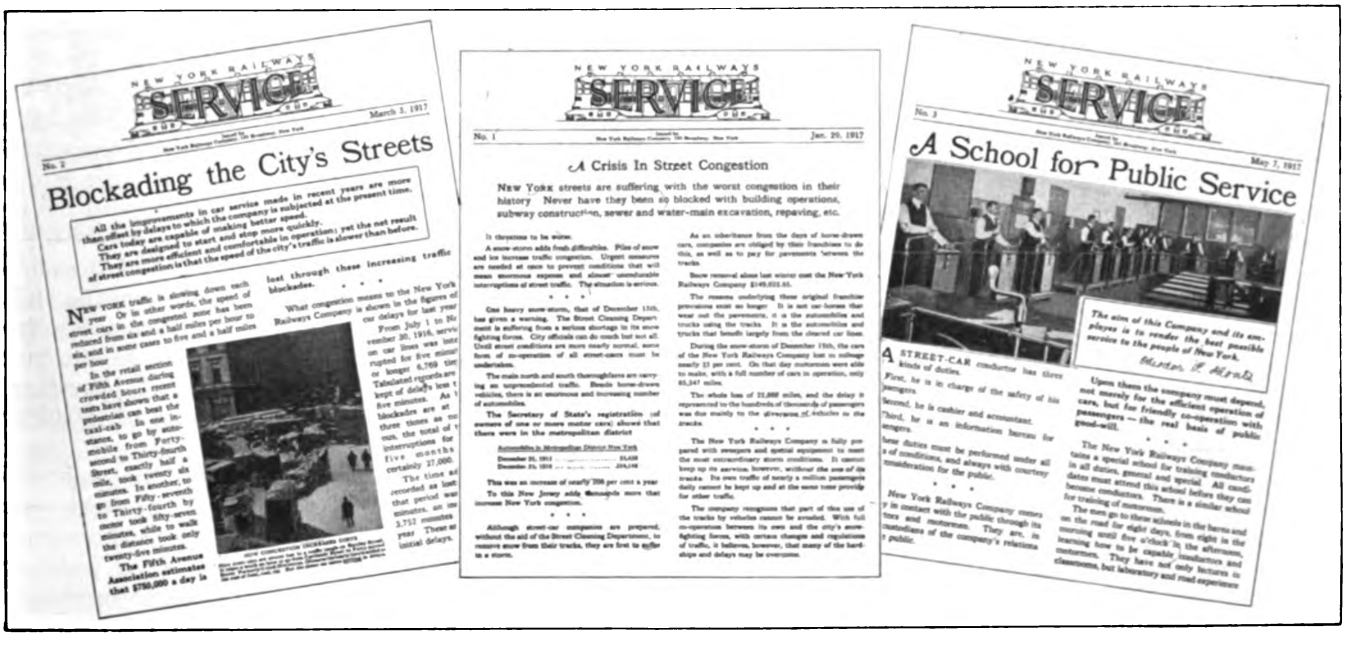
The problems of the Interborough, the management feels, are quite different from those of most companies. The Interborough carries a traffic that taxes its facilities to capacity. Its cars are crowded, and no more trains can be operated on the present system, as the lines are completely saturated now.

The management wants its patrons to know that it is literally sitting up nights trying to think of ways to relieve the congestion on its lines with a view to making people more comfortable. In other words, the company's problem is to show the public that it is operated by men whose first thoughts in giving service is consideration of the passengers. To do this, it is believed that the human touch must never be absent.

PUBLICITY USED FOR THE SURFACE LINES

Some of the cards used during the year in the surface cars of the New York Railways, of which Mr. Shonts is also president, were the same as those displayed in the subway and elevated cars. Others, however, dealt with problems peculiar to the surface lines.

As a Christmas greeting to the children of New York, Mr. Shonts issued an illustrated booklet of safety rhymes. This was published by the New York Railways and distributed to children throughout the city. The main characteristic of the book is the action portrayed in the illustrations. Another feature is a note ad-



NEW YORK RAILWAYS SERVICE

No. 2 March 3, 1917

Blockading the City's Streets

All the improvements in car service made in recent years are more than offset by delays to which the company is subjected at the present time. Cars today are capable of making better speed. They are designed to start and stop more quickly. They are more efficient and comfortable in operation; yet the net result of street congestion is that the speed of the city's traffic is slower than before.

NEW YORK RAILWAYS SERVICE

No. 1 Jan. 20, 1917

A Crisis In Street Congestion

New York streets are suffering with the worst congestion in their history. Never have they been so blocked with building operations, subway construction, sewer and water-main excavation, repaving, etc.

NEW YORK RAILWAYS SERVICE

No. 3 May 7, 1917

A School for Public Service

The aim of this Company and its employes is to render the best possible service to the people of New York.

Upon them the company must depend, not merely for the efficient operation of cars, but for friendly co-operation with passengers — the real basis of public good-will.

EXPLAINING TO THE PUBLIC MATTERS OF SURFACE OPERATION

Meeting War Burdens in Croydon

Employment of Women Conductors Must Be Regarded as Success—Higher Costs of Operation Have Overbalanced Receipts—Companies Are Entitled to Demand Fare Increases to Maintain Service and Financial Stability

By T. B. GOODYER
Manager Croydon (England) Corporation Tramways

MORE than three years of war finds the Croydon Corporation Tramways, in the London suburban area, operated, like the majority of systems in Great Britain, under conditions which a few years ago would have been considered impossible. The fact that the country was unprepared for the gigantic struggle now in progress eased to some extent the difficulty with regard to labor. To set up the vast machinery now in operation for the successful prosecution of the war took time, and in that fact many employers benefited. The drain on labor was gradual, allowing new provisions to be made from time to time to meet the altered conditions. Whatever the result may have been from the military aspect, there is no doubt that the adhesion to the voluntary system of recruiting for some considerable time following the outbreak of the war tended to render less difficult the task of tramway managers in Great Britain.

Tramway employees have responded to the call of their country and civilization as readily as any section of workers. Following the declaration of war a considerable number of men were withdrawn from the tramway industry by the calling up of the army and navy reserve. The loss of these men in Croydon had the effect of eliminating the margin of reserve men rendered essential by reason of the fluctuation in the service operated on five days of the week, and on Saturdays and Sundays.

For a time the loss of men was confined to the section mentioned, but as the magnitude of the task was gradually realized, men from all grades began to answer the call for volunteers. Then arose the proposition of maintaining the car services with a seriously depleted staff. Considerable help was rendered by the employees foregoing their "rest days," but before long the constant drain made it necessary to increase the hours of duty. As the system of payment at Croydon is on the hourly basis, no adjustment in respect to wages was necessary, the employees automatically benefiting financially by the altered conditions.

After pressure had been brought to bear by the management of various systems, the commissioner of police for the metropolitan area finally agreed to license women to act as conductors. There is no doubt that certain men held very strong views concerning the advent of women in this class of employment. Although the practice of employing women in this capacity had been in vogue for some time in the provinces, the innovation in the London area caused dissatisfaction among the union men. Eventually, however, they waived their objections when the women were offered the same terms as the men whose places they were to fill temporarily.

A small number of women conductors were engaged in Croydon at the beginning of 1916. The ill-feeling referred to above was probably the principal factor in connection with the strike of employees which occurred, firstly, in a neighboring company system, and secondly, on the Croydon undertaking in April, 1916. The Town Council offered to look into the men's grievances if they would return to work, but the men were obdurate. With the exception of a few of them who realized the mistake they had made and returned to work, a large number of strikers did not again take up service with the corporation.

The sudden withdrawal of 70 per cent of the motormen and conductors threatened to shut down the undertaking, but the men had little or no sympathy from the general public. Yet the management had to tackle what seemed an impossible task, that of providing a service to meet the convenience of a town of 180,000 inhabitants with but a mere handful of men.

Notwithstanding the labor shortage, the problem of resuming a normal service was solved in eight weeks. Inspectors and regulators were temporarily removed from their ordinary duties and placed as motormen. The conductors who had remained at work were trained and put on as motormen. Members of the official and depot staffs drove cars after the completion of their daily duties and also on Sundays. Several members

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(*Concluded from page* 219)

dressed to the children and signed by Mr. Shonts. It is printed on the inside of the cover of the booklet.

Series of bulletins are being issued by the companies from time to time. Their effectiveness lies both in their typographical appearance and in the presentation of the material in a "different" way. Not long ago the Interborough published a bulletin on some traffic facts that were developed in a few hours spent with the trainmaster of the subway early one morning. There was nothing new about the material, but nearly every newspaper in New York published leading news articles based on the pamphlet. Copies of this were sent to 25,000 people in New York, a selected list.

An important step in the Interborough's publicity work during the year was the publication of a pamphlet on the completion of the third-tracking of the elevated railroad.

Another bulletin told of the patriotic work of the Interborough and its men. The company's and its employees' Liberty Bond subscriptions, the number of men in the military and naval service, the help given to the Red Cross—all were shown. The story was told mostly with illustrations. Just the bare facts were given in words. This, however, is typical of all the publicity work the Interborough is doing. It does not characterize its own actions. It states the facts and lets the public draw its own conclusions.

of the Town Council and other volunteers—one a magistrate—even took out licenses and thus assisted the management to meet the public convenience.

New applicants as motormen were gradually obtained, and the conductors' places were almost entirely filled by women. It therefore soon became possible for the inspectors and regulators to resume their ordinary duties. Except for a few days at the commencement of the strike, the local public suffered but little inconvenience.

WOMEN CONDUCTORS HAVE MADE GOOD

The employment of women as conductors must be regarded generally as a success, especially in consideration of the abnormal conditions under which they are working. The actual work of fare collection per conductor has considerably increased owing to the heavier loading of the cars. This has been brought about principally by the large number of women riders who have entered the industrial world to help make up for the shortage of man power.

The street lighting restrictions in the metropolitan area and in many provincial cities and towns have been very severe, and although there has now been a welcome withdrawal of certain conditions, for a long time the cars had to be operated in semi-darkness. This obviously was very trying to the women conductors new to the work, especially in regard to the correct punching of tickets and change-giving, and also at rush hours during the evening. Although the physical strain has proved too great in some cases, the women have in general been able to withstand the arduous duties and conditions much better than was at first anticipated.

While the women conductors accepted service on the same conditions as male employees of that grade, it has been necessary to grant certain minor concessions, including the provision of seats on the platform and the collection of top-deck passengers' fares on the platform upon boarding.

It has not yet become necessary at Croydon to use women as drivers, although the experiment is reported as being successful on a few systems in the country. Obviously local conditions will to a large degree govern the result of such a departure. In Croydon the narrow thoroughfares, together with the heavy vehicular congestion, will militate against the success of women drivers. Another important factor is the car equipment. Difficulty would undoubtedly be experienced at the present time in obtaining the necessary additional braking gear to render the cars more safe under the less experienced operation by women drivers.

FIFTY-FOUR PER CENT OF MEN WITH COLORS—EQUIPMENT DIFFICULTIES

Thus far 211 Croydon employees, representing 54 per cent of the pre-war staff, are serving with the colors. Their positions are guaranteed on return to civil life, and allowances are made to them or their dependents on such a scale that they suffer no financial loss by enlistment. Practically the whole of the fit men of military age are serving with the colors, only a few men of military age and in the lower medical categories holding temporary exemption from military service.

Of almost as great importance as the labor shortage is the difficulty experienced with regard to stores and materials. Many are the minor devices resorted to in the mechanical line to keep things going, without sacrificing safety. While this may prove in the long run to be detrimental to the equipment, there is unfortunately no alternative when new material is not available and the services have to be maintained, especially for the sake of the large number of munition workers traveling to and from work.

Like the majority of systems in Great Britain, Croydon has experienced a marked increase in revenue compared with pre-war figures. No doubt a large portion of the additional traffic arises from the "out-of-doors" habit cultivated in the men by military training. This in the course of time affects their families. In both the national and tramway interests it is to be hoped that this habit may remain upon the conclusion of the war.

Against the increased income, however, has to be set the large advance in working expenses arising from increased wages, war bonuses, war service allowances, and the higher costs of stores and materials. These items became so serious in Croydon in August, 1916, that it was necessary to increase the fares to preserve the financial stability of the undertaking. Previously the Croydon fares had been among the cheapest in the country. Hence a somewhat extensive revision was possible, while at the same time keeping the revised charges below the general average for the country.

The first year's results of the revision have been satisfactory. It was estimated that an 8 per cent advance in revenue would be sufficient to cover the increased cost of operation and provide the necessary contribution to the reserve and renewals fund. This figure has been exceeded by a fairly useful margin. On the other hand, the operating expenses still continue to mount, and it is impossible to say to what level they may ultimately rise.

THE PUBLIC MUST PROVIDE ADEQUATE REVENUES

Many tramway systems in Great Britain—both municipal and private—have been compelled to revise their scale of fares in order to meet the greatly increased cost of operation. I have observed that the question of increasing fares on many of the electric railway systems in the United States has been engaging the most careful attention of operators over a long period. The matter has, in my view, long passed the doubting stage. It has become an acknowledged fact that if good service and increased wages are to be provided, together with money to meet the higher cost for all materials required in maintenance, the revenue must come from the only source possible—namely, the public. It is a practice which is now being followed in almost every other kind of business, but I fear we, in the tramway world, have all been somewhat late in putting it into effect.

While fare revision is bound to be unpopular with the traveling public, the interests of the ratepayers generally, where municipal undertakings are concerned, are best served by the maintenance of the financial stability of the concerns. The shareholders in privately owned companies have the right to expect, and are entitled to demand, similar consideration, even at the expense of a policy that may be unpopular for the time being. The abnormal period through which we are passing has compelled us to become reconciled to various changes, many of which are far more important than increases in tramway fares.

Present Situation Will Prove Blessing

Utility Service Better Appreciated—Relief Heretofore Deemed Remote Can Now Be Secured—Freight Handling and Distance Charges Advisable

By Henry L. Doherty
President Henry L. Doherty & Company, New York, N. Y.

IN these days of soaring prices for raw materials it is not a comfortable thing to be unable to fix your own selling price, but be forced to wait until a state commission or a municipal body is made to see the necessity for an increased price. When the railroad situation became desperately serious, ways were found to take care of it. Ways will be found to take care of the situation that now faces many of the public utilities. It will not require the drastic action which was necessary in the case of the railroads, for there are many methods whereby relief may be secured.

I think the present situation will in the end prove the greatest blessing to the public utilities of anything that has ever happened. The public established its right to have public utility charges reduced if they were unfairly high, and they must now be good sports and consent to have them increased if they are unfairly low. The people are already getting an appreciation of what public service means as never before. They realize that they are dependent upon these companies for the necessities and comforts of life, and no longer regard them as mere profit takers, and for many a year after this war is over the people will have a truer appreciation of what these companies do for them. Reforms can be secured under these conditions that have heretofore seemed very remote.

FREIGHT HANDLING SHOULD BE TAKEN UP

Street railway problems cannot be so easily and quickly corrected as those of the gas and electric companies. The electric companies have already developed a large power business, and the gas companies are now developing a large use of gas for industrial purposes. A similar opportunity exists for the street railways in the handling of freight, and yet practically nothing of any moment has yet been done by any of the street railway companies in handling freight, and it will require some time for the working out of suitable equipment and methods.

A few years ago it would have been idle to have asked most cities for the right to handle freight, and yet today it is only a lack of appreciation of what the railways might do for the city that prevents numerous cities from demanding that the street railway companies should handle freight. Our traffic problems are becoming so serious in the different cities in all parts of the United States that the quickest, and certainly the most economical, means of practical relief is to premiumize the street railway companies in the handling of freight.

It is axiomatic that freight can be moved more cheaply on steel rails and steel tires than with horse-drawn vehicles with steel tires on brick pavements, or motor-driven trucks with rubber tires on brick pavements. A street railway freight car moving on steel rails will make less noise, do less damage to the street, and interfere far less with other traffic, and in the majority of cases these cars could carry as much as ten wagonloads at a time. Sooner or later our electric railways are bound to become the principal freight carriers in our cities.

I would like nothing better as a sporting bet than to take the street railways of New York City as handlers of freight and guarantee to do more to relieve the traffic conditions of the city than could be done by the expenditure of $100,000,000 to relieve traffic conditions by other methods.

RATIONAL FARES BASED ON DISTANCE

Sooner or later the railway companies will also come to the matter of rational methods of charging. It is absurd to charge the same to carry a passenger ten blocks or 10 miles. Charges should be based on distance. The difficulties of establishing a distance system of charging are largely imaginary. It is remarkable how much intolerance there is to the mere suggestion of charging by distance, but it is largely due to the absurd and irrational zone systems that have been used. With a rational distance system of charging, both the public and the railway companies will be immensely benefited. Instead of causing congestion, it should tend to have an exactly opposite effect. I know of no man of skill in railway operation and management who condemns distance charging if he has given it serious and intelligent thought.

In one of our railway situations the Polish workmen in one of the factories ride to the extreme opposite corner of the city so they can live in a Polish settlement. Distance charging would be an inducement for them to find homes near the factory in which they work. Another of our railway properties operates through a suburban territory much of which is devoted to factories, and one terminal is in the heart of a congested city. The workmen in these factories largely reside in the congested city rather than in the beautiful suburbs which are close to the factories in which they work. Charging for transportation by distance will not tend to bring about congestion, but will contribute to more healthful and better living conditions.

The stockholders of railroad companies were punished for years by antagonistic regulation and legislation, but the public is now paying and suffering for this folly. Like treatment of the public utilities will inevitably bring like suffering to the people.

It is too bad that it requires such an awful crisis as this to make some men think, but this entire war situation will not be entirely without its blessings. The public, for its own good, should demand prompt and fair treatment for the public utilities. Unless they are given a fair margin of profit their credit will be crippled, and the public will pay the freight in the end.

I am more than satisfied with my public utility investments, and view the future with the greatest optimism.

One Hundred Years of Engineering

The Institution of Civil Engineers of London, England, on Jan. 2 completed the hundredth year of its existence, having been established in 1818 at a meeting of eight engineers at the Kendal Coffee House in Fleet Street. At the meeting of the institution on Jan. 8 a statement commemorative of the founding of the institution was presented, war-time conditions precluding more formal celebration of the centenary.

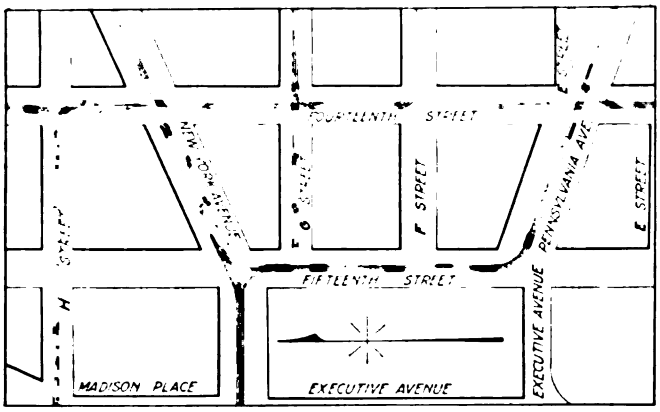
Relieving the Most Congested Point in the National Capital

First Section of Beeler Report on Washington Recommends 50 per Cent Cut in Stopping Places, Double Berthing, Front-End Fare Collectors, One-Way Traffic Streets and Other Means

THE first section of the report by John A. Beeler to the Public Utilities Commission of the District of Columbia on the steps necessary to afford immediate relief to the existing congestion on the lines in Washington, D. C., was made public in that city on Jan. 27. This section is devoted to the congestion in "the throat" of the Capital Traction Company system in Fifteenth Street, between Pennsylvania and New York Avenues, which the report considers the greatest in the city. Conditions must be improved there before any marked improvement elsewhere on the local traction system is possible.

CITY DID NOT GROW AS PLANNED

Unlike most cities, Washington was laid out by its founders according to a definite plan, but the principal development has been toward the northwest and latterly also toward the northeast. The Police Census of Nov. 1, 1917, showed a population of 395,947. There has been a large influx of people within the last year on account of the war.



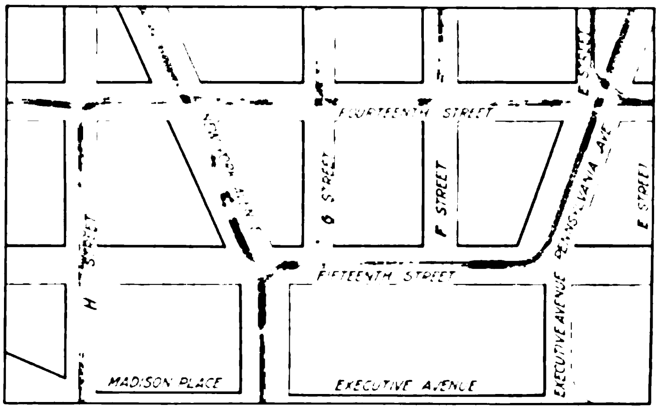


FIG. 1—THE BLACK SPOTS SHOW THE PRESENT STOPS FOR CARS IN THE CONGESTED THROAT OF TRAFFIC IN WASHINGTON. FIG. 2—HOW THESE STOPS CAN BE CUT TO HALF AS MANY

The city is served by two traction systems, the Washington Railway & Electric Company system with 118.8 miles of track, and the Capital Traction Company with 52.5 miles. On the regular routes 271 all-day cars are scheduled to operate, with 304 added during the period of maximum load, making a total of 575. Of these, the Capital Traction Company operates 38.5 per cent, and the Washington Railway & Electric Company 61.5 per cent. The worst conditions are met while people are going to and from their work. In some cities this series is called the "rush hour," but the report suggests that in Washington it would be a misnomer, as the cars do anything but rush. A better name would be "the crush hour."

The maximum condition of choking occurs on Fifteenth Street, between Pennsylvania and New York Avenues, where the cross currents of street car traffic converge from eight different lines and where 211 cars are scheduled to pass during 4.30 and 5.30 p. m.

Observations taken on Jan. 6, 1918, show that, even on Sunday afternoon when the most favorable conditions prevail, the average speed of cars near this point was only 6.86 m.p.h. This was for a distance of 2300 ft. On a week day in the middle of the afternoon the average speed of outbound cars was 6.12 m.p.h., while during the evening load on Jan. 11 from 4.30 to 5.30 the outbound speed averaged but 4.12 m.p.h. The lowest rate that was recorded occurred during 5.45 to 6 p. m., when the average speed was but 2.99 m.p.h. The traffic affected comprises two-thirds of that of the Capital Traction Company. The spacing also varied.

Ten measures for immediate relief were recommended as follows:

1. The stopping places should be reduced to one-half. At present a northbound car has six and a southbound car eight regular stopping places between these points, which are but 2300 ft. apart. Fig. 1 shows the present stops and Fig. 2 the proposed stops. This reduction will not only permit freer movement of the cars through the throat, but will also do away with the stops at certain danger points, such as on New York Avenue before the turn is made into Fourteenth Street, northbound.

2. Double berthing must be employed at all the stops included within this congested district. The first car to approach a stop should always take the forward position. When a second car arrives while the first is still standing, it should take the second berth, and when it goes forward after taking on and discharging passen-

gers, it must proceed without stopping at the forward berth.

3. Safety zones, amply protected by traffic stanchions, should be placed at each of the proposed stops, the length of zone being sufficient for loading two cars simultaneously. These platforms should be about 10 in. high and 6 ft. wide, and they will protect the public more effectively from street traffic than any other practical arrangement. For the present these platforms can be constructed of wood, but more permanent construction can be substituted if desired later. Wooden platforms are, however, less slippery in wet or icy weather.

4. Front-end fare collectors should be stationed on each of the principal loading platforms during peaks of heavy traffic. These men should sell tickets, collect fares and issue transfers. If properly carried out, the use of front-end collectors results in more even loading of the cars and reduces the time lost at stops.

5. Street cars must be given preference by traffic officers. In other words, on the approach of a street car, the traffic officer must so regulate the other traffic as to permit the car to proceed at once to its proper stopping place unless the berth it should occupy is blocked by another car, or some other emergency prevents. Traffic officers should endeavor always to keep the near-side berths empty and the far-side berths filled by passing two or more cars on one indication of the traffic sign. As the use of the conduit system makes it necessary for cars to coast over intersecting tracks or other special work, cars in pairs cannot proceed so close to each other as would otherwise be permissible.

6. Limited parking of automobiles. Between 8 a. m. and 10 a. m. and between 3.30 p. m. and 6.30 p. m. automobiles should be allowed to stop only long enough to take on and discharge passengers on Fourteenth Street, between H Street and New York Avenue, and on New York Avenue, between Fourteenth and Fifteenth Streets. At other times a slightly longer stop may be allowed, but never more than fifteen minutes. Other limitations on parking cars are recommended.

7. Certain streets should be devoted to one-way traffic. The graphs, Figs. 3 and 5, show the results of a vehicular count at Fourteenth Street and New York Avenue, Fifteenth Street and New York Avenue and Fifteenth and G Streets. If northbound vehicular traffic should be cut off on Fifteenth Street, between G Street and New York Avenue, and eastbound traffic on New York Avenue, between Fifteenth and Fourteenth Streets, there would be a minimum of interference to the cross currents of both street car and automobile traffic, as shown in Figs. 4 and 6.

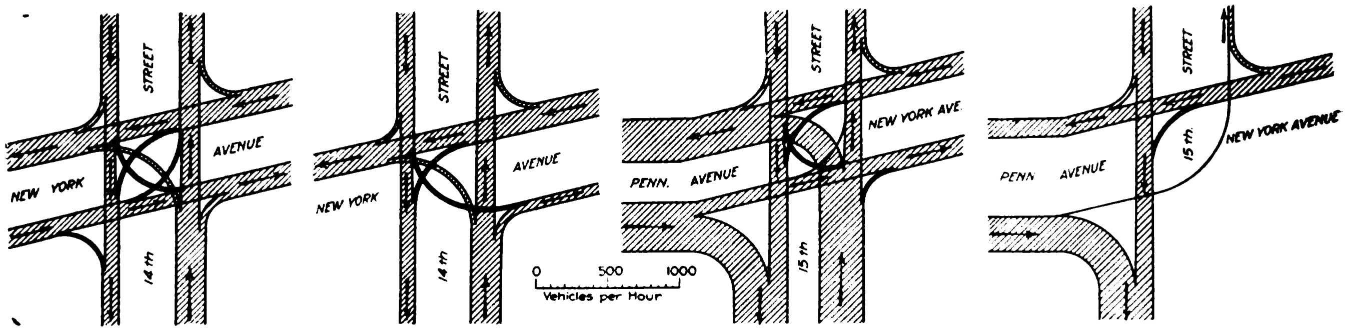
8. Through routing of Chevy Chase cars. Certain changes are suggested.

9. The schedules should be changed so that cars will not be bunched when running on time, so that more uniform spacing of cars will be secured.

10. Introduction of the skip stop. The report says: "A general readjustment of the stopping points all along these lines should follow at once. An average spacing of not less than 660 ft. (eight stops to the mile) should be employed. Wherever safety stops are necessary, they should be combined, as far as possible, with passenger stops. Passengers will thus be afforded quicker service without any increase in the present free-running speed of the cars. There is no reason why a saving of from 15 per cent to 20 per cent of the time now consumed for a trip cannot be made by this means. A certain number of cars that are now running will be able to provide an increase in carrying capacity, because the cars can return more quickly for another trip."

In commenting on the advantage of diverting automobile traffic, the report says: "Each street car, when loaded, holds from eighty to 100 people, while the private automobile crossing its path usually carries but two or three. By holding up the street cars for other vehicles, the many are delayed for the benefit of the few. The owners of automobiles should be the first to recognize this fact, and will no doubt be ready to contribute toward relieving the congestion of the streets, especially as many of them can do so with only slight changes of route and without loss of time. They should remember that street cars are confined to tracks and are obliged to have definite routes and stopping places, whereas automobiles are easily diverted and are elastic in their movements." It then suggests that vehicles from the east desiring to go north or west of the Treasury can do so best by means of Thirteenth Street, which is free of car tracks, or by the use of Executive Avenue, as it avoids all street car junctions, stopping places and traffic officers.

The next section of Mr. Beeler's report will deal with the staggering of working hours in Washington, relief to the Washington Railway & Electric Company's tracks, etc.



FIGS. 3 AND 4—PRESENT RUSH-HOUR VEHICULAR MOVEMENT AND PROPOSED SIMPLIFIED PLAN, FOURTEENTH STREET AND NEW YORK AVENUE. FIGS. 5 AND 6—SAME FOR FIFTEENTH STREET AND NEW YORK AVENUE

The Nashville Railway & Light Company, Nashville, Tenn., which for some time has been buying coal in car lots and supplying its employees at cost, is now hauling wood into the city from Glendale Park and distributing it among the employees for fuel.

Rate of 2.5 Cents a Mile Granted

Indiana Commission Decides that This Is Justified by the Emergency Confronting the Indianapolis & Cincinnati Traction Company

THE Indiana Public Service Commission has just handed down a decision of importance to interurban lines in that State. As announced in a preliminary note last week, it has allowed the Indianapolis & Cincinnati Traction Company to increase its rate per mile from 2 to 2½ cents. Although the commission cautions the interurban carriers of the State that every fare case must depend upon its own merits, the decision recognizes the principle that interurban lines can, for just cause, be freed from the restrictions of the Indiana 2-cent fare law.

COMMISSION CAN RAISE RATE

The commission first interpreted the State utility law as to power to increase interurban rates. It was decided that the Legislature intended to, and did, grant to the commission the power, in case of emergency, in order to prevent injury to the business or interests of any interurban railway of the State, temporarily to alter or amend any existing rates of such interurban line.

MORE REVENUE IS NEEDED

After an analysis of all of the evidence as to the increase in the costs of operation of the company's lines due to abnormal conditions, the commission was of the opinion that, conservatively estimated, the general increase in the cost of operation in 1918 would be from 20 to 25 per cent over the cost of operation for 1917.

The company has suffered a deficit for three years. Not only has it paid no returns on its common and preferred stock, but after the payment of only operating expenses, taxes, interest on bonded debt, floating debt and fixed charges, there were the following deficits: 1915, $17,425; 1916, $23,547; 1917, $9,975.

If the company has, in 1918, gross earnings equal to those in 1917, which in this respect was the best year in its history, and if 20 per cent for operating expenses is added to the operating expenses of 1917, the company will, in the commission's opinion, face a deficit for 1918 of approximately $76,000, not including a reasonable allowance for depreciation.

The company's business, the commission said, has been in the hands of competent and efficient officers. Economy has been practiced in the management and operation of the lines. The salaries and wages paid are, in many instances, extremely low, although it does not appear that this fact has resulted in inferior service or the employment of incompetent workmen. It is clear, also, that the actual operation of the company's lines is carried on in a reasonably efficient manner. The commission was unable to find where material reduction in the operating expenses could be made without consequential rendering of inadequate or improper service.

From the evidence at the hearing, and from the investigation and report of the commission's engineers, the commission found that the value of the property, actually used and useful for the convenience of the public, was in excess of $3,500,000. Under normal conditions (without considering at this time the matter of allowance to cover depreciation) the company would be entitled at least to a 6 per cent return on $3,500,000, or $210,000. The commission believed that, in order to prevent injury to the business and property of the company, it is necessary to provide a means of payment of $179,850, which represents only a payment of 5 per cent interest on the outstanding first mortgage bonds and that preferred stock which is an underlying and contractual security, and the payment of 6 per cent interest on the floating indebtedness carried in bank. This amount does not provide for any return on the $2,000,000 of common stock, or on the $1,000,000 of overlying preferred stock.

The commission remarked, however, that in meeting the needs of utilities in emergencies it would not in such periods underwrite usual dividends. In this instance, the company did not pray for anything except that the corporate life and the standard of service of the company should not be impaired. The commission took occasion to state, however, that this is a period of national sacrifice in which each must bear his burden. From these burdens the commission will not relieve utilities while carrying out the intent of the Legislature to keep utilities intact through such chaotic times.

The business of the company is almost entirely interurban in character, and the income derived purely from passenger revenues constitutes approximately 86 per cent of its total revenue (record of 1916). The remaining 14 per cent of its income is derived from the transportation of express, mail, milk, freight and dispatch freight.

In the judgment of the commission, an increase in passenger rates from 2 cents to 2½ cents per mile, together with an estimated $15,000 freight rate increase already allowed, would increase the company's 1918 revenues approximately $77,000. This is practically equivalent to the approximated deficit for 1918.

The commission, therefore, ordered the existing passenger rate schedule to be suspended, and new rates, effective on Jan. 23, to be used until further order of the commission. The emergency rate structure follows:

1. A rate of 2½ cents per mile with a reduction of 5 per cent for round-trip tickets.
2. Commutation books as follows: Twenty-five times the increased one-way fare for forty trips within a calendar month; thirty times the increased one-way fare for sixty trips within a calendar month.
3. In lieu of the present interchangeable 1000-mile mileage book, a book containing 2000 1-cent coupons, which book shall be sold for $17.50, the coupons therein to be accepted at face value for passenger fares.

LETTER TO PATRONS PUBLISHED

After the decision, Charles L. Henry, president of the company, published in all the newspapers along the company's lines a friendly letter giving the main points of the commission's remarks. Mr. Henry closed his statement as follows:

"We fully realize, as will you, that the increased fares and rates we are permitted to collect will barely take care of the increased expenditures now in sight, and may not be enough to take care of those which will unavoidably come. We confidently rely upon your further co-operation in all efforts to keep down unnecessary expenditures and demands upon the company during these perilous times. All street and other improvements which will call for expenditures by the company should be deferred, as they cannot be made without further increased charges for passenger and freight service.

"With your assistance, we will bend all of our energies not only to the keeping up of our present standard of service, but to a constant increase of its efficiency, so that your communities will all be more than ever benefited. This is especially necessary during such times as the present when steam railroad service is so seriously affected as to deprive the communities of what they have heretofore had at their hands."

A Frank Statement to Patrons

Fort Wayne Company Supports Fare Application With Explicit Explanation to Its Patrons—Fundamentals of Railway Economics Also Set Forth

When the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., recently made application to the Public Service Commission for the discontinuance of six-for-a-quarter tickets, the company at the same time issued to the public a sixteen-page pamphlet telling in detail its story. A total of 15,000 of the pamphlets were printed and distributed by means of boxes in the cars.

The pamphlet is noteworthy not only because of the frank way in which the company explained to the public the reasons why it must ask for increased revenue, but also because of the painstaking manner in which the general problems confronting all electric railways were set forth.

In introducing the pamphlet the company stated that it was furnishing transportation for less than cost, and that it could not continue to do so and give adequate service. The problem had been studied for the last nine months, and the company was outlining the facts and what appeared to it to be the best solution. Satisfactory service, however, was said to be a problem which could be worked out only in co-operation with the patrons, and the company expressed the hope that the patrons would help it in rendering such service.

The pamphlet then proceeded to describe the financial conditions of the Fort Wayne company, the meaning of current tendencies and the outlook. It then took up the basic economics of electric railway transportation, the meaning of the automobile, the possible future of electric railways, the steps taken by the company to solve the problem and immediate moves which should be made.

In closing, the company stated that the importance to the community of electric railway service was so great that too much care could not be taken to have the problem fully understood. If it were possible to operate an electric railway on a 5-cent fare in Fort Wayne, it should be done. The company would continue to give its best efforts to do this and wanted the help and suggestions of patrons to make the effort a success.

The comments of the company upon the future of the industry, noted above, are worth quoting. They are as follows:

"The general plans for the future development of electric railways have been advanced. The first plan contemplates the use of the light-weight one-man cars with frequent operation. This method it is claimed would improve the service, reduce expenses per car-mile and might offer a solution of the problem. The second method suggested is to use the electric lines largely for long hauls and rapid transit and have the short-haul business taken care of by motor vehicles which are more flexible of operation in congested districts. This latter plan would mean that electric railway tracks would be laid only on streets where the electric cars could be granted practically full right-of-way. In the larger cities it would take the form of subway and elevated construction where absolute free car movement could be had.

"In cities of moderate size, the first of the plans outlined appears to be more feasible. Either plan will require the expenditure of considerable money for change in equipment or track and roadway, and they have only been advanced by operators as possible future solutions of the problem to be studied and tested. During what might be called the transition period every company will be obliged to make such adjustments as the special local conditions demand."

Service-at-Cost Plan Approved

F. J. Macleod Says that Gross Revenues Must Be Increased, and Plan of Massachusetts Investors Seems Most Practicable Means

A SERVICE-AT-COST PLAN should be adopted for the electric railways of Massachusetts. Such is the belief of F. J. Macleod, chairman Massachusetts Public Service Commission, as expressed before representatives of the Boston Stock Exchange at the Algonquin Club, Boston, on Jan. 31. This plan seems to him to be the most practicable one under the present system of private ownership and operation.

RAILWAYS NEED MORE NET INCOME

The additional net income which electric railways now need, Mr. Macleod remarked, can be obtained only through a reduction in operating expense, taxes or fixed charges, or through an increase of gross revenue. The companies have already been forced by the pressure of hard times to do their utmost in effecting operating economies, and no further substantial relief is in sight from that source until they are enabled to obtain additional capital for the rehabilitation of their properties.

Decrease of operating expense is also possible through reductions of service, but it would appear that the companies in general have already gone far enough, if not too far, in that direction. Another possible means of retrenchment in certain cases would be the entire abandonment of unprofitable lines. Such action would involve the wiping out of a large part of the investment already made and would in many cases be a real hardship to the communities served. But a railway, Mr. Macleod said, is not primarily an eleemosynary institution. Unless the public is willing to assume the burden of this unprofitable operation, the companies may be forced in some instances to abandon service.

From the present outlook, Mr. Macleod continued, no decrease of fixed charges seems practicable through obtaining lower interest rates. Such rates have steadily risen, and it is doubtful that the end is in sight. As for taxes, however expedient it might be under present emergency conditions to provide for the remission of the local property and the corporate franchise taxes in whole or in part, it is extremely doubtful if any such scheme is practical in the absence of some general revision of the present system of corporate taxation. The commutation tax on earnings, however, which practically makes the companies pay for paving work twice, should be abolished. This the commission recommends not as a remedial measure, but as a simple act of justice.

In the main, however, if the financial condition of the railways is to be substantially improved, the result must be accomplished through an increase in gross revenues. The commission, Mr. Macleod said, believes that it is possible to obtain some increased revenue without an increase of fares by stimulating additional traffic through the operation of one-man cars on a more frequent headway and by using every possible effort to attract short-haul riders. The effective carrying out of such a program would, however, require additional capital which is not now available. The only other method of increasing gross revenue is by a readjustment of fares.

Mr. Macleod then mentioned the service-at-cost plan proposed by Homer Loring, president of the Street Railway Investors' Association, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 17, 1917. Briefly stated, his plan contemplates the issuance of additional capital for the purpose of creating a reserve fund which may be drawn upon temporarily to meet the necessary interest and dividend charges if the company's current revenues are insufficient to meet the cost of service. Fares are to be adjusted up or down as occasion may require, in order to prevent any substantial increase or decrease of the reserve fund.

It is proposed that the commission shall approve or establish a sliding scale of fares which shall automatically fluctuate up or down whenever the reserve fund falls or rises more than 30 per cent. The commission is also required to determine for each company the amount of its capital investment and the proper amounts to be set aside annually for depreciation and other reserve funds. Companies shall be prepared to undertake a reasonable program of rehabilitation satisfactory to the commission, and the commission shall be equipped to exercise a more thorough supervision over operating methods and practices of all companies accepting the act.

SERVICE-AT-COST PLAN SHOULD BE ADOPTED

The commission, Mr. Macleod stated, has already given its indorsement to this plan in principle and believes that it should be enacted into law. Continuing, he said:

"In its main features the service-at-cost plan is similar to plans which are in successful operation in Dallas, Des Moines, Kansas City, Cleveland and other cities. The principle upon which it rests appears to be sound and equitable, and, in so far as it may tend to impress upon the public mind the necessary relationship between cost and service, it should make for a better understanding of the issues involved, for greater public confidence and co-operation, and for smoother administration of the present regulatory system.

"It should also make possible a more ready and flexible adjustment of fares to changing financial conditions and the revenue requirements of the companies than is possible under the present system. In so far as this result can be accomplished without sacrifice of the public interest, it will tend to place investments upon a more stable basis and to eliminate the delays which are such a frequent cause of complaint against the present system of public regulation.

"The chief misgivings which the commission entertains in regard to the complete success of this plan is the uncertainty as to whether the revenue needs of the companies can in all cases be adequately met by a readjustment of fares. Much experimentation is still necessary before it is possible finally to determine the exact method of fare increase which is best adapted to the special traffic conditions of each company and will give the largest revenue results from the increases allowed.

"The traffic possibilities of the territory served by certain electric railways are insufficient, under any scheme of fares that might be proposed, to meet the cost of operation. Neither the service-at-cost plan nor any other plan based upon a readjustment of existing fares will prove adequate for that situation. For these companies the outlook seems hopeless unless the communities which they serve are prepared by some form of subsidy to bear a portion of the burden of their operation.

"The service-at-cost plan, however, seems to be the best remedy that is practicable under the present system of private ownership and operation. It is important to bear in mind that any plan which will bring about the restoration of credit so essential to any satisfactory solution of the present problem must be one in which the investors themselves have confidence. The service-at-cost plan is recommended by the fact that the investors themselves have proposed it and have given it the support of their expert opinion that it will accomplish the desired result."

OTHER AID MAY BE NECESSARY

In Mr. Macleod's opinion, however, it is possible that no plan which can now be devised will enable the companies, unaided, to meet the conditions with which they are confronted in the present extraordinary situation. If such proves to be the case, the only other remedy is for the State to come to the relief of the companies. As Mr. Macleod had suggested before, this might be done by having the State furnish the companies with needed rolling stock and power apparatus upon the installment plan of purchase, thus giving the companies the benefit of the State's better credit and the lower rate of interest which it is able to command. This, Mr. Macleod said, is only one of several suggestions of a similar character which might be made.

Cost of Preparing Company Publication

The cost of publishing *Triangle Talks*, a weekly organ devoted to the upbuilding of the employees' service and *esprit-de-corps* of the Bay State Street Railway, Boston, Mass., is $150 a week. This has been published weekly for ten months. From the letters to the company and other evidence, the management feels that the magazine is profitable, especially when the small individual cost of dealing with 6000 men is considered. These facts were brought out by Robert S. Goff, vice-president of the company, at a recent fare hearing before the Massachusetts Public Service Commission.

New Tentative Accounting Classification for New York

Second District Commission Adapts I.C.C. Classification to Its Use—Proposed Classification Requires Depreciation Accruals and Other Changes

THE Public Service Commission for the Second District of New York has prepared a tentative classification of accounts for electric railways and distributed it to the various companies for constructive criticism. The new classification, which, when formally adopted, will supersede the now-effective classification approved in 1908, is intended to bring the accounting requirements of the New York commission into closer correspondence with those of the Interstate Commerce Commission. The proposed effective date for the new classification is Jan. 1, 1919, and criticisms are desired not later than Oct. 1.

The executive committee of the New York Electric Railway Association has filed with the commission a copy of its report on the classification. This committee criticises certain features of it, principally the instructions with reference to accounting for depreciation, and asks for an opportunity to present its criticism more fully. This opportunity will be given, but up to the present no date for a hearing has been set.

POINTS OF DIFFERENCE

Because of the special needs of the New York Second District commission, it has been deemed necessary to subdivide some of the primary I.C.C. accounts and to modify the general instructions in some particulars. The important respects in which the tentative New York classification differs from that of the federal classification may be summarized as follows:

1. The proposed system requires depreciation accruals on all classes of depreciable property at a rate to be stated in terms of a percentage of its cost or book value. The I.C.C. system requires depreciation to be accrued only on equipment, but allows it on other classes of property. Both systems leave to the individual companies the selection of adequate depreciation rates, subject to commission review.

2. The proposed system modifies somewhat the general instructions of the I.C.C. classification with reference to accounting for depreciation and retirements. It also modifies or makes more definite the accounting for rental of equipment, specifically requiring that rent for equipment held under a long-term lease shall be chargeable to income deductions and not to operating expenses.

3. The proposed system requires greater detail in the accounts for power costs, both operating and capital, and subdivides the I.C.C. accounts to make them comparable with the commission's classification of power accounts for electric light, heat and power companies.

4. The proposed system allows a corporation which conducts a general electric light and power business as well as an electric railway business to keep the primary power accounts of an electrical corporation. To the commission it may show the operating power costs as operating expenses of the electric railway department in reports made for that department, and as operating expenses of the electric department in reports made for that department, in each case showing the other department's proportion of such costs through a transfer credit entry in the reported operating expenses.

5. The proposed system provides for certain subdivisions of other accounts—that is, the substitution of several primary accounts for one account of the I.C.C. classification. For example, "Organization," "Miscellaneous Construction Expenditures" and "Miscellaneous Intangible Capital" are substituted for the I.C.C. road and equipment account No. 550, "Miscellaneous."

The foregoing summary relates to differences between the proposed classification and the I.C.C. classification upon which it is based. There are a number of instances in which the tentative classification differs from the now effective classification of the New York commission, but these are comparatively unimportant.

OPINION OF RAILWAY MEN

The report of the executive committee of the New York Electric Railway Association, mentioned above, was based on a report of a special committee of accounting officers. In its resolution to the commission the executive committee commended the adoption of so many salient features of the standard I.C.C. classification. It criticised the provisions for depreciation accounting, however, as follows:

"With respect to the proposed requirements of the New York Second District commission in the matter of depreciation accounts, we are strongly of the opinion that, at this time, they are too drastic and burdensome upon the carriers. The proposed classification requires depreciation accruals on all classes of depreciable property at a rate to be stated in terms of a percentage of its cost or book value. The Interstate Commerce Commission's system requires depreciation to be accrued only on equipment, leaving it optional with the carriers to accrue, or not to accrue, depreciation on way and structures, and power plant and equipment. The proposed system by suggestion, amounting almost to mandate, attempts to establish the rates of depreciation to be accrued, using the following language in a note: 'Under normal operating conditions depreciation accruals should amount to at least 2 per cent and not more than 5 per cent per annum on the average total cost of all way and structures, or to at least 2 per cent and not more than 10 per cent per annum on the average total cost of all equipment.'

"We believe that the policy of the Interstate Commerce Commission in not requiring depreciation accruals on classes of property other than equipment is wise, since experience has demonstrated that many of the more costly units of other property rightfully may be held as not depreciable, for the reason that safe and economical operation necessitates constant maintenance of these units at a point approximating original physical condition, and original, if not enhanced, value.

"We do not believe that the New York Second District commission should undertake to set either minimum or maximum limitations as to the rate of depreciation to be accrued by carriers. Operating conditions in different localities of the State differ so widely that it is manifestly unfair, inequitable and unwise to attempt by dictum to establish uniformity of rates in depreciation accruals. In reserving to itself the right to disapprove any rule or rate established in a particular case by a carrier, the commission has ample

President Brush Favors Six-Cent Fare Instead of Zone System

In Testifying Before the Connecticut Public Utilities Commission in the Hartford Six-Cent Fare Case He Outlines a Number of Fundamental Considerations Affecting the Establishment of Zone Systems

MATTHEW C. BRUSH, president Boston (Mass.) Elevated Railway, testified before the Public Utilities Commission of Connecticut recently in connection with the Hartford 6-cent fare case, and expressed his belief that the 6-cent fare offers a better solution of the problem of increasing revenue on city lines than does the zone system. Mr. Brush was called as a witness by the Connecticut Company to present his views upon the urban street railway revenue problem in general, and incidentally discussed Boston conditions from the standpoint of remedying present unsatisfactory conditions.

The situation in Massachusetts to-day is such that with practically one exception—a small road in the southern part of the State—there is not a property in the State that can raise any capital or make any additions or improvements. A substantial portion of the companies are paying no dividends. There has been very little development in the Massachusetts properties in the past few years, due to the fact that net earnings have been insufficient to permit the issue of securities at par, no issue below par being permitted by the Massachusetts laws. Practically all street railway securities in the State are selling at less than par, with the result that it has been impossible to issue any securities whatever. The maximum price at which Boston Elevated stock has ever been issued was $155 per share. Taking the entire capital stock of the company, the average paid-in price is $112.50, and the stock recently closed at about $29. The last dividend was passed. In 1917 3.5 per cent was paid. The decrease in the value of the stock is attributed to the decrease in the dividends, and the latter is due to decreased net earnings resulting from increased cost of labor and material.

"There will always be an element of risk in the street railway business," said Mr. Brush, "due to its rapid development. The average layman may not realize it, but four years ago we installed a 15,000-kw. turbine which was the finest thing the art had produced. Within the last twelve months we have installed a unit of 35,000-kw. rating, which will generate power at about 20 per cent less per kilowatt-hour. This makes the unit of five years ago at least semi-obsolete. I doubt if there is any other business where the development is as rapid. The same is true in the development of the type of car used. To-day we run in the (Cambridge) subway the biggest electric car in the world. It carries from 250 to 300 people, makes a run in eight minutes through a $9,500,000 subway, and the car costs about $17,000. That may be contrasted with the horse car. The opportunity for initiative on the part of the board of directors has been gradually taken away by regulations and restrictions, so that the man in charge of the property is practically subject to the judgment of some one as to what he shall do. Almost every labor case becomes a matter of arbitration. The very nature of our business does not permit us to regulate the price of our commodity or the expense we must go to to manufacture it."

FIVE-CENT FARE INADEQUATE

Mr. Brush said that the 5-cent fare was never enough to enable a road to take care of depreciation and obsolescence. Material costs anywhere from 60 to 700 per cent more than it did two years ago. The Boston Elevated recently signed a contract for brakeshoes which was 83 per cent higher than last year and 263 per cent higher than two years ago, and the lowest bid was accepted. A Cambridge subway car originally cost $10,500, compared with $22,500 to-day. One hundred surface cars recently purchased at $8,500 would now cost about $11,000 each. Wages are increased by the agreement with the union expiring in May, 1919, amounting to $450,000 the first year.

UNIT FARE PREFERABLE TO ZONE SYSTEM FOR CITIES

J. F. Berry, counsel for the Connecticut Company, asked the witness his opinion of the suggestion that a line be drawn around the city of Hartford 2½ or 3 miles from the center, and that the charge be on a mileage basis outside. Mr. Brush said that there is no question in his mind but that a unit-fare system, whether it is 5 or 6 cents, or more, has done more to develop this country than any other one feature. At Boston, with a system covering 80 square miles and thirteen municipalities, the unit-fare system has caused development in the outlying districts, and it has been an asset to the community and to the merchants of Boston. People are likely to endeavor to locate themselves with reference to their downtown work on the basis of time rather than distance, and this has been one of the difficulties of the company. The building of $35,000,000 worth

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power and scope, and, with all of the facts, both physical and financial, in any particular case before it, can prevent any carrier from either under-accrual or over-accrual of the element of depreciation."

The executive committee, therefore, expressed its dissent to the depreciation requirements of the tentative New York classification and recommended the substitution therefor of the depreciation accounting requirements as set forth in the I.C.C. uniform system of accounts. The resolution was signed by Wilbur C. Fisk, Edward A. Maher, Jr., W. O. Wood, James E. Hewes, T. C. Cherry, H. B. Weatherwax and William F. Stanton.

of subways merely extended the average ride from 2½ or 3 miles to about 5 miles, which has made a 5-cent fare prohibitive. On the average, the company cannot carry people 5 miles for 5 cents.

"If you established a zone system around Boston," said Mr. Brush, "you would immediately congest every district you have tried to relieve. The practice in Massachusetts, with the exception of a straight interurban independent line, has been, when making a modification of rates, not to change the fare limits at all. The Public Service Commission has maintained that it is unfortunate, where people have, say, for twenty-five years, arranged their domestic and business life in a way to get to and from their work at a certain price, to treat one part of that district differently than another. In our case, if you tried to establish a zone scheme in lieu of the 6-cent fare which we think is the proper solution, you would have to bring the zone line so close to the heart of Boston that one-half of your passengers would have to ride the other side of it, paying, say, 5 cents inside and 2 cents outside; and to get the equivalent of a 6-cent fare, one-half the passengers would have to ride at 7 cents. If you undertook to do that, entirely aside from the equity of it or the good of the community, there would be created an impossible condition. We could not possibly collect the fares.

"In Cleveland and Milwaukee that zone line occurs at a point where the patronage on the line is practically nil, so that the collection of fares in those cities is a different matter. If that idea were applied around Boston you would have to have the zone line so far out in the country that the earnings would not be increased, the distance for 5 cents still being too great."

Mr. Brush emphasized the injustice of placing a zone line through suburban territory so as to discriminate between home owners who have located in neighborhoods on the understanding that equal fare treatment is to be accorded. It is impossible to segregate the different classes of traffic. If the Washington Street tunnel and the Cambridge subway should be filled with sawdust for ninety days the Boston stores would be forced into the hands of receivers. The witness held that zone fare collection is impossible on an elevated line.

Mr. Brush said that he had recently gone over a study of the zone system as it might be applied to the Boston Elevated Railway, and the best that could be shown for the zone system was a yearly increase of revenue of $750,000. The company actually needs about $3,000,000 more per year. A zone arrangement which would yield $3,000,000 would present a condition which would be impossible from the standpoint of fare collection. Further, it was figured that to obtain $750,000 additional revenue by the zone system the company would have to spend $250,000. Mr. Brush said that if the company had the authority it would advance fares to 6 cents at once. Regarding the question of having city lines pay for the outlying lines, the witness said that he believes in considering a community as one unit. Any attempt to make the lines in Brookline (Boston district) self-supporting, for example, would be ruinous. It has even been suggested that a community as a whole should subsidize the property rather than to have the tracks taken up.

The solution of the whole street railway question, the witness said, is the "service-at-cost" scheme. Public service commissions throughout the United States were created for the purpose of assuring to patrons service at cost. "There is no question in my mind," said Mr. Brush, "but that the commissions, or most of them, have succeeded in seeing to it that the public got service not only at cost, but at less than cost. The difficulty lies in the fact that the public does not believe it. The patrons do not think that they are getting service at cost. The investor knows that he is not getting the service of his funds at cost. The service-at-cost scheme has been tried at Cleveland, and recently it has been introduced in Dallas, and is now in effect in Toledo, and, I think, in Kansas City. Other places are considering it. The present commission appointed by the Massachusetts Legislature of last year at present is preparing a report, and is considering at this time a scheme for service at cost which provides a graduated scale of fares, to go up and down automatically as the rehabilitation fund is increased or depleted. That is exactly the Cleveland scheme, with the exception of avoiding the setting of a maximum. The Cleveland scheme will be a failure if the time comes when the maximum in the scale is reached." Mr. Brush deprecated the ordering into effect of tickets in 6-cent-fare decisions in view of the increased cost of living and the justice of paying more for transportation. Many commodities have increased from 50 to 100 per cent, and it is to the credit of the management of the railways that so small an increase as 1 cent will save them.

Mr. Brush said that 100,000,000 free transfers are issued yearly on the Boston system, and that if a charge should be levied against these it would be impossible to withstand the pressure for the establishment of through lines which would be the result. No community can afford to support a subway out of the car rider the witness stated.

Manufacturers' Night at New England Street Railway Club

"MANUFACTURERS' NIGHT," a regular annual event, was celebrated by the New England Street Railway Club on Jan. 24 at the Hotel Somerset, Boston, Mass. President A. H. Ford of Portland, Me., called the meeting to order after the usual dinner, and nominated Charles C. Peirce, General Electric Company, Boston, to serve as master of ceremonies. A toast was drunk to the health of the men at the front and a vaudeville entertainment was enjoyed during the evening, about 250 members and guests being present. The committee in charge of the evening's entertainment consisted of: John W. Belling, General Electric Company, Boston, chairman; L. P. Morris, Westinghouse Electric & Manufacturing Company; W. W. Field, Barbour-Stockwell Company; J. W. Nason, Frank Nason Electric Company; A. A. Hale, Griffin Wheel Company; G. W. Denyven, E. P. Sanderson Company; and W. L. Boyer, Bemis Car Truck Company.

Cars of the Louisville Railway which leave Louisville for Camp Zachary Taylor, the federal army cantonment south of the city, are now stopped at the entrance to the camp where guards require all who fail to produce passes to leave the cars. On the first Sunday that the cars used the extension into the camp the guards, with orders to stop people but not cars, let several thousand into the cantonment before the orders were amended.

Unprecedented Operating Difficulties on Electric Railway Properties

Canvass Made by This Paper Discloses Conditions, an Understanding of Which by the Public, Would Insure Sympathetic Co-operation—Reports from Various Sections Analyze the Situation

THE war and the weather have combined with previously acting agencies to render the operation of electric railways more difficult during the past few weeks than ever before in the history of the business. To learn just what the conditions are the editors of this paper have secured telegraphic and other statements of the situation in typical cities and an attempt is made here briefly, but graphically, to reflect it.

COLONEL KEALY WIRES DETAILS OF THE SITUATION IN KANSAS CITY

In a telegram just received from Philip J. Kealy, president Kansas City, Mo., railways, he states that local service has been delayed very little by severe weather, but that the revenues of the company have been severely affected. A number of trips have been lost during the severe weather due to crews failing to report rather than to weather conditions preventing operation. About 6 per cent of the trips have been lost on account of labor shortage. The labor turn-over is now approximately 8 per cent per month, as compared with a corresponding turnover in normal times of about 3 per cent.

It is exceedingly difficult to get competent trainmen and repairmen. The government has been taking out extra repairmen by trainloads for government work, principally shipbuilding in the West. As a result of the difficulty of securing men, both trainmen and repairmen, employment standards have been lowered, resulting in most careless operation of cars and an unusually large number of "pull-ins" daily on account of defective equipment. The number of "pull-ins" has increased 300 per cent, and the number of collisions over 200 per cent in the past four months.

The labor shortage could be relieved considerably by the employment of women, especially on trailers, but the local men have taken the position that they will strike if any women are placed on the cars.

The most serious trouble is fuel shortage. From August to December service was cut from 10 to 25 per cent daily in the maximum rush period in an effort to conserve fuel, but the fuel situation is becoming worse instead of improving, and only the coming of more clement weather will relieve it.

LARGE LABOR TURN-OVER DECREASES EFFICIENCY

J. H. Hanna, vice-president Capital Traction Company, Washington, D. C., wires that the company's service has suffered many delays due to weather conditions, particularly since Dec. 26. Since that date from ten to forty-six trips daily have been omitted on account of illness of trainmen. Nothing like this has occurred in the company's experience. The normal weekday schedule calls for 1914 trips. From Jan. 1 to 24 124 trainmen were employed, 88 leaving the service during this period. The average per month for 1916 was 32 in and 30 out. The company has had to make the qualifications for trainmen much less severe than formerly.

Labor conditions on the Lehigh Valley Transit lines, according to H. R. Fehr, president, are similar to the above. Many employees have left, attracted by offers from munitions and other industrial plants, so that the force as a whole has decreased in effectiveness. The transportation department has remained nearly normal, but in other departments the present monthly turnover of labor is 50 per cent as against a normal turnover of 10 per cent.

The quality of the coal which the company is receiving is not up to standard, making it difficult at times to keep up steam in the power house. Not only are deliveries of material for maintenance much delayed, but practically all the materials have increased in price and decreased in quality.

Mr. Fehr also mentions that from Dec. 15, 1917, to date there have been ten snow or sleet storms accompanied by unusually cold weather and frequent high winds. These conditions have taxed the equipment so heavily that the percentage of "pull-ins" has doubled, and tripper service has been curtailed from 50 to 75 per cent. Early in 1917 twenty-four double-truck cars, with seating capacity of fifty-seven, were ordered, but at present just two of these cars have been received, the delay being due to the priority of war orders on which the car-building plant was working.

Another trouble has been that due to the obstruction of tracks by vehicular traffic it has been impossible to maintain schedules.

The company serves the Bethlehem Steel Company, with its 28,000 employees, of whom probably 25 per cent use trolley service under normal conditions. At present, in order to facilitate the transportation problem, the Bethlehem Steel Company, in co-operation with Mr. Fehr, is studying the question of staggered working hours. The company has also presented to the City Council of Allentown a plan to abolish twenty-seven half-block stops, and has been assured of co-operation in every possible way toward bettering present existing conditions.

ALBANY, N. Y., IS MORE FORTUNATE

An exception to the rule as to operating difficulties, presumably due to its location, is furnished by the United Traction Company, Albany, N. Y. H. B. Weatherwax, vice-president, reports that service has been little interfered with by weather conditions, and that labor shortage has caused no loss of trips. The labor turn-over is less than usual, and there is no difficulty in keeping competent platform men and repairmen.

There have, of course, been traffic delays due to weather conditions, but no trips have been lost. There has been some difficulty in keeping competent repairmen, but applications for platform jobs have, for the past two months, been above normal.

STATEMENT BY PRESIDENT T. E. MITTEN OF THE P. R. T.

To put the situation clearly before its patrons, the Philadelphia Rapid Transit Company has issued the following statement signed by Mr. Mitten:

> This company, in common with all steam and electric railway carriers of the country, has been suddenly confronted with a super-normal demand upon its facilities at a time when the scarcity in the labor market and the delays in the delivery of materials have made impossible the immediate securing of additional equipment or even the full maintenance of usual standards in the repair and operation of the present facilities.
>
> At this time also the United States Government and the State Fuel Administration are imposing upon public utilities the strictest conservation of coal and recommend all possible saving in the schedules and heating regulations.
>
> The company has thus far avoided actual reduction in the schedules but it has been greatly hampered in maintaining the full schedules by cars being held in the barns because of shortage in such material as armatures, wheels, bearings, etc. All of this material has been on order for several months but the manufacturers are unable to make deliveries either because of the demands upon their own plants or because of the congestion in transportation.
>
> This management is now in consultation with responsible representatives of the government looking to the bringing about of needed relief including the granting of priority orders on equipment and material required in meeting the present situation.
>
> While preference in the assignment of available cars must be necessarily given to those lines serving the shipbuilding and munition plants in various sections of the city, the company is exerting its utmost not to discommode any of its patrons unavoidably. To this end it bespeaks the continued patience and co-operation of the public in its endeavors to maintain the best service possible under the unprecedented circumstances now existing.

HOW SNOW AFFECTS ELECTRIC RAILWAY OPERATION

A typical picture of the ways in which snowfall interferes with service is furnished by a report sent in by L. S. Cairns, general manager Eastern Pennsylvania Railways, Pottsville, Pa.

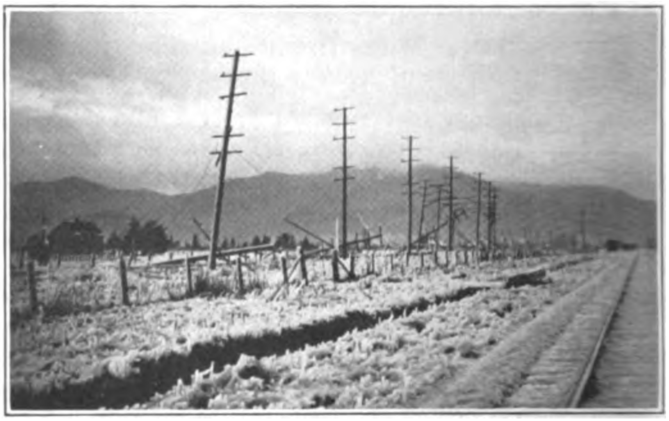
The effect of the 14-in. fall of Dec. 13 and 14 was that all operation was discontinued at about 11 p. m. on Dec. 13. Five divisions, or perhaps two-thirds of the cars operated, were put in operation at some time during the day of Dec. 14, and four divisions, or practically the remaining one-third, during the following day. One division with one car operating on the end of one of the lines was not in operation until the morning of Dec. 16. In other words, 50 per cent of the lines were opened and operated within twenty-four hours, 40 per cent more within forty-eight hours, and the remaining 10 per cent within the next few hours.

On Jan. 15 the company experienced some delays due to a 5-in. snowfall. On Jan. 26 3 in. of snow fell and on Jan. 28 6 in. additional of snow fell. These later snowfalls did not seriously inconvenience the general operation, although cars were operated late and in a few cases delayed due to snowdrifts at some outlying points.

This company has not as yet suffered any special inconvenience due to shortage of labor, as far as platform men are concerned, although some handicap to the work is felt in regard to shortage of skilled mechanics and lack of track men.

Strenuous Days for Repair Force on British Columbia Electric Railway

A SEVERE storm which lasted for three days recently caused a great deal of damage to the Fraser Valley Branch of the British Columbia Electric Railway. Heavy rain fell, freezing as it came in contact with wires, poles, rails, etc. The ice formed to a thickness of 4 in. and 5 in. on standing objects, and this weight, together with the wind, caused many poles containing high-tension trolley and telephone wires to fall. On one 2-mile stretch of track 146 poles fell and 106 on another. Wrecking equipment, consisting of three steam locomotives, one steam derrick, two line cars and three work trains, was rushed to the scene of trouble and proceeded with clearing operations without the aid of electrical energy. Ice formed almost as quickly as it could be removed and in many places the poles had fallen across the center of track, making progress very slow. At the end of three days milder weather and a "Chinook" wind took the ice and snow. This caused exceeding high water in all streams and rivers, washing out the tracks in many places, at one point leaving a gap 65 ft. long and 20 ft. deep, other washouts being ¾ mile long and 1 to 4 ft. deep. Train service was operated to the point of clearing, part way by trolley and the balance by steam power.



TRANSMISSION LINES FELLED BY ICE AND WIND

It was estimated that a total of about 550 poles were felled. To hasten operation poles with trolley bracket arms attached were placed at intervals of approximately 200 ft. with the intention of later placing additional poles at intervals of 100 feet. The trolley wires followed the erection of the poles and only sufficient other wire was strung as would permit re-establishing light, power and telephone connection. A fair estimate of the cost of repairs was placed at $150,000. Shortly after the interruption to service, three passenger trains, and a milk, way-freight and express service were being operated over the whole line. This service could not be augmented until trolley wire and roadbed were more substantially repaired.

The Public Service Commission for the First District of New York will soon fly a war service flag containing 257 stars. Two members of the commission. Col. William Hayward and Maj. Henry W. Hodge, and many members of its staff are in one branch or the other of the United States service, and some are already at the front in France.

Moving Cars Through Congested Intersections*

As a Solution of This Problem and a Step Toward Rapid Transit the Author Suggests an Appeal to the Public to "Step Lively"

By A. GABOURY
Superintendent Montreal (Que.) Tramways

EVERY electric railway, and more especially one engaged in transporting the population of a big city, has its hours of trouble. Many of its problems have been solved as they presented themselves, but there are others that are not so easily handled. Among them, probably the latest, is this: "How are we going to move at intersections the ever-increasing number of cars?" Transportation men have spent many an hour thinking about how to do it. Has the problem ever been solved? I doubt it.

Why has this new problem not come to the top? Is it not because railways, in endeavoring to solve the other problems in connection with increasing traffic, have added car after car to their existing routes, in many cases on account of the refusal of city councils to foresee the needs of the future and provide for them by establishing new routes?

The public expects principally one thing—service. To it the matter is very plain. The more passengers there are, the more cars are needed. To a certain extent the demand can be met and congestion of passengers taken care of, but there is a limit beyond which lies trouble. The more cars put on a line, the slower each unit moves and the more congested that line becomes, until finally the question arises as to how to take care of the cars at intersections.

The first problem of congestion of passengers simply meant extra equipment, but the problem caused by extra equipment on already overloaded routes is not so easily solved. Cars can be rerouted to avoid curving at intersections and new lines can be built to parallel existing ones, but since the intersections definitely limit the number of cars that can go through, congestion results after this limit is reached. If every effort on the part of the railway does not bring the solution, let it then apply politely to the traveling public to share the responsibility and to help. But how? By stepping lively, by moving smartly.

It would certainly facilitate the movement of cars, especially at intersections:

If every passenger would remember that the rear of the car does not stop opposite the street corner, but about 50 ft. back, and would stand at this distance from the corner.

If every passenger would move smartly when getting on or off a car.

If every passenger would have his fare ready and would go inside the car without delay.

If every transfer passenger would present his transfer unfolded so the conductor could examine it quickly and give his attention to the next passenger.

If every passenger after paying his fare would walk to the front of the car, ready to alight by the front exit at his stopping point, and thus allow other passengers to board at the rear while he was alighting at the front.

If every passenger would prepare in advance to get off at his corner by moving toward the exit in readiness to alight the moment the car stopped.

If every passenger would buy his tickets in advance and have exact fare ready at the intersections.

Yes, certainly all this would help, but how can we obtain this help? By no other means than by a serious and well-conducted publicity campaign along the above lines with the use of either the public press or the windows of every one of the cars. After the campaign has been thought out seriously and plans of action carefully laid down, go ahead frankly and sincerely. Be sure that the wording of your literature will inspire confidence and command respect and esteem, and that it will convince the public that the results obtained will be to its own best interests.

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*Abstract of address read before recent meeting of Canadian Electric Railway Association.

How One Company Cured "Jitneyitis"

Better Public Relations Work of the Atlantic City & Shore Railroad Won the Support of the Public Against Unfair Competition

By JOHN M. CAMPBELL
Secretary and Auditor, Atlantic City & Shore Railroad, Atlantic City, N. J.

ACCORDING to official figures the first jitney appeared upon the public streets of Atlantic City, N. J., on March 13, 1915. This form of transportation immediately became popular, no doubt owing to its novelty, and the number of jitneys increased daily. Supply and auto dealers encouraged them, and by midsummer 600 jitneys—nearly all Fords, and second-hand ones too—had taken complete possession of Atlantic Avenue, the principal thoroughfare of the resort and the right-of-way of the main stem of the Atlantic City & Shore Railroad system. This great number of unrestricted and unregulated vehicles not only developed most difficult traffic problems for the police, but practically prevented safe travel for private vehicles and pedestrians.

City rulers made several ineffectual attempts to straighten out the tangle. The passage of an ordinance imposing an annual tax of $25 caused a few local jitney drivers to discontinue operation, only to turn their badly-worn cars over to floaters from other cities who continued to skim the cream of the short-haul traffic in the busy section. The inevitable soon happened. The electric railway, deprived of its principal revenue, made earnest but fruitless appeals to the city rulers for the enactment of more rigid regulation of this unfair competition. The earnings so decreased that the company was forced to default interest, and it was soon forced into receivership.

The railway, left to fight its own battle, then started a campaign of educating the public to an appreciation of facts. The first move was the publication of a little four-page weekly pamphlet, *Trolley Talks*, in which patrons of the line and others were shown the importance to them of the continuation of the electric railway system, its intimate relation to the progress of the city, and the utter dependence of the suburban communities upon a safe, high-grade system of electric transportation.

A department of public relations was established, and criticisms and suggestions from patrons were invited and received. Every complaint was carefully analyzed and a remedy applied. In case a patron had a grievance, the cause was ascertained and a courteous, uniformed

Safety Campaign with New Note

Northern Ohio Traction Makes Point that Recklessness Is Unpatriotic Because It Causes Accidents

By E. Burt Fenton
Publicity Agent Northern Ohio Traction & Light Company, Akron, Ohio

SELF-PROTECTION as a patriotic duty is the keynote of a publicity campaign in the interest of safety, completed at Canton, Ohio, on Nov. 10, 1917. The campaign was conducted by the Northern Ohio Traction & Light Company, which operates the street railway system of the city, as a part of a comprehensive movement within the company's organization for the elimination of accidents.

The purpose of the publicity campaign is described in one of the fourteen articles in these words:

> This company can prescribe safety rules for its employees and enforce them. It can equip its cars and its lines with the best of safety devices—and is doing so as rapidly as possible. It can place danger signals and other protective devices where they ought to be. It can use every device and precaution known to the Science of Safety—and has done so or is in process of doing so.
>
> But—
>
> *It cannot make you careful if you choose to be reckless.* That part is *up to you.*

Carrying out the idea, the non-employed individual was urged daily for two weeks to "Be careful. Be careful. *Be careful!*" The ordinary dangers of street travel, whether afoot or in a vehicle, were pointed out and each individual exhorted to keep his eyes open.

In all of the fourteen articles, which were run in liberal newspaper space over the signature of the company, it was put squarely up to the individual that he owes it to his country to keep himself in proper condition to do the work of the country, that the success of the army abroad depends upon the efficiency of each individual at home. One article, having for its text the fact that the people of Canton had subscribed double the city's quota to the Second Liberty Loan, under the caption "A 200 Per Cent City," the patriotic idea was expressed thus:

> It is just as much a patriotic duty to protect your body from injury as to loan your money to Uncle Sam. He needs your money—will need more of it. But he needs *you* even more—your brains, your muscles and your skill. Are you protecting these national assets? * * * Uncle Sam needs *you*—your mind, your body, your bodily members—*and he needs them all together*, not scattered around. Make Canton a 200 per cent city in *Safety* as well as *Money.*

Need of "Whole Men"

Shortly after the beginning of the European war in 1914, over a million workmen in the United States, subjects or citizens of the nations at war, were called to the colors of their respective countries. This left a wide gap in the ranks of American industry—a serious labor shortage.

Almost simultaneously, American industry began an unparalleled expansion, demanding more and more labor as factories doubled and tripled their capacities—creating a demand for labor unequalled in history.

Within the present year nearly a million men have been taken from the ranks of industry to serve their country under the Stars and Stripes and the war plans of the government contemplate the enlistment of five or six times that number This vast army must be equipped with the myriad of things—arms, food, clothing, shelter, munitions, airplanes, motor driven vehicles, etc., which an army requires. These needs call for a vastly increased production in every line of raw materials and manufacture.

All along the line, as the need of more and more labor arises, there are fewer and fewer men to perform it.

This means that industry—all industry—has greater need of WHOLE MEN than ever before, men in good health, with all their arms and legs and bodies in good working order all the time—"on edge" to give the best there is in them.

Under the circumstances, it is more than foolish—it is almost criminal—for any individual to needlessly risk life or limb.

IT IS A PATRIOTIC DUTY TO AVOID ACCIDENTS.

If you must occasionally "take a chance" in your haste or heedlessness, wait until the man-power of your country is less valuable than it is now.

Be careful. Be careful BE CAREFUL.

THE NORTHERN OHIO TRACTION & LIGHT CO.

N. B.—Another talk on Safety tomorrow.

GET THE HABIT

It is just as easy to form a good habit as a bad one.

"Taking chances" is a habit.

Running vehicles recklessly—getting on or off moving cars—crossing streets between regular crossings—walking or driving in front of moving cars—failing to look both ways before crossing a street or a railway track—all these become habits with the people who do careless things. The fact that up to date your carelessness has not brought injury to yourself or someone else is no argument for continuing to be careless. There's a first time for everything.

Caution can be made habitual. A few days of watchfulness, a little exertion to remember that there is danger at every street crossing, a little care in running a motor vehicle, forced for a time, will soon become so much a habit that you will soon become unconsciously cautious. You will look out for your own safety and that of others without thinking about it.

There are hundreds of people right here in Canton who have acquired the habit of caution—who avoid danger by looking out for and avoiding it. It comes as natural to them to slow down their machines at corners and other danger points, to look both ways before crossing a street, to wait for the car to stop befre getting on or off—just as natural as to get hungry at meal time. Doubtless these people at some time had to learn to be cautious, but they learned it so well that they have no occasion to think of it now.

You can cultivate this habit, if you will.

In the long run, you'll find your way through crowded streets just as quickly and get where you are going just as soon as those people who take foolish chances with their lives and limbs.

Whether you are afoot or in a vehicle it pays to—

Be careful! Be careful! BE CAREFUL!

THE NORTHERN OHIO TRACTION & LIGHT CO.

TYPICAL ADS IN SAFETY SERIES

No attempt was made to duplicate the many "don'ts" usually made part of similar campaigns, but the "be careful" slogan was used every day as something that could be easily remembered and always kept in mind. One advertisement was devoted to the elusiveness of the "Go" signal at street crossings, so far as pedestrians are concerned.

This publicity campaign was used simultaneously with a series of lectures to the school children of Canton by Mrs. Minnie Riddle of the Chicago Bureau of Safety, who was engaged by the company for that purpose. Mrs. Riddle's talks to the children related to safety precautions in the home, on the playground and on the streets, and were adapted to the understanding of the pupils of all grades. During her stay she addressed the pupils of every school room in the city, public and parochial, making about 125 addresses in all.

Mrs. Riddle will conduct similar speaking campaigns in the schools of all of the communities served by the Northern Ohio Traction & Light Company, beginning soon in Akron.

(*Concluded from page* 233)

employee was sent to make amends. The latter plainly tried to show the desire of the company to avoid a repetition of the objectionable occurrence.

The motormen were carefully studied, and the most efficient one—curiously enough, the most popular one with the riding public—was selected for special work. His sole duty was to see that every motorman operated his car just as nearly like the model as possible. Similarly, a conductor popular with the riding public was carefully observed, and his actions and methods were copied and applied by the other conductors with the most pleasing results.

After many months of such conditions the management was sure of having secured a very efficient means of getting right to the hearts of the patrons. They recognized what had been done for them and would be done in the future, and they showed their appreciation by a new attitude toward the system. Then a final appeal was made to the city rulers. They, at last feeling the trend of public sentiment and realizing the true situation, in May, 1917, passed an ordinance barring the jitneys from operation in competition with the railway.

The ordinance has been carried to the higher courts by the jitney interests, but to date the city has been sustained in its action. Meanwhile the private vehicles and pedestrians are once again able to travel safely on Atlantic Avenue, the electric railway system is looking forward to a prosperous season, and the general expressions of satisfaction on every hand at the elimination of the jitney from Atlantic Avenue show a realization that the jitneys in competition with an adequate electric railway system are an unmitigated nuisance.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

Car Axles—Their Design, Manufacture and Service

PART I—ESTIMATING FIBER STRESS

By Norman Litchfield

ATTENTION was recently called through an editorial in this paper to the necessity for uniformity in the production of a high quality axle for passenger service under electric railway cars. There can be no question as to the importance of this feature, and furthermore, it presents one of the most difficult problems in the attainment of that desired ideal, the absolutely safe axle. It, however, forms but one of a group of problems entering into the matter, and it is the purpose of this article to review the history of the development of the modern axle, and to set forth in convenient form the various points of design, manufacture, tests and inspection, and operating methods which experience has proved desirable. No feature of car equipment has received more attention, and rightly so, for the axle represents the last link between the safety of passengers and serious accident—so much so that on properties handling large numbers of passengers, the operating officials no longer look upon an axle as a mechanical detail to be purchased as cheaply as the state of the market and the dexterity of the purchasing agent will permit, but rather as a piece of accident insurance the value of which depends upon the care with which it was prepared and the stability of the company issuing it. The axle, therefore, must meet the strictest requirements of correctness in mechanical design and high quality of material, it must be produced as uniformly as possibly by competent and trustworthy parties under proper checks and inspection, and it must be used under careful methods of installation and inspection during operation.

An axle is primarily a beam, cylindrical in section, supported at two points—the wheel hubs. With the car stationary the loading consists of the car truck and passenger weight acting vertically on the journals, and a certain portion of the motor weight on the motor bearings. In service, however, the axle becomes subjected to a variety of forces, some of which are exceedingly difficult of determination. The swaying of the car, especially through curves and switches, produces a heavy side thrust of the wheel flange against the rail, thereby applying a powerful force couple to the axle at the wheel hub. To this are added the vertical oscillation of the car on its springs, the effect of impact at rail joints, the torsion of the motor, the braking action, the gear vibration, etc. Furthermore, it is well known that the strain on a member is much more severe when for any cause the forces acting thereon are reversed rapidly in their direction, the magnitude also depending on the rapidity of the reversals, the effect of which on an axle running with 36-in. wheels at say 45 m.p.h. is equivalent to 840 reversals per minute.

While it is not practicable to calculate all of the forces, it is feasible to determine some of them and to analyze their combined effect on the axle, with the resulting fiber stress. Then from experimental data and experience the factor of safety necessary or desirable to use in the design can be judged. The fundamental facts are admirably covered in a report of a committee headed by E. D. Nelson and contained in the proceedings of the Master Car Builders' Association for 1896. Time has very largely borne out most of the deductions reached in that report and for the convenience of those to whom this report is not readily available such passages as are of immediate interest are quoted here.

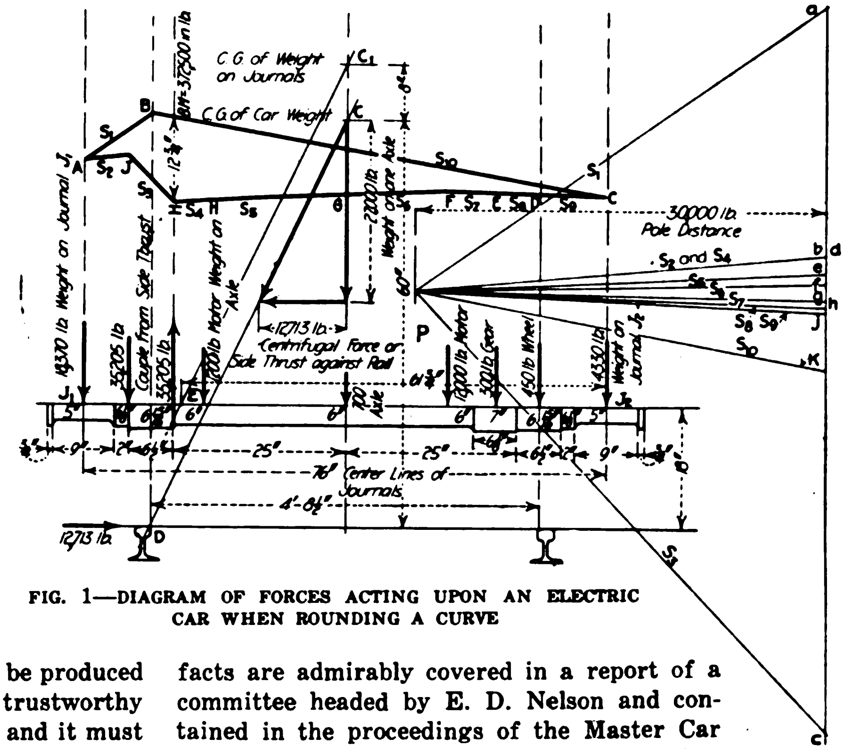

C. G. of Weight on Journals
C1
C
C. G. of Car Weight
BH=317,500 in lb
12¾"
8¼"
B
A
S1
S2
J
S3
H
S4
H
S5
G
S6
F
S7
E
S8
D
S9
S10
S1
C
18370 lb Weight on Journal J1
35205 lb
Couple from Side Thrust
35205 lb
12000 lb Motor Weight on Axle
22000 lb Weight on one Axle
12713 lb
Centrifugal Force or Side Thrust against Rail
60"
61¾"
P
700 Axle
12000 lb Motor
300 lb Gear
450 lb Wheel
14330 lb Weight on Journal J2
J1
J2
5"
6½"
6"
6"
6"
7"
6½"
5"
6⅝"
9"
2⅞"
6½"
25"
25"
6½"
2⅞"
9"
76" Center Lines of Journals
4'-8½"
10"
12713 lb
D
30000 lb. Pole Distance
a
b
d
e
f
g
h
J
K
c
S2 and S4
S6
S5
S7
S8
S9
S10
S1

FIG. 1—DIAGRAM OF FORCES ACTING UPON AN ELECTRIC CAR WHEN ROUNDING A CURVE

The committee first turned its attention to the analysis of the forces acting on a car axle, these being worked out by the late Prof. A. J. DuBois of the Sheffield Scientific School of Yale University. A calculation was first made of the location of the center of gravity of the car under consideration, which was found to be approximately 6 ft. above the head of the rail. The committee then ascertained by a road test that the vertical oscillation of the car on its springs added about 26 per cent to the load on the journals when stationary. This, it should be understood, is purely vertical oscillation and is not to be confounded with the shifting of the load from one journal to the other due to the swaying of the car. The maximum effect of the latter is assumed to be obtained by a horizontal force acting through the center of gravity of the car, and of intensity just sufficient to tip the car over. A simple calculation will show that at a distance of 6 ft. from the top of rails set at the standard gage of 4 ft. 8½ in. this force is equal to $0.4023W$, where W is the weight of the car. Hence the centrifugal force of the car rounding a curve is assumed as equal to 40 per cent of the weight. This, it may be said in passing, is equivalent to rounding a 600-ft. radius or 9-deg. curve at the rate of 60 m.p.h.

Two methods of calculating the bending moments are given—one analytical and the other graphic. The latter forms rather the more convenient method, it being the well-known graphic solution of forces and moments by use of the force and equilibrium of polygons, which needs no explanation here, as it is fully explained in all standard works on mechanics. For an example we give in Figs. 1 and 2 a graphic analysis of the A. E. R. E. A. standard axle "E. C." having 5-in. x 9-in. journals with 6 in. diameter between wheel hubs. This is rated at a maximum loading of 27,000 lb., representing on two four-wheel trucks a car weighing with passenger load approximately 54 tons, equivalent to the average interurban car. While this car may not attain a maximum speed of 60 m.p.h., still the much smaller radius of curves in general use on electric lines as compared to steam practice makes the development of the full centrifugal force equally or even more likely.

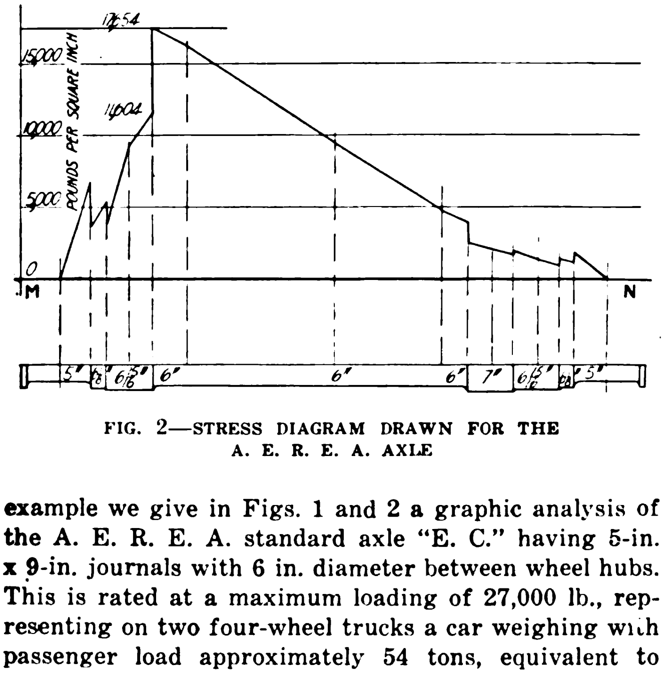


FIG. 2—STRESS DIAGRAM DRAWN FOR THE A. E. R. E. A. AXLE

An analysis of the weight in an average electric car shows that the great mass of the trucks, motors and equipment lowers the center of gravity of the whole car down to 5 ft. from the top of the rail, whereas the M.C.B. committee give 6 ft. for an ordinary steam coach. As the center of gravity of the electric car is lower than in the steam coach it follows that the side thrust from centrifugal action necessary just to overturn the car is greater than on the steam car, and a greater force can thus be exerted on the axle. The small radius curves and less favorable track conditions usually existing on interurban lines makes quite possible the exertion of this full force.

The stresses in the axle are most conveniently calculated by the graphic method, using the equilibrium polygon. For convenience of reference, the following explanation is given of its application to the axle in question.

As the basic assumption is that sufficient centrifugal force is exerted just to overturn the car, it follows that the resultant (through the center of gravity) of the car weight and the side thrust must pass through the head of the outer rail, thus relieving the inner rail of any pressure. As the weights of the wheels and gear and of the axle itself and a portion of the motor weight are not borne on the journal, these items are deducted from the total and the center of gravity of the masses whose weight is on the journal determined. This is found to be 68 in. above the rail. The resultant of the weight on the journal and the corresponding centrifugal force is parallel to CD or C_1E, Fig. 1.

The division of the weight between the two journals will then be in the proportion $\frac{EJ_2}{J_1J_2}$ so that the weight on the outer journal is 18,370 lb. and on the inner journal 4330 lb.

At each end of the outer wheel hub forces are exerted forming a couple caused by the side thrust, and equal to 35,205 lb. Lay off to any convenient scale the various forces, ab = 18,370 lb., bc = 35,205 lb., cd = 35,205 lb., de = 1200 lb. (motor), ef = 700 lb. (axle), fg = 1200 lb. (motor), gh = 300 lb. (gear), hj = 450 lb. (wheel), jk = 4330 lb.

Assume the pole P any convenient distance, taken in the figure as 30,000 lb., to the same scale as the forces ab, bc, etc., and draw the rays Pa, Pb, Pc, etc. Then through any point A on the line of direction of the force J_1 draw AB and AJ parallel respectively to Pa and Pb and JI, IH, HG, GF, FE, ED, DC and CB parallel to the other rays. If the work is done correctly the intersection of AB and CB will be on the line BD. The vertical intercept of the sides of the equilibrium polygon, measured in inches, to the same scale as the drawing of the axle, multiplied by the pole distance, 30,000 lb., gives the bending moment, in inch-pounds in the axle at that section. From these bending moments and the known section moduli at the various sections, equal to $0.098\ d^3$, the stresses at the different points are calculated in pounds per square inch, laid off to any convenient scale vertically from the line MN, Fig. 2, and the stress diagram is drawn in.

It is at once seen that the point of maximum stress is at the inner end of the wheel hub on the commutator side, and that its value is 17,654 lb. per square inch. As before stated, the assumption of centrifugal force taken would require an excessive speed on a perfect curve to produce. But when it is remembered that this force is the product of the mass and the sidewise acceleration, and that switch points and curves are far from perfect and therefore induce exceedingly high rates of side acceleration, it will be seen that the conditions are not improbable.

In the next article of this series we shall discuss the merits of the axle analyzed herein to show how it might be improved by application of the theory outlined. A modified axle, with fiber stresses determined by the same method, will be described also. In the concluding article the materials available for use in axles and the care and treatment of axles, will be taken up.

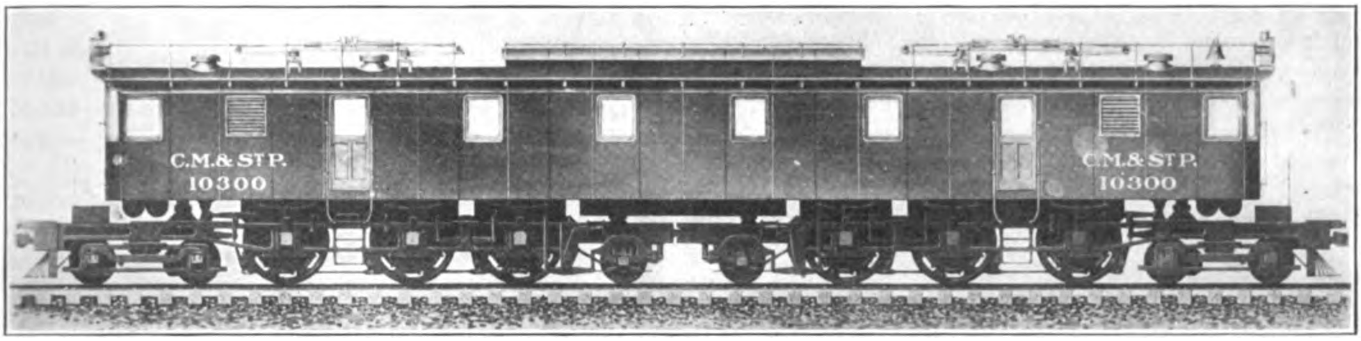
New Passenger Locomotive for the St. Paul

Center of Gravity Is 63 In. Above Rail, One-Hour Rating 4000 Hp., and Starting Tractive Effort 112,000 Lb.

THE Westinghouse Electric & Manufacturing Company and the Baldwin Locomotive Works have under construction for passenger service on the Chicago, Milwaukee & St. Paul Railway ten direct-current, regenerating locomotives. These form part of the electrification extension described in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 3, 1917, page 819.

MECHANICAL FEATURES OF THE LOCOMOTIVE

The complete locomotive, with a total length over couplings of 90 ft., weighs ready for service 266 tons, and has an adhesive weight of 330,000 lb. The single cab is carried on the two main running gears, each having a four-wheel guiding truck, three driving axles in a 16-ft. 9-in. rigid wheelbase, and a two-wheel trailing truck. It thus corresponds to two Pacific-type running gears coupled with a link and having the two-wheel trucks on the adjacent ends.


NEW LOCOMOTIVE FOR PASSENGER SERVICE ON CHICAGO, MILWAUKEE & ST. PAUL RAILWAY

The main running gear center pins are located midway between the first and second driving axles of each running gear. On one running gear the center pin is designed to restrain the cab both longitudinally and laterally, while on the other the center pin restrains the cab only laterally, permitting free longitudinal movement. This arrangement of riding and floating pins relieves the cab of pulling and buffing strains due to train load, as these strains are taken directly through the running gear side frames and bumpers. The driving wheels are 68 in. in diameter, and carry 55,000 lb. per axle. The guiding trucks have 36-in. wheels, while each two-wheel truck has a load of 38,500 lb. at the rail, with approximately 62,000 lb. distributed on each of the four-wheel trucks.

On any single driving wheel, the non-spring supported weight is that of wheels, axles and driving boxes only.

The flexible type of quill drive is used to afford a means of permitting a motor located well above the roadbed to drive an axle which, with its wheels, is free to follow the rail independently. This drive secures all the advantages of a flexible gear in cushioning the transmittal of torque and minimizes the road shock.

Each main running gear has three-point equalization with a single point toward the end of the locomotive, in accordance with accepted steam-locomotive practice. The four-wheel guiding truck center pin and cross-equalized leading pair of driving wheels are equalized together on the longitudinal center line of the locomotive. This arrangement combines the advantages of the standard front and construction of the "American" and "Consolidation" types of steam locomotives. The remaining two pairs of driving wheels and the two trailing wheels of the main running gear are side-equalized together again, following accepted steam-locomotive practice. The method of equalization used here provides a weight variation on the driving wheels of only 6 per cent from normal when the locomotive is pulling at 30 per cent adhesion.

The center of gravity of the main running gear, including motors, is 41½ in. above the rail, and the height of the center of gravity of the complete locomotive is 63 in. above the rail.

The designers of this locomotive point out as salient features the following: Large capacity in single-cab unit; flexibility of running speeds with small rheostatic losses; twin-motor design with quill drive; low-voltage auxiliaries simplifying inspection, maintenance and operation; simple and effective regeneration; improved equalization to minimize weight transfer in trucks; auxiliary train-heating plant.

One of these locomotive units is capable of hauling a 950-ton train (twelve coaches) over the entire mountain section at the same speeds as called for by the present schedules. The one-hour rating is 4000 hp. and the continuous rating is 3200 hp. with a starting tractive effort of 112,000 lb. The normal speed on level track is 60 m.p.h., and on a 2 per cent grade a speed of about 25 m.p.h. is maintained.

MOTORS, CONTROL AND AUXILIARIES

Flexibility of speed control is obtained by the use of nine running positions without rheostatic loss. The six 1500-volt twin motors on one unit are connected for three-speed combinations as follows: One set of six motors in series, two sets of three motors each in series, and three sets of two motors each in series.

Two additional running speeds are obtained on each speed combination by means of inductive shunts on the main motor fields, which assist in cutting down current peaks, as well as save rheostatic losses. The speed range is from 8 to 56 m.p.h., depending on the load.

The use of the twin-motor design with quill drive permits effective use of the space between the driving wheels, and the use of two armatures, each wound for 750 volts direct current, geared to the same quill. This voltage is preferred to 1500 on account of the better

Electrical Properties of Vulcanized Fiber

Effect of Temperature, Thickness and Color on Breakdown Voltage—Physical and Chemical Properties—General Uses

By William Eves, 3d
Engineering Department American Vulcanized Fiber Company

CONSIDERABLE work has been done in the measurement of the electrical properties of vulcanized fiber, but not very much of the information that has been obtained on the subject has been collected. Breakdown voltage is by far the most important electrical property concerning which information is required by the user as it is considered in 98 per cent of the cases.

Breakdown Voltage

The breakdown voltage per unit of thickness of vulcanized fiber is a function of the thickness itself, the extent to which the gelatinization of the individual piles of paper has been carried, the temperature of the sample at the time of the test and to some degree the color.

Moisture to a certain degree is necessary for the life of vulcanized fiber and any zinc chloride used as the gelatinizing agent that remains after the washing processes will be in solution in the natural moisture. This may happen in spots at which points leakage would occur between the electrodes of the testing set. Local heating would result, reducing the resistance of the small amount of solution, and breakdown would occur before the breakdown voltage of perfect fiber was reached.

The method and conditions of the test will also affect the voltage at which the sample will break down. The shape of the electrodes will affect the distribution of the electrostatic flux throughout the material, and the medium in which the terminals are immersed, oil or air, and the rate of application and the method of application of the voltage will determine the amount of heating due to corona loss, causing consequent drying and carbonization and premature breakdown.

Curves Showing Effect of Temperature and Thickness

The accompanying curves were plotted from test data obtained at the Massachusetts Institute of Technology by Katzenstein and Burt. In all, 4000 tests were made, including red, black and gray fiber, but it has been considered advisable to reproduce here only the temperature curves for gray fiber. The tests were all made with the same electrodes, and the voltage was increased at the constant rate of 1000 volts per second. At temperatures higher than room temperature the samples were prepared by heating in an oven for one hour for the thinner specimens and from four to five hours for the thicker.

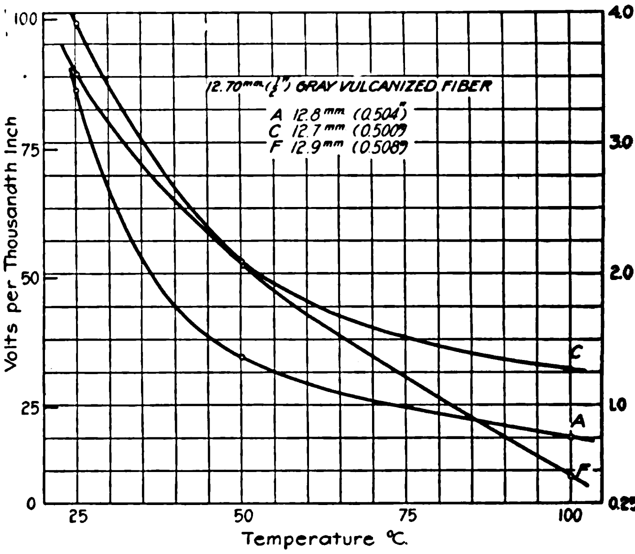


FIG. 1—BREAKDOWN VOLTAGE OF ½-IN. GRAY VULCANIZED FIBER

Some Observations Made In the Investigation

Fig. 1, referring to gray fiber of ½ in. thickness shows an average decrease in breakdown voltage in the 25 deg. to 100 deg. temperature range, of 77 per cent. Tests on a thickness of 0.03 in. show an increase of 80 per cent in breakdown voltage for the same range of temperature. Tests on thickness greater than ½ in. are not very interesting, because the voltage required to break down a sample of such thickness is greater than most commercial voltages.

A comparison of results on black fiber of 0.067 in. thickness shows on average increase of 12 per cent in breakdown voltage. Greater thicknesses show a decrease with increase in temperature.

The results of tests with red fiber of ¼ in. thickness show the average decrease in breakdown voltage in the range from 25 deg. to 100 deg. to be approximately

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(*Concluded from page* 237)

commutating characteristics inherent in motors built for the lower voltage.

The only high voltage apparatus among the auxiliaries on the locomotive is the motor of the small motor-generator which is used for train lighting and charging the storage battery. Low-voltage auxiliaries were adopted to secure minimum complication of installation, maintenance and operation. Ordinary inspection can be carried on, including the functioning of switches and auxiliaries, with no 3000-volt power on the locomotive.

The regenerative control in these locomotives has been designed to secure positive operation of this feature over widely varying speeds. The same main motor combinations for "motoring" are used for "regenerating," except that the fields of the main motors are separately excited over a wide range by means of axle-driven generators. These are so connected with balancing resistance as to insure inherent stability in the motor characteristics during regeneration.

These machines are mounted on the pony trucks of the locomotive and, in addition to exciting the motors during regeneration, furnish power for operating the air compressors and blower motors when the locomotive is hauling. This arrangement insures a supply of current to the air compressor motors irrespective of the overhead trolley supply, and provides that compressed air will always be available for use of the air brakes.

Each locomotive is equipped with an oil-fired steam boiler, designed to burn the ordinary fuel oil used by the railway company. Provision is made for a storage of 7500 gal. of water and 750 gal. of oil in each engine.

60 per cent. Thin red fiber shows an average increase in breakdown voltage from 25 deg. to 100 deg. of approximately 20 per cent.

The most plausible theory for the change from an increasing variable with increasing temperature to a decreasing variable with increasing temperature but with an increase in thickness, is that the small amount of moisture and zinc chloride in solution cause the resistivity to decrease with increase in temperature, while the fiber loses a certain amount of its contained moisture when heated, greater thicknesses doing so much less rapidly than lesser thicknesses, but not at all in proportion to the thickness.

The results of many tests made with the fiber of five large manufacturers have been averaged, and the composite results are shown in Fig. 2. This curve gives values for room temperature only.

BREAKDOWN VOLTAGES* OF SEVERAL THICKNESSES OF VULCANIZED FIBER

Thickness in Inches	Breakdown Value. Volts per 0.001 In.
1/32	225 to 425
1/16	150 to 300
1/8	125 to 275
1/4	100 to 225
1/2	75 to 150

*Results higher than these have frequently been observed, but these limits will include the majority of cases.

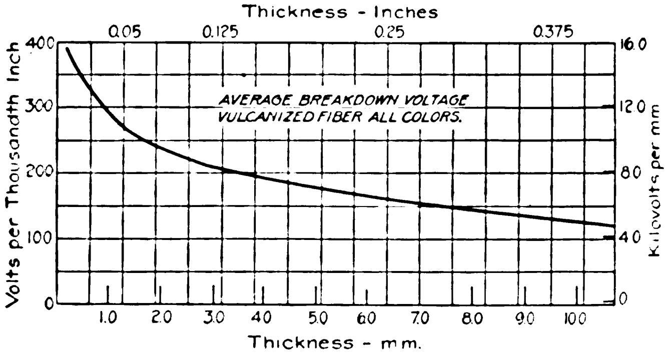

FIG. 2—AVERAGE BREAKDOWN VOLTAGE OF VULCANIZED FIBER OF ALL COLORS

Gray fiber is made from paper of the natural color, with no coloring matter of any kind. Black contains a small amount of lamp black or other coloring matter, and red is colored with a relatively large amount of various grades of oxide of iron. Any loading material placed in the paper from which vulcanized fiber is made tends to interfere to some extent with the chemical treatment, and the result is a less homogeneous material. Coloring matter acts as a loading material and produces a slightly more "papery" fiber, which usually has a higher breakdown value because of the greater degree of lamination. Moreover, fiber is made from three grades of paper, which vary in the degree to which they are gelatinized by the chemical action. The paper from which ⅛ in. to ¾ in. fiber is made is treated to the greatest extent with the zinc chloride, and consequently a more homogeneous material with low breakdown voltage results. In a large number of cases the loading factor of red fiber is so much more pronounced than the tendency for the small amount of solution of oxide of iron to lower the breakdown voltage that the dielectric strength of red fiber will be higher than that of gray fiber. Black fiber is usually between the red and gray grades and nearer the gray in its breakdown voltage.

As vulcanized fiber loses its normal amount of contained moisture its pliability decreases and finally it becomes brittle. This is caused either by application of a sustained temperature of 80 deg. to 100 deg. cent. (176 deg. to 212 deg. fahr.) or to higher temperatures up to 200 deg. cent. (392 deg. fahr.) for shorter periods of time. At this latter temperature charring commences. It has the following strengths in pounds per square inch: Tensile, 9000-13,000; compressive, 33,000-43,000; shearing, 9000-13,000.

Vulcanized fiber is not waterproof. It absorbs water to a certain degree, but is not injured by either hot or cold water, for it returns to its original dimensions and properties when dried. Most dilute acids and alkalis cause no effect other than the effect of water, but concentrated acids cause disintegration. However, organic solvents and all oils have absolutely no effect and are not absorbed in the slightest degree.

GENERAL USES FOR ELECTRICAL INSULATION

Vulcanized fiber was first used in 1873 for axle washers and railway car-journal dust guards. One of the largest uses at the present time, either for electrical or mechanical purposes, is for railway signal insulation. The rail joints opposite every block signal must be insulated in order that the rails may be used as the signal circuit. The ends of the rails are insulated by means of fiber end posts and a fiber head plate and base plate with bushings around the bolts are used to insulate the fish plate from the rail. Every spur must have an insulated joint where it leaves the main track, and every switch rod and steel tie and all metal parts that connect the two rails electrically must be insulated. The specifications for this application are quite severe.* This is an instance where the material is subject to severe weather conditions and extreme mechanical strain, and yet the dielectric strength must be high even when it contains a fairly high percentage of moisture.

When the breakdown voltage per thousandth of an inch, the specific gravity and the cost per pound of vulcanized fiber are compared with the corresponding values for other insulating materials, it will be found that the commercial insulation value of vulcanized fiber is very high. Its ability to be machined with great accuracy and to be bent, punched and formed to shape should be taken into account. In fact, it can be used in many cases where no other material will answer.

Circulating Water in Car Heaters

It has been found at the carhouses of the Ohio Electric Railway, Columbus, Ohio, that the difficulty of starting the water to circulate in the pipes of hot-water car heaters can be overcome by putting the car in motion. To this end the car is sometimes run for short distances and stopped suddenly each time. A small motor-driven centrifugal pump has also been installed on some cars for the same purpose. The experience of this company in the use of car heaters of this type was related in some detail by F. J. Foote, master mechanic, in an article in the ELECTRIC RAILWAY JOURNAL for March 3, 1917, page 397.

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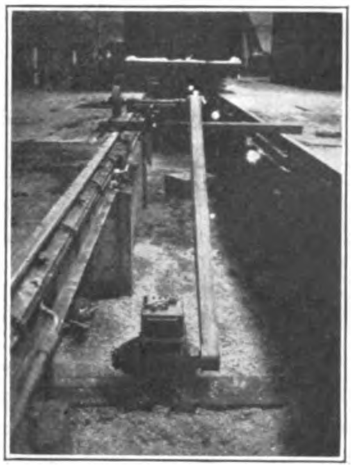
*See standard specifications of Railway Signal Association.

Quick Method of Grinding Wheels

By J. F. Merrick
Master Mechanic Oakwood Street Railway, Dayton, Ohio

We have on our system approximately a mile of track with an average gradient of about 6 per cent, the maximum being 8.5 per cent, and the braking required on this section subjects the wheels to very severe tests, making flat spots not uncommon, especially on cast wheels. Turning the wheels true both reduces the wearing capacity and requires considerable time, and although emery shoes would remove the flat, it would take, in most cases, two or three days.


APPARATUS FOR GRINDING WHEELS AT THE PIT

To obviate these difficulties we designed an apparatus both for grinding the wheels and for truing up the flanges, as shown in the accompanying illustration. The grinder consists of an emery wheel and a pulley on opposite ends of a shaft, mounted on a 6-in. x 8-in. timber. This is laid across the track under the car, and bolted down, and power is supplied by a track-grinder motor which is set in the pit. The car is jacked up, and the proper car motor is operated to turn the defective wheel, while the remaining motors are cut out. The emery wheel has a feeding mechanism operated by a ball handle similar to that of a lathe tool.

With this method it is possible to grind a wheel during the time it would take to prepare it for turning in a lathe. By providing two emery wheels, with the pulley in the middle, two wheels can be ground simultaneously, thus saving more time and making the work on both more nearly the same.

Protecting Signs Used in Rochester

A convenient and substantial danger sign used by the New York State Railways, Rochester, N. Y., is shown in Fig. 1. It consists essentially of an iron framework supporting the signboard, which is about 2 ft. square and upon both sides of which the sign is painted in different color combinations. Two hooks, screwed to the top of the board, provide places for hanging lanterns.

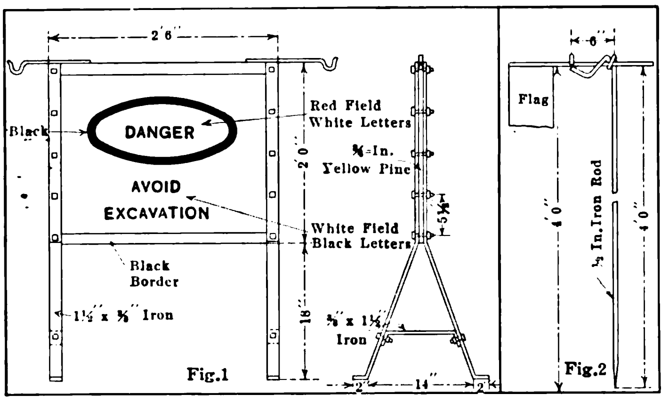


FIG. 1—DANGER SIGN USED IN ROCHESTER. FIG. 2—FLAGSTAFF USED ON INTERURBAN LINES

This sign is used almost exclusively throughout the city to protect track gangs and material and also in place of regular "Street Closed" horses. While it is impossible to give any data as to the effect its use has had on the prevention of accidents, it is considered well worth its cost, since the ease with which it is transported adapts it especially to repair and construction work on city streets. The cost of this sign in the early part of last year was $6.

During construction work on its interurban lines the company uses the standard flagstaff shown in Fig. 2. This is used also with a yellow flag or a yellow light when work requiring low-speed operation is in progress. It is also easily shifted from place to place.

Effective Snowplow Equipment for Interurban Roads

The Bamberger Electric Railroad, Salt Lake, Utah, has built in its shops some interesting snowplows to be used in keeping track open during drifting snow.

Fig. 1 shows the type of plow as applied to the standard motor car equipment of this company. Note that the wings of the plow are so curved as to give the snow a rotary motion, throwing it entirely clear of the track. This makes a channel wide enough to clear the journal boxes, rear steps and other parts of the car. The plow is fastened to the wooden pilot which has been effectively braced to the main body frame of the car. As shown in the figure, the construction is such that the cars can be coupled in trains, space having been left to allow free action of radial drawbars.

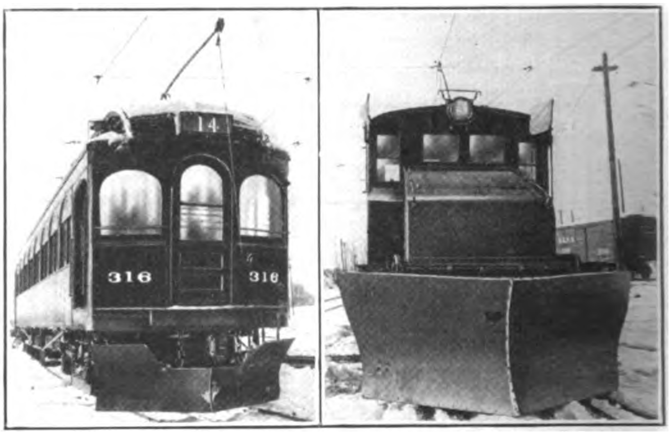


FIG. 1—TYPE OF SNOWPLOW USED ON MOTOR CARS. FIG. 2—SNOWPLOW EQUIPMENT FOR USE ON LOCOMOTIVES

It is stated that motor cars carrying this plow seem to make better speed and pull less heavily on the substations than cars not so equipped.

In Fig. 2 is seen a similar type of plow built for the locomotives. This plow has been made entirely of scrap ¼-in. sheet steel heavily reinforced and mounted on a steel frame. Sixty-five pound steel rails, bent at right angles, are attached to the locomotive frame, and on these are mounted two air cylinders for raising the plow from an operating position of 1-in. clearance to a carrying position of 6-in. clearance above the top

Pay-as-You-Leave One-Man Car at Plymouth, Mass.

THE Brockton & Plymouth Street Railway is operating two pay-as-you-leave one-man cars upon that part of its line between the Hotel Pilgrim, in Plymouth, Mass., and the Kingston town line, a distance of about 10 miles. This mileage is divided into three overlapping zones as shown in Fig. 1. The fare unit for the whole or any part of a single zone is 6 cents, and for the entire line between the above-mentioned terminals, 12 cents. Fares are paid either in cash or with tickets which may be purchased in advance.

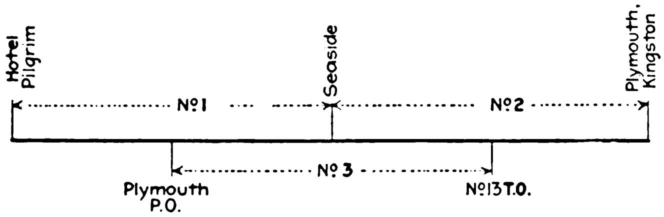


FIG. 1—OVERLAPPING FARE ZONES, BROCKTON & PLYMOUTH STREET RAILWAY

Upon entering the car, which is shown in Fig. 2, each passenger is given a metal identification check, Fig. 3. These checks are of three designs, square, octagonal and circular. Each represents one of the three fare zones and is stamped accordingly. Before leaving the car the passenger in each case returns his check to the operator and is told the amount of his fare. This he deposits in one of two compartments of a C-16 International fare box, arranged for both ticket and coin service. The slot for tickets will not admit a coin or identification check, and the circular openings in the coin receiver are too small to admit a ticket or a check. The tickets are mutilated as they pass through the box. Coins (cents, nickels and dimes) are held visible to the operator in the coin receiver until released by him. They then pass automatically through an adding machine showing the total value of fares collected at any time. The coins are then removed by the operator and used over and over in change-making.

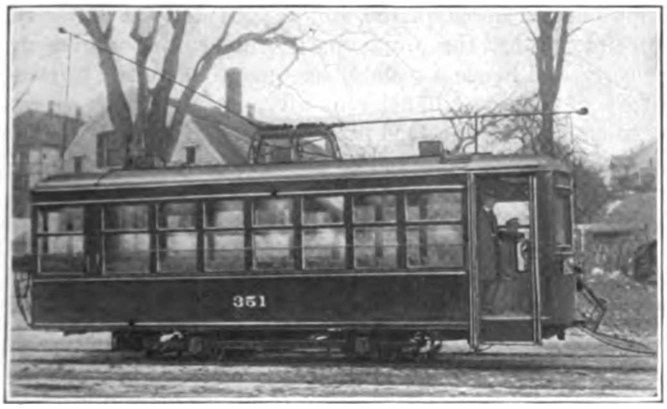


FIG. 2—SAFETY PAY-AS-YOU-LEAVE CAR, BROCKTON & PLYMOUTH STREET RAILWAY

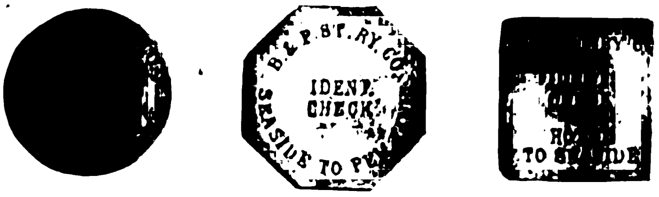


FIG. 3—METAL IDENTIFICATION CHECKS, BROCKTON & PLYMOUTH STREET RAILWAY

No transfers are given in connection with the operation of these one-man, or safety cars, as the Stone & Webster organization, managing the road, designate them, but school children are carried at half fare, in accordance with the Massachusetts law. The cars were built by the St. Louis Car Company. They are each equipped with two GE-258 motors, safety controller handle, automatic door, step, braking, sanding and unlocking door equipment along the usual lines of design applying to this type of rolling stock. Besides the controller contact which must be held in position in order to operate the car, a pedal switch is provided in each car to relieve the operator of the inconvenience of constantly holding his hand upon the control. An average service of 180 car-miles per day is performed by each of these cars.

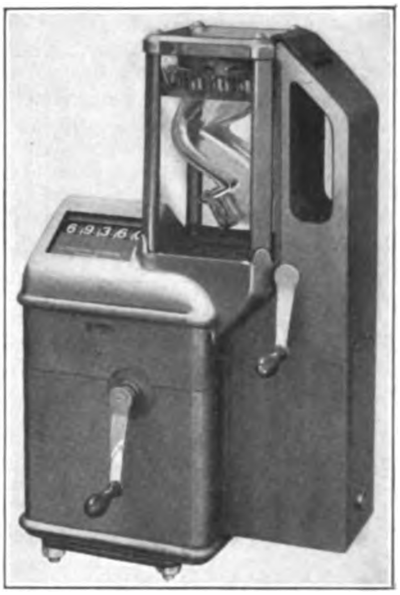


FIG. 4—FARE BOX USED ON ONE-MAN CARS

(*Concluded from page* 240)

of the rail. This operation is controlled by a simple valve at the motorman's position.

As in Fig. 1, it will be noted that the plow has been so shaped as to give the snow a rotary motion that at a fair rate of speed deposits it clear of the second track. The plow is mounted in front of the pilot and is readily attached to the locomotive. This operation comprises the application of twelve bolts to connect the holder rails to the frame and eight bolts for the brace rod between the holder rails and the frame.

The two holes shown in the front of the plow were cut to permit the passage of a chain to the coupler in case it should be desirable to use the locomotive for wrecking purposes with the plow attached. The locomotive weighs approximately 40 tons and the plow an additional 1250 lb.

Rate of Bituminous Increased-Production Better This Year

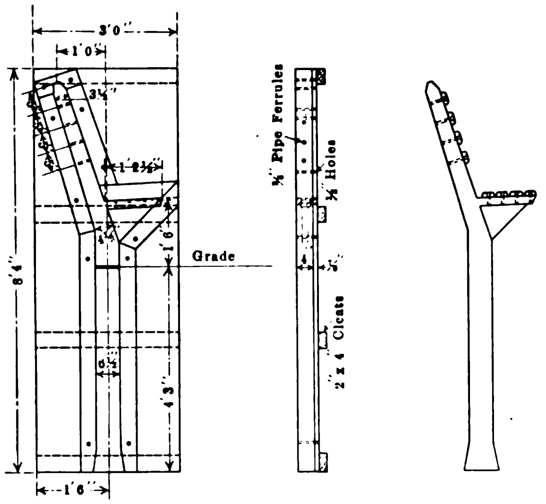
The increase in bituminous coal production in 1917 over 1916 was 8.3 per cent in place of the expected 10 per cent. The increase was 23 per cent over 1915. The year 1918 has started off with an average per working day of 1,799,000 tons, an increase of 1¼ per cent over the average for 1917.

Concrete Makes Good Benches for Interurban Shelters and Parks

ELECTRIC railways are often called upon to provide outdoor benches at waiting shelters along interurban lines and in company-owned parks. As these benches get rough usage it is desirable to make them as rugged as possible and at the same time they should present an attractive appearance.

ATTRACTIVE BENCHES MADE OF CONCRETE

A concrete bench which meets these requirements and one which can be readily made by the railway's own men is shown in the illustrations. The forms for the concrete are made of 4-in. planks which are bolted to a baseboard from which they are removed as soon as possible after the concrete has set. The concrete is a 1:1:2 mixture, the coarse aggregate consisting of ¾-in. washed gravel. Four ¼-in. square rods 8 ft. long and twisted are used in each of the standards, and two rods of the same cross-section but 1 ft. 4 in. long are placed in the brackets underneath the seat. The standards are set 4 ft. apart and 4 ft. 3 in. in the ground. It is reported that benches of this type which have been in service for more than a year have caused no trouble from breaking or from heaving.



Concrete Forms for Standards

Standard with Forms Stripped

DETAILS OF FORMS FOR MAKING CONCRETE BENCH

The cost of making and installing the benches is about $8.75 complete.

Coasting 1581 Miles More Per Day

In the latest issue of the *B. R. T. Monthly*, William Siebert, superintendent of surface transportation, points out that the schedules on the Brooklyn Rapid Transit system call for 33,400 trips per day. If each motorman on each trip would coast an additional 250 ft. it would mean a daily saving in power consumed equal to the amount of power it would take to operate a car 8,350,000 ft., or 1581 miles. From five to ten times this amount could easily be saved.

Precautions that Prevent Freezing in Air Piping

THE large number of air-operated mechanisms used on railway equipment make it necessary to take great precaution in the installation of the air-piping between the compressor and the main reservoirs to prevent freezing of the condensed moisture. This is especially true of pneumatically operated apparatus which employs valves with small openings. The January issue of the *Electric Journal* tells of some important parts that should receive careful attention.

Contrary to a general impression, freezing at very low temperature is not so troublesome as it is a little below 32 deg. Fahr. because at low temperature most of the moisture has been frozen out of the atmosphere. The installation of air piping should be such that the maximum amount of moisture is retained in the main reservoir and no pockets should exist where moisture is liable to collect. The pipe between the compressor and the main reservoir, as well as the pipe between the two main reservoirs, should be at least 25 ft. long, and when the length of car does not permit a straight run the pipe should be made in the form of horizontal coils.

A scheme which is similar to the pipe coil, but having the additional advantage of multiple paths, is the arrangement of a number of tubes fastened into two heads or drums. One of these drums can be used as a moisture trap, preventing the major portion of the moisture from getting into the main reservoir. For a given length of piping with the same diameter in the two systems one arranged in the single path and the other in multiple paths, the single path will require a greater velocity and hence a greater loss in pressure for the delivery of a given quantity of air.

In connecting the feed pipe to the reservoir particular attention should be given to make sure that the connections do not give a reduction of pipe area at any point, as the change in area increases the possibility of freezing. One of the most common breaches in the proper method of making an air installation is to use an "L" fitting at this joint, which not only gives a reduction of area but forms a trap for moistude to accumulate. A better and much more satisfactory scheme for this connection is to have a straight run or large radius bend to the main reservoir where possible and use a connector which does not give a reduction in area.

All piping from the reservoir to the various pieces of apparatus should be arranged to drain back into the reservoir as far as possible, and when this is impossible it should at least drain away from the apparatus.

There have been a number of installations where the compressor intake has been mounted inside and, in some cases underneath, the car. The best place to mount the intake is on the roof, as it is then possible to obtain cool, clean air. More moisture is obtained from the interior of a car than from the exterior, especially on a cold day, because the higher temperature of the air within the car permits the presence of more moisture per unit volume of air.

Even with the best installations it is impossible to prevent considerable moisture from getting into the system and to prevent trouble from this source a rigid inspection should be maintained during the winter. It is a good practice to drain the main reservoir at least once a day and oftener if possible.

Recent Happenings in Great Britain

Coal Saving, Labor Shortage, Package Delivery and Other Matters Growing Out of the War Are Main Topics to Receive Attention

(From Our Regular Correspondent.)

The coal conservation sub-committee has issued an interim report to the Ministry of Reconstruction regarding electrical power supply in Great Britain. The sub-committee proposes, briefly, to supply all industries with energy generated at big "super-power" stations, not more than sixteen in number for the whole country, and to eliminate or combine all smaller stations. The primary object of the scheme is to economize coal supplies. The amount of coal used in the United Kingdom for the production of power is 80,000,000 tons at a cost of about £40,000,000 at the pit head. By an up-to-date and national scheme of electrification 55,000,000 tons of this, valued at £27,000,000 a year, could be saved. This, with a saving of the by-products now wasted by the burning of coal in open grates and boiler furnaces, would effect a national economy of £100,000,000. The generating machines in the stations should be of large size, not less than 20,000 hp. each. In more important industrial districts machines of as much as 50,000 hp. might be used to even greater advantage. At the present time the supply of electricity in Great Britain was split up among about 600 companies and municipal undertakings. The average generating capacity of such of these undertakings as possessed power stations was only 5000 hp., or about one-fourth of the capacity of one single generating machine of economical size and about one-thirtieth of that of a power station of economical size. The committee favored private enterprise. The sixteen great power authorities, whether private companies or public bodies, would be controlled by a national board of electricity commissioners. Existing plants would be handed over on equitable terms to the new authority.

YOUTHS AS DRIVERS

The Board of Trade inquiry into the recent tramcar accident in Glasgow has elicited some interesting information as to the conduct of tramways in war time. The car in question was being driven by a lad about sixteen years of age. It took the corner at Queen's Park gate at very high speed and was overturned. As a result three persons were killed and about fifty others were injured. Colonel Pringle, who conducted the inquiry, elicited from the chief instructor in the tramways motor school the information that in tramway service youths stood the cold better than women, and were less emotional and excitable. It was contended that a boy of sixteen was as strong as a woman of twenty-five. The traffic manager stated that in ordinary times the department did not employ men under twenty-one years of age, but owing to the fact that about 3000 of the staff were absent in the army it had become necessary to employ youths or women. The traffic manager stated that women were not efficient drivers as a rule. Of 800 women trained in Glasgow for such work, only 258 had been retained. Three months ago the department started the experiment of training lads of sixteen and upwards, and at present the corporation had 146 under age, of whom thirty-nine were qualified as motormen, fifty-one were training, and fifty-six were conducting. There were disadvantages in the employment of these youths, but if the corporation did not utilize them, cars would have to be taken off. This would be a serious matter in important munition centers.

INCREASE IN STAFF PROPOSED

At a recent meeting of the London County Council the highways committee submitted proposals for the appointment of an assistant electrical engineer and for the settlement of details of reorganization not covered by the main scheme approved in February. The proposals included increase of the fixed staff of the tramways department. Including the appointment of an assistant electrical engineer, indicated in the main report, the estimated additional expenditure involved by the proposals in the report is £1,655 and ultimately £2,905 a year. The committee is satisfied that economies in working costs will outweigh the additional expenditure which is proposed for the staff.

By a new defense of the realm regulation, the Board of Trade, for the purpose of making the most efficient use of the materials or plant belonging to a tramway or light railway undertaking with a view to the successful prosecution of the war, may by order require the whole or any part of the rolling stock, materials and plant, including permanent way, of any such undertaking to be placed at its disposal or at the disposal of any person or body of persons named by the board. Where any such order has been made, the board or any such person or body of persons may take possession of such portions of the rolling stock, materials or plant of such undertaking as may be required, and may remove them and make use of them for the purposes of any other tramway or light railway.

A large number of the Councils through whose districts the cars of the London United Tramways pass have decided to petition against the company's bill to increase fares, abandon parts of its lines, abolish wayleave payments and put off the time of purchase of the undertaking by local authorities.

It is of some interest to note the effect of the abolition of the halfpenny stages at Keighley. The tramways department had settled down to the halfpenny stage system for some time before the war. Keighley's short and compact tramway system lent itself admirably to the halfpenny arrangement. The cases of crowding out longer distance passengers were comparatively few. With the increased running costs due to the war it was found impossible to make the halfpenny fares pay. Recourse was had first of all to a twenty-for-a-shilling prepaid ticket system. Later on the corporation adopted penny fares for all stages. For a time the number of passengers registered showed a marked drop from the halfpenny totals. Now the passenger records are mounting again. The totals for the last four weeks for which figures were available show an advance of £153 over those for the corresponding period of the previous year. The Town Council has sanctioned an advance in fares by the trackless trolleys to meet the increased running charges.

CO-ORDINATE ROAD TRAFFIC

The Leeds tramways committee has been asked by the government department responsible for the co-ordination of road transport if it cannot make more use of the cars for the conveyance of parcels. A similar communication has been sent to the tramway undertakings in many other cities. One of the exceptions is Bradford, which has taken the lead in the matter of package handling. Road transport offers a wide field for the exercise of various economies—economy in man-power, petrol, fodder, etc. Three or four tradesmen's vans delivering goods on the same day in the same locality represent a wastage which in these times it is most desirable to avoid, and this departmental activity is aimed at concentrating into one organization the entire parcel delivery system in any given district.

No cheaper method than the use of the trams could be devised for this purpose. It is interesting to know that the system is in operation in Bradford to such an extent that the parcels department is handling, apart from newspapers and milk from the municipal depot, between 9000 and 10,000 parcels a week.

The Halifax Tramways committee has decided to ask the Town Council to sanction an all-round increase of 50 per cent in tramway fares. The recommendation is made because of the growing difficulties of maintaining the present services in consequence of reduced staff and material and the increased cost of repairs, renewals and labor. It is also necessary to put a stop to overcrowding on the cars.

The question of municipal tramways was mentioned at a recent meeting of the Grimsby Corporation highways committee. It was reported that the lease of the tramway company would expire in 1921, and it was decided to appoint a special committee to consider the question of acquiring the undertaking. This committee will be authorized to make investigations, collate information, and to engage such advice as may be necessary to enable it to present a complete report to the Town Council. A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Forty-eight Cars Burned

Damage at Buffalo Not as Great as at First Reported, But Will Total $500,000

Fire which swept through the Forest Avenue station of the International Railway, Buffalo, N. Y., on the night of Jan. 23 destroyed forty-eight cars and four snowplows and track sweepers. Twelve other cars were slightly damaged. The loss is estimated at $500,000. The burned cars will be replaced immediately, but the company will probably move the location of the carhouse. Investigations made by the railroad officials failed to determine the cause of the fire.

After conferences with the J. G. Brill Company, Philadelphia, that company promised to divert to Buffalo thirty cars now being built for other companies. These cars are of the double-end type similar to those destroyed in the fire. The company has received twelve cars from the G. C. Kuhlman Car Company, Cleveland, Ohio, on its second order for fifty cars and the other thirty-eight cars will be delivered within the next sixty days.

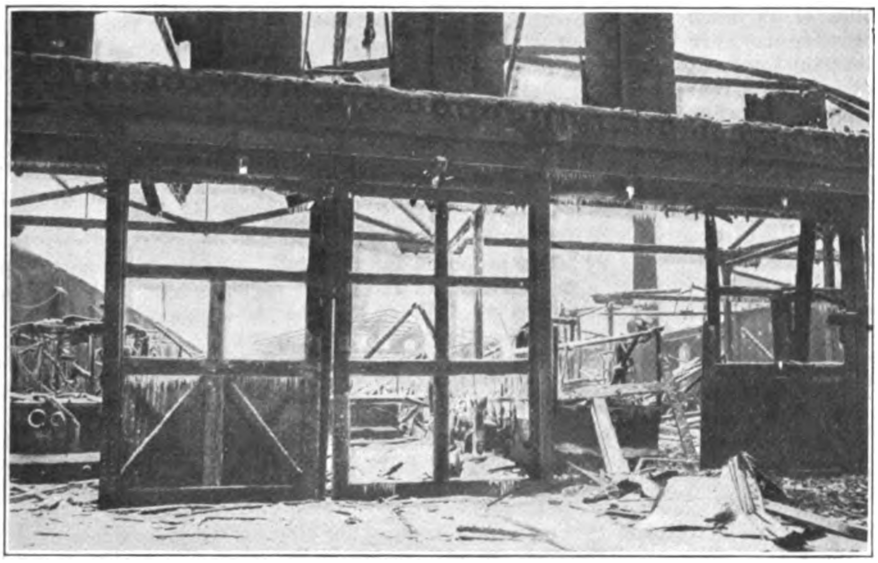
The Forest carhouse was one of the oldest owned by the company. It was a one-story brick structure 500 ft. x 150 ft. About eighty cars were operated out of it, but fifteen cars were lying on storage tracks on property adjoining the station on the night of the fire and the balance were being operated on the three lines which run out of the burned structure.

Within thirty minutes after the fire was discovered the entire building was in ruins. As soon as the power had been cut off at the power houses the firemen started to throw water onto the building, but it was fully fifteen minutes before this was done. The frame roof fell onto the cars and every car in the house was destroyed beyond repair.

About half of the burned cars were of the double-end type. The others were near-side pay-as-you-enter cars. None of the company's new equipment was operated out of this carhouse. The loss of this equipment will seriously handicap the company until all the cars can be replaced. From the Forest carhouse are operated all the cars for the Elmwood Avenue line, which is the main traffic artery to the Pierce-Arrow Motor Car Company, the Curtiss Aeroplane Company, and other large war industries in the congested Elmwood-Hertel Avenue section. Cars have been diverted from several of the company's other carhouses to handle a large part of this traffic.

E. G. Connette, president of the International Railway, has not decided whether the Forest station will be rebuilt. The company owns the property, which is located in a valuable residential section with a long frontage on Richmond Avenue, a popular residential street. The company is considering the purchase of property in the Elmwood-Hertel section for a new carhouse. This proposed site would be of great value to the company because it would be in the center of a rapidly growing industrial section.

The rolling stock equipment of the company as last reported consisted of 945 motor cars and ninety-three other cars. The company operates about 400 miles of electric railway.



ALL THAT REMAINS OF THE FOREST AVENUE STATION

Manila Officials Return

J. H. Pardee, president, and J. P. Ripley, railway engineer, the J. G. White Management Corporation, New York, N. Y., who have been making a general inspection of the Manila Electric Railroad & Light Corporation and other interests in the Islands operated by the Management Corporation, have returned to this country.

Franchise Approved

St. Louis Settlement Grant Goes to Public Service Board Before Final Action by City

The bill providing for the settlement of the differences between the United Railways, St. Louis, Mo., and the city was approved by the Board of Aldermen on Jan. 18 by a vote of twenty-four to five, and sent to the Public Service Board, which must submit a report on the franchise measure under a provision of the city charter before final action is taken by the Aldermen. Under the charter the Aldermen are not bound to accept any amendment suggested by the Service Board. They are merely required to receive a report from that body before acting finally, in order not to pass on franchise legislation without expert engineering advice.

The bill was approved with amendments agreed upon by the public utilities committee, on motion of Alderman Barney L. Schwartz, chairman of the committee. Alderman Hall objected to approving the amendments before the Service Board acted, but his motion to send the bill to the Service Board without amendments was lost.

The bill extends the franchise of the United Railways thirty years, and substitutes a special tax of 3 per cent on gross revenues for the mill tax and special franchise taxes. It creates a board of control with power to order extensions and betterments of service whenever the company can afford the investment. The city will recognize the company's right to earn 6 per cent on a valuation of $60,000,000, and all earnings above 7 per cent will be turned into a fund which the board of control may use for building extensions or providing improvements in service, or for reducing the capital stock of $60,000,000. Extensions or rolling stock purchased out of such surplus are to belong to the city, and the company is not to be permitted to earn profits on this investment. The accrued mill tax of $2,300,000 is to be paid within five years and the company is to pay 6 per cent interest on all of the deferred payments.

The Service Board took up the measure for the first time on Jan. 22 and decided to hold daily meetings until the measure has been fully considered. President Kinsey said the board would not be able to reach a report when the Aldermen hold their next meeting, but that it would probably be in a position to submit a report at the meeting on Feb. 1.

The board indicated on Jan. 22 that it may recommend an amendment to the settlement bill providing that whenever the earnings exceed 7 per cent on a valuation of $60,000,000 the surplus may be used to reduce car fares. The present bill provides that surplus earnings may be used by the Board of Control in building extensions to the company's lines or in bettering the service.

Another amendment proposed on Jan. 22 was that the right of the city to condemn the property by a suit in the Circuit Court be stipulated in the settlement bill.

Strike on Municipal Railway

City Council Refuses to Bow to Threat of Coercion by Other Municipal Employees

The men in the employ of the Monroe (La.) Municipal Street Railway, operating 10 miles of line, went on strike on Dec. 26. This is the second strike of the employees of the municipal railway system in four months. The men claimed a "lockout" on the part of the city and failure of the city to live up to the contract between them and the city as interpreted by the arbitrators who settled the previous strike. Mayor Apgar said the "walkout" was due to the fact that there was not a sufficient number of men available to continue operation of the cars with two operatives on each car, and because the city refused to pay double time to the operatives for one-man operation. To the operators of the one-man cars the city had paid time and a half.

The city at once set about the task of finding men to replace those who had gone out, and in a few days was able to restore service practically to normal. Subsequently the City Council rejected a proposal by the executive committee of the Monroe Labor Council whereby the men who struck and the city would renew their contract and the men would return to work operating cars on the one-man plan, the wage scale to be the subject of subsequent agreement. This action reaffirmed the city's determination not to enter into another contract with the men. At the same meeting the Council ratified Mayor Apgar's action in hiring imported operatives and authorized the Mayor to hire at home or elsewhere not only additional men to operate cars but any men needed to operate other public utilities owned by the city. This authority was given in view of threats of a sympathetic strike which might tie up such utilities as the electric light plant and water works.

Two Estimates of Minneapolis Railway Values

Majority and Minority Reports Made by the Central Franchise Committee to the City Council Differ by $5,809,572

The central franchise committee on Jan. 23 presented to the City Council of Minneapolis, Minn., its report of the valuation of the property of the Minneapolis Street Railway, controlled by the Twin City Rapid Transit Company. Two sets of figures were presented. Twenty-nine members of the committee signed a majority report that places the total value at $21,279,932. Eighteen members signed a minority report that places the total value at $15,470,360. Many qualifying or modifying considerations attach to the reports.

The majority report presents the figures as representing fair value proper to be used as a basis for a valuation of a new franchise for the company. It puts the physical valuation on Jan. 1, 1916, at $18,868,130, including overhead charges, and the going concern value on Jan. 1, 1918, at $2,411,802. The majority report is issued, its context states, subject to express provisions, one of which is that the $2,411,802 allowed for going concern value on Jan. 1, 1918, shall be eliminated from capitalization at the rate of 2-11 a year, after Jan. 1, 1918, until a new franchise goes into effect.

The minority report, based upon the Cappelen and Pillsbury reports long precedent, criticises these reports and presents the figure $15,470,360 as arrived at by taking the Cappelen physical valuation of $21,152,221 and subtracting $5,681,861, made up of items that the report says should be deducted. The minority report disagrees with the majority report in a number of important respects.

Each report presents analyses in detail of the various important items involved.

The company's franchise expires in 1923. Since the matter of a renewal of the grant came actively before the City Council several years ago, the following valuation reports have been made:

Date—By Whom	Valuation
Sept. 29, 1916—City Engineer F. W. Cappelen—Existent physical value Jan. 1, 1916........	$21,152,221
Cost to reproduce new.........	22,432,072
Including capital expended in development and commercial value of water-power leases (figures commonly referred to as representing the Cappelen report)	25,914,308
Including value of water-power leases to July 1, 1923, value of steam-property leases and value of downtown terminal block	28,789,085
Nov. 28, 1916—Street Railway Company	35,323,376
Dec. 22, 1916—C. J. Rockwood, attorney	19,107,607
Aug. 21, 1917—C. L. Pillsbury, engineer	24,300,000
Nov. 15, 1917—J. D. Hogarth, Milwaukee	13,608,730
Jan. 23, 1918—Central franchise committee, majority report..	21,279,932
Minority report.............	15,470,360

The minority report dissents from the majority report with reference to what it terms the "function of our committee to act as an arbiter," and says it has not conceived the committee to have such function and that it does not desire to relieve the City Council of the duty imposed upon it of making an agreement with the railway.

Disagreement on Future Procedure

The two reports differ widely in their suggestions as to what should be done next. The majority report says:

"In view of all considerations involved it will be to the best interest and welfare of the public of this city to secure a prompt settlement of the problem on the basis of valuation figures set forth."

The minority report disagrees with this and, after commenting on the statement that the stock of the company is widely distributed among men of influence in Minneapolis, says:

"The personnel of its officers is and has been in the past so closely related to those conducting large industrial and financial enterprises here, that sound business judgment dictates that a utility value from a board of national reputation and representing the people's point of view should advise the city as to what elements should be allowed in the final capitalization."

The reports have gone to the street railway committee, which will meet again at the call of the chairman to take up the matter.

Extension to Ballard Ready

Addition to Seattle Municipal Railway Will Be Placed in Operation This Month

Operation of the Seattle (Wash.) Municipal Railway, Division A into Ballard, over the Fifteenth Avenue N. W. bridge, is expected to begin during February. The opening of this extension will be the signal for the operation of municipal cars on Fourth Avenue as far as the County-City Building at Jefferson Street, by common-user agreement with the Seattle & Rainier Valley Railway. Because of the light construction of the Loyal Heights Railway, which has been taken over by the city, it will be impossible to operate the city's large cars over that line, so that between the County-City Building and the north terminus at Thirty-second Avenue N. W. and West Eighty-fifth Street there will be a transfer of passengers to and from large and small cars at West Sixty-seventh Street and Twenty-second Avenue N. W.

The City Council has concurred in the recommendation of the Public Utility Department that the agreement between the Loyal Railway and the Western Washington Power Company, which owns the Everett interurban, concerning the exchange of transfers, be continued in force. It has also been decided to permit the issuance of transfers between the city's Ballard line and the Loyal Heights unit, when it becomes city property, on 4-cent fares.

Temporary Agreement on Bay State Wages

Acute Situation Probably Relieved by Understanding Between Receiver and Representatives of the Men

The negotiations regarding wages that have been in progress between the officers of the Bay State Street Railway, Boston, Mass., and the representatives of the union of employees were terminated on Jan. 23. The men had requested an increase which would have cost the company about $900,000 more a year than at present for wages. The company presented a co-operative plan for the consideration of the men. The contract under which the men are now working has until May, 1920, to run.

On Jan. 29 danger of a strike appeared averted by the reaching of an understanding between union representatives and the company relative to wage conditions during the present period of abnormal and reduced schedules resulting from the coal shortage. Conferences between Wallace B. Donham, receiver, and W. D. Mahon, of the Amalgamated Association, were concluded a few days ago, and it was expected on Jan. 29 that a formal agreement would shortly be signed which will remove all possibility of a strike. Up to the time of sending the ELECTRIC RAILWAY JOURNAL to press the details of the agreement had not been made public beyond the fact that it contained provision for wage increases dependent upon the co-operation of the men with the company's efforts to obtain increased efficiency of service. The temporary agreement will not invalidate the current agreement between the men and the company as to wages and working conditions in general.

A week after Mr. Donham became receiver, without any warning, the men took a strike vote, based on the necessity of the receiver shutting down part of the service on account of the coal shortage, notwithstanding the fact that the men were fully paid, under terms of the contract, whether they worked or not.

At the second conference arising out of this situation, Mr. Donham told the men that in his opinion this was not the real issue between the company and the men, but that they wanted increased wages. He told them further that he sympathized with their feeling, and they ought to have more wages, as prices had gone up since the war began. He told them, however, the Bay State Street Railway had no funds out of which it could pay any increased wages, but that the company was making an effort to work out plans under which it could get more money. It was explained in behalf of the company that it was impossible for it to meet the demands of the men.

Mr. Donham desired, however, to work out a method under which the men could get more money and he presented to them, over a series of conferences, a plan under which, with their co-operation in saving operating expenses the company could make substantial savings, most of which Mr. Donham was prepared to give to the men. As evidence of his good faith and belief that this savings plan would result in a real increase in the money received by them, Mr. Donham guaranteed, out of the share in the savings which would, under the plan, go to the company, to pay the men 1 cent an hour in addition to their contract wages. He further guaranteed that their share in the savings would equal at least 1 cent an hour additional, and stated to them that estimates made by the company showed that the savings would equal 2 cents an hour. In other words, he made a definite offer to guarantee 2 cents an hour during the period of the war and six months thereafter, and to give the men an additional 1 cent if they could save it. All of this was conditional only on the men co-operating with the company to bring about these savings.

RECEIVER MAKES STATEMENT

After the sub-committee of the general conference board, assisted by President Mahon and Executive Board Member John H. Reardon and Vice-President P. J. O'Brien informed Mr. Donham that they would have nothing whatever to do with the plan, Mr. Donham made a statement in which he said:

"I do not know what the intentions are of the representatives of the men, as they in no way expressed themselves in this regard, but it is a source of complete astonishment to me that the committee should take this position.

"The members of the committee stated they took the position because they thought I was trying to break up the union. This is not so. On the contrary, it has been my absolute intention to work with the union and I had so stated to them. Also that I was endeavoring to build up the spirit of co-operation between the company and the men, believing that the result of co-operation through them, working with their union, and me, as receiver, would be to the mutual advantage of both sides, and would be very greatly to the advantage of the public.

"For example, one of the principal features through which the men were to benefit in financial return was by their acting under our instructions to prevent accidents; another was saving power and thereby coal consumption, which is a matter of the very greatest importance to the public at the present time; third, by courteous and friendly treatment of passengers, thereby increasing riding, the results of which I was prepared to share with them.

"It will be noticed that the plan which I suggested to the men is not the ordinary profit-sharing plan, which is for the benefit of the individual workman, but that the plan which we worked out would have distributed the savings over men in large groups, a method which, so far as I know, has never been in any way considered opposed to the principle of collective bargaining."

W. D. Mahon, the president of the Amalgamated Association, said that the union had a contract with the company that contained ample provisions for any co-operation necessary and that he would not recommend to his men something he did not understand himself.

Service-at-Cost Plan

Rumor Has It That the Massachusetts Legislative Investigating Committee Will Recommend This Plan

Holders of electric railway securities will be guaranteed a return of 6 per cent on their investment, jitney competition will be greatly reduced, excise and commutation taxes will be abolished and increased electric freight and express service will be authorized if the Massachusetts Legislature adopts the recommendations of the special commission on street railways as forecasted at Boston during the week ended Feb. 2 in anticipation of the filing of the formal report of that body.

Up to Jan. 30 the report had not been filed, but many of the anticipated recommendations were being freely discussed at the State House. Bills already filed contain provisions along the line of the legislative commission's recommendations. The legislative commission is expected to make it clear that it does not feel that State ownership and operation would solve the electric railway problem and that it does not approve of the State's acting as banker for companies in financial straits. It is understood that Governor McCall would not approve either of these plans.

According to reports the legislative commission indorses the service-at-cost plan first suggested by the Association of Owners of Massachusetts Street Railway Securities. A bill providing legislation putting this plan into operation has been prepared and will be offered to the Legislature. Under this plan the State would appoint a State director for each road and accountants to examine the books; the Public Service Commission would determine the amount of invested capital, and each company would be obliged to set aside from 4 per cent to 8 per cent of its capital stock as a reserve fund, the maximum fund being $1,000,000. Rates would be fixed semi-annually, each company being obliged to file eight different schedules of fares, four above and four below its present schedule, and establishing variations of from 1 cent to 10 cents on lines now charging 5 cents. All profits would be turned into the reserve fund, and if the fund increased 30 per cent in six months, the fare would drop 1 cent during the next six months.

Authority to grant electric railway freight permits would be taken from local municipal governments and vested in the Public Service Commission, and the companies would be relieved of all street repair work except between the tracks in paved streets and a space 18 in. outside each rail on unpaved streets.

Car Hearing Goes On

B. R. T. Again Argues for Relief from Order Requiring Purchase of 250 Surface Cars

The Public Service Commission for the First District of New York on Jan. 23 reopened the hearings on the order to compel the Brooklyn Rapid Transit Company to buy and operate 250 new surface cars.

William Siebert, superintendent of surface lines of the company, testified that, owing to the opening of new transit lines, it was his opinion no new surface cars were needed.

John L. Wells, of counsel for the company, said that the situation had changed since the order was issued because the war had made it much more difficult to procure motormen and conductors, and that to buy the surface cars required by the order would necessitate the company borrowing $3,000,000. Mr. Wells contended that on account of the opening of the new high-speed lines adequate service on the surface lines would be possible very soon by using fewer cars. Commissioners Whitney and Hervey demanded a tabulation from the company supporting this contention.

John J. Dempsey, vice-president of the company, estimated that the opening of the Brighton Beach-Flatbush Avenue-Eastern Parkway-Eastern District subway would be equivalent to an addition of 250 new surface cars, while W. S. Menden, chief engineer of the New York Municipal Railway Corporation, which operates the dual rapid transit lines allotted to the Brooklyn Rapid Transit Company, estimated that the operation of 400 surface cars would be saved by the new tubes.

Walter Barnaby, auditor of receipts of the Brooklyn Rapid Transit Company, testified that there had been an average decrease in receipts of $50,000 a month for the last four months of 1917 over the similar period of 1916 on the surface lines. He mentioned the Fifth Avenue, Third Avenue, Flatbush-Seventh and Smith Street lines as those on which the falling off in traffic was most marked.

On Jan. 28 Charles H. Sabin, president of the Guaranty Trust Company, testified that he believed it would be unwise to compel any corporation at this time to spend money unnecessarily. He said that he was not competent to decide what was necessary in the matter of railroad facilities for the city.

John J. Dempsey, vice-president of the company, testified that if the third tracking of the Fulton Street elevated line in Brooklyn had been completed, and if other transit improvements, now under way, were ready for operation, the 250 cars would not be necessary. He added that when the pending improvements were finished it would be possible to take from the surface lines from 296 to 500 cars.

William H. Williams, of the Delaware & Hudson Railroad, introduced by the Brooklyn Rapid Transit Company as a witness, said that no railroad should spend any money during the war on new equipment. He insisted that permission from the federal government should be obtained before the Public Service Commission required any of the companies under its jurisdiction to put any money into improvements during the war.

Engineers and Mechanics for Aviators

The Navy Department announces that men will soon be selected for aviation service. Men of suitable qualifications who report now to the Navy recruiting offices are eligible for examination for commissions and ratings. The rates of pay and duties assigned in this aviation work in the Navy will make this opportunity highly attractive to mechanical engineers and to draftsmen, mechanics and others who are experienced in gasoline engine design or operation. Among the men desired are the following:

Graduate mechanical engineers and men of experience along engineering lines for special duty in the bureau of steam engineering, and in connection with work of this bureau at various places.

Mechanical engineers for special work under the bureau of construction and repair. These men will be used in connection with the development of air craft.

Mechanical draftsmen for duty in bureau of construction and repair on aviation work. These men will receive special aeronautical training as needed.

Suitable men for training for quartermasters (aviation) and carpenters' mates. Men for training as quartermasters (aviation) should be experienced in fabric work, wire working or any form of light rigging. For carpenters' mates (aviation) boat builders are especially desired, but any men with woodworking experience will be considered.

Ordnance Department Needs Help of Various Kinds

Stenographers, typists, production clerks, statisticians, multigraph operators, engineers of tests of ordnance material, assistant engineers of tests of ordnance material, machinists, toolmakers, mechanical draftsmen, munition inspectors, etc., are wanted for the ordnance department of the army to serve in the United States. For further information apply to the representative of the United States Civil Service Commission at the post office or custom house in any city, or to the Civil Service Commission in Washington, D. C. Except for the positions of stenographer and typewriter, typewriter operator, multigraph operator, and general clerk, applicants are not assembled for a written examination, but are rated principally upon their education, training, and experience, as shown by their applications and corroborative evidence.

News Notes

Last Kansas Horse Car Line Replaced.—The Consolidated Street Railway, operating 2 miles of railway between Cottonwood Falls and Strong City, Kan., with horses, has substituted a self-propelled electric car for the horse cars.

Storm Does $150,000 Damage.—W. G. Murrin, assistant general manager of the British Columbia Electric Railway, Vancouver, B. C., recently placed the estimate of damage to the company's Fraser Valley line during the recent storms and washouts at $150,000.

Bus Hearing in New York on Feb. 8.—The hearing before the Board of Estimate & Apportionment of New York City on the application of the Fifth Avenue Coach Company for permission to operate in Manhattan and the Bronx has been adjourned until Feb. 8.

Municipal Ownership Plan Carried.—Municipal ownership of the electric railway facilities in Windsor, Ont., after the expiration of the franchise of the Sandwich, Windsor & Amherstburg Railway in 1932 is probable, following the recent election, when a vote of 1462 to 317 carried a proposition for such a change. An extension of the electric railway franchise was voted down 855 to 366, while the plan for the city to make needed improvements on the lines and to charge a rental therefor until 1932 carried by a vote of 958 to 380.

Suit to Test Cleveland Rapid Transit Act.—Prosecuting Attorney Samuel A. Doerfler of Cleveland, Ohio, on Jan. 24 filed in the Ohio Supreme Court a writ of ouster against the Cleveland Rapid Transit Commission on the ground that a city, which is operating under a home-rule charter, cannot avail itself of the provisions of the general law. It is claimed that the members of the commission are holding office without warrant of law. This suit was brought merely to test the legality of the commission before it proceeds with the work for which it was created.

Praise for Milwaukee Company.—The Milwaukee *Wisconsin* said of the Milwaukee Electric Railway & Light Company in its issue of Jan. 9: "The Milwaukee Electric Railway & Light Company, profiting by experience of former years, has attained a high degree of efficiency in combating the efforts of old King Winter to put it out of business. It deserves credit for the car service it gave the public in spite of the recent storm, and for the benefit to the community incidentally derived from the open space it maintained between the drifts on streets occupied by its tracks. This might have been an advantage of incalculable value in case of fire."

Financial and Corporate

Federal Financing Aid

Secretary McAdoo Urges Congress to Authorize $500,000,000 Corporation to Handle Security Issues

The creation of a $500,000,000 government corporation to make loans and advances to enterprises essential to the war and otherwise assist in private financing was recommended to Congress on Jan. 28 by Secretary McAdoo.

The Secretary also asked that all private issues of securities of more than $100,000 be made subject to the approval of the government body, to be known as the "War Finance Corporation."

The proposed corporation would have power to make advances to banks which finance industries essential to the war or to buy direct the securities of such corporations, subject to certain restrictions concerning price and length of the loans. The corporation also would make short-time advances to savings banks.

Further powers of the corporation would be "to subscribe for, acquire and own, buy, sell and deal in bonds and obligations of the United States." It could issue notes or bonds of its own of an amount not more than eight times its capital, which would be supplied originally by the government.

The corporation would be managed by the Secretary of the Treasury and four directors to be appointed by the Secretary with the approval of the President. The draft of a bill embodying Secretary McAdoo's suggestion was prepared and will be introduced shortly in both houses of Congress.

ADVISORY BOARD

In accordance with a plan to have the Federal Reserve Board pass upon voluntary security applications, Allen B. Forbes of Harris, Forbes & Company, New York, has been appointed chairman of a board of three advisers to the federal body. The recommendation for a securities authorization board by a special committee of the Investment Bankers' Association of America, of which Mr. Forbes was chairman, was noted in this journal last week.

B. R. T. TO HAVE HELP

At the annual meeting of Brooklyn Rapid Transit Company on Jan. 25 T. S. Williams, president, in reply to the inquiry by stockholders regarding the $57,000,000 of notes which mature next July, said that the company's officials had taken up the matter of this maturity with the Federal Reserve Board authorities in Washington and had been directed by them to take up the matter with the local authorities. This maturity is one of the largest occurring in 1918.

The local Reserve Bank authorities have the matter under consideration. Mr. Williams said: "I want to express full confidence that whether such financing is undertaken by the government or privately in some way, the maturity of these notes will be taken care of without any question. The government authorities have asked the company's officials to take no definite step in regard to the note matter until they (the government authorities) arrive at a decision."

Interborough-Consolidated Report

Company Received 20 per Cent on Interborough Stock and Pays 6 per Cent on Own Preferred Issue

According to the report of the Interborough-Consolidated Corporation, New York, N. Y., for the calendar year 1917, the surplus balance on Dec. 31 totaled $1,645,356, as compared to $1,875,877 the year before. Indebtedness amounting to $750,000, however, which was part of money advanced by the Bankers Trust Company in June, 1916, was paid off in 1917.

As shown in the accompanying income statement, the company received 20 per cent dividends on its holdings of Interborough Rapid Transit stock, and it paid 6 per cent on its own preferred issues. The company had in its sinking fund on Dec. 31, 1917, $2,881,588 of Interborough-Metropolitan 4½ per cent collateral trust bonds.

Surplus balance Dec. 31, 1916...	$1,875,877
Dividends on Interborough Rapid Transit Company stock......	$6,782,560
Interest and dividends on securities owned	138,403
Interest on loans, bank balances, etc.	34,902
Total income	$6,955,865
Total	$8,831,743
Interest on Interborough-Metropolitan 4½ per cent collateral trust bonds	$3,052,125
Interest on advance from Bankers Trust Company..........	65,562
Interest on bills payable........	2,964
Sinking fund on Interborough-Metropolitan 4½ per cent collateral trust bonds............	300,000
Administration and general expenses	41,809
Taxes	229,494
Total deductions	$271,304
Total	$3,691,956
Surplus available for dividends..	$5,139,786
Dividends on preferred stock..	2,744,430
Net surplus	$2,395,356
Appropriation to Bankers Trust Company	750,000
Surplus Dec. 31, 1917..........	$1,645,356

The company controls the Interborough Rapid Transit Company subway and elevated lines and the surface lines of the New York Railways through ownership of stock.

Abandonment Set for Feb. 1

Alton & Jacksonville Railroad to Discontinue Operation Under Authority from Illinois Commission

The Alton & Jacksonville Railroad, successor to the Alton, Jacksonville & Peoria Railway, which has been operating an interurban railroad between Alton and Jerseyville for several years, was to discontinue operation and dispose of its property after Feb. 1, by virtue of authority granted by the Illinois Public Utilities Commission in a recent case (7188), in which the company made application for such authority. The city of Alton, the city of Jerseyville and former bondholders of the company appeared in opposition to the application.

Testimony submitted at the hearing in this matter showed that the territory served by the Alton & Jacksonville Railroad was also served in a general way by the Chicago & Alton and the Chicago, Peoria & St. Louis steam railroads. During the period from Jan. 1, 1916, to June 30, 1917, the Alton & Jacksonville operated at a net loss of $46,274, of which amount $7,276 was an operating deficit. Taxes amounted to $5,247 and interest on the $450,000 of outstanding bonds was $33,750. No interest was paid on these bonds during this period nor at any other time. The testimony further showed that from $65,000 to $90,000 would be needed for repairs, if operation of the road were to be continued.

The commission found that the territory through which the Alton & Jacksonville Railroad operates is not such as demands the operation of such a road, nor such as would, with reasonable certainty, make the operation of the road under the most efficient management a profitable undertaking. According to the commission order the railroad should probably never have been built.

HOW PROCEEDS OF SALE MUST BE USED

In authorizing the sale of the physical property of the railroad, the commission ordered that the proceeds of the sale must be applied and disposed of in the following manner:

1. To the payment of any State, county, municipal or government taxes or assessments, judgments and liens, except bonds, due and payable, if any;
2. To the payment of open accounts, if any exist, due and owing by said railroad company;
3. To the payment of accrued interest on the bonded indebtedness;
4. To the payment of principal of bonded indebtedness;
5. The balance, if any, to be distributed to the stockholders as their interests may appear.

The case of the Alton & Jacksonville Railroad was appealed to the Circuit Court of Sangamon County on Jan. 9. No motion was made for a rehearing and no stay order had been asked up to Jan. 29. At that time it was stated that the commission's order would become effective on Feb. 1 unless further action was taken prior to that date.

Electric Railway Statistics

Comparison of Returns for October, 1917, With Those for Same Period in 1916 Show Increasing Cost of Operation

A comparison of electric railway statistics for October, 1917, with figures for the corresponding month of 1916, made by the Information Bureau of the American Electric Railway Association, indicates a continued rise in operating expenses. This condition is noticeable throughout the country, although in the Southern District traffic in connection with the operation of military camps has apparently tended to accelerate somewhat the rate of increase of operating revenues.

Data for October, 1917, representing 7394 miles of line of electric railways scattered throughout the country, figured on the per mile of line basis, indicate an increase in operating revenues of 5.78 per cent and in operating expenses of 12.65 per cent, and a decrease in net earnings of 5.77 per cent. Data representing approximately 70 per cent of this mileage indicate an increase in the amount of taxes paid of 10.53 per cent and in operating income a decrease of 13.73 per cent.

The returns from the city and interurban electric railways, as shown in detail in the accompanying table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River; Southern District—South of the Ohio River and east of the Mississippi River; Western District—West of the Mississippi River.

Of the three groups shown returns for the Southern apparently indicate a slight degree of improvement over the corresponding period of the previous year, while returns for the Eastern and Western are decidedly unsatisfactory. Data for the Eastern group, representing 4722 miles of line, show an increase in operating revenues of 4.41 per cent and in operating expenses of 10.55 per cent, and a decrease in net earnings of 6.92 per cent.

Returns for the Western group, representing 1668 miles of line, indicate an increase in operating revenues of 8.64 per cent and in operating expenses of 20.89 per cent, and a decrease in net earnings of 9.18 per cent. Returns representing approximately 85 per cent of this mileage indicate an increase in the amount of taxes paid of 19.58 per cent and a decrease in operating income of 18.63 per cent. The unfavorable returns for the Western district may largely be accounted for by labor difficulties as well as by a general rise in the wage scales of electric railway employees.

The operating ratio for the country as a whole has increased from 62.68 in 1916 to 66.76 in 1917. The operating ratio of the Eastern District has increased from 64.88 in 1916 to 68.89 in 1917, while that of the Western group has increased from 59.27 in 1916 to 65.95 in 1917.

Abandonment Confirmed

Ohio Court Upholds Commission in Its Decision Not to Require Continuance of Operation

The Supreme Court of Ohio has ruled that under the law the Ohio Public Utilities Commission has no authority to set a date for an interurban railway to go out of business after the company has failed. The question arose from an appeal by patrons of the Lake Erie, Bowling Green & Napoleon Railway to the commission to prevent suspension of operation. The commission decided it did not have jurisdiction, and dismissed the case. The Supreme Court affirmed the decision.

At the same time the court decided that Theodore Luce, who purchased the railway, may proceed to junk it. Suit had been brought by the prosecuting attorney of Wood County to oust him as head of the bondholders' committee, which purchased the line and began to junk it, in the hope that some arrangement might be made to continue it in operation. It was contended that the road would pay if properly managed. Since that time another road has arranged to operate a portion of the line, but under the decision since rendered the owner may dismantle the line, should he so decide.

The light and power plant at Bowling Green, which was owned by the company, has been operated continuously.

Data for Stockholders' Tax Return

The section in the present income tax law which provides that profits or surplus paid to stockholders as dividends "shall be taxed to the distributee at the rates prescribed by law for the years in which such profits or surplus were accumulated by the corporation" is leading many companies to send notices to stockholders, giving the facts, so that the individual stockholder may properly make up his income tax statement. The detail with which some of these dividend statements to stockholders are prepared is shown by the following notice issued by Wells Fargo & Company on Jan. 19, 1918:

> The attention of stockholders is called to the fact that the dividends paid in 1917 are, under the provisions of the income tax

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS, OCTOBER, 1917 AND 1916, COMPILED FROM MONTHLY RETURNS OF ELECTRIC RAILWAYS TO THE AMERICAN ELECTRIC RAILWAY ASSOCIATION

Account	United States				Eastern District				Southern District				Western District			
		Per Mile of Line				Per Mile of Line				Per Mile of Line				Per Mile of Line		
	Amount, October, 1917	1917	1916	Increase Over 1916, per Cent	Amount, October, 1917	1917	1916	Increase Over 1916, per Cent	Amount, October, 1917	1917	1916	Increase Over 1916, per Cent	Amount, October, 1917	1917	1916	Increase Over 1916, per Cent
Operating revenues	$13,809,872	$1,868	$1,766	5.78	$8,716,797	$1,816	$1,768	4.41	$1,506,117	$1,500	$1,393	7.68	$3,586,958	$2,150	$1,979	8.64
Operating expenses	9,219,519	1,247	1,107	12.65	5,987,967	1,268	1,147	10.55	866,160	862	800	7.75	2,365,392	1,418	1,173	20.89
Net earnings	4,590,353	621	659	†5.77	2,728,830	578	621	†6.92	639,957	638	593	7.59	1,221,566	732	806	†9.18
Operating ratio, per cent	1917, 66.76; 1916, 62.68				1917, 68.69; 1916, 64.88				1917, 57.47; 1916, 57.43				1917, 65.95; 1916, 59.27			
Av. No. of miles of line represented	1917, 7,394; 1916, 7,291				1917, 4,722; 1916, 4,694				1917, 1,004; 1916, 956				1917, 1,668; 1916, 1,640			
COMPANIES REPORTING TAXES																
Operating revenues	$9,679,043	$1,751	$1,664	5.23	$5,650,323	$1,594	$1,542	3.37	$815,785	$1,610	$1,476	9.08	$3,212,935	$2,177	$2,024	7.56
Operating expenses	6,757,118	1,223	1,084	12.82	4,161,466	1,174	1,078	8.91	460,373	909	815	11.53	2,135,279	1,447	1,194	21.19
Net earnings	2,921,925	528	580	†8.97	1,488,857	420	464	†9.48	355,412	701	661	6.05	1,077,656	730	830	†12.05
Taxes	697,620	126	114	10.53	374,550	106	101	4.95	71,371	141	116	21.55	251,699	171	143	19.58
Operating income	2,224,305	402	466	†13.73	1,114,307	314	363	†13.50	284,041	560	545	2.75	825,957	559	687	†18.63
Operating ratio, per cent	1917, 69.85; 1916, 65.14				1917, 73.65; 1916, 69.91				1917, 56.46; 1916, 55.22				1917, 66.47; 1916, 58.99			
Av. No. of miles of line represented	1917, 5,527; 1916, 5,473				1917, 3,545; 1916, 3,517				1917, 507; 1916, 507				1917, 1,476; 1916, 1,449			

† Decrease.

law quoted below, "deemed to have been made from the most recently accumulated undivided profits or surplus," which were as follows:

Semi-annual dividend declared Dec. 28, 1916, and paid Jan. 20, 1917, from earnings of the calendar year of 1916.

Quarterly dividend declared March 22, 1917 and paid April 20, 1917: $1.4217 from 1917 earnings, $0.0783 from surplus earnings accrued prior to March 1, 1913.

Quarterly dividends declared June 28 and Sept. 27, 1917, and paid respectively July 20 and Oct. 20, 1917, from 1917 earnings.

Special dividend declared Dec. 28, 1916, and paid Jan. 20, 1917, from surplus earnings accrued during the following periods: Prior to March 1, 1913, $9.3611 per share; March 1 to Dec. 31, 1913, $1.1999 per share; Jan. 1 to Dec. 31, 1914, $1.44 per share; Jan. 1 to Dec. 31, 1915, $8.7636 per share; Jan. 1 to Dec. 31, 1916, $12.5686 per share.

One-Man Cars Save Road

At the annual meeting of stockholders of the Batavia (N. Y.) Traction Company, Stephen W. Brown, president of the company, announced that the company has been placed on a sound financial basis through the operation of one-man pay-as-you-enter cars. There was an increase of 28,000 fares in 1917 over the preceding year, the total for 1917 being 343,000 fares. The company operates single-truck, double-end one-man cars. The company is also planning the construction of new lines in rapidly growing sections of the city and a 5-mile, single-track line to Horseshoe Lake, a summer resort.

Financial News Notes

Sold Under Foreclosure.—The Orleans-Kenner Electric Railway, 16 miles long from New Orleans to Kenner, La., is reported sold under foreclosure to J. Blanc Monroe for $225,000. It is understood that the purchase was made on behalf of the bondholders.

Preferred Dividend in Scrip—Common Passed.—The directors of the Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., have decided to pay the preferred dividend in scrip and drop the common stock dividend. The company has obligations coming due in May and it was decided to conserve the cash, as government financing has made it difficult to finance the cost of improvements by the sale of securities.

Receiver for Illinois Road.—D. Harvey, master-in-chancery of Kane County, Ill., has been named receiver of the Chicago, Aurora & De Kalb Railroad, Aurora, Ill., upon a petition filed in the Kane County Circuit Court by the Continental & Commercial Trust & Savings Bank, Chicago, Ill., representing certain bondholders. These charge that while the interest is being paid on the bond obligations the company is not living up to the terms of the indenture securing the bonds which provides for a sinking fund for the redemption of these bonds.

New Republic Railway & Light Company Issue.—A syndicate headed by Reilly, Brock & Company and Harper & Turner, Philadelphia, Pa., are offering a portion of an issue of $1,500,000 of Republic Railway & Light Company, Youngstown, Ohio, two-year 6 per cent convertible secured gold notes, due on Jan. 15, 1920. These notes are part of a total authorized issue of $2,500,000. They are secured by deposit of an equal amount of Mahoning & Shenango Railway & Light Company 7 per cent preferred stock and all the common stock, and are further guaranteed as to principal and interest by indorsement by the Mahoning & Shenango Railway & Light Company.

Foreclosure Proceedings Likely Soon.—The reorganization committee of the Petaluma & Santa Rosa Railway, Petaluma, Cal., has extended the time for deposit of bonds under the plan until and including Feb. 1. In a circular letter the committee states that the response to the call for deposit of the first and second mortgage bonds has been a gratifying one. It is added that the reorganization agreement will become operative upon the deposit of 90 per cent of the outstanding bonds. The committee feels that this amount is practically assured. Foreclosure proceedings on both mortgages, it is stated, will probably be instituted without delay. A review of the affairs of the company was published in the ELECTRIC RAILWAY JOURNAL for Jan. 12, page 104.

Georgia Earnings Gain.—A. B. Leach & Company, summarizing reports of earnings of the Georgia Light, Power & Railways Company for the last six years, point out that the business of this company is substantially larger than ever before in its history. The figures for the calendar year 1917, approximated on the basis of actual earnings for eleven months to Nov. 30 and December estimated, show that gross earnings increased 13.4 per cent over 1916 and net earnings 13.8 per cent; net income, 25.3 per cent; balance, 73.3 per cent. The total earnings for the twelve months ended Nov. 30, 1917, amounted to $1,164,261, as compared to $1,028,949 in 1916, and the railway earnings increased from $322,711 in 1916 to $355,267 in 1917. The company controls the Macon Railway & Light Company.

New Monongahela Valley Note Issue.—Hambleton & Company, Baltimore, Md., are offering at 99 and interest, to yield 7.05 per cent, $3,000,000 of Monongahela Valley Traction Company one-year 6 per cent gold notes due on Feb. 1, 1919. The notes are in the denomination of $1,000. The proceeds derived from the sale of the notes are being expended in the erection of a 20,000-kw. power plant and for other corporate purposes, such plant to be used in part for war needs, as demonstrated by the action of the United States government in giving priority orders for equipping the plant. The notes are followed by $3,389,798 of preferred stock upon which dividends are paid at the rate of 6 per cent per annum, and $8,278,086 of common stock upon which dividends are paid at the rate of 5 per cent per annum.

Electric Railway Monthly Earnings

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$1,712,683	$30,257	$1,682,425	$227	$1,682,198
1m., Dec., '16	1,570,819	20,310	1,550,509	314	1,550,195
12m., Dec., '17	19,252,492	357,229	18,895,263	2,861	18,892,402
12m., Dec., '16	10,110,342	239,389	9,870,953	258,961	9,611,992

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, CLEVELAND, OHIO

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$41,783	*$28,012	$13,771	$11,635	$2.136
1m., Nov., '16	35,940	*21,216	14,724	11,649	3,075
11m., Nov., '17	496,163	*310,912	185,251	128,473	56,778
11m., Nov., '16	426,104	*240,686	185,418	125,691	59,727

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$268,643	*$186,536	$82,107	$50,267	$31,840
1 " " '16	209,936	*131,340	78,596	49,018	29,578
11 " " '17	2,559,445	*1,798,210	761,235	543,485	217,750
11 " " '16	2,271,968	*1,504,507	767,461	536,251	231,210

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$25,987	*$16,986	$9,001	$5,075	$3.926
1 " " '16	26,089	*14,468	11,621	5.241	6,380
12 " " '17	341,718	*211,220	130,498	61,465	69,033
12 " " '16	323,507	*183,470	140,037	64,197	75,840

JACKSONVILLE (FLA.) TRACTION COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$60,939	*$42,368	$18,571	$15,848	$2,723
1 " " '16	48,375	*35,394	12,981	15,508	†2,527
12 " " '17	690,833	*462,942	227,891	188,581	39,310
12 " " '16	618,511	*422,330	196,181	183,091	13.090

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$142,814	*$103,922	$38,892	$35,149	$3,743
1m., Nov., '16	125,610	*86,790	38,820	36,263	2,557
11m., Nov., '17	1,618,439	*1,103,340	515,100	381,998	133,102
11m., Nov., '16	1,468,736	*924,797	543,940	400,089	143,850

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Nov., '17	$270,510	*$144,286	$126,224	$28,259	‡$107,548
1 " " '16	163,929	*92,228	71,701	29,222	42,479
12 " " '17	2,470,263	*1,399,013	1,071,250	348,390	‡742,025
12 " " '16	1,904,904	*1,149,770	755,134	347,583	407,551

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$2,622,429	$1,582,589	$1,039,840	$810,783	$229,057
1m., Dec., '16	2,487,287	1,396,094	1,091,193	813,920	277,272
6m., Dec., '17	15,030,458	8,817,187	6,213,271	4,867,365	1,345,906
6m., Dec., '16	13,857,145	7,703,819	6,153,326	4,887,233	1,266,092

UNITED LIGHT & RAILWAYS COMPANY, GRAND RAPIDS, MICH.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
12m., Nov., '17	$2,046,898	*$170,122	$1,876,776	$689,368	$1,187,408
12m., Nov., '16	1,849,084	*141,631	1,707,453	575,006	1,131,447

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Increase in Fare in Spokane

Companies There Will Raise Price of School Tickets to Four Cents and Charge Five Cents for Others

Officials of both the Spokane Traction Company and the Washington Water Power Company, operating electric railways in Spokane, Wash., express the hope that by increasing the rate on tickets to school children from 2½ cents each to 4 cents each, effective from Feb. 1, and by discontinuing the sale of twenty-two tickets to others at $1 and obliging these patrons to pay a straight 5-cent fare they will be able to increase earnings.

Waldo G. Paine, vice-president and traffic manager of the Spokane Traction Company, and C. S. MacCalla, vice-president and general manager of the Washington Water Power Company, say that until this has been tried no move will be made to charge a 6-cent fare.

The recent intimation from these officials that later such a move may be made resulted in the Corporation Counsel being instructed to investigate the law. He reported that the present State law does not permit the companies to charge more than 5 cents for fare.

Traffic Rules Approved

Police Departments of New York State Cities Agree to Uniform Rules for Controlling Traffic

Uniform traffic regulations for New York State have been approved by the police departments of the cities of the State, according to a statement made public by the New York State Conference of Mayors and Other City Officials on traffic regulation and the causes of automobile accidents.

In a report to the conference the State Bureau of Municipal Information says:

"We are pleased to report that the police departments have universally approved the new law and that no changes of material importance have been suggested. The reports to us show that the law has worked out admirably in all the cities and that the uniform regulations have been generally observed with the result that the number of accidents, compared with the increase in automobile traffic in the cities, has been reduced. There is, however, need for greater effort to reduce accidents and make the highways safer."

RECOMMENDATIONS SUGGESTED

Basing its suggestions on the reports of the police departments the bureau has recommended to the conference the following:

1. A more rigid enforcement of both the State highway traffic act and the speed provisions of the State automobile law.
2. A better knowledge of the traffic and speed laws and compliance with their provisions by the drivers of all kinds of vehicles.
3. The regulation of pedestrians crossing or in any way using the highways.
4. Changes in the automobile headlight law.
5. A law requiring the registration of drivers and an adequate examination and test of at least all new operators of automobiles and motorcycles.
6. Greater co-operation between police and parents in regulating the play of children in the streets, and increased recreation facilities in congested districts.

The Mayors' Conference has called a meeting for the purpose of discussing these suggestions and considering needed legislation.

Fare Advance for Seattle

Puget Sound Traction, Light & Power Company Preparing Petition for Six-Cent Fare

The Puget Sound Traction, Light & Power Company is preparing a petition to the State Public Service Commission for permission to advance railway fares in Seattle to 6 cents. According to information received from Olympia, action by the Public Service Commission on the company's petition likely will await an examination of the company's books to ascertain present receipts and disbursements. This examination was ordered by the commission recently on the company's statement that it intended to file a 6-cent schedule. As the investigation is being made in advance of the receipt of the petition from the company, it is expected that the case will be ready for immediate hearing when the filing of the petition for an increase in fare is made.

Walter F. Meier, acting corporation counsel of the city, has advised the City Council to prepare to oppose any attempt to increase fares in Seattle.

Emergency Committee for Pittsburgh

An emergency transportation committee has been appointed by Mayor E. V. Babcock of Pittsburgh, Pa., to assist in helping to improve service on the lines of the Pittsburgh Railways. Members of the committee are: John W. Weibley, president of the Pittsburgh Taxicab Company; Reid Kennedy, president of the Monongahela Trust Company; J. R. Rider, vice-president of the Pressed Steel Car Company; David J. Berry, editor of the *National Labor Journal;* A. W. Robertson, attorney of the Pittsburgh Railways, and David C. Ainey, assistant engineer of the Public Service Commission. Among the points to be worked out by the committee are the following:

Adoption by the Pittsburgh Railways of such means as might be considered sufficient to induce patrons to use the cars in non-rush hours; co-operation of manufacturers in arranging work periods so as to utilize the best available facilities of the railway; efforts by merchants to induce customers to shop in the non-rush hours, and active support of commercial, industrial, civic and press bodies in promoting the public welfare.

The civic bodies which are leading the campaign for improved service have been notified that the State Public Service Commission will hold hearings in Pittsburgh within a few days to receive complaints.

Food at Cost in Baltimore

Company There, as War Emergency Move, Goes to the Aid of Its Employees

The United Railways & Electric Company, Baltimore, Md., has arranged to aid its employees to obtain foods at cost. This war emergency measure will be tried out at once.

A commodious and ample room with a large storage space adjoining is being erected in the carhouse at Charles Street, near Lafayette Avenue. This location is central and served by several lines, making it convenient of access from all parts of the city.

This war emergency measure is being undertaken voluntarily by the company to assist its employees during the period of high prices. Nothing in the way of profit will be added to the cost price of the foodstuffs. If the employees find the savings sufficiently attractive, the distribution will be maintained while prices continue high.

EMPLOYEES ON MANAGEMENT COMMITTEES

In order to make the plan fully effective, a number of the employees have been asked to serve as a committee to make suggestions and to supervise the purchases and operation of the scheme so that it may be made to meet the emergency most completely.

Employees and their wives will be provided with suitable means of identification to the end that this distributing agency will only be used by them for purchasing at cost food necessities bought by the United States in wholesale quantities.

Still further to insure the success of the undertaking free transportation will be given to the wife of each employee so that there will be no expense imposed in going to and from the Charles Street location.

Among the things that will be distributed to the employees are beef, pork, mutton, ham, butter, lard, canned goods, flour, corn meal, potatoes, turnips, apples, oranges, crackers, rice, sugar, coffee, tea, etc.

War Conditions Discussed at Boston Hearing

Chairman of Commission Says Boston Elevated Needs More Modern Cars—Traction Company Has Lost 900 Men Since War

The effect of the war upon electric railway service conditions was discussed before the Public Service Commission of Massachusetts recently at a hearing called upon a general complaint of the service of the Boston Elevated Railway in Dorchester following the opening of the South Station-Broadway section of the Dorchester tunnel. The bone of contention was the handling of traffic at the Broadway terminal of the tunnel, where transfer is made between through trains to and from Harvard Square, Cambridge and surface lines serving South Boston and Dorchester.

QUICK PASSENGER MOVEMENT NECESSARY

The point was made that the tunnel in its uncompleted state could not handle the traffic thrown upon it at Broadway station from both South Boston and Dorchester. It was also charged that the company had failed to secure an adequate number of conductors and motormen through its policy of discouraging the employment of men subject to the draft.

Chairman Macleod, of the commission, said that the electric railway service of the State had broken down in the sense that the steam railroad service had failed to meet the test of war conditions under private ownership and operation. He pointed out that the service could not be handled by the Boston Elevated Railway in this district until some way could be found to provide a large number of new cars of a modern type, susceptible to quick loading and unloading, in order to relieve the congestion to move the passengers quickly at terminal and concentration points.

NEITHER CASH NOR CREDIT AVAILABLE

The company claims that it had neither cash nor credit with which to purchase additional cars, and that if it had, it could not secure deliveries under a year or two. Mr. Macleod said that high prices ought not to deter the expansion of existing facilities under private ownership, if any way could be found to effect it: if not, the problem would then have to narrow itself down to the most efficient utilization of the equipment that the company had on hand, and that resolved itself into a proper balancing of service between different communities, districts and lines.

Edward Dana, manager of surface transportation of the Boston Elevated Railway, said that from July 1 to Dec. 31, 1917, the company had hired 887 men, 300 of whom were between the ages of twenty-one and thirty-one. Men ostensibly subject to the draft had not been employed. The company operated 16,000 trips a day and was losing between 200 and 300 trips in the rush hours. At present there were 114 cars per hour scheduled around the loop at the Broadway station, and about 6500 persons passed through. The cars were less suited to the traffic than those that were operated through Harvard Square station, at the other end of the tunnel.

New center-entrance motor cars were being fitted out of service as fast as possible, fifty-seven having been received out of an order for 100. Forty-two of these cars were required in the East Boston Tunnel. It was suggested that present conditions be improved by operating a portion of the service to the upper level of the Broadway station and by restoring the service between Meeting House Hill and Dudley Street, to enable the Washington Street tunnel to be utilized by some of the patrons of the company now routed through the Dorchester tunnel. Forty-one of the 114 rush-hour cars at Broadway station were destined for South Boston. Since July 1, 354 men had left the company's service and about 900 had left since war was declared against Germany by the United States.

Ohio Fare Changes Likely

First the Interurbans, Now the City Companies, Find Their Burdens Too Great

Fare changes for roads in Ohio other than those referred to in the ELECTRIC RAILWAY JOURNAL from time to time recently would seem to be in prospect. The Cleveland Railway will probably be able to manage matters for a time, with its adjustable scale of fares, but officers have already pointed out the possibility of an even higher rate than is provided in its grant, should the heatless days prove as much of a loss as at first anticipated.

The Columbus Railway, Power & Light Company, it is currently reported, will shortly ask for an increase in fare commensurate with the rates that are paid in other cities of similar size. Officials state that the cost of fuel, materials and labor has increased out of all proportion to the growth of the business. The company is now selling tickets at the rate of eight tickets for a quarter. This is lower than the present rates at Cleveland, although Cleveland is the boasted 3-cent city of the country.

Intimations have been made to members of the Council at Youngstown that the Mahoning & Shenango Railway & Light Company will shortly ask for a flat 5-cent fare on the city lines. At the present time twenty-five tickets can be purchased for $1.

The Interurban Railway & Terminal Company, Cincinnati, has taken an appeal to the Supreme Court from the holding of the Public Utilities Commission on an action in which it asked for an increase in the rate of fare to 2½ cents a mile. The city of Cincinnati filed a demurrer to the company's petition and it was sustained by the commission.

The petition of the Ohio Electric Railway for an increase in its rate of fare was heard before the commission on Jan. 23. Only minor objections were made to the proposed increase, although the road has 700 miles of track. Statistics were presented to show that the road was being operated at a loss under the greatly increased cost of everything. Decision was reserved.

An examination of the books of the Toledo Railways & Light Company is now under way to determine whether increased wages can be paid to the motormen and conductors. Officers of the company contend that it will be impossible to increase wages without an increase in the rate of fare.

Fare Increase Denied

Ohio Commission Holds That Franchise Provisions Prevents It from Allowing Fare Advance

The application of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, for permission to file a new schedule of rates in excess of those provided for in its franchise has been refused by the Public Utilities Commission of Ohio. The commission held it has no jurisdiction to set aside rates prescribed in a franchise.

Application was filed by the company with the commission for the purpose of increasing rates on its interurban lines between Youngstown and Girard, Niles, Warren and Hubbard. It was proposed to raise the present rate from Youngstown to Girard from 5 to 10 cents, and from Youngstown to Warren from 15 to 25 cents. The other tentative advances were in proportion.

When the hearing on the case was held each of the communities was represented in opposition to the advance, while John T. Harrington appeared for the company. The latter contended that the advance was necessary for the company to maintain service. Representatives of the cities named alleged that the utilities commission was without jurisdiction in the matter, which was covered by local franchises.

The company has appealed to the State Supreme Court for the reversal of the decision of the commission. The question involved is the right of the commission to fix new rates regardless of rates prescribed in franchises, granted prior to the organization of the commission.

Praise for Evansville Railways

The Evansville (Ind.) *Courier* in a recent article paid a high tribute to the Evansville Railways, the Public Utilities Company, the Evansville, Suburban & Newburgh Railway and others. The paper said that it realized the difficulties which beset the interurban officials in the way of automobile competition and appreciated what increasing costs meant to the companies.

City May Buy and Loan Equipment to Railway

Mayor of Buffalo Sees in This Possible Solution of Problem to Which War Department Has Assigned Colonel Arnold

Unless orders are placed at once by the International Railway, Buffalo, N. Y., for 100 new cars in addition to the 100 side-exit Peter Witt cars now being received from the G. C. Kuhlman Car Company, the city will buy the equipment and lease it to the railway. Mayor George S. Buck made this statement to E. G. Connette, president of the International Railway, at a conference attended by members of the new municipal electric railway commission, Col. Bion J. Arnold, Chicago, of the War Department at Washington and John C. Brackenridge, who has been retained by the City Council to make a survey of traffic conditions on the city lines of the company.

COLONEL ARNOLD PROMISES AID

When President Connette said that several questions, including that of financing the purchase of the equipment, would have to be considered by directors of the company before such an order could be placed, the Mayor suggested that the notes of the International Railway covering the proposed equipment would be acceptable to banking houses, and Colonel Arnold of the War Department said that the government would aid in a situation involving transportation problems of workers in munitions plants and other war industries.

It has been agreed that the company shall have additional time in which to consider the placing of a new order for 100 cars. The company has been directed to place in operation in the meantime during the rush-hour periods all of its open cars as an emergency measure. Old cars not equipped with vestibules for the motormen may be rebuilt so as to afford the necessary protection and will probably be placed in operation until the new cars arrive.

HOW THE WAR BOARD IS INTERESTED

Federal officers in charge of production in munition and other war industries called the attention of the War Department at Washington to the railway situation in Buffalo, and it is because of this fact that Colonel Arnold was sent to investigate conditions. When President Connette explained to Colonel Arnold the many difficulties encountered by the company in getting its order of 100 cars from the car builders, the colonel promised the full co-operation of the government in getting the new equipment in the shortest possible time. A preliminary investigation disclosed that the car builders have been delayed through the loss of a shipment of electrical equipment from a Boston manufacturer. This shipment is now being traced by federal agents and every aid will be extended to the Kuhlman Company in an effort to rush the delivery of the Buffalo cars. The government has promised to provide flat cars to bring the new equipment to Buffalo so as to avoid the delay caused by operating cars on their own power between Cleveland and Buffalo.

In a weekly report to the City Council on traffic conditions on the International lines in Buffalo, Mr. Brackenridge said that the company has based its car schedules upon too high a rate of speed. This caused frequent bunching of cars and delays. He said that the rate of 9 m.p.h. during the winter months was too high for Buffalo and that 7 m.p.h. should be the maximum during the winter. Mr. Brackenridge recommended that the company employ checkers to ride the cars and keep an accurate check on the length of time required for the car to reach certain specified points along the line. During a road inspection with members of the municipal electric railway commission Mr. Brackenridge reported he observed spaces between cars, considerably in excess of the 3600 ft. provided for under the schedule of this line. On the Elmwood Avenue line, which serves the Elmwood-Hertel industrial district and the large war plants, Mr. Brackenridge said that the schedule from terminal to terminal was thirty-eight minutes and the actual running time during rush-hour periods was fifty-eight minutes.

SCHEDULE SPEED TOO HIGH

In commenting on the schedule speed of this greatly congested line, Mr. Brackenridge said the rate of speed should be reduced from 9 m.p.h. to 6 m.p.h. and if this latter figure is found too low, it should be increased after careful checks are made by checkers who ride the cars. Mr. Brackenridge said that the low rate of speed would probably not work out well on paper, but that in actual operation it would prevent delays, bunching of cars and congestion. Statistics were filed with the municipal authorities by Mr. Brackenridge which had been taken from the "McGraw Electric Railway List" of August, 1917, showing the population per car and number of cars per mile of track operated in the large cities of the country.

POLICE AUTHORITY GIVEN TO SUPERVISORS

Upon the recommendation of Mr. Brackenridge, E. J. Dickson, vice-president of the International Railway, has agreed to place the company's thirty-two supervisors in uniform and each supervisor will be sworn in as a special officer and will display an officer's badge on the outside of his uniform so as to enable him to assert his authority in keeping track-hogs from delaying cars. Each supervisor will be placed in charge of 3 miles of double track. Mr. Brackenridge said that many of the irregularities he has observed in the operation of cars could be effectively corrected by uniformed supervisors.

Additional trains have been placed in operation on the belt line service around the city by the New York Central Railroad so as to relieve the traffic situation. Mr. Brackenridge said that with efficient operation and regular schedules, this loop service around the city could handle at least 42,000 passengers and thereby greatly relieve the street car situation.

Use of Women Protested

Brooklyn Labor Union Objects to the Employment of Women by the B. R. T.

In response to a protest made by the Central Labor Union of Brooklyn and Queens against the employment of women on the electric railways in Greater New York, Chairman Straus of the Public Service Commission for the First District has replied that if the union thought it could produce facts showing that the employment of women menaced the adequacy, safety or continuity of the service, an effort would be made to arrange for public hearings at which testimony along these lines might be submitted. Mr. Straus' statement was in part as follows:

THE COMMISSION'S ATTITUDE

"The commission has not the power to say on physical or moral grounds, or for reasons of health, public policy, or the maintenance of proper wage standards, that women shall or shall not be employed, or that only men shall be employed. The law thus far leaves to the companies the selection of employees and leaves to the companies and their agreement with present or prospective employees the determination of the wage contracts. The commission has no power to exclude either men or women from any employment by reason of sex, or to say that men or women shall not continue in the employment of a railroad company."

Mr. Straus said that the question of competency, qualifications, or suitability of employees could be treated by the commission only if the public safety or convenience was threatened.

Who Am I?

I do much good.

I am an asset to you.

I have made friends and followers for the company.

I am a universal rule; in fact, I have become a habit.

I help you to hold your job.

I am everywhere.

Great men have written books about me.

I am contagious.

Without me no business can be truly successful.

I am one of your good friends.

I gain much and lose nothing.

I am a habit well worth acquiring.

I am on an equal footing with kindness.

I am COURTESY.

JOHN C. RIESENBERGER in *Here We Are.*

Heating Order for Brooklyn

After a consideration of the coal supply and other conditions word was sent by the Public Service Commission for the First District of New York to the Brooklyn Rapid Transit Company on Jan. 26, that there no longer existed any reason why heat should not be furnished in the cars and trains of that system in Brooklyn, and that the commission would expect that beginning not later than Jan. 29 heat would be so furnished.

The company on Nov. 14 asked the commission to suspend its heating order during the rush hours. It was explained that it was not proposed to stop heating the cars altogether, but to heat them probably an hour before they were placed in service for the rush hour so as to reduce the energy necessary to maintain a reasonable temperature. The commission then approved a plan for a test of the new arrangement. This plan was referred to in the ELECTRIC RAILWAY JOURNAL of Nov. 24, 1917, page 967.

Transportation News Notes

Ordinance for Increased Fare.—An ordinance has been introduced in the City Council at Frankfort, Ky., providing for 6-cent fares. The Kentucky Traction & Terminal Company, which operates the city lines, announced that unless the relief which it asked was granted, it would have to curtail service materially.

Three Killed in Accident.—A rear-end collision in which an interurban car of the Louisville & Southern Indiana Traction Company, on the approach to the bridge over the Ohio River at Louisville, was struck by a through car from Indianapolis to Louisville late on Monday afternoon, Jan. 14, resulted in three deaths and a score of passengers injured.

Trainmen Required to Help Enforce Law.—The city of Houston, Tex., has enacted an ordinance by which conductors of electric railway cars are required to report to the city secretary when any automobile passes a car which has stopped to take on or discharge passengers. The city ordinances prohibit this, and the trainmen are required to assist in enforcing the law.

Youngstown Company Threatened.—The city solicitor of Youngstown, Ohio, was authorized by the City Council on Jan. 21 to notify the officials of the Mahoning & Shenango Railway & Light Company that if railway service was not increased 50 per cent within the next thirty days proceedings would be started to revoke the franchise under which the company is operating.

California Jitneys Disappearing.—Although a few months ago 800 jitneys were operating in Los Angeles, Cal., less than fifty are now in service, according to the *Key System News*. There is none in San Diego, Alameda or Berkeley, only about a dozen in Oakland, and a few in Sacramento. San Francisco is practically the only California city which still has a considerable number of the "parasites."

Bay State Bulletin on Press Articles.—The Bay State Street Railway, Boston, Mass., has begun the plan of sending a weekly memorandum to all department heads calling attention to articles in the technical press in which it is thought the recipients will be interested. Occasionally an entire article will be so circulated, as was the case with the text of some remarks by W. H. Glenn, Atlanta, which appeared in the ELECTRIC RAILWAY JOURNAL for Jan. 19, page 149.

426 Collisions in a Month.—The New York (N. Y.) Railways Company has made an analysis to show the streets most prolific in accidents in December. There were 426 collisions between cars and vehicles of different kinds during the month. As a result, five employees, twenty-five passengers, and fifty-seven persons on vehicles were injured. One hundred and sixty-nine passengers were injured getting on and off cars in the month. More people were hurt getting on than off. The company's latest compilation shows a total of 1143 accidents of all kinds in December, 1917, as compared with 1855 in December, 1916.

Help the Motorman!—The Quincy (Ill.) Railway, included in the Illinois Traction System, has appealed to drivers of vehicles and to pedestrians to co-operate with the motormen of its cars in an effort to reduce the number of street accidents. The company says: "Safety first. Help the motorman. The motorman sees hundreds of wagons, automobiles, bicycles and baby carriages crossing his track every day. He sees and has to watch the movements of thousands of persons. He has to stop his car hundreds of times. He has grave responsibilities. He has to be careful. Why not help him by being careful yourself?"

Relief from Special Fare Contract.—Judge Cushing of the Hamilton County (Ohio) Common Pleas Court held on Jan. 17 that the contract for a special monthly ticket rate for its employees made by the King Powder Company with the old Rapid Railway cannot be enforced in equity against the Interurban Railway & Terminal Company or its receivers and that the only relief possible for the employees of the powder company must come from the Public Utilities Commission. The powder company had sought to enjoin Charles S. Thrasher and Charles M. Leslie, the receivers, from discontinuing the old monthly rate.

New York Fare Cases to Proceed.—The Public Service Commission for the First District of New York has been informed that the Third Avenue Railway and other surface railroads will be ready to go ahead with their cases when the hearings on the companies' applications for permission to charge 2 cents for transfers are resumed on Feb. 6. These hearings have been adjourned from time to time at the request of the companies, but the most recent adjournment was made at the request of the city of New York through the corporation counsel, who stated that the city, a party to the cases, would not be ready to resume until the date mentioned.

Fare Increase Proposed for Galesburg.—The Galesburg Railway, Lighting & Power Company, Galesburg, Ill., controlled by the Illinois Traction System, has decided to ask the State Public Utilities Commission for a straight 5-cent fare. At the present time the company issues twenty-five tickets for $1, the tickets being sold only at the office of the company. It was originally intended to ask the City Council for the increase, but later when that body assured the company that it would not object to a request for the elimination of the tickets being made of the State commission, and that it would abide by the decision of the commission, it was decided to make the request direct to the State regulatory body.

New Publications

Income Tax Procedure, 1918. By Robert H. Montgomery. The Ronald Press Company, 20 Vesey Street, New York, N. Y. 800 pages. Leather, $4.

This succeeds Mr. Montgomery's 1917 interpretation of the income tax law. It includes the latest possible advices regarding the new laws, and provision is made for sending to buyers a supplement of important treasury rulings soon expected. The book is noteworthy for its careful exposition of the law and its frank criticism of provisions and treasury rulings which the writer thinks should be changed.

How to Study. By George F. Swain, LL.D., professor of civil engineering in Harvard University and Massachusetts Institute of Technology. McGraw-Hill Book Company, Inc., New York. Sixty-five pages. Paper, 25 cents.

Into the small compass of this book Professor Swain has condensed the principles of a neglected but essential art. While every thinking man will concede that his progress depends upon his methods of study, very few have given much thought to mental processes. There is no doubt that even a casual reading of "How to Study," which is written in popular style, will enable any man who uses his head at all to use it to better purpose.

Personal Mention

P. M. Hatch, who has been manager of the Ponce (P. R.) Electric Company, is now in the ordnance department at Washington.

Bert H. Wales, formerly chief inspector of the Denver (Col.) Tramway, has been promoted to the position of superintendent of the South Division of the company.

W. L. Weston, manager of the Houghton County Traction Company, Houghton, Mich., has been commissioned a first lieutenant in the United States Infantry.

E. L. Milliken, lighting superintendent of the El Paso (Tex.) Electric Company, has been appointed manager of the Houghton County Traction Company, Houghton, Mich.

C. J. Munton, president and general manager of the Fort Wayne & Northwestern Railway, Kendallville, Ind., has been re-elected president of the Noble Motor Truck Company.

James O. Heyworth, president of the International Transit Company, Sault Ste. Marie, Mich., has been appointed manager, Division Wood Ship Construction, Emergency Fleet Corporation. United States Shipping Board.

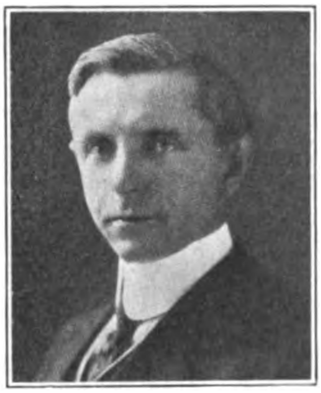
Edmond O'Callaghan, formerly superintendent of employment and inspection and recently appointed assistant to the claim agent with the Bay State Street Railway, Boston, Mass., has resigned to become connected with O'Neil & Parker, Boston representatives of the United States Fidelity & Guaranty Company, Baltimore.

G. A. DeHaseth, chief engineer of the Tacoma Railway & Power Company and chief engineer and roadmaster of the Puget Sound Electric Railway, Tacoma, Wash., has been appointed manager of the Ponce (P. R.) Electric Company, in place of P. M. Hatch, now in the Ordnance Department at Washington. Both properties are controlled by Stone & Webster.

Dana L. Spring, who for the last nine years has been a member of the law firm of Norton, Penney, Spring & Moore, of counsel for the International Railway, Buffalo, N. Y., has resigned from the firm to enter partnership with Hamilton Ward. Mr. Spring has specialized in trial work and has handled this branch of the International Railway's negligence actions for several years.

A. J. Bush, Jr., Dallas, Tex., has been appointed assistant to the general manager of the Texas Electric Railway, Dallas, the consolidated Strickland lines. Mr. Bush will maintain headquarters in Waco and will have charge of the Waco division of the Texas Electric Railway, and will also be manager of the Waco city system, which is owned and operated by the Texas Electric Railway.

W. J. Flickinger, chairman of the efficiency committee of the Connecticut Company, New Haven, Conn., since Nov. 1, 1914, has been appointed to the position of assistant to the president. The title of chairman of the efficiency committee has been abolished. Mr. Flickinger entered railway work with the Lehigh Valley Railroad in June, 1899, and continued with that company until March, 1907. He was employed in the car shops and at the office of the master car builder of that company at Packerton, Pa., from June, 1899, to July, 1900. He was connected with the office of the superintendent of motive power of the company at South Bethlehem, Pa., from July, 1900, to September, 1905. He was employed in the office of the purchasing agent of the company in New York City from September, 1905, to March, 1907. On April 1, 1907, Mr. Flickinger entered the employ of the New England Investment & Security Company, Boston, controlling the New Haven Railroad's electric railways in Massachusetts, as a clerk in the office of President L. S. Storrs, of that company, now president of the Connecticut Company. In September, 1908, at the time the offices of that company were moved to Springfield, Mass., Mr. Flickinger became chief clerk to Mr. Storrs. He continued in that capacity until July 1, 1911, at which time he went with Mr. Storrs in the same capacity with the Connecticut Company, New Haven, Mr. Storrs having been elected president of that company. On Nov. 1, 1914, he was appointed chairman of the efficiency committee of the Connecticut Company. In 1917 Mr. Flickinger was awarded the bronze replica of the Brady gold medal for 1916 awarded to his company for the best record by an electric railway for the year along safety lines. In addition to the other duties that will devolve upon him in the position of assistant to the president Mr. Flickinger will continue the work heretofore carried on under the title of chairman of the efficiency committee. Mr. Flickinger was the first president of the Connecticut Company section of the American Electric Railway Association, having retired from the position only a few weeks ago.



W. J. FLICKINGER

C. C. Curtis, lighting superintendent of the El Paso (Tex.) Electric Company, will assume the duties of manager of the Cape Breton Electric Company, Ltd., operating the electric railway and lighting properties at Sydney, N. S., replacing E. L. Milliken, who goes to Houghton, Mich., as manager of the Houghton County Traction Company, in place of W. L. Weston, now first lieutenant in the United States Infantry. The El Paso, Cape Breton and Houghton properties are all controlled by Stone & Webster.

Roy Ballou has been appointed chief inspector of the Denver (Col.) Tramway. Mr. Ballou has traveled far and wide. He was formerly a petty officer in the United States Navy. As such he took up as a member of the American forces in their participation in putting down the Boxer rebellion in China. He is also said to have upheld the reputation of the navy as its representative in a limited round engagement with Terrible Terry McGovern when the terrible one was in his prime.

James O. Carr, Schenectady, a republican member of the Public Service Commission for the Second District of New York, has placed his resignation in the hands of Governor Whitman. Mr. Carr's term does not expire until 1920. He desires to resume the practice of law. Before his appointment to the commission Mr. Carr was one of the attorneys for the General Electric Company. In 1916 he went abroad to study the transportation systems of France, England and Italy under war conditions.

G. A. Richardson, general superintendent of the railway department of the Puget Sound Traction, Light & Power Company, has returned to Seattle from the East. Several weeks ago Mr. Richardson was called into conference with officials of the American International Shipbuilding Company, and of the Philadelphia (Pa.) Rapid Transit Company, regarding transportation to and from the city and the Hog Island industrial development. During his absence from Seattle Mr. Richardson visited Boston, New York, Chicago and other cities.

Luzerne S. Cowles has resigned from the Boston (Mass.) Elevated Railway to accept the position of engineer in the structural division of the Stone & Webster Engineering Corporation. Mr. Cowles was born in Hartford, Conn., in 1876, and was graduated from the Massachusetts Institute of Technology in 1897 in the department of civil engineering. His practical engineering experience began in the estimating department of the Boston Bridge Works, and, after a year's travel and study in Europe, in 1899 he became associated with the bureau of elevated and subway construction of the Boston Elevated Railway. He had been with this company for the last eighteen years.

Harry L. Brown, western editorial representative of the ELECTRIC RAILWAY JOURNAL, with headquarters in Chicago, has accepted a temporary appointment as radio engineer in the office of the Chief Signal Officer, United States Army, Radio Division, Washington, D. C. It is understood that he will have direct charge of the work of preparing literature for use as instructional material in the special radio courses which are being established at many of the engineering colleges throughout the country in co-operation with the Signal Corps. L. E. Stibbe of the New York editorial staff of the ELECTRIC RAILWAY JOURNAL will take up the editorial work in the Chicago office temporarily.

C. H. Hubbell, formerly auditor of receipts of the Illinois Traction Company, Peoria, Ill., is now connected with the First National Bank, Cleveland, Ohio, in the capacity of tax consultant. Mr. Hubbell is a certified public accountant. He was previously income tax inspector of the United States Treasury Department. As part of his work for the bank Mr. Hubbell has recently compiled a table showing concisely the application of the federal income and profits tax laws to Liberty Bonds. He had from one to ten inquiries daily in regard to these matters, and the statement which he has compiled is particularly helpful because it is compact, and reference may be made to it much more easily than to the tax laws and to the laws under which the bonds have been issued.

Richard D. Simms, treasurer of the Capital Traction Company, Washington, D. C., has been advanced from colonel to brigadier-general, in command of the District of Columbia National Guard. The new post does not interfere with the duties of General Simms as treasurer of the company. He succeeds Brigadier-General Harvey, now at Camp Shelby. Brigadier-General Simms was born in the District of Columbia forty-nine years ago and was educated in the public schools there. For twenty years he was employed in the District of Columbia government. In 1905 he resigned his position as purchasing agent of the District to become treasurer of the Capital Traction Company. Brigadier-General Simms has already served twenty-two years in the National Guard of the District, enlisting as a private in the field artillery. He was next made a first sergeant of cavalry, and later was in the infantry. He served a total of seven years as an enlisted man and fifteen years as a commissioned officer. In 1898 he was a captain in the First District of Columbia Volunteer Infantry. He served at Camp Alger, Va.; Camp Chickamauga, Ga., and at Tampa, Fla., and Huntsville, Ala. At the conclusion of the war with Spain General Simms returned to the local National Guard as a first lieutenant. He was promoted to major in 1899, and in 1909 was made a colonel. He was retired voluntarily in 1911.

E. C. Faber, Head of War Board Traffic Bureau

Man from Illinois Has Big Task of Arranging to Place Facilities of Electric Lines at Disposal of Government for Relief of War-Time Traffic Situation

To Edwin C. Faber, as traffic manager of the Traffic Bureau of the Electric Railway War Board, with headquarters in the Munsey Building, Washington, has been entrusted the big task of bringing the facilities of the electric railways of the country to the aid of the nation during the present crisis.

STARTING THE WHEELS

One of Mr. Faber's first acts as traffic manager of the Electric Railway War Board was to send to electric railways a list of questions for the purpose of assembling traffic data for the benefit of the Director General of Railroads. Mr. Faber states that under present circumstances it is the patriotic duty of each American citizen to bend every effort toward relieving the present traffic congestion and toward placing on the highest plane of efficiency every existing transportation facility. This will entail co-operation on the part of everyone concerned, including the public, and this must be constantly borne in mind in any consideration of the subject. It is evident that the electric railways can be used to supplement steam railroad service, thus relieving the steam roads of a considerable amount of short-haul traffic, so as to render steam road cars and facilities available for long-haul business—business which the electric railways are not in a position to handle.

E. C. FABER

WHAT MR. FABER HAS DONE

Mr. Faber is vice-president of the Aurora, Elgin & Chicago Railroad, operating more than 170 miles of third-rail and overhead electric railway out of Chicago, from which property he has secured leave of absence. He has had a remarkably successful career from the time when, as a young man, he secured a clerkship in one of the offices of the Cleveland Electric Railway.

Born in 1875, twenty-six years later Mr. Faber became general superintendent of the Cleveland system, and for many years bore the distinction of being the youngest general superintendent of an important city electric railway of the United States. His success has been very largely due to his faculty of "doing things" and the persistence with which he has familiarized himself not only with the details of the particular job in which he was engaged at the time, but those of every other position within his ken. From clerk he became a timekeeper, then connected with the accounting department, of which he later assumed charge, then general passenger agent; assistant to the general manager and finally general superintendent.

After the Cleveland city property changed hands in 1902 and its former general manager, Ira A. McCormack, became general manager of the Grand Central Terminal in New York, he commandeered the services of Mr. Faber, who had an important part in connection with the electrification of the New York Central lines entering New York. This work was done by the General Electric Company and when completed, Hinsdale Parsons, vice-president of the General Electric Company, made Mr. Faber his assistant and put him at work making investigations and reports on the various electric railway, light and power properties in which the company was interested.

In 1904 Mr. Faber became general manager of the Aurora, Elgin & Chicago Railroad and vice-president of the Elgin, Aurora & Southern Traction Company. A year later these two properties were consolidated with the Cook County & Southern Traction Company and Mr. Faber became general manager of the combined properties. In 1913 he was in addition made vice-president of the company.

HELP HIM! IT'S YOUR DUTY!

Mr. Faber's very wide knowledge of the electric railway business and his connection with interurban railways admirably fit him for the new position to which he has been appointed. But Mr. Faber's task—that of taking over by the electric railways such business of the steam roads as the electric lines can handle—is one that he, unaided and alone, cannot carry out to a full measure of success. He realizes this and has said so frankly. The electric railway industry stands to gain or to lose by just the extent that it does or does not co-operate with Mr. Faber along the lines laid down by him in his original traffic questionnaire.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Davis Creek & Spring Hill Railway, Spring Hill, W. Va.**—Incorporated to construct a line from near Spring Hill to a point near the middle fork of Davis Creek. Capital Stock, $50,000. Incorporators: R. N. Snyder, Samuel Edwards, L. P. Snyder, H. T. Smith and E. M. Surber, all of Charleston, W. Va.

Franchises

Los Angeles, Cal.—The Los Angeles Railway has received permission from the City Council to abandon its East Fourteenth and Tennessee Streets line on condition that the company will extend its West Jefferson Street line from Third to Ninth Avenue.

Elmira, N. Y.—The Elmira Water, Light & Railroad Company has asked the City Council of Elmira for a franchise to construct a line on East and West Chemung Place from Main Street to Maple Avenue, in order that a portion of the heavy traffic may be taken off the Main Street bridge.

Richmond, Va.—The street committee of the City Council of Richmond adopted a resolution recommending that the petition of the Richmond & Seven Pines Railroad to use the streets of the city under the new ownership in the same manner which they are now being used be granted.

Track and Roadway

Birmingham Railway, Light & Power Company, Birmingham, Ala. — Electric railway service has been discontinued by the Birmingham Railway, Light & Power Company on its Rugby Highlands car line, East Lake, southside, under orders from the State Fuel Administration as a war measure to save fuel.

Los Angeles (Cal.) Railway.—This company will extend its lines over Tenth Street to the private right-of-way to the new Los Angeles high school.

Pacific Electric Railway, Los Angeles, Cal.—Work is progressing rapidly on the double-tracking of the Pacific Electric Railway line between Los Angeles and Pomona.

Chicago (Ill.) Surface Lines.—The first lap of the Hegewisch extension from 108th Street and Ewing Avenue has been placed in operation as far as 118th Street and Burley Avenue. The cars will reach the plant of the Interstate Iron & Steel Works.

Consolidated Street Railway, Strong City, Kan.—This company which operates a 2-mile horse car line between Cottonwood Falls and Strong City, will put on a self-propelled car. The track is being relaid to accommodate the heavier equipment.

Southwest Missouri Railroad, Webb City, Mo.—The contract for the construction of culverts and bridges for this company's proposed line between Baxter Springs and Picher, via Hockerville and St. Louis, has been awarded to the Topeka Bridge Company.

International Railway, Buffalo, N. Y.—The Public Service Commission for the Second District of New York, has announced a hearing to be held at its office in Buffalo on Feb. 6 in the proceeding which it has instituted to alter grade crossings by the International Railway of certain streets in North Tonawanda. The railway company, the city of North Tonawanda and other persons interested have been ordered to show cause, the commission holding that public safety requires an alteration of certain existing crossings. It is proposed that instead of crossing at grade the railway shall cross by overhead bridges, Payne Avenue, Linwood Avenue, Fredericka Street, East Fulton Street, Jackson Avenue, Stenzel Street, Ward Road and other streets in the city south of Witmer Road, which are crossed at grade including Sixteenth Street, Seventeenth Street, Eighteenth Street and Nineteenth Street.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—The Public Service Commission for the Second District of New York issued an order directing the Elmira Water, Light & Railroad Company to discontinue operation of cars of certain weight over the Main Street bridge in Elmira. Steps will be taken by the company to build about 1800 ft. of new track and divert traffic to the Lake Street bridge.

Ottawa (Ont.) Electric Railway.—A report from this company states that it will reconstruct 2 miles of track.

Virginia Railway & Power Company, Richmond, Va.—In order to better the electric railway service in Norfolk, the Virginia Railway & Power Company made a proposition to the traffic committee, composed of delegates from the Norfolk business organizations, to make Monticello Avenue and Granby Street one-way traffic streets. The proposition made by the company included a better electric railway system for the Ghent section of Norfolk and a ten-minute schedule for Berkley. In order to put the proposition through without delay the company would use the Bay Shore tracks to make a standard gage system all over the city.

Monongahela Valley Traction Company, Fairmont, W. Va.—Surveys are being made by the Monongahela Valley Traction Company in the Marietta District for the extension of the company's lines into certain suburban districts. Lines will be extended to West View and Norwood, necessitating additions of about 2½ miles of track.

Shops and Buildings

Northern Electric Railway, Chico, Cal.—A new station will be built by the Northern Electric Railway near Globe.

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—Announcement has been made by the Terre Haute, Indianapolis & Eastern Traction Company that hereafter all freight shipments will be handled at the new freight house and terminal, Kentucky and Oliver Avenues, Indianapolis.

Concord, Maynard & Hudson Street Railway, Maynard, Mass.—Fire completely destroyed the carhouse of the Concord, Maynard & Hudson Street Railway at Main Street and Great Road, and all the rolling stock owned by the company with the exception of two cars. Twelve trolley cars, a snowplow and a construction car were burned together with a large amount of wire and other construction material.

International Railway, Buffalo, N. Y.—Fire completely destroyed the Forest Avenue carhouse of the International Railway on Jan. 23, together with forty-eight cars, four snowplows and sweepers and one work car. The loss is estimated at about $500,000. For further details see page 244.

Power Houses and Substations

Northern Electric Railway, Chico, Cal.—John P. Coghlan, receiver of the Northern Electric Railway has sought an order from United States District Judge Dooling, authorizing the purchase of an additional generating unit at a price of $37,500. In his petition Mr. Coghlan asserts that the freight traffic on the Northern Electric Railway is steadily increasing.

Pensacola (Fla.) Electric Company.—This company contemplates the erection of a 13,200-volt transmission line to the Pensacola naval station.

Interborough Rapid Transit Company, New York, N. Y.—Plans are being prepared by the Interborough Rapid Transit Company for the erection of a one-story transformer station, 50 ft. x 100 ft. on Livonia Avenue, near Rockaway Avenue, Brooklyn, to cost about $40,000.

Virginia Railway & Power Company, Richmond, Va.—Plans have been made and application filed by the Virginia Railway & Power Company for an addition to its power plant at the foot of Twelfth Street, Richmond, to cost $6,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Prevailing Conditions in Wire Market

Western Stocks in Very Bad Shape—Supplies in the New England Market Are Increasing

To some observers the future price of copper wire to the trade is a puzzle. The government has, of course, fixed the price of ingots at 23½ cents. Ordinarily the mills formerly got about 1 cent a pound for working it up. Now they get, on account of labor conditions, from 3 cents to 4 cents, bringing factory prices on wire up to 26½ cents to 27½ cents. Chicago jobbers are at present continuing on a 30-cent base for rubber-covered and a 28-cent base on weatherproof.

On the Pacific Coast rubber-covered wire stocks have been seriously depleted of late by the slowing down of deliveries without corresponding decrease in demand. Despite this condition a tendency to a lower price is reported. Weatherproof wire stocks are also in worse shape than before, but are not so bad as rubber-covered.

In New England, however, wire and cable stocks are increasing, at least temporarily. One large manufacturer reports putting the first stock order through the works for many months, covering varied sizes. Weatherproof wire is quoted at 27 cents and rubber-covered at 30 cents.

Weatherproof wire was quoted in New York as the week opened at 28¼ to 34¼ cents per pound in 100-lb. lots.

Transportation Delays Deliveries

Local Stocks of Supplies Are Feeling the Strain of Lessened Incoming Material

Storms of the past two or three weeks in the East and Middle West have crippled transportation badly. Similar congested conditions prevail on the Pacific Coast. Each week the receipts of supplies have been smaller.

As a result local stocks of many staples are diminishing and in not a few instances a very serious situation is being faced. Embargoes to the Eastern seaboard have diminished stocks of iron and steel goods. In this list are a great many products used by railways in maintenance work.

Various things are being done in different parts of the country to relieve the congested condition of the roads, but even with the saving effected it will be many weeks before any material reduction can be made in delivery time.

Besides having the immediate effect of putting a strain on local stocks of finished products the railroad breakdown has another more lasting result. Factories have not been able to procure sufficient supplies of raw materials in many instances and the later output of the finished product will naturally be affected.

Cedar Pole Market Exceeds Expectations

Lack of Transportation Facilities and Utility Financing Conditions—Accumulation of Large Stocks

The twenty-second annual meeting of the Northern White Cedar Association was held at the Radisson Hotel, Minneapolis, Minn., on Jan. 22 and 23. Vice-President J. E. Gerich presided in the absence of the president, J. T. Kirkpatrick, who was unable to attend owing to work in connection with the exemption appeal board at Houghton, Mich. The meeting was attended by representatives of twenty-two of the leading cedar producers. The secretary in his report, reviewing the principal activities during the year, stated that the year 1917 was marked by an extraordinary traffic in cedar products, which was much greater than was anticipated. No papers were read, the entire time being devoted to presentation of committee reports and discussions of pertinent subjects.

The pole committee reported a good supply of poles on hand, which is ascribed to a lack of transportation facilities and the inability of many operating companies to procure funds for improvements. The post committee predicted a satisfactory business for post shippers. An exceptional market for posts had not been looked for in 1917 owing to the need of increased crop production and the high costs of fencing and farm labor. From the discussion of car supply it is thought that the situation is better this year than it was last. The priority which is expected for shipments of poles to public utilities it is thought will contribute to a favorable traffic in this product during 1918. It was recommended that the work of the pole advertising committee be continued, and appropriations were made for this and post advertising.

The election of officers for the ensuing year resulted as follows: President, J. E. Gerich, MacGills & Gibbs Company, Milwaukee; vice-president. L. L. Hill, Page & Hill Company, Minneapolis; W. L. Lafean, Chicago, and J. C. Kirkpatrick, the retiring president, were elected directors. W. D. Thomas and N. E. Boucher were continued in office as treasurer and secretary respectively.

Lightning Arrester Sales Active

Reports from the South State That Deliveries Are Slowing Up—Two to Five Months Specified

Heretofore the demand in the South for lightning arresters was more or less sporadic, but expansion of transmission systems in the Southeast has tended to flatten out the demand. Manufacturers report that last week's thunderstorms stimulated sales and brought to the attention of operating engineers the necessity of anticipating summer requirements. The aluminum-cell type has been quite active, but deliveries are slowing up. Manufacturers report great difficulty in securing steel containers and aluminum. Arresters for 6600 volts and below are promised for two months. Higher potentials cannot be had in less than five months, with the possibility of even longer shipments. There has been no decided change in prices recently.

Electric Railway Credits in the Southeast

Material Manufacturers and Jobbers Aver Collections Good—Peculiar Position of Traction Properties

Manufacturers and large jobbers handling electric railway material report that collections in general show an improvement over December, with the exception of a small number of isolated cases. A few of the larger accounts with manufacturers covering heavy equipment were slow coming in during the latter part of December, but these were taken care of in the early part of January and a fairly clean slate is presented at this time.

Electric railways in the Southeast hold a peculiar position, in that the majority are consolidated and operated in conjunction with lighting and power systems or controlled by holding companies. This feature influences the perspective of the credit man. The isolated systems that are not securing any direct benefit from military transportation are traveling a hard road in the face of increasing labor and maintenance costs. On the other hand, those systems securing military patronage are holding operating ratios down and doing as well as can be expected.

There is no doubt, however, that the equipment manufacturers are following up accounts more closely, and although this may not be construed as restricting or tightening up of credit facilities, nevertheless buyers are impressed with the fact that their accounts must be

Track Material Steady but Slow

Equipment for Maintenance and Replacements Receiving the Call—Prices High—Certain Lines Scarce

With manufacturers and supply dealers of minor accessories and specialties, covering particularly track materials, the market is not altogether stagnant. In fact, considerable activity is noted with houses operating in this field, when conditions are taken into account. An authority on rails, plates, bolts, spikes and general track material states prices are keeping in line with the government selling figure on pig iron. This is also true of refined iron, bar steel and angle bars. Inquiries will not come along for immediate delivery. There is a mild inquiry for such specialties, mainly for track maintenance and replacement, on the part of electric roads, but it is nevertheless steady. Track cannot last forever, according to the same speaker, and even if the electric railways are in no financial position to buy as they should there is evidence that something is moving in the supply field, and it represents a regular trade if not remarkable in volume.

The straits that some electric roads are in for track maintenance and replacement is illustrated by a company in New York State that ordered a couple of cars of rails. When en route and before arriving at their destination the rolling mill, the statement says, ascertained its customer was by no means able to pay for the goods according to the contract. Without even notifying the buyer, the rails were rerouted and forwarded to another road, which happened to be in sufficient funds to pay the bill. It is said this is not an isolated instance, although no complaint is heard, because the electric properties are believed to be doing the best they can under the circumstances. Rail bonds including special heavy bonds are deliverable inside of a month. Third-rail anchors in carloads are going forward within the same time.

Another manufacturer stated the price of copper was checking the sale of copper bonds to a considerable extent. In the spring, however, he looked for an improvement.

The recent storms were not only crippling transportation, rendering it more uncertain than ever, but the embargoes from Pittsburgh East, though expected to be raised, will probably be renewed. Steam railroad officials declare that the weather conditions are the worst they had experienced in thirty years. There were added difficulties because of the magnitude of current traffic. The actual freight situation is not a great deal improved over what it was on Jan. 1.

PROSPECTS IN PIG IRON MARKET

The last week has witnessed an opening of the pig iron market for the second half of the year and, while the volume of business is not large, the prospects are good for some heavy buying in the near future. After the wind-up of work on last year's adjustments and accounts a general desire to buy raw material is held to have taken possession of the trade. Sales for the second half are not very specific, in cases leaving out time of delivery and price, but being specific in description of material. The price is left open, as contracts must be written with a clause adjusting the price to any that may be made later by a government agency. A bolt and spike manufacturer stated he knew of many orders for pig iron which remained unfilled on account of the embargoes. That is to say, the material was finished at the foundry, but no cars could be had for shipping. Spikes, bolts, screw spikes can be delivered in a couple or three weeks, as can also some angle bars and tie-plates. Producers are ready to ship if they had facilities.

A manufacturer of track specialties, such as clamps, guard rail braces, derailers, tie plates, tie rods, rail joints, etc., states he was offering 60-lb. rails, for as good a delivery as the situation would permit, although the shipment would be prompt at $70 a ton. A lot of 1000 rails was available, however, at $60. Also a quantity of rails made for the Russian government, but undeliverable, was on the market at a still lower price. These rails differed from the kind used on American roads slightly, but they could be adapted with little trouble. They would probably find a market, he added, with a Cuban electric road. A large order of turnbuckles for the Interborough Rapid Transit Company, New York, ordered on Oct. 24 last, has not been received yet. Everyone concerned admits it is a seller's market.

Culverts are in weak demand just now, according to sales agents handling these goods, on account of the season. Old car wheels and relaying rails are scarce and backward on delivery. High prices prevail for both. Concrete showed a shade advance with the recent change in the price of cement due to the increase of lighterage charges. It is further reported that Portland cement is likely to move up at any time with a most decisive jump. There are some in that trade who think a $2.50 price per barrel, wholesale, will be reached before the end of the year.

(Concluded from page 258)

kept up in good shape in order that the manufacturers may, in turn, take care of heavy current obligations covering raw materials, and eliminate, as far as possible, the necessity for further borrowing on short time paper. The serious problem of steam railroad financing has been removed by government operation, but the situation regarding the financing of other public utilities remains as a potential item.

Current opinion in the Southeast is that Congress will take up the subject of corporate financing in the belief that no satisfactory solution will be found that does not involve some degree of governmental intervention of control, in this way distinguishing between essential and non-essential industries during the period of the war, and diverting much-needed capital to the electric railways and other public utilities.

War Board Rulings on Scrap Metals and Licenses

Exportation of Materials Under False Declaration—Photostatic Copies of Licenses Accepted

Desiring to stop the exportation of iron and steel products which are intended at destination to be scrapped and used as scrap metals, the War Trade Board has issued a a prohibitory order to that effect. Under date of Jan. 13 a formal announcement of the board states that any firm exporting articles manufactured of iron and steel, such as second-hand rails, car wheels, and other material, for the purpose of being scrapped at destination, is guilty of false declaration and subject to penalties.

Another order of the War Board, under date of Jan. 10, is a ruling that photostatic copies of the originals of licenses granted by the Bureau of Enemy Trade may be used in lieu of and will be given the same force and effect as the original licenses.

Rolling Stock

Petersburg & Appomattox Railway, Petersburg, Va., expects to buy ten new standard double-truck interurban cars in the near future.

Macon Railway & Light Company, Macon, Ga., in a rear-end collision with a freight train on Jan. 19, had a motor car destroyed by fire.

Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., has six convertible cars now on order with the J. G. Brill Company, Philadelphia, Pa. The company contemplates building another electric locomotive early in the year.

Concord, Maynard & Hudson Street Railway, Maynard, Mass., on Jan. 25 had its carhouse destroyed by fire, of unknown origin, and all the rolling stock owned by the company, with the exception of two cars. Twelve passenger cars, a snowplow and a construction car were burned, together with a large amount of wire and other construction essentials.

Hudson River & Eastern Traction Company, Ossining, N. Y., on Jan. 28 had a passenger car smashed to pieces by running against a station abutment. The car slipped on ice-coated rails, ran down a steep hill and jumped off the end of the track, after a run of 1000 ft. against the station of the New York Central Railroad.

Dallas (Tex.) Street Railway Company, being in the market for a new motor car and trailer, it was found that the car builders, according to a local report, refused to accept an order for the equipment with delivery stipulated earlier than two years. However, the needed cars—second-hand—were purchased from the Shreveport (La.) Traction Company.

Philadelphia, (Pa.) Rapid Transit Company is considering the purchase of a lot of 200 cars from The J. G. Brill Company. The additional rolling stock is needed to facilitate and enlarge transportation for the shipyard workers at Hog Island, Cramp & Sons Company and similar establishments in the vicinity of the city. The company has been negotiating with the United States government to assume the financial responsibility for the equipment, which probably will be of General Electric Company type. If these negotiations with the government to provide the funds for the purchase of these cars prove successful, they will be built and delivered on a priority basis.

Trade Notes

R. J. Morgan, formerly supervisor of sales for the American Steel Export Company, New York, N. Y., has been made assistant general sales manager.

Western Service Company, Spencer, Iowa, has been organized for the purpose of engaging in civil and electrical engineering and power-plant efficiency practice.

Crescent Electric & Manufacturing Company, Pittsburgh, Pa., recently bought the entire stock of the Pittsburgh Armature Works, thereby greatly increasing its capacity for work in that line.

Goulds Manufacturing Company, Seneca Falls, N. Y., has put into effect, beginning Jan. 1, 1918, a bonus system whereby all hourly piece work and salaried employees rated at $40 a week or under will receive quarterly a bonus of 10 per cent on their total salary for the previous three months. This bonus is contingent upon a stipulated amount of time being put in at actual work during the year and is aimed to encourage full-time work.

C. C. Nuckols, president of the Consolidated Car-Heating Company, who at the outbreak of the war was commissioned major in the Ordnance Department, has been ordered by the War Department to report to Washington for active duty under the direction of Col. Samuel McRoberts, recently appointed head of the procurement division of the Ordnance Department. The directors of the company have relieved Major Nuckols of active duty in connection with the Consolidated Car-Heating Company. During his absence Cornell S. Hawley will have active charge of the management of the company, as mentioned last week.

Holden & White, Inc., Chicago, Ill., distributor of the air rectifier for the prevention of frozen air brakes, has installed it on the following railway systems: Omaha & Council Bluffs Street Railway Company, Gary & Interurban Railroad Company, Charles City Western Railway Company, Springfield (Mass.) Street Railway Company, Terre Haute, Indianapolis & Eastern Traction Company, East St. Louis & Suburban Railway Company, New York State Railways, Lincoln Traction Company, Mahoning & Shenango Railway & Light Company, Lackawanna & Wyoming Valley Railroad Company.

New Advertising Literature

American Spray Company, New York, N. Y.: Cooling water with sprays is the subject of bulletin No. 71.

John F. Godfrey, Elkhart, Ind.: The Godfrey coal conveyor is illustrated and described in a circular prepared by John F. Godfrey.

Westinghouse Lamp Company, New York, N. Y.: A folder showing the growth of its plants caused by the increase in the demand for its lamps.

Rubber Insulated Metals Corporation, Plainfield, N. J.: "Rimco" rubber-insulated pliers are illustrated and described in a leaflet prepared by this concern.

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletin 233, just ready for mailing, goes into the merits and descriptions of air compressors and other machines.

Chicago Fuse Manufacturing Company, Chicago, Ill., and New York, N. Y.: "Union" renewable inclosed fuses for 250 volts and 600 volts are described in a leaflet prepared by this company.

National Tube Company, Pittsburgh, Pa.: "Rubber? No!" is the title of a four-page, illustrated circular, printed in colors, describing the "remarkable ductility of 'National' pipe," with specific examples.

Stow Manufacturing Company, Binghamton, N. Y.: Bulletins Nos. 101 and 102, entitled "Portable Tools of Proven Value," which will be sent upon request, contains and describes tools produced by a builder of forty-two years' experience.

Trico Fuse & Manufacturing Company, Milwaukee, Wis.: A leaflet descriptive of its renewable cartridge fuses. Seventeen features of these fuses are pointed out in this leaflet. This company has also printed a leaflet giving list prices of the fuses.

Wilson Welder & Metals Company, Inc., New York, N. Y.: Catalog No. 2, on electric welding. This book includes information on the development of the Wilson system, specifications of equipment, portable equipment, size, weight and use of electrodes and schedule of equipment, table of economies, physical tests of welded joints, economy and operation, etc.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.: Catalog A-2132 contains technical information regarding Bakelite Micarta-D gears. The distinctive features of this material for noiseless gears and pinions are listed, together with its physical properties. Methods of turning and drilling and gear cutting are described and illustrated with many halftones and drawings. Methods of attaching to the driving shaft which have proved suitable for gears of all sizes are shown and tables of pitch, teeth and other gear data are also given. There are formulas for the horsepower rating, the amount of power which can be transmitted through press fit and for calculating other variables in gear practice. It will be sent on request to the company's nearest office.

RAILWAY MATERIALS

	Jan. 23	Jan. 30
Rubber-covered wire base, New York, cents per lb.	30-33	30
Wire, weatherproof (100 lb. lots), cents per lb., New York	34¼-38¼	29.25-34.25
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38-38.35	33.50-38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.63	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.31	$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.32	$1.32
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	51	50

NEW YORK METAL MARKET PRICES

	Jan. 23	Jan. 30
Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	27	27
Lead, cents per lb.	7	7.82½-7.92½
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7.87½	6.85
Tin, Straits, cents per lb.	*86.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	34-36	34-36

OLD METAL PRICES—NEW YORK

	Jan. 23	Jan. 30
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	17½	17½
Yellow brass, cents per lb.	13½	13¼
Lead, heavy, cents per lb.	5¾	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.42	$42.42
Old carwheels, Chicago, per gross ton	$35.00	$35.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.50	$17.00

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*Nominal.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, February 9, 1918 *Number* 6

Rochester Saving Coal, Washington May Follow

THIS issue contains two articles which are of great interest at this time when necessity for saving fuel by everyone is of such paramount importance. One of these articles describes the steps which have actually been taken in Rochester by which, through a few changes in schedules and in operation, 17 per cent of the fuel used to operate electric cars has been saved. This amounts in Rochester to about 100 tons a day.

The other article on the possibilities of coal saving by electric railways is the Renshaw-Lambert-Layng report on their Washington investigation, of which some results were given out by Director Allen of the War Board at the Albany hearing on Jan. 4. This report, of which a copy was submitted to the Public Utilities Commission of the District of Columbia early last month, has just been made public by the War Board. Briefly, it shows that Messrs. Renshaw, Lambert and Layng have applied to the Washington situation a number of the principles of economical service described by Mr. Layng as desirable, in his article in our issue of Jan. 5. The result is that these engineers estimate that in Washington 25,790 tons of coal per year might be saved without impairment of the service to any considerable extent, and their estimates have been checked and approved by a committee of the National Research Council.

At the present time, when the attention of everyone is on fuel economy, exact information of this kind is most valuable to both electric railways and the communities which they serve. It should be of great assistance in calling the attention of both to wasteful practices which ought now certainly to be abolished in the interests of national economy.

Don't Forget the Medal Competitions

IT IS NOT too early for companies to begin planning to capture the Anthony N. Brady safety medal, to be awarded by the American Museum of Safety, and also the medal with which the American Electric Railway Association will recognize conspicuous merit in the papers presented this year before the company sections. Conditions in the electric railway field have of late been conducive neither to large expenditure on safety work nor to literary productivity. Viewed from another angle, however, there should be at least a reasonable incentive, even in 1918, to enter these competitions. If a railway has made a creditable accident record under circumstances like those obtaining at present the award of the medal will mean more to this particular company this year than it would two or three years ago. Similarly in the other competition, while the upset condition of everything has undoubtedly interfered with company section meetings, the very stress of circumstances has caused some excellent and timely papers to be presented already and it is not too late to have more of this kind prepared. The depressing influence of the war and the absence of the usual association meetings will make it difficult to maintain interest in competitions of any kind for a time, but if they are good in peace time they should be doubly useful now.

Safe Axles for Electric Railway Cars

IT IS FAIR to say that the constant possibility of axle breakage is one of the chief causes of worry of the man responsible for the upkeep of rolling stock. The fundamental necessity of sound axles is evident. At the same time it is not good engineering to put more material into an axle, or into anything else for that matter, than is necessary to allow a proper factor of safety. A correct understanding of the principles which are involved in the safe operation of axles is therefore essential if the risk of breakage is to be minimized and the steel is to be economically disposed.

Compared with that of most structures the theory of the car axle is extremely complicated, in spite of its apparent simplicity. This is due to the nature of the stresses to which an axle is subjected. The hammer blows which it gets when the car passes over track irregularities, the bending moments due to rounding curves, etc., all combine to stress the outer fibers to a great and uncertain extent. The effects of these stresses must be determined from experience, but soundly to interpret the results of experience with a view to safety and, next in importance, economical use of material requires a knowledge of axle theory.

In view of the above facts this journal takes unusual satisfaction in presenting to its readers a series of three articles on interurban car axles by Norman Litchfield, the second of which is printed this week. These articles epitomize the results of years of practical and scientific study of the subject. Mr. Litchfield's point of view is that experience has shown that if certain maximum fiber stresses are not exceeded axles are long-lived. Analysis by well-known principles of mechanics, based upon experimental data and assumptions vindicated by experience, shows how the axle material should be distributed to produce the lowest possible maximum fiber stress. A combination, therefore, of analysis and empirical information must inevitably form the safest possible basis for axle practice. This position is logical—it leaves no place for rule-of-thumb. The best proportions for an axle to fulfill a given set of requirements are not to be settled by sentiment, opinion or compromise. They are logical deductions from the application of ascertainable laws.

We hope that Mr. Litchfield's articles will stimulate the readers of this paper to blow the dust from their old text-books on mechanics and dig deeply in the theorems which may possibly have failed to interest them during school days. This ought to be done, for here is a problem on the solution of which their highest success in part depends.

Commissions Should Be Recognized as Part of the Industry

IN THE development of the principles of public utility regulation, the larger commissions have built up extensive staffs of technical experts. In number of men and in ability, these engineering and transportation staffs are comparable with those of the largest public utility companies within the jurisdiction of the commissions. In some respects, even, these men have a better opportunity to understand the fine points of public utility operation than if they were connected with an operating company because their daily work takes them to many systems and gives them a wider field for observation.

In most cases these staffs have been built up almost entirely by men who have received their original training in railway work with operating companies. Indeed, there are several cases where commission officials have been invited to accept the highest executive offices in railway companies, as well as the converse, namely, where prominent public utility officials have resigned to enter into commission employ. These cases are bound to become more common in future because commissions will naturally desire to strengthen their forces by the best material available. The result of this situation is that there has been introduced, almost insensibly, into the electric railway industry a third component to supplement the two parts into which the industry has always traditionally been divided, namely, into operators and manufacturers.

We believe that every railway man as well as all others who have the best interests of the railways at heart will welcome this condition. The better the public utility commissions understand electric railway practice and the abler their technical staffs, the better and fairer will their regulation be. But it would help if there was a more general recognition by the companies of the fact that the commissions and their staffs form a component part of the industry and one from which help in solving their technical problems may be expected.

How can this be done? One opportunity is in association work, if the time ever comes when association activity can recommence and be conducted as it was before the declaration of war. Fortunately the constitution of the association puts no bar in the way of such wider participation in the work of the association by representatives of public utility commissions. Members of the staff of any commission, as well as the commissioners themselves, can join the association as individual members. But we believe the association could well go farther than that. These men should be led to understand that they are especially welcome at association gatherings, and their place in the industry could well be recognized by the appointment of individuals on various committees.

At one time there was considerable opposition to the admission of manufacturers to full membership in the association and to their appointment on association committees. This has now largely disappeared, and most of the important committees of the American and Engineering associations now include members from the manufacturing sides of the industry. The War Board is the principal exception to this rule; just why we do not know, but even here its important fuel conservation report was prepared by manufacturers.

The same good results which followed the recognition of the manufacturers as an important part of the industry by the association should follow the extension of a similar recognition to the commissions. After all, it makes little or no difference whether a traffic expert or transportation engineer is with an operating company, with a manufacturing company, or with a commission if he understands his business and can offer help to improve conditions.

The ELECTRIC RAILWAY JOURNAL does not intend to preach anything which it does not practise. We welcome contributions from technical men connected with commissions on problems in the industry just as much as we welcome discussions on the same subjects from operating officials. We endeavor to make the paper as much a paper for commissions as for railway men and to discuss commission problems, so far as they relate to electric railway matters, as we do problems directly connected with electric railway operation.

Greater Output and Higher Efficiency the Goal

COAL saving, though important, is not the only objective before electric railway operators. As more men in this country are called to engage in military service, those in the remaining "essential industries" like railroading must see that there is no diminution in the effectiveness of the properties in their charge, because of this man scarcity.

If ever there was a time when the electric railways—and everyone else—had an opportunity as well as a duty to practise efficiency it is now. Efficiency is being forced on us every day. Whether the subject is willing or unwilling, he gets his share. From the smallest home, where we are being educated to the most economical use of fuel and food, to the greatest corporation—these principles are being preached daily. The executive who was too dense or too cautious to put theory into practice before can hardly escape this war-time education to avoid waste, which is forced upon him by circumstances.

From this universal demand for greater individual output and greater individual efficiency no one is exempt, from the president down. The larger problems, of course, fall to the executive for solution, but the microscope must be applied to every department to discover where corrective measures are necessary and practicable.

Nor will the wise manager be content to put the brakes on extravagant expenditures. Opportunities are at hand on almost every property to get new business—to increase gross revenues. In some cases it is the first real opening for taking on freight business, turned aside for the present by steam roads. Once secured this business need not be lost. Motor truck transportation agencies are already going after it.

In still more cases the opportunity lies in the education of the platform employees. Many "fares" are driven to the necessity of walking or to competitive companies by failure of conductors or motormen to give them a chance to get aboard. Others are lost by lack of interest where a crew delayed by blockade idly awaits the wrecking wagon instead of trying to remove the cause.

The executive who does not learn his lesson from the present emergency may never have another chance. These critical times will be the making or breaking of many a system. It behooves all to "speed up." It is "our present and immediate task."

Duplication of Service Must Be Eliminated

WHILE the tidal wave of jitney competition which swept over the country from the Pacific to the Atlantic a couple of years ago has receded to a marked degree, the jitney is still seriously affecting electric railway earnings, notably in the Middle West and on the Pacific Coast. This fact is emphasized by the testimony presented at recent rate hearings before both the Indiana and California commissions and reported in contemporaneous issues of this journal.

We are told by those best in position to know that to win the war will require the utmost in service from both the human and material make-up of the country. This above all is not a time for competing businesses. Co-operation must be the order of the day. With this thought in mind the federal government recently took over the major transportation facilities of the country. Men engaged in useless work—useless as far as winning the war is concerned—must turn their energies to useful work. Yet we see municipalities permitting competition in local transportation systems—competition which duplicates not only precious man power, but precious fuel and munition power as well. It is not the intention here to discuss the respective merits of the electric railway and the jitney as means of local transportation. Let the matter rest on duplication of service only. The question may fairly be put up to any municipality, "Which will you have, electric railways or jitneys? You can have one of the two but not both." Can any sane man doubt what the answer would be?

The trouble is that the public is particularly prone not to worry about crossing a bridge before it gets to it. It only wakes up when the ruins finally crash. Within the year this has been well illustrated by the sudden awakening of public interest in the local transportation systems of several communities after these systems had passed under the auctioneer's hammer to the junk man. It is (not should be) a matter of community patriotism that where two competing transportation systems exist one must be eliminated. Which shall it be? In a final show of hands there would be no question as to the answer. But community patriotism must be aroused on this point. In the matter of "that the people may know" most of our railways have possessed an amount of lethargy quite comparable to that possessed by the public in matters of community interest. The problems of the railways must be stated freely and frankly. After all, they are the people's railways. Sane, wide-open publicity is about the only hope for those railways which are now going to the wall on account of jitney depredations.

Labor and Capital Should Come Together

ONE of the most striking developments of the war has been the changed condition of labor in Europe. It is impossible to disregard the significance of the fires raging socially in Russia and seemingly kindling in Austria and even Germany, or the power which labor now has in England. In our own country Charles M. Schwab said ten days ago that the worker was to dominate the world.

A more temperate statement, but somewhat along the same lines, is that of former Supreme Court Justice Hughes, who said before the New York Bar Association last month: "Individual privilege [in the future] will have to show cause before a public to which old traditions are no longer controlling—a public trained in sacrifice—which will enforce its own estimate of the common right." And again he said, "The present exercise of authority over the lives of men will hereafter find its counterpart in a more liberal exercise of power over the conduct, opportunities and possessions of men."

Mr. Schwab and Justice Hughes had the courage to recognize the changing order. Many employers, however, will undoubtedly refuse to do so and will declare that labor already has too much and that no one shall dictate to them how they shall conduct their enterprises. Similarly, there are extremists among labor. If these two are left to lead us out of difficulties, the country will suffer. It is for the moderates on both sides to compose the differences.

In the electric railway field the situation presents a different aspect than in industrial work, as far as wages are concerned, because the rate which companies can charge for their service is restricted while the wages which they may be forced to pay, either because of market rates or through arbitration agreements, have no such limit. One step to place electric railways on an equal footing with other large employers of labor would be to have a flexible fare, depending in amount on the wages paid or, better still, on the entire cost of operation. Such a plan is recognized in the new Philadelphia franchise as well as in the Cleveland Tayler plan. Still another step would be to make the wages in turn depend upon the three main factors which should control them, namely (1) the cost of living, (2) the efficiency of the workmen either individually or in groups and (3) the profits of the company, the influence of each factor on the total wages to be determined in some equitable manner.

This much is certain. In the period after the war, or perhaps before the close of the war, there must be some plan evolved to cover the relations between electric railway employers and employees which will be more logical and more just than the present one of a struggle of might.

Soon there will meet in Washington a Labor Policy Board. It will hold the balances for our general industrial peace. There must be give-and-take—compromise. Both sides must surrender much that they value highly. Far-seeing employers are ready to make sacrifices. So, too, are the forward-looking labor leaders. The interests of the country demand that both sides look carefully to it that they be not misrepresented.

Above all, let both be prepared for large concessions. In that direction lies peace and the country's good.

Combining Loads to Gain Economies of Large Units and High Diversity Factor—I

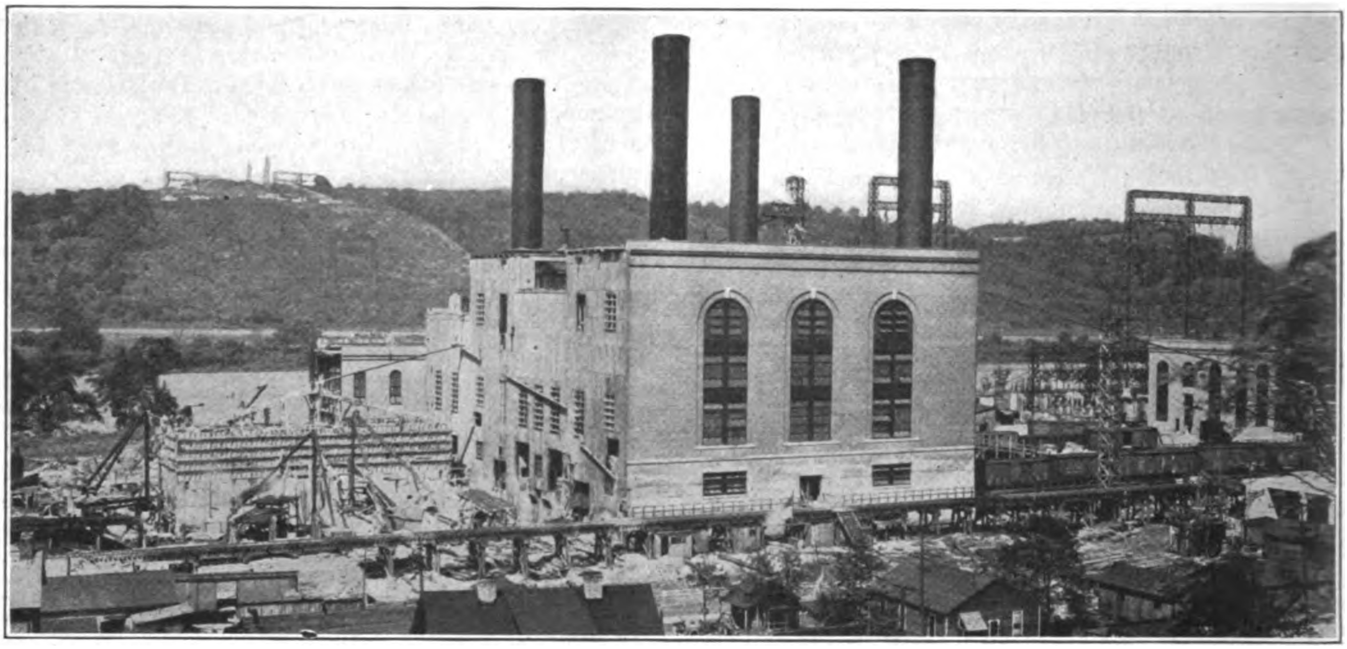

FIG. 1—GENERAL VIEW OF WINDSOR POWER PLANT

West Penn Power Company and American Gas & Electric Company Place Their Combined Demands on Huge Jointly Owned Generating Plant—New Power House of Six Units and 200,000-Kw. Capacity Is Strategically Located with Reference to Loads and Coal and Water Supplies, and Embodies Many New Features of Design

THE centralization of the power-generating facilities of one of the great industrial sections of the country into a single plant of enormous capacity, situated at the most advantageous location to serve the territory, is the idea behind the joint construction of the 200,000-kw. Windsor (W. Va.) power plant of the West Penn Power Company, a subsidiary of the West Penn Railways, and the American Gas & Electric Company. It is considered to be, in a sense, a pioneer project in that it is the first steam station to be built as a bulk supply source of electrical energy. The economies to be realized from extremely large units, the diversity factor resulting from the combination of loads spread over a large territory and including a wide variety of industry, and the strategic location relative to the raw materials and loads, were the desiderata which led these two important companies to combine their generating facilities and thus make an arrangement which would supply steam-generated electrical energy so cheaply that it could be economically distributed over wide areas. The scheme when completed will compare favorably as to energy cost with the large hydro-electric developments of the West, which distribute their output through long distances.

The West Penn Power Company, which is the energy supply company for the West Penn Railways, and the American Gas & Electric Company combined, supply practically all of the commercial and electric railway energy requirements of southwestern Pennsylvania, northwestern West Virginia and eastern Ohio, a particularly rich industrial section in the valley of the Ohio River. The American Gas & Electric Company supplies light and power service to Scranton, Pa., Newark and Canton, Ohio, Wheeling, W. Va., and a number of other communities and industries in this section. The West Penn Power Company supplies energy to the 322.56 miles of electric railway and more than 400 cars of the West Penn Railways, and commercial energy to numerous towns along these railway lines and elsewhere in this territory. The loads of each company are superimposed on those of the other at the common power plant. Each company takes its supply of energy from the station through its individual outdoor step-up and metering substation and transmits it out over a network of high-tension lines serving the many communities and industries and electric railways in the three states.

One of the important problems in connection with this new plant was the selection of the most advantageous location, all things considered. The site finally chosen comprises 58 acres of inexpensive real estate along the Ohio River from which an adequate and dependable supply of reasonably good water is obtainable. The station thus situated is but 2000 ft. from a coal mine producing fuel with a heat value running around 13,500 B.t.u. per pound, and is on the Pittsburgh, Wheeling & Kentucky branch of the Pennsylvania Railroad, affording direct transportation from other coal mines, should the one at the power plant be shut down. It is practically at the load center of the territory served, and is about midway between the Eastern and Central time belt, whereby the advantages of diversity resulting from serving loads thrown on the power-house at times differing by one hour are added to the more usual diversity advantages from the wide variety and character of load supplied.

GENERAL LAYOUT OF WINDSOR STATION

In general the Windsor plant is laid out on the unit plan with four boilers and one 30,000-kw. turbo-generator per unit. These four boilers are arranged in pairs on opposite sides of a wide firing aisle, the four boilers thus occupying about the same space in the longitudinal direction of the plant as the turbo-generator they serve, which is set with its axis parallel to the firing aisle. The firing aisle between the boilers is 47 ft. wide with a 12-ft. opening in the floor through the center of the aisle. The space underneath the floor is used for a huge coal-storage pit, from which coal is handled through the floor opening by means of a crane and bucket hoist, directly into the coal bunkers.

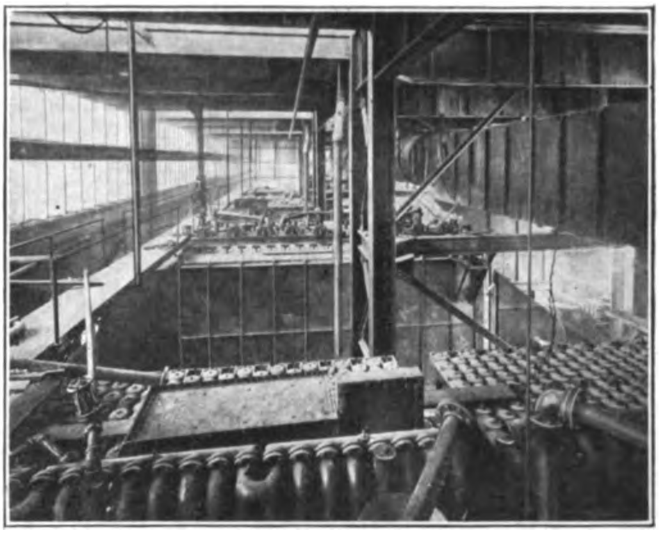

FIG. 3—TWO SECTION ECONOMIZERS OVER BOILERS

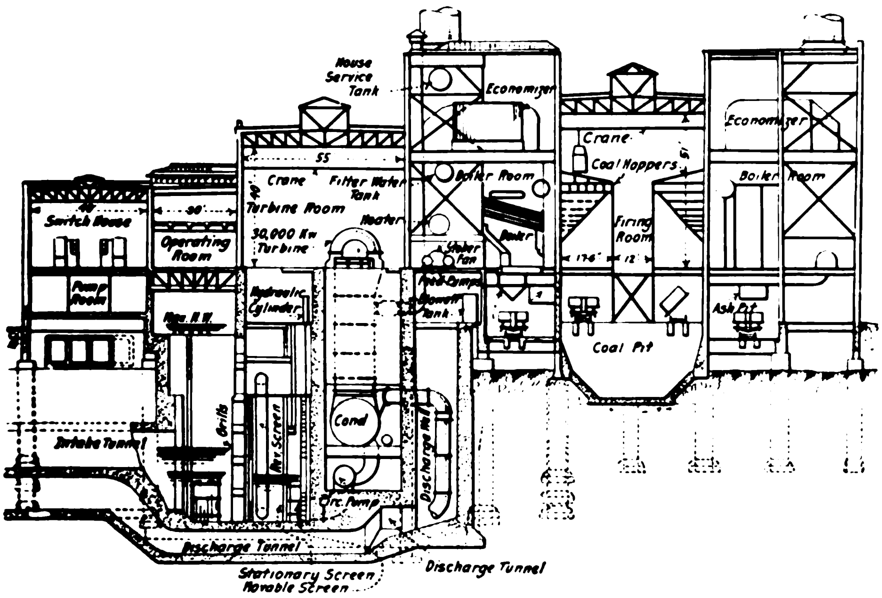
House Service Tank
Economizer
Economizer
Crane
Coal Hoppers
Boiler Room
Boiler Room
55
Crane
Filter Water Tank
40
Switch House
30
Operating Room
Turbine Room
Heater
30,000 Kw Turbine
Stoker Fan
Boiler
Firing Room
17-6
12
Pump Room
Hydraulic Cylinder
Feed Pumps
Blowoff Tank
Ash Pit
Res. H.W.
Coal Pit
Grills
Intake Tunnel
Rev. Screen
Cond
Discharge Well
Circ. Pump
Discharge Tunnel
Stationary Screen
Movable Screen
Discharge Tunnel

FIG. 2—CROSS-SECTION THROUGH WINDSOR PLANT SHOWING COMPLETE ARRANGEMENT OF EQUIPMENT

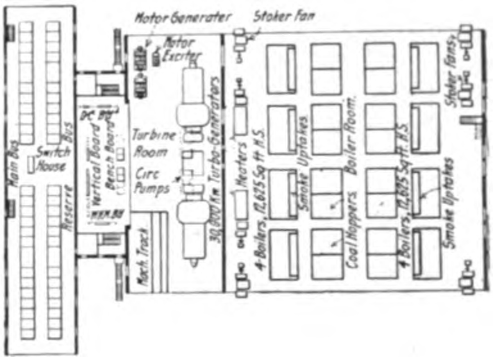
Motor Generator
Stoker Fan
Motor Exciter
Main Bus
Switch House
Bus
Reserve
DC Bus
Vertical Board
Bench Board
Turbine Room
Circ Pumps
Mach. Track
30,000 Kw Turbo-Generators
Heaters
4-Boilers, 12,825 Sq. ft. H.S.
Smoke Uptakes
Coal Hoppers
Boiler Room
4 Boilers, 12,825 Sq. ft. H.S.
Smoke Uptakes
Stoker Fans

FIG. 4—SIMPLIFIED PLAN OF WINDSOR PLANT SHOWING COMPLETE LAYOUT OF TWO UNITS OF STATION EQUIPMENT

The turbine room occupies a central position in the plant, as the boiler room is on one side and the switchboard operating room and switch house on the other. The switchboard operating room is built directly over the intake well and is supported on 6-ft. steel trusses which span the space between the turbine room wall and the wall of the switch house, but which are placed in such a way as not to interfere with ready access to the well for the necessary frequent cleaning. This space over the intake well has been further utilized by putting in an intermediate floor and making an office for the chief engineer and load dispatcher on the second floor. All the main operating rooms are on the same floor level, which was located at an elevation of about 35 ft. above the ground on account of the wide variation of the water level in the Ohio River. This uniform floor level will greatly facilitate the operating conveniences in a plant of so large capacity. The high elevation of these floors necessitated running all tracks into the building on trestles. These were costly at the outset, but the space beneath them will make an economical ash dump for several years to come.

Two of the 30,000-kw. units are now in operation, and it is expected that two additional units will be completed in 1918. The last two units to make up the present-planned ultimate capacity of nearly 200,000 kw. will be installed shortly thereafter. All of these turbines will be placed in a single row through the turbine room with axes parallel to the length of the building. The boilers to serve them will be set in two rows as described above, with steel stacks on each side, one for each three boilers. When completed with the six units installed, the over-all dimensions of the power house will be roughly 295 ft. x 280 ft.

The present article covers, in addition to the general features already mentioned, the boiler room and coal handling equipment. In a later article the turbine room, water supply, electrical and control equipment, electrical distribution system, etc., will be taken up.

FEATURES OF BOILER-ROOM DESIGN

Each of the boilers in the Windsor plant is of the Babcock & Wilcox cross-drum type with 12,625 sq. ft. of heating surface. Each is equipped with a separate economizer and with both induced and forced draft so arranged and controlled that the pressure in the firebox is practically zero. The induced draft fan is set over the boiler and inserted between the economizer and breeching. It is driven by a 60-hp. motor. The forced-draft or stoker blast is supplied by a blower installed behind the furnace. It is driven by a 100-hp. motor and was designed to give a pressure equal to 6½ in. of water. Hand regulation of the dual draft arrangement is employed to gain the proper proportions of fuel and air.

FIG. 5—GENERAL VIEW OF OPERATORS' COLONY

The boilers are equipped with Westinghouse underfeed stokers with fourteen retorts per boiler. Steam is supplied at 250 lb. pressure and 250 deg. superheat. All boiler settings are incased in steel to prevent air leakage, and each boiler is equipped with a Diamond Power Specialty Company soot cleaner.

The two pairs of boilers on opposite sides of the firing aisle which go to make up a single bank are interconnected by means of a steam pipe which is carried over the aisle up close to the roof, in order to clear the crane-way. This connects with a steam header which in turn connects with the turbine. These headers for the separate banks of boilers are connected together to allow interchange of steam from the boilers of one unit to the turbine of another unit. An arrangement which provides an extra large furnace and insures a good combustion of fuel is brought about in the boiler setting by placing the drum 26½ ft. above the firing-aisle floor.

Coal is supplied to the stokers from the bunkers along the front of the boilers by gravity. The underfeed type stokers were chosen for use in the Windsor plant because of their proved efficiency in burning West Virginia coal, and because of their heavy overload capacity.

The Sturtevant high-pressure-type economizers, which have 8625 sq. ft. of heating surface, are arranged in two sections, eight tubes wide and thirty-six tubes long, in order to secure what is believed to be a maximum heat transfer arrangement. This also allows the space between the two sections to be utilized for a by-pass duct and a duct connecting with the double-suction fan behind the economizer. Such an arrangement of the economizer makes possible a narrower construction and one more readily accessible for repairs and cleaning.

The dampers installed in the uptake are so arranged that in one position they close off the economizer and open up a by-pass duct, and in the other position they open the path through the economizer and cut off the by-pass. The gases pass from the economizer and induced-draft fan through a breeching which connects three boilers to a steel stack 13 ft. in diameter and 146 ft. high above the boiler-room floor. With the gases actuated by both the induced and forced drafts, a practically balanced draft condition may be maintained.

METHOD OF HANDLING COAL

One of the interesting features in connection with the boiler end of the plant is the plan which has been utilized for the handling of coal and ashes.

Coal is secured under a long-term contract from a mine owned by the Richmond Coal Company, situated about 2000 ft. from the power house. The mine cars bring the coal out of the mine and dump it into a crusher which delivers the coal into bunkers below, from whence it is drawn by gravity into standard-gage, side-dump cars. These cars, owned by the central station company, are then taken into the power house on a track which extends underneath the boiler-room firing-aisle floor, where the coal is dumped into a concrete pit extending the entire length of the boiler house. The fact that these cars are standard gage is considered important, since in an emergency it will permit the shipment of fuel from other mines without transferring from one car to another.

The pit underneath the firing aisle measures about 35 ft. wide by 24 ft. deep below the tracks, and extends the entire length of the boiler room. Its capacity is about 2500 tons. From this pit the coal is lifted by means of a 3-yd. grab bucket and overhead traveling crane, weighed by a device on the crane and dumped into the individual hoppers serving each boiler. This scheme of

Saving Fuel Through Operating Economies

Committee of Engineers Shows How More Than 25,000 Tons of Coal Can Be Saved Yearly on Washington Electric Railways

THE Electric Railway War Board has just made public the text of the report made last December by the committee appointed to investigate the fuel savings possible on the lines of the Washington Railway & Electric Company, and the Capital Traction Company in Washington, D. C. The experts who prepared the report consisted of Clarence Renshaw and M. B. Lambert of the Westinghouse Electric & Manufacturing Company, and J. F. Layng of the General Electric Company. The committee's recommendations involve the use of skip, or stagger stops, the elimination of such car-mileage as can be spared without hardship to the public, the reduction of heat in cars, the operation of the most economical power houses or power plants, and the staggering of office hours of government departments. The War Board also made public an indorsement of the report dated Jan. 3 and signed by L. B. Stilwell, W. F. Durand and Comfort A. Adams, as members of a subcommittee of the National Research Council, also letters from John A. Beeler and Louis Brownlow, consulting engineer and chairman respectively, of the Public Utilities Commission of Washington, to whom the report had been submitted. Mr. Beeler, writing under date of Jan. 7, said there was no question in his mind but that the proper and intelligent application of the methods advocated in the report would conserve fuel and energy, as estimated, while the rapid transit facilities afforded the public in the district should be improved because of the decreased time required to make each trip. Mr. Brownlow expressed the belief "that changes of the nature suggested can be put through so as to effect savings at least as great as those indicated."

Coal Savings Possible

The report by Messrs. Renshaw, Lambert and Layng estimates that an annual saving in coal of 25,790 tons could be made by the Washington electric railways, as follows:

Source of Saving	Tons Per Year
Skip-stop plan	**9,400**
Double berthing and modifying rapid-transit stops	**600**
Eliminating unnecessary mileage in non-rush hours	**3,220**
Reducing heat 50 per cent.	**2,250**
Shutting down small plants to effect the same load reduction as would carrying all Capital Traction Company's load by Potomac Power Company	**9,700**
Staggering office hours of government departments	**620**
Total	**25,790**

The report of the committee is substantially as follows:

The Washington Railway & Electric Company (the Potomac Power Company) averaged during the year ending October, 1917, approximately 9500 tons of coal per month with an economy of approximately 1.9 lb. per kilowatt-hour, and generated an average of approximately 11,000,000 kw.-hr. per month. About 52 per cent of this output was used for lighting, 13 per cent for the three interurban railways (W. B. & A., W. & Va. and W. & O. D.) entering Washington, and 35 per cent for the city and suburban lines of the Washington Railway & Electric Company.

The Capital Traction Company, at its Georgetown power house, averaged approximately 2800 tons of coal per month with an economy of approximately 2.6 lb. per kilowatt-hour, and generated an average of approximately 2,200,000 kw-hr. per month. At its Chevy Chase power house it averaged approximately 460 tons per

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(Concluded from page 266)

handling the coal permits of the storage of a rather large quantity of fuel within the power house without great expense, since it was possible to construct the storage bin of concrete rather than of steel. A large coal-storage yard will be provided near the plant in the near future.

A standard-gage track underneath each row of boilers permits of the dumping of ash from the hoppers under the furnaces directly into dump cars for removal. This arrangement is clearly shown in the cross-section of the plant.

Owing to the necessity of radiating great quantities of heat from the large turbine units the design of the power house was made especially liberal with regard to light and air. The large amount of heat radiated is saved in part, however, by conducting the warm air from the generators to the basement of the boiler room, where it is taken up by the stoker fans and delivered to the furnaces.

In the early construction stages of the building the difficulty of securing a solid footing under the boiler room and switch house was met by sinking caissons. It is interesting to note, however, that it was unnecessary to carry out this method of construction beneath the remainder of the station, since it was possible to utilize the walls and foundations of the deep condenser wells and intake crib to support the superstructure. The condenser well walls also serve the further purpose of foundations for the turbo-generators.

Sargent and Lundy, consulting engineers, of Chicago, were the designers of the Windsor station, and they also have charge of the construction work. The high-tension yard of the American Gas & Electric Company was engineered and constructed by the Electric Bond & Share Company. The sub-contracts for the building foundations, high tension yard foundations, and the railroad trestle foundations were all awarded to the Foundation Company of America. The sub-contractor for the steel work was the Riverside Bridge Company.

month with an economy of 4.1 lb. per kilowatt-hour, and generated approximately 240,000 kw-hr. per month. The entire output of both of these stations is used for railway purposes.

Owing to the way in which the streets are laid out in Washington street corners occur at very irregular intervals. Not only are some corners very close together, but the average number of street corners per mile is high. Assuming the Georgetown line of the Washington Railway & Electric Company to be typical, the possible stopping points average about thirteen per mile, and even in the non-rush hours it is considered necessary to make a large proportion of these stops. Observations on several city lines in the middle of the day showed that the cars were making from 8.6 to 9.5 stops per mile. While owing to the limited time the committee did not personally investigate the suburban lines, it is understood that the number of stops on these, considering the character of the lines, is proportionately excessive.

A peculiar custom in Washington is the making of what are called "fire stops." In front of the buildings in which fire protective apparatus is housed and before crossing certain streets which are commonly used by fire apparatus the cars are required to stop. The cars of the two companies make approximately 53,000 of these stops every day. Some of these fire stops would, of course, have to be made in any case to take on or let off passengers, but assuming that one-half of them would have to be made for this reason, even if the fire ordinance was not in effect, it is estimated that the coal consumed by making the other half of these fire stops is at least 880 tons per year.

In order that any rational skip-stop plan may be put in effect, it will be necessary to eliminate these fire stops. From a rough study of the Georgetown line of the Washington Railway & Electric Company, it is estimated that the number of stopping points on the various lines can be reduced approximately 40 per cent, and that the number of stops made will then be reduced approximately 25 per cent as compared with those made at present without any hardship to the public. This reduction in the number of stops should effect a saving of at least one-eighth of the coal used for railway purposes, equivalent to 780 tons per month, or 9400 tons per year.

Even on the basis assumed, the number of stopping points on city lines still would be a little more than eight per mile, or slightly less than 660 ft. apart. Even allowing for some irregularity, no persons on this basis should have to walk more than about 400 ft. beyond the point to which he would go at present (the average would be very much less than this). Even this maximum distance would mean a walk of only 1½ minutes.

The committee believes that the use of skip stops in Washington would effect great improvement in the service and greatly reduce the street congestion.

In most cities where the skip-stop plan is used no stops are skipped in the downtown district. In Washington, however, it is very necessary and desirable to skip stops in this district and the outlying ones, and the above estimate has been based on doing this.

Another practice which is noticeable in Washington is the way in which a car will often make two or even three stops at a single corner. If one car has stopped at the corner a second car will often stop behind it. This car will not take on or let off passengers, however, but will wait until the first car moves on and will then pull up to the corner to load or unload. Under such circumstances, the second car should take on or let off its passengers at the original stop behind the first car and it should then go on when ready without stopping at the corner.

It is also the custom to stop all cars at rapid-transit crossings. The committee suggests that at such crossings one or the other line have right of way and that under normal circumstances the cars should merely slow down instead of actually stopping.

It is difficult to estimate just what the above two changes would save, but the saving would amount to at least 600 tons per year, and in combination with the skip-stop plan would give a total saving of 10,000 tons.

ELIMINATION OF UNNECESSARY CAR-MILEAGE

While short-line or turn-back cars are employed to a considerable extent in Washington, there seems to be a tendency, as in other cities, to run an unnecessary number of cars to the far end of certain lines, in some cases giving six-minute headway where ten or twelve-minute headway would be sufficient. A considerable saving in coal can be effected without any hardship to the public by eliminating this unnecessary service.

On the Capital Traction Company's lines, for instance, during the non-rush hours one-half the Colorado Avenue cars of the Fourteenth Street line could be turned back at Decatur Street, and on the other end could be turned at First and B Streets. It is also believed that all of the cars of this line which now run to Decatur Street could be turned back at Park Road. Further the F and G Street cars of the Pennsylvania Avenue line could run only between Twenty-sixth Street and Pennsylvania Avenue, N. W., and First and B Streets, S. E. One-half the Eighth and F Street cars of the Georgetown line could be run to Union Station only instead of to Eighth and F Streets. In addition to the above, there are certain savings which could be made in the early morning and late evening hours.

On the lines of the Washington Railway & Electric Company the committee did not pick out specific cases, but assumed that the same proportion of the total daily mileage could be eliminated in a similar way.

The elimination of this unnecessary mileage would save approximately 1300 tons of coal per year for the Capital Traction Company and 1920 tons for the Washington Railway & Electric Company, or a total of 3220 tons. In addition some dead mileage could be saved during the rush hours, but no attempt was made to estimate the extent of this.

The difference in the average energy consumption per car-mile for the seven months in which heat is used as compared with the five months in which heat is not used is 0.58 kw.-hr. per car-mile for the Washington Railway & Electric Company, and 0.4 kw.-hr. for the Capital Traction Company. Assuming that 85 per cent of this difference is due to the use of the heaters, the total coal for heating purposes is 4500 tons per year for the two roads.

A test made by the Capital Traction Company on Dec. 5 showed that the output of its plant during the rush hours (7.30 to 10 a. m. and 4 to 7 p. m.) was approximately 36.5 per cent of the output for the day. Using this figure for a basis, it is assumed that the car-mileage during rush hours is roughly one-third of the total. The heat used during rush hours should, therefore, require approximately 1500 tons of coal per year, and by eliminating the heat entirely during this period and using it as at present during the remaining time this amount of coal should be saved.

If, instead of cutting off all heat during rush hours, one-half the heat were cut off for the entire day, the saving would be approximately 2250 tons of coal per year instead of 1500 tons. The committee believes that if reasonable judgment is used and competent supervision is given to the matter of cutting off heat, instead of working on an entirely arbitrary basis, one half of the coal now used, or 2250 tons per year, can be saved, with practically no discomfort to the public.

OPERATION OF MOST ECONOMICAL POWER HOUSES OR POWER PLANTS

As already indicated, the Washington Railway & Electric Company, on account of the much greater capacity of its station and the higher load factor of its output, is able to operate with 1.9 lb. of coal per kilowatt-hour as compared with 2.6 lb. and 4.1 lb. respectively for the two stations of the Capital Traction Company. If the entire load could be carried by the Washington Railway & Electric Company's plant and the others shut down a considerable saving in coal would result. Making suitable allowance for losses in transmission, the saving in coal from shutting down these plants is estimated at approximately 2300 tons per year for Chevy Chase and 7400 tons per year for Georgetown, a total of 9700 tons.

To permit the stations of the Capital Traction Company to be shut down, however, would require the purchase of rotary converters with transformers, etc., for the Chevy Chase plant as well as the building of certain high-tension lines. The capacity of other high-tension lines would have to be increased. Some of these would be underground lines and would require new ducts as well as new feeders.

The Capital Traction Company's power houses, although less economical than those of the Washington Railway & Electric Company, are still very efficient. The difference in the unit coal consumption is brought about by the smaller size of the power stations and also because the load factor is that of a purely railway load as against that of a combined railway and lighting load on the other plants. In Washington there are many plants which are now operating in hotels, government buildings and elsewhere which are reported to require 8 to 10 lb. of coal per kilowatt-hour. Many of these plants are already provided with Washington Railway & Electric Company's service and use this service during the summer. A much more rational plan for conserving the coal supply of the nation therefore would be to shut down these small plants rather than that of the Capital Traction Company. It might even be desirable to use the plants of the Capital Traction Company to supplement the Washington Railway & Electric Company's plants, and thus provide more power, as the Capital Traction Company's plants are not fully loaded. This would permit the shutting down of more small uneconomical plants than would otherwise be possible.

The committee understood that the coal burned by the total of such plants in the city is much greater than that of the Capital Traction Company. To be conservative, however, there was included in the summary of coal which can be saved only the amount which could be saved by eliminating the power stations of the Capital Traction Company (9700 tons), although it is the idea that this would be saved not by shutting down these stations but as indicated above.

STAGGERING OFFICE HOURS OF GOVERNMENT DEPARTMENTS

From the best information available there are nearly 50,000 government department employees who are dismissed each day at 4.30 p. m. The two railway companies together operate 271 cars during the midday non-rush hours, the number being gradually increased to 390 at 4 p. m. and to a maximum of approximately 545 at 5 p. m. There is thus an increase of 155 cars after 4 p. m. which can, in a general way, be attributed to the necessity for carrying the department employees.

At present it seems probable that most of these 155 cars make only about two round trips. If the office hours were staggered so as to begin at fifteen minutes intervals from 8.30 a. m. to 9.15 a. m. and to close correspondingly from 4 p. m. to 4.45 p. m., considerable relief could be obtained in street congestion and a saving effected in coal. At the same time the committee believes that the change would not be so radical as to cause hardship to the employees or to interfere with the necessary relations between the several departments or between the general business community and the departments.

It is estimated that on such a basis the rush-hour cars could make three trips instead of two, and that 100 additional cars would be sufficient for carrying the load on the same basis as it is now carried by the 155. Thus the peak load of the Capital Traction Company would be reduced at least 10 per cent, or about 900 kw., and that of the Washington Railway & Electric Company lines about 1470 kw. With this reduction in peak loads there would be less coal required for carrying banked boilers, estimated roughly at 620 tons per year. It might, of course, be that the railway companies would want to operate a greater number of cars than the above in order to carry the people more comfortably than at present and to lose fewer fares from crowding. If this were done the gain obtained would be in the shape of better service rather than in a saving of coal.

By staggering the office hours a greater amount than this the saving might be increased somewhat, but any greater staggering would interfere too much with the business of the departments and the lives of the employees to be feasible at the present time.

SUMMARY

Summarizing the above, the total weight of coal which the committee believes can be readily saved by changes in the operation of the two railway systems, which could be easily effected without impairing the service to any appreciable extent, and by staggering

the office hours of the government departments by an amount sufficiently small to be easily practicable, is as follows:

Source of Saving	Tons Per Year
Skip-stop plan	9,400
Double berthing and modifying rapid-transit stops	600
Eliminating unnecessary mileage in non-rush hours	3,220
Reducing heat 50 per cent	2,250
Shutting down small plants to effect the same load reduction as would carrying all Capital Traction Company's load by Potomac Power Company	9,700
Staggering office hours of government departments	620
Total	25,790

If heat is shut off during peaks instead of being reduced 50 per cent all day, the saving would be 1500 tons instead of 2250, and the above total would be correspondingly reduced.

Rochester Lines Save Coal

Through Co-operation of Chamber of Commerce and Local Fuel Administrator, Various Operating Economies Are Introduced

BY JAMES F. HAMILTON

General Manager New York State Railways, Rochester Lines

A GOOD example of what can be accomplished by co-operation is shown by the results attained on the Rochester Lines of the New York State Railways in the efforts lately made towards conserving fuel.

The ELECTRIC RAILWAY JOURNAL has already mentioned the appointment, on Jan. 3, by the Public Service Commission, Second District, State of New York, of a committee to study the possibilities of fuel conservation on electric railways, as well as the recommendations drafted as a result of a meeting of this committee in Rochester on Jan. 10. These recommendations were in turn forwarded to all the railway companies in New York State under the Public Service Commission, Second District.

In starting action in the city of Rochester the company realized that any efforts it might make would be futile unless it had the support and co-operation of the directors of local industry and commerce. The Rochester Chamber of Commerce and its energetic secretary, Rolland B. Woodward, presented the means by which this co-operation could be secured. In fact, to Mr. Woodward and Local Coal Administrator M. R. Miller, also a member of the Chamber, are due the real credit for the steadiness and speed with which the electric railways and the industries of Rochester were induced to work uninterruptedly toward the same economic end. It also must be recorded that every meeting held by the Chamber of Commerce for this purpose was unanimous in its action, and this could not have taken place unless the executive heads of all of Rochester's great industries had been unselfishly anxious to assist.

As a preliminary to effective action, the Chamber of Commerce appointed a committee under the chairmanship of J. T. Hutchings, vice-president of the company which furnishes Rochester with its electrical power as well as gas, who at once started the work of the committee.

To the end of reducing the number of cars operated in the rush hours, a study was made as to the location of all the factories, manufacturing plants, department stores, etc., as to the number of persons employed in them and as to their requirements as regards street car service.

The city of Rochester is peculiar in the fact that its geographical and business centers practically coincide. Most of the transferring from one line to another is done in this common center. It was soon learned that the opening and closing time of the various industrial plants, stores, etc., was the important factor to be considered.

Within twenty-four hours, a tentative schedule was made whereby the opening and closing time was staggered in such a manner as to permit cars to secure full complements of passengers at both ends of their routes. This change in schedule received the ready support and co-operation of all interests and has been in effect fourteen days. It has enabled the company to discontinue the use of twenty cars during the morning rush hours and thirty cars during the evening rush hours. The accompanying table shows the actual hours adopted.

SAVING IN HEAT AND LIGHT

Another surprising result which has been attained has been the saving of from 30 lb. to 50 lb. of coal per car per day ordinarily used to heat the cars, making a total saving of approximately 225 tons per month. All cars on the Rochester system are equipped with coal boxes which were filled each night at the various stations by the mechanical department. As the crews of cars then filled the stoves whenever they deemed it necessary, more coal was consumed than was absolutely required.

STAGGERED HOURS OF OPENING AND CLOSING ROCHESTER'S INDUSTRIAL PLANTS

Industries	Opening Hours A. M. Previous	Opening Hours A. M. Present	Closing Hours P. M. Previous	Closing Hours P. M. Present
Symington Mch. Corp., E. Main	7.00	8.00	3.00	4.00
Ritter Dental Mfg. Co., West Ave.	7.30	7.00	5.30	5.00
Taylor Instrument Co., Ames St.	7.30	7.00	5.30	5.00
Gleason Works, University Ave.	7.00	7.00	5.40	5.40
Symington, Anderson Gun Plant, University Ave.	9.00	8.00	5.00	4.00
Amer. Woodwkg. Mch. Co., Lyell	7.00	7.00	5.00	4.50
Gen. Ry. Sig. Co. (office) West Ave.	8.00	8.00	5.30	5.30
Stromberg-Carlson Tel. Mfg. Co., University Ave.	7.00	7.00	5.30	5.00
Todd Prot. Co., University Ave.	7.25	7.25	5.00	5.00
Gen. Ry. Sign. Co., West Ave.	7.00	7.30	5.15	5.45
Eastman Kodak Co. (1st section), Lake Ave	7.30	7.10	5.25	4.55
Bausch & Lomb Op. Co., St. Paul	7.30	7.30	5.30	5.30
Eastman Kodak Co. (2nd section), Lake Ave.	7.30	7.10	5.30	5.15
Eastman Kodak Co. (3rd section), Lake Ave.	7.30	7.30	5.30	5.25
Eastman Kodak Co. (4th section), Lake Ave.	7.30	7.30	5.30	5.30
Eastman Kodak Co. to Charlotte	7.30	7.30	5.30	5.15
Rochester Folding Box Co., Charlotte	7.30	7.30	5.30	5.45
Retail stores	8.30	9.00	6.00	6.00
Clothing manufacturers	7.15 7.30	7.30	5.15 5.30	4.45

The saving in coal mentioned was accomplished by locating coal boxes at certain points on the system and stationing a man at each location, assigned with the duty of seeing that sufficient coal is placed on fires in such cars as passed his station. This arrangement caused the fires to be coaled at regular intervals and by proper supervision the former waste was eliminated.

Another material result was attained in the saving of coal by following the recommendations of the committee in the matter of lighting cars. By minor changes in the wiring of our cars involving a very slight expense, we have succeeded in reducing by approximately 50 per cent the amount of electric cur-

(*Concluded from page* 270)

rent used for lighting the cars. Although a noticeable change was made in the illumination of the cars, it cannot be claimed that our cars are unsafely lighted now, for no changes were made in the lighting of platforms or vestibules. At the same time, many pounds of coal will have been saved.

SAVING IS 100 TONS A DAY

The economies cited resulting from the reduction in the heating and lighting of cars, the staggering of the hours of industrial plants and the consequent increase of the load factor of our power stations, made a saving of approximately 17 per cent, or 100 tons of coal per day, and it is expected that a still better showing may be made in the future by additional economies of a similar nature.

We did not find it advisable to inaugurate the skip-stop or stagger stop on our lines because of local conditions, but the study conducted on this plan has resulted in the elimination of a number of non essential stops.

It is with pleasure that I state that our employees are co-operating in every way possible in the fuel conservation movement and that we are receiving the hearty support from the manufacturing industries, the city officials, our Chamber of Commerce and other civic bodies.

Indiana Freight Rates Up 15 Per Cent

Commission Recognizes Superiority of Interurban Service—Shows Comparative Steam and Interurban Costs—Allows Emergency Rates

ANOTHER important decision just handed down by the Indiana Public Service Commission concerns charges for freight haulage. In its ruling of Jan. 18 the commission placed the interurbans of the State on an equality with the steam railroads as to freight rates. Although evidence at the hearings showed conclusively that the interurban cost of freight carrying is higher relatively than that of steam railroads, still the new rates will mean much to the traction systems. The increases amount to approximately a 15 to 20 per cent—and in some cases more—advance over former rates. The new rates also make for greater uniformity and less discrimination than did the old rates, established in 1908.

COMPARATIVE COSTS

A study of the compilations made by respondents regarding the terminal and road haul costs, the commission said, showed a surprising difference in operating cost as between interurban railways and steam railroads. In the commission's opinion, it is reasonably fair to assume that the average of less-than-carload revenue and cost is represented by third class. It, no doubt, varies on different interurban lines, but it is a sufficiently average approximation to warrant its use in rate computations.

A comparison of the third-class rates, as shown by the cost figures of respondents, with the third-class intrastate rates for steam railroads, shows that the operating cost of handling classified freight is less to interurban railways than to steam railroads for distances of less than 50 miles, and considerably greater for distances above 50 miles, as shown by the accompanying table.

The interurban figures in this table represent the third-class rates justified by respondents' cost figures, if applied on an assumed operating ratio basis of 60 per cent. The figures in the last column represent the third-class rates authorized by the commission for steam carriers operating intrastate.

The hearings showed that the cost of equipment used by the interurbans in rendering freight service is very much greater per unit than is the cost of equipment of the steam roads. The record is also conclusive to the minds of the commission that the volume of business carried is very much less in the case of the interurban. Both of these matters demand consideration of greater investment in rendering service.

SUPERIORITY OF INTERURBAN SERVICE

Laying aside analysis of costs and return on investment, however, the commission stated that uppermost in its mind was the question of the justice of requiring the interurban railways to render at a lower rate the same service as that rendered by the steam railroads, if not better. The record indicated that the service of this character rendered is not only equal but superior to that of the steam railroads. The superiority of interurban freight service, the commission said, is quite generally recognized by shippers and commissions.

	Interurban Railways	Steam Railroads
5 miles	$0.072	$0.125 per 100 pounds
10 miles	.0855	.13 per 100 pounds
20 miles	112	.145 per 100 pounds
40 miles	.1646	.18 per 100 pounds
60 miles	.2172	.20 per 100 pounds
80 miles	.2699	.215 per 100 pounds
100 miles	.3309	.23 per 100 pounds

In conclusion the commission stated that it would not be able, in all probability, to justify the new rates for operation during normal times. It would, therefore, deal with the interurbans as it did in its recent order for the steam railroads, by putting into effect "wartime emergency rates," these to be limited to a period of one year from the date of order. Present abnormal operating costs are thought by the commission to be temporary.

The companies covered by the order are the Terre Haute, Indianapolis & Eastern Traction Company; Ohio Electric Railway; Union Traction Company of Indiana; Indianapolis & Cincinnati Traction Company; Chicago, South Bend & Northern Indiana Railway; Southern Michigan Railway; Fort Wayne & Northern Indiana Traction Company; Fort Wayne & Decatur Traction Company; Interstate Public Service Company; Louisville & Northern Railway & Lighting Company; Louisville & Southern Indiana Traction Company; Indiana Railways & Light Company, and Indianapolis & Louisville Traction Railway.

The Missouri Public Service Commission has issued a 163-page booklet, giving in the form of annotations, of sufficient thoroughness to serve as a digest, a complete statement of the points ruled upon in formal adjudications affecting the public service commission law of that State. At the close of the work appears a table of cases, arranged according to reports, volumes and pages, from which the case title of any decision shown can be readily obtained.

Public Control; Guaranteed Dividend; Higher Fare for Rehabilitation

Massachusetts Public Service Commission Recommends to Legislature Plan Whereby Stockholders, Car-Riders and Taxpayers Can Help to Restore Boston Elevated Railway—In Report on Operation Mr. Beeler Points Out Possible Operating Economies of $1,200,000 a Year—Says System Needs $2,700,000 for Rehabilitation Annually for Five Years

THE transportation system of the Boston Elevated Railway is not meeting the public needs, for the property has not been kept in good, modern operating condition, the net earnings are shrinking, the service is poor and the credit is gone. Such is the opinion expressed by the Massachusetts Public Service Commission in a special report on Feb. 2 to the State Legislature.*

In order to avoid a receivership, the commission recommends the adoption of public control and the use of public credit. It would, in short, have the stockholders place the property in the hands of trustees representing the public, and then have the municipalities served guarantee a 5 per cent dividend for two years and 5½ per cent thereafter. The sale of the Cambridge Subway to the Commonwealth would provide $9,000,000 of new funds. The ordinary costs of service would be met by a 5-cent fare, deficits being covered by the municipal guarantee. An extra cent, however, could be charged by the trustees in order to meet the extraordinary costs of depreciation and rehabilitation. The commission is preparing a draft of the necessary legislation to accomplish these changes.

In the commission's opinion, such a plan has the advantage over any other that has been suggested for these reasons:

"It definitely establishes the status of investors. It creates public confidence in the administration of the company's affairs, and conditions favorable to the effecting of all feasible operating economies. It provides, at relatively low cost, a sure source of new capital. It takes care of depreciation. It makes possible, without inflation, whatever rehabilitation of the property is practicable under present conditions. It distributes the burden in the emergency fairly between car-riders and the whole community, and it makes it certain that any increase in fares which may be made will be used to insure better service at lower operating cost."

The commission's report is submitted in two parts—the first containing a statement of the essential facts, and the second discussion and recommendations. The first part covers the organization of the company, its finances and rate of return, and similar basic facts. Expenses and charges during the last two years, it is shown, have been increasing at a faster rate than earnings, and this tendency has been even more marked in the months since June 30, 1917. And during the coming year, it is said, the situation is likely to grow worse.

The first part also includes a summary of a report by John A. Beeler in regard to management and operation. Shortly after the Public Service Commission was authorized on June 15, 1917, to continue the study of the Boston Elevated Railway, it engaged Mr. Beeler to make a special investigation. Mr. Beeler's examination began in July and ended in November. His report, constituting with exhibits a printed book of 279 pages, has now been made public in connection with the commission's own report.

MR. BEELER CRITICIZES EQUIPMENT AND TRACK

In summarizing Mr. Beeler's report the commission notes the following conclusions in regard to physical property: Mr. Beeler finds the rapid transit track in good condition, but the surface tracks are in poor shape. He says: "There are miles of rails that are crooked, broken, patched, repatched and welded, with joints that have been cupped, built up, hammered out and built up again. The general condition is, in fact, bad. 'Slow orders' are now in effect covering 34 miles of main line track."

Rolling stock is in about the same condition. In Mr. Beeler's opinion, "outside of the comparatively few stepless, center-door cars, which are modern, efficient and attractive in every respect, the equipment on the streets of Boston is either semi-obsolete or completely so." Most of the surface cars, judged by modern standards, are uneconomical and inefficient. Many of them are in need of paint and have not been kept clean or in good repair. The wooden cars on the rapid transit lines are "fast approaching the day when they should be retired and all-steel cars substituted." Service on these lines is frequently interrupted by equipment defects.

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*The present report of the Massachusetts Public Service Commission to the State Legislature originated in this way. As a result of the plea of the Boston Elevated Railway for financial relief, a special recess commission was organized by legislative resolution about the middle of 1916 to report to the Legislature on the needs of the property. The commission was composed of the Lieutenant-Governor of the State as chairman, the President of the Senate, the Speaker of the House, two members of the Senate, four members of the House, and the full boards of the Public Service Commission and the Boston Transit Commission.

After long and careful consideration of the company's brief, abstracted in the ELECTRIC RAILWAY JOURNAL of Sept. 30, 1916, the special commission on Feb. 1, 1917 (E. R. J. Feb. 10, 1917), recommended that the Legislature grant certain measures of relief which did not involve any direct burden on the public. These measures included abolition of the compensation tax and State acquisition of the Cambridge Subway. The commission noted certain objections to a fare increase and recommended that action be deferred. It suggested that the Public Service Commission investigate and report by February, 1918, upon the company's efficiency of management and that the Boston Transit Commission report at the same time upon the prospective rapid transit needs for the next decade.

The most important recommendation of the special commission—namely, State acquisition of the Cambridge Subway—was not adopted by the Legislature because of executive opposition. Certain lesser recommendations, tending to improve the financial condition of the company, were followed, and provision was made by special legislative act for further inquiry by the Public Service Commission along the lines above indicated. The report now made by this body should, therefore, be regarded as a continuation of and supplement to the report of the special commission in 1917.

The 1917 report of the special recess commission and the present report of the Public Service Commission deal with the electric railway situation only in Boston. These reports should not be confused with one under way for the whole State of Massachusetts. By legislative resolution a "street railway investigation commission" was created near the middle of 1917 to study the general problems of electric railway administration and financing and to report to the 1918 Legislature. The report of this body, just presented and briefly described in the News Section this week, indorses a service-at-cost plan suggested by Massachusetts investors. The approval of this plan, for State-wide use, by the Public Service Commission was noted in remarks of Chairman F. J. Macleod reported in the ELECTRIC RAILWAY JOURNAL of Feb. 2.

Power stations and apparatus on the whole are in excellent condition. Many of the other buildings, however, are not well suited for present railway use, some of them being inheritances from horse-car days. Carhouses and shops are widely scattered and often of unsatisfactory design. "A material reduction in the cost of maintenance could undoubtedly be made by new shops and consolidation of departments," if the company's financial condition warranted the expenditure.

Proposed Relief for Boston Elevated

Municipal guarantee of 5 per cent dividend for two years and 5½ per cent thereafter.

Control by board of trustees representing public.

$9,000,000 of new money through purchase of Cambridge Subway by Commonwealth.

Deficit below ordinary costs of service under 5-cent fare to be met by municipal guarantee.

Six-cent fare chargeable at will of trustees, the extra cent going into a fund to meet extraordinary costs of providing for depreciation and rehabilitation.

Mr. Beeler's findings in regard to the physical condition of the Boston Elevated Railway, briefly indicated above, are said to be largely confirmed by the commission's own inspectors. Furthermore, it says that it does not understand the company to contest their general accuracy.

Mr. Beeler believes that a much larger sum should be appropriated each year for depreciation. For 1916 his report places this amount at $2,247,995, or about 4.4 per cent of the book value of depreciable property. Compared with the expenditure actually made for depreciation purposes in that year, the additional amount which should have been spent or set aside is placed at $1,508,073.

The company, the commission says, offers no specific objection to Mr. Beeler's estimate of depreciation requirements. In the commission's opinion, it is clear that depreciation has been neglected. Whether or not Mr. Beeler's estimate is correct, however, is a more difficult question. It is not wholly certain, the commission states, that past experience may be taken as a trustworthy guide for the future. The useful lives assumed by Mr. Beeler for the various classes of property are as follows:

Class	Life	
Track and line	18	years
Cars and car equipment	22	years
Power plant buildings and equipment	25	years
Shops, car houses and equipment	25	years
Elevated stations	50	years
Subway and tunnel equipment	25	years
Signals and telephones	20	years
Bridge betterments	50	years
Engineering and superintendence	24.6	years

According to the commission, these lives are similar to those usually employed in depreciation estimates and take into consideration obsolescence and inadequacy, as well as wear and tear. If cars are properly repaired they can be made to last almost indefinitely; but it is assumed that at the end of twenty-two years they will be obsolete in type and ripe for replacement. The same is true of power plants and shops. It is not easy to believe, however, that the new and modern cars which are now being received will reach the end of their usefulness in twenty-two years, or that the new power station in South Boston will be ready for the scrap heap at the end of twenty-five years.

The general conclusion of the commission is that Mr. Beeler's estimate is generous. It represents a standard which a company might well maintain in times of prosperity, although the commission is inclined to believe than it would prove, in practice, somewhat higher than necessary to keep the property in reasonably modern condition. As long as war-time conditions prevail, it would be consistent with the public interest not to require so high a standard to be maintained. If the company were able to appropriate one-half as much for depreciation as Mr. Beeler estimates, it would be doing far more than it had ever done in the past.

The greater portion of Mr. Beeler's report deals with operating conditions. While he considers the existing management "virile and aggressive" and has high praise for the work of many departments, he believes that service can be improved and large savings effected in operating expenses if certain changes are made. Briefly stated, these are as follows:

1. *Changes from Surface Car to Rapid Transit Operation*

Certain subways and elevated structures are now used by surface cars. These are the Tremont and Boylston Street subways, the East Boston tunnel, and the elevated and viaduct from North Station to Lechmere Square. By an analysis of operating expense Mr. Beeler shows that it is much more costly to operate surface cars than rapid transit trains, and the accommodations are inferior. On the other hand, in the case of the rapid transit and surface subway lines the overhead charges, representing rentals actually paid and a return of 6 per cent on the investment, are enormous. Out of each $1 of receipts 71.4 cents on the rapid transit lines and 79.6 cents on the surface subway lines are absorbed for that purpose, as compared with 14.7 cents on the street surface lines. The cost of subways and tunnels is so great that they ought to be utilized in the most efficient way. He therefore proposes to substitute trains for surface cars wherever feasible.

Under his plan, three-car trains would be operated from the Kenmore terminal of the Boyston Street subway to the North Station on a two and one-half minute headway during normal hours and a two-minute headway during rush hours. From the North Station the trains would go alternately to Lechmere Square over the viaduct lines, and to the South Station over the Atlantic Avenue line, giving five-minute service during normal hours and four-minute during rush hours on each. A simple terminal would be built at the Kenmore station, and passengers using the Beacon Street and Commonwealth Avenue surface lines would transfer at this point. Cars now entering the subway at the Public

Garden would loop back through Park Square and Church Street, passengers transferring to the subway trains. Cars now entering the subway at Pleasant Street would turn back at the Boylston Street station; and cars using the viaduct line, at Lechmere Square, where a terminal station would be constructed.

Mr. Beeler discusses the advantages and disadvantages of this plan at length and finds that the former greatly outweigh the latter. Perhaps the two most important advantages are that it would make possible a great improvement in the service on the Washington Street tunnel line and also go far to eliminate the confusion and congestion at Park Street. At the latter street the present congestion is caused chiefly by the cross-currents of passengers seeking cars at different berths. The number of seat miles operated through the subway would be increased by the proposed plan, and confusion would be avoided, since passengers could board the first train available instead of waiting for some particular car.

The plan contemplates raised platforms, flush with the car floor, at all stations in the Boylston Street and Tremont Street subways, and the introduction of the third rail. The company will soon have, with the rapid transit cars already ordered, sufficient equipment for the purpose, and the total expense, including the stations at Kenmore and Lechmere Square, is estimated by Mr. Beeler at about $400,000.

2. *Changes in Rapid Transit Operation*

Service on the route between Sullivan Square and Forest Hills is now impaired by the fact that about every fourth train goes over the Atlantic Avenue line, instead of through the Washington Street tunnel. Crowds collect in the tunnel stations during this interval, the next train is overcrowded and delayed and the entire schedule slowed down. Trains move through the tunnel in bunches of three with loads badly distributed, while the Atlantic Avenue trains have excess capacity. By linking the Atlantic Avenue line with the Kenmore-Lechmere Square route, as above described, regular and dependable service could be given in the Washington Street tunnel.

3. *Changes in Surface Car Operation*

Mr. Beeler finds that from the point of view of the average car-rider, the most serious fault in the operation of surface cars in Boston is the extremely distorted headway on many lines. He recommends a rerouting of cars, based on the principles that main lines from outlying points should, in general, terminate at the nearest rapid transit station; that lines performing crosstown service should be maintained strictly as crosstown lines, and that lines crossing the congested business district should have the shortest possible routes. The rerouting recommended is set forth in detail for each district. Mr. Beeler believes that this plan would give more efficient service with less of the objectionable bunching of cars, and at the same time save a substantial amount of car mileage.

A further bad feature of present surface car operation is the amount of time consumed in lay-overs at the end of runs. Out of every hour eleven and one-half minutes are so used, or 19.2 per cent of the total active time. Mr. Beeler shows that this is much in excess of the percentage in other large cities. In his rerouting plan the average lay-over is decreased from eleven and one-half minutes to eight and one-half minutes, resulting in an estimated saving of $171,716 per year.

4. *Power and Transportation Economies*

The report states that power, although produced with great economy, is now wastefully used. Cars almost invariably are started with brakes only partially released, and, owing to the manner in which the rigging is adjusted, are operated most of the time with shoes touching the wheels. Motormen should be taught to use the controller properly and to throw off power and coast as often as possible. The use of a device for measuring efficiency in this direction, properly followed up, should result in a saving of about 20 per cent of the power consumed.

The cost of superintendence of transportation is very high. Mr. Beeler recommends in detail a new and less complex scheme of organization eliminating superfluous officials and cutting expenses about $100,000 a year, at the same time bringing the management into closer touch with the men. It contemplates a reduction in the number of operating divisions, carhouses and rating stations, the merger of the inspection and instruction departments, and fewer starters and clerks.

Station employees in connection with prepayment areas cost the company $400,000 in 1916. Mr. Beeler believes that many of these are unnecessary, and that, by a systematic reduction in the force, a saving of at least $80,000 can be effected.

5. *Further Suggestions*

Other opportunities for economy are suggested by Mr. Beeler. Minor matters are wasteful methods in sanding track and removing snow, and the possible elimination of certain rapid transit stations which are little used. Of more importance is the method of issuing, collecting, inspecting and accounting for paper transfers. Improvements are recommended which Mr. Beeler believes will greatly reduce the present transfer abuse, thus conserving revenue. Suggestions are also made with respect to the methods of handling damage claims and in regard to the sale of unused real estate. In the case of the employees, the application of the principle of seniority to shop work is criticised, and the desirability of hearty co-operation between the men and the company is emphasized.

6. *Summary of Estimated Savings*

The estimated savings involved in his recommendations are recapitulated by Mr. Beeler as follows:

Equipment:		
Due to reduced mileage		$91,551
Power:		
Due to reduced mileage	$52,751	
Due to increased coasting	153,099	
		205,850
Conducting transportation:		
Superintendence	$101,604	
Station expense	80,000	
Smoking cars	6,000	
Reduced mileage	456,546	
Reduced lay-overs	171,716	
		815,866
Injuries and damages:		
Due to reduced surface mileage		89,189
		$1,202,456

It is stated that these savings would be largely due to the substitution of rapid transit for surface operating methods, and changes made possible thereby. Some of them could be made at once on the inauguration of the new service; others, such as the savings incident to better use of power, could only be obtained gradually. No allowance was made for possible savings under Section 5 above.

REHABILITATION OUTLINED BY MR. BEELER

Mr. Beeler concludes his report by stating that examination of the physical property, especially rolling stock and track, furnishes convincing evidence that the system must pass through a thorough rehabilitation. In other words, renewals neglected in the past must be made and all abandoned property taken from the accounts. If such rehabilitation is not undertaken, he believes that the situation can only go from bad to worse.

No Ordinary Relief Sufficient

Any of the ordinary methods of providing relief would be insufficient. If the company merely receives the right to charge a 6-cent fare, there is no likelihood, under present financial conditions, that any large amount of capital would be forthcoming, except at excessive cost, or that any plan of rehabilitation would be adopted which would really go to the root of the difficulty.

Unusual conditions demand unusual remedies. The commission believes that in the present emergency private credit and private enterprise are unequal to the task and that no fundamental improvement can be accomplished unless the whole community puts its shoulder to the wheel and pulls the Boston Elevated Railway out of the slough into which it is rapidly sinking, the burden being shared by stockholders, taxpayers and car-riders.

—MASSACHUSETTS PUBLIC
SERVICE COMMISSION

Assuming that five years would be necessary for such rehabilitation, he summarizes the cost of the work as shown in the table below.

This estimate covers the approximate cost of placing roadbed and track in good average condition; of substituting modern, semi-convertible equipment for most of the old box cars and open cars now in use, and of improving shops and carhouses. The making good of impairment caused by discarded property would be an additional charge upon earnings.

Under Section 10 of Chapter 500 of the Acts of 1897, the amended legislative act under which the Boston Elevated Railway operates, the company was restricted from charging more than 5 cents, but it secured special protection against a reduction in the rate. This contract, the commission says, was not imposed upon the company against its will. Because of it, the company has not been required to pay the so-called "commutation" tax imposed upon all other electric railway companies or to carry school children for half fare. On the other hand, the company has frequently accepted the provisions of statutes providing for new subways or tunnels, although it had the legal right, under the terms of the contract, to refuse to do so.

Track:	
29 miles per year for five years at $35,000	$5,075,000
Cars:	
New passenger cars	5,000,000
175 motor equipments at $5,000 for center-door trailer cars	875,000
Power:	
Installation of power-saving devices on cars	150,000
Rapid transit system for Boylston and Tremont Street subways, etc.	400,000
Shops, car houses and miscellaneous	2,000,000
Total rehabilitation cost	$13,500,000
Cost per year for five-year period	$2,700,000

The question which the Legislature asked the commission is this: Should Section 10 be repealed? It is a contract, the commission now replies, which cannot be annulled without the consent of the company, but it is assumed that such consent will be given if the contemplated action is likely to improve the financial position of the stockholders. If the contract is to be abrogated, however, such action should be taken because the public interest makes it necessary.

In the present case, the commission avers, the public need is clear. Physically and financially the transportation system operated by the Boston Elevated Railway is now below par. The duty of the Legislature, therefore, is to take such steps as are necessary to secure for the metropolitan district the transportation facilities and service which are essential to its welfare, but, in so doing, to impose as small a financial burden as possible upon the community.

The plan suggested to the Legislature by the commission provides for direct public control, but at the same time retains the advantages of private ownership. It leaves the situation such that at any time in the future the present status may be restored without difficulty, if such a course should then be deemed wise. The plan follows:

1. The company shall remain a private corporation, subject to the laws of the Commonwealth, and there shall be no transfer of the ownership of its property, except in the case of the Cambridge Subway.
2. The stockholders shall, in return for the guarantee of dividends of 5 per cent upon their shares for two years and 5½ per cent thereafter and as long as this guarantee continues, in effect transfer their voting power to a board of trustees representing the public.
3. This guarantee shall be made by the cities and towns served by the company through the medium of the Commonwealth, it being made in the name of the Commonwealth but with the provision that any payments thereunder shall be assessed upon the cities and towns in proportion to track mileage.
4. This guarantee shall continue indefinitely, until the Legislature shall otherwise order.
5. The board of trustees shall consist of five members, two of whom shall be residents of Boston appointed by the Mayor of the city, two of whom shall be residents of the other cities and towns served by the company appointed by the Governor, the fifth member, who shall be chairman, to be chosen by the other four members or, in the case of inability to agree, by the chief justice of the Supreme Judicial Court. No trustee, however, shall be an officer of the company.
6. The trustees shall receive from the company salaries to be fixed by the Legislature and shall be permitted to engage in other business not inconsistent with their official duties; they shall become the directors of the company; and their term of office shall be three years, all terms expiring at the same time, so that there may periodically be a complete change of control, if deemed desirable in the public interest.
7. The plan shall take effect upon the acceptance of the statute in which it is embodied by two-thirds in interest of the stockholders at a meeting duly called for the purpose; the present contract between the State and the company, as far as it relates to fares, shall cease upon, but not before, such acceptance; and upon and after such acceptance, the voting powers now exercised by the stockholders shall be exercised by the board of trustees appointed as above provided. If deemed advisable, the transfer of voting power to the trustees might be made by written instruments signed by the stockholders or by deeds of trust accompanied by a deposit of the shares in exchange for certificates of beneficial interest.
8. It is proposed that the company shall be subject, ex-

cept as may otherwise be specifically provided, to the supervision of the Public Service Commission.

9. It is proposed that new capital shall be provided in the manner recommended by the special commission last year—namely, by the sale to the Commonwealth of the Cambridge Subway, payment to be made in installments as funds are needed.

Under this plan, the commission says, transfer of control would be effected without any more disturbance of the affairs of the company than would be caused by the election of a new board of directors. The trustees could, and probably would, retain the present officers. Neither the city nor the State would alone control. The purchase of the Cambridge Subway would provide, at low cost, a fund of about $9,000,000 to be drawn upon for capital purposes, and would make unnecessary any issue or guarantee of new securities for a considerable period of time.

In the opinion of the commission the plan proposed is fair and advantageous to the stockholders, and it is fair to the public. As for an appraisal of the Boston Elevated and West End properties, the commission has not felt that such is necessary in order to deal justly and wisely with the existing situation. According to the commission, there have been faults in management, extravagances and instances of bad judgment, but the company has provided a great and costly system of transportation and has continually enlarged the service which a passenger may receive for a 5-cent fare. If it has neglected depreciation and failed to keep its property in the best of condition, this has been due very largely to the attempt to satisfy two conflicting interests. On the one hand has been constant pressure from the public for new and costly rapid transit facilities; on the other has been the desire to meet the reasonable expectations of stockholders.

In renewing the recommendation of the special commission last year for the acquisition of the Cambridge Subway by the Commonwealth, the Public Service Commission answers the objections of the Governor as follows:

"There is nothing novel in public ownership of subways and tunnels in the metropolitan district. The policy was first adopted in 1894 and has been consistently followed ever since, except in the case of the Cambridge Subway. Manifestly it is desirable that the whole connected group of subways and tunnels in Boston should be publicly owned, rather than that a minor portion should be retained in private hands.

"Local transportation systems bear a less direct relation to the war emergency than do the steam railroads, but it is clear that a breakdown in the Boston Elevated system, or even serious congestion of its service, would diminish the efficiency of a population whose energies are being devoted in no small measure to war purposes. Any expenditures necessary to keep this transportation system in good workable condition and to prevent intolerable overcrowding and delay are justifiable, under existing conditions, and, if the credit of the Commonwealth is used either directly or indirectly to meet such needs, it would be employed in the common defense."

POSSIBILITY OF OPERATING ECONOMIES

Even under the commission's plan the problem will still remain of taking the necessary steps to rehabilitate and improve the property and of meeting the cost of providing the service, including the guaranteed return. Upon the present basis, the commission states, there seems no prospect that the company will earn 5 per cent upon its stock during the current year. Any deficiency can be met in but three ways, through operating economies, an increase in fares or taxation.

Conceding that the investigation was "both thoroughly and intelligently" made, that "if the improved methods and practices suggested by Mr. Beeler could be adopted they would undoubtedly result in a considerable saving," and that "most of his suggestions, in principle at least, are sound," the company expresses the opinion that "the possibility of instituting many of the savings is somewhat remote," chiefly because of local conditions, and that a much larger expenditure of capital would be involved than has been estimated. According to the commission, the local conditions to which the company refers have to do with the attitude of the public and of its own employees. In other words, the view is that the necessary co-operation of the men could only be secured after long effort and that the changes in operation recommended in the report might not prove acceptable to the public.

The commission believes that Mr. Beeler has made a most valuable report. It has been printed for free circulation, and after the public has become acquainted with it hearings will be held with a view to definite action. It will be necessary in some instances to enlist the good-will and co-operation of the employees, in others to make certain capital expenditures, and in still others to receive the approval and help of the public. The process will be gradual, and various modifications and adjustments may prove necessary, but to the commission the prospects seem good that ultimately substantial economies can be effected, and that some can be secured at once.

WHAT REHABILITATION IS DESIRABLE NOW?

While economies of operation and of management will help, it is clear to the commission that they will not wholly solve the problem, especially if depreciation is provided for and rehabilitation undertaken. Under the circumstances, any construction of new subways may be dismissed from immediate consideration, and also any plan for the provision of new shops. The work now in progress on the Dorchester tunnel and the Everett extension, however, should be pushed to completion as rapidly as possible, and any new construction work ought to be undertaken which is incidental to such of Mr. Beeler's plans for the better utilization of existing facilities as may finally be adopted. Furthermore, every effort should be made to restore the surface track to first-class condition and to begin the gradual substitution of modern rolling stock for present obsolete equipment. Provision should be made for future depreciation, perhaps not so large a provision as Mr. Beeler recommends, but a far better provision than has heretofore been made, and discarded property should gradually be eliminated from the accounts.

Additions and betterments may properly be paid for out of the proceeds from the sale of the Cambridge Subway or out of the amounts taken from earnings to offset discarded property. Replacements, however, ought to be charged at once against income. The act of last year permits a different procedure. Under this statute replacements, such as would be involved in any extensive substitution of new rolling stock for old, may be capitalized temporarily and charged off gradually over a period of not more than fifteen years.

The trouble with this plan, to the commission's mind, is that it temporizes with the situation. It will be far better for the public and for the company, if it can be done, to meet the cost of replacements directly from earnings, avoid any inflation of capital, even though it be temporary, and secure at once the full financial advantage from change of conditions. Any increased burden upon earnings could be fully met only in two ways—through an increase in fares or through general taxation.

HIGHER UNIT FARE SIMPLEST AND EASIEST WAY OF RAISING FARES

The commission feels that a straight increase in the present unit charge is the simplest way of raising fares and the one of easiest application. Strong arguments can be advanced for the "zone system," and in certain situations, particularly where the amount of short-haul riding is large, these arguments may have controlling force, as the commission has recognized recently in the Holyoke fare case. In the present instance, however, the rapid transit lines and congestion are embarrassing factors, and the disadvantage of a straight increase is less marked because of the preponderance of long-haul riding. The Boston Elevated system, as Mr. Beeler points out, is distinctively a long-haul system, and the facilities which it affords are so necessary to most patrons that a 6-cent fare would probably result in less decrease in riding than is ordinarily the case.

COMMUNITIES SHOULD SHARE BURDEN

In the commission's opinion, however, the communities served should share the financial burdens of the situation, and it recommends the following plan, to be used in conjunction with public control:

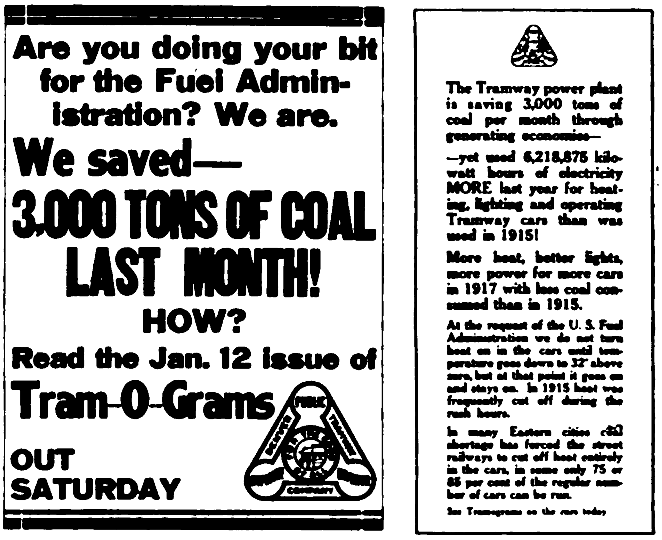
1. If the revenue derived each year from a 5-cent charge on each passenger and other sources of income is insufficient, after allowing 16 per cent for maintenance and depreciation, to pay all other operating expenses, interest, rentals, taxes and other charges against income, and dividends at the guaranteed rate, the deficiency shall be met under the guarantee by the cities and towns served in proportion to track mileage.
2. If the revenue so derived is more than sufficient to pay such expenses and charges and dividends at the guaranteed rate, the excess shall be applied to the following purposes in the order given:
   - (a) To repay any amounts which may have been contributed by the cities and towns under the guarantee.
   - (b) To meet any additional requirements which would otherwise be met by an increase of 1 cent in the unit fare, as below provided.
   - (c) To meet the cost of extensions and improvements to the property, with the proviso, however, that if excess earnings should reach this point the board of trustees would be empowered, at its option, to reduce the unit fare below the 5-cent rate.
3. The board of trustees shall have power at any time, without recourse to the Public Service Commission, to increase the unit fare from 5 cents to 6 cents, the additional cent paid by each passenger to go into a special fund to be used only to make such further provision for depreciation and rehabilitation and for the gradual charging off of discarded property as the board of trustees, with the advice of the commission, shall determine to be necessary.

Under this plan, the 5-cent charge would be used to meet what might be termed the ordinary costs of service, the taxpayers making up any deficiency. The extraordinary costs of providing for depreciation and rehabilitation would be met by the additional 1-cent charge. This makes it necessary to draw some line between maintenance and depreciation, and the standard of 16 per cent of gross receipts which has been adopted is about the amount which has been expended in the last two years for maintenance, exclusive of the sums set aside for depreciation.

Upon the basis of the number of revenue passengers in 1917, an additional cent charged throughout the year would yield $3,810,173. It would furnish a large fund for rehabilitation purposes and would make it possible, if conditions were favorable, to complete the work within a reasonably short period of time. For every dollar spent in this way the public would benefit in better service and the company in lower operating cost.

Tramway Makes Good Fuel-Saving Record

EXTENSIVE generating economies and the co-operation of its employees, encouraged by a judicious bonus system, have resulted in a substantial saving in coal by the Denver (Col.) Tramway, as shown by a comparison of its records for the months of December, 1916 and 1917. In telling the public with posters and through the newspapers of the good showing made last month, the company directed attention to the current issue of *Tram-o-Grams*, in which it was explained how the saving was accomplished. The installation of new generating equipment has reduced the coal consumption during the last two years from 4½ lb. to 2½ lb. per kilowatt-hour and decreased the amount of help necessary by reducing the number of boilers, although the length of working day was decreased and vacations for the men were also introduced. A system of bonuses by which the power-house employees share in the savings has induced the men to lend their efforts heartily in searching out all possible sources of economy, with the result that now the slogan is to "get it down to 2¼ lb. per kilowatt-hour." More scientific operation of the cars is also partly responsible for the reduced fuel record. The tramway company is said to be prepared to extend the bonus system to other than the power department as soon as the men make it worth while by increased efficiency.



Are you doing your bit for the Fuel Administration? We are.

We saved—

3,000 TONS OF COAL LAST MONTH!

HOW?

Read the Jan. 12 issue of

Tram-O-Grams

OUT SATURDAY

The Tramway power plant is saving 3,000 tons of coal per month through generating economies—

—yet used 6,218,875 kilowatt hours of electricity MORE last year for heating, lighting and operating Tramway cars than was used in 1915!

More heat, better lights, more power for more cars in 1917 with less coal consumed than in 1915.

At the request of the U. S. Fuel Administration we do not turn heat on in the cars until temperature goes down to 32° above zero, but at that point it goes on and stays on. In 1915 heat was frequently cut off during the rush hours.

In many Eastern cities coal shortage has forced the street railways to cut off heat entirely in the cars, in some only 75 or 85 per cent of the regular number of cars can be run.

See Tramograms on the cars today

SAMPLES OF DENVER TRAMWAY FUEL-SAVING PUBLICITY

Pittsburgh Railways Charging Higher Fares

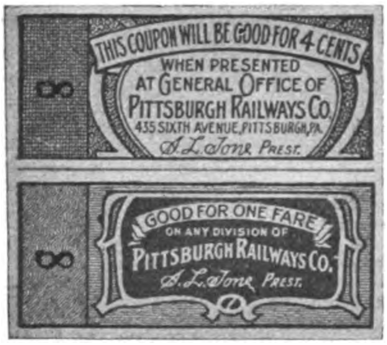
New Fares Put on Trial Last Month Well Received by Public Despite Handicapped Service Due to Severe Winter—Two Rides for 11 Cents

ON JAN. 22, following the thirty days' notice required by the State law, the Pittsburgh Railways put into effect two new rates of fare, as follows:

If the passenger pays a cash fare, he pays 6 cents for a single ride. He may, however, buy two tickets for 11 cents, or a strip of ten tickets for 55 cents, making the charge for a ride 5½ cents. These tickets are sold by conductors and also at a number of stores in Pittsburgh and in the different cities and towns through which the lines of the Pittsburgh Railways extend. These stores are glad to sell these tickets at cost, in view of the trade which is brought to them by this convenience. In the advertisement which the company carried in the daily papers announcing the increased fare, the names of stores in which tickets would be sold were published.

AVOIDING DIFFICULTY IN MAKING CHANGE

A fear sometimes expressed in connection with the establishment of a six-cent fare is that conductors will be delayed in making change, especially at first, when passengers are not accustomed to tendering the exact fare. It is thought that the use of tickets will materially reduce this delay. Another plan was also adopted besides that of supplying conductors with $3 in 1-cent pieces when he starts on his run. This plan is to issue a 6-cent ticket combined with a 4-cent change coupon, so that the combination can be sold by the conductor for 10 cents. A reproduction of one of these "change coupons," with the 6-cent ticket attached, is illustrated herewith. These change coupons, by themselves, can be used as cash in payment of fares. That is to say, they will be accepted by conductors at a value of 4 cents with 2 cents additional in payment of a fare. Or two 4-cent "change coupons" and 3 cents in cash will be accepted by conductors as payment for two single-fare tickets of the value of eleven cents. In other words, the object of the company in issuing the "change coupon" is to avoid delays when passengers are boarding cars and because of the prevalent scarcity of pennies.



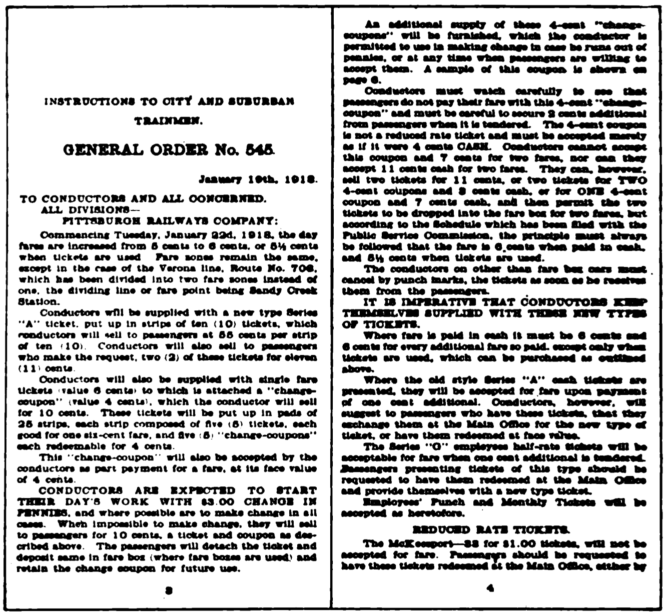
TEN-CENT CHANGE COUPON

Before the plan was inaugurated the company carried advertisements in the daily newspapers giving all information, and explaining that passengers could assist in eliminating loading delays by using tickets of the two-for-11-cent kind or by having the exact fare in 6 cents ready, or by accepting the 4-cent "change coupon," if they should proffer a dime for fare.

These regulations have proved much less formidable in practice than they sound. As a matter of fact, the public has bought the two-for-11-cent tickets in enormous quantities, so that the 6 + 4 combination remains simply an emergency relief for the conductor. Studies are now being made to secure the proper kind of locked, non-jamming fare box. At present, fares are collected by hand.

HIGHER FARES A SUCCESS

The company has reason to feel highly gratified at the way its patrons have appreciated the justness of a higher rate of fare, particularly as the unusually severe winter, car delivery delays, and the competition of munitions makers, has made it impossible to give the full service that the company desires. The very morning that the higher fare was inaugurated power was off the lines at various places for nearly three hours, yet the public accepted the situation with good humor. The passengers themselves gave short shrift to kickers.



INSTRUCTIONS TO CITY AND SUBURBAN TRAINMEN.

GENERAL ORDER No. 545.

January 19th, 1918.

TO CONDUCTORS AND ALL CONCERNED.
ALL DIVISIONS—
PITTSBURGH RAILWAYS COMPANY:

Commencing Tuesday, January 22d, 1918, the day fares are increased from 5 cents to 6 cents, or 5½ cents when tickets are used. Fare zones remain the same, except in the case of the Verona line, Route No. 706, which has been divided into two fare zones instead of one, the dividing line or fare point being Sandy Creek Station.

Conductors will be supplied with a new type Series "A" ticket, put up in strips of ten (10) tickets, which conductors will sell to passengers at 55 cents per strip of ten (10). Conductors will also sell to passengers who make the request, two (2) of these tickets for eleven (11) cents.

Conductors will also be supplied with single fare tickets (value 6 cents) to which is attached a "change-coupon" (value 4 cents), which the conductor will sell for 10 cents. These tickets will be put up in pads of 25 strips, each strip composed of five (5) tickets, each good for one six-cent fare, and five (5) "change-coupons" each redeemable for 4 cents.

This "change-coupon" will also be accepted by the conductors as part payment for a fare, at its face value of 4 cents.

CONDUCTORS ARE EXPECTED TO START THEIR DAY'S WORK WITH $3.00 CHANGE IN PENNIES, and where possible are to make change in all cases. When impossible to make change, they will sell to passengers for 10 cents, a ticket and coupon as described above. The passengers will detach the ticket and deposit same in fare box (where fare boxes are used) and retain the change coupon for future use.

3

An additional supply of these 4-cent "change-coupons" will be furnished, which the conductor is permitted to use in making change in case he runs out of pennies, or at any time when passengers are willing to accept them. A sample of this coupon is shown on page 6.

Conductors must watch carefully to see that passengers do not pay their fare with this 4-cent "change-coupon" and must be careful to secure 2 cents additional from passengers when it is tendered. The 4-cent coupon is not a reduced rate ticket and must be accepted merely as if it were 4 cents CASH. Conductors cannot accept this coupon and 7 cents for two fares, nor can they accept 11 cents cash for two fares. They can, however, sell two tickets for 11 cents, or two tickets for TWO 4-cent coupons and 3 cents cash, or for ONE 4-cent coupon and 7 cents cash, and then permit the two tickets to be dropped into the fare box for two fares, but according to the Schedule which has been filed with the Public Service Commission, the principle must always be followed that the fare is 6 cents when paid in cash, and 5½ cents when tickets are used.

The conductors on other than fare box cars must cancel by punch marks, the tickets as soon as he receives them from the passengers.

IT IS IMPERATIVE THAT CONDUCTORS KEEP THEMSELVES SUPPLIED WITH THESE NEW TYPES OF TICKETS.

Where fare is paid in cash it must be 6 cents and 6 cents for every additional fare so paid, except only when tickets are used, which can be purchased as outlined above.

Where the old style Series "A" cash tickets are presented, they will be accepted for fare upon payment of one cent additional. Conductors, however, will suggest to passengers who have these tickets, that they exchange them at the Main Office for the new type of ticket, or have them redeemed at face value.

The Series "G" employees half-rate tickets will be acceptable for fare when one cent additional is tendered. Passengers presenting tickets of this type should be requested to have them redeemed at the Main Office and provide themselves with a new type ticket.

Employees' Punch and Monthly Tickets will be accepted as heretofore.

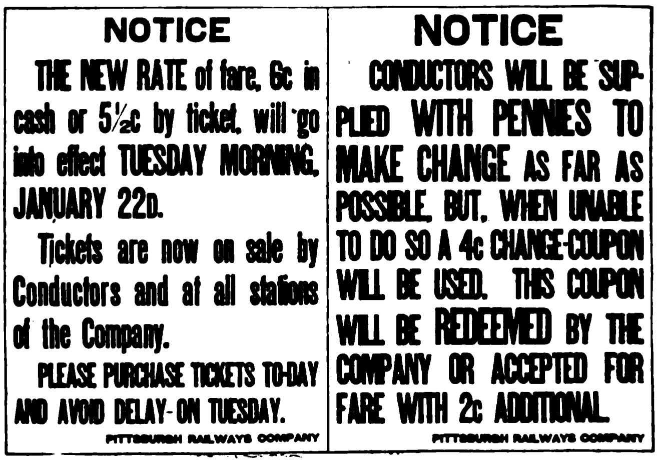
REDUCED RATE TICKETS.

The McKeesport—22 for $1.00 tickets, will not be accepted for fare. Passengers should be requested to have these tickets redeemed at the Main Office, either by

4

INSTRUCTIONS ISSUED TO TRAINMEN

An amusing instance of the effect of the new fare on a flustered conductor is told. A passenger, wishing to make matters easy for this conductor, tendered a quarter and a penny so that he could get exact change. The conductor, confronted by this novel situation, insisted on returning the penny and making 19 cents change out of the quarter.



NOTICE

THE NEW RATE of fare, 6c in cash or 5½c by ticket, will go into effect TUESDAY MORNING, JANUARY 22D.

Tickets are now on sale by Conductors and at all stations of the Company.

PLEASE PURCHASE TICKETS TO-DAY AND AVOID DELAY ON TUESDAY.

PITTSBURGH RAILWAYS COMPANY

NOTICE

CONDUCTORS WILL BE SUPPLIED WITH PENNIES TO MAKE CHANGE AS FAR AS POSSIBLE. BUT, WHEN UNABLE TO DO SO A 4c CHANGE-COUPON WILL BE USED. THIS COUPON WILL BE REDEEMED BY THE COMPANY OR ACCEPTED FOR FARE WITH 2c ADDITIONAL.

PITTSBURGH RAILWAYS COMPANY

POSTERS ANNOUCING THE NEW RATE

American Association News

War Board Met at Washington Headquarters on Feb. 1

Manila and Toledo Sections Held Big General Meetings with Music as a Feature

War Board Meeting of Feb. 1

THE American Electric Railway War Board met at Washington, D. C., on Feb. 1 and spent the day in routine business. All of the members of the Board were present and also President J. J. Stanley and Secretary E. B. Burritt of the American Association.

The organization of the traffic bureau and its proposed plans for utilizing the electric railway lines in the handling of government freight and passenger traffic, were thoroughly considered. Careful attention was also given to a request from the War Department of the government for recommendations of men for certain specific war duties.

Further details of the meeting will be given in a later issue of this paper. The Board will meet again on Friday, Feb. 15.

J. M. Bury Elected President of Manila Section

AT THE meeting of company section No. 5, held on Dec. 4, a number of business items were attended to, the principal one being the election of officers for the coming year. The result was as follows: President, J. M. Bury; vice-president, M. E. Chaves; secretary, J. G. Hess, Jr.; treasurer, B. Solano; director for four years, F. Santiago.

The preceding meeting, held on Nov. 20, was the occasion of the presentation of a very practical paper by B. H. Blaisdell, chief engineer power plant, on the subject "A Kilowatt-Hour and the Coal Required to Produce It." An abstract of this paper will appear in a later issue of the JOURNAL. As a compliment to J. H. Pardee, president J. G. White Management Corporation, and J. P. Ripley, railway engineer of the same company, who were present on a visit from the United States, the meeting was made an open one. Mr. Blaisdell's paper was extensively discussed and the gist of the discussion will be incorporated with the abstract of the paper.

At the November meeting, Eugene Wagor, traffic inspector, who won "honorable mention" in the 1917 competition for the best paper presented before a company section, was awarded the sum of 50 pesetos by C. Nesbitt Duffy, vice-president of the company, in recognition of the honor which the section received through Mr. Wagor by virtue of this award. It will be remembered that Mr. Duffy had promised 100 pesetos to any member of the section who should receive the medal. While no gift had been promised to the winner of "honorable mention," Mr. Duffy felt that Mr. Wagor had come so close to winning the medal that he had earned this recognition.

In commenting upon the award to Mr. Wagor, Mr. Pardee called the attention of the employees to the fact that the motormen and conductors are the company's salesmen. The motormen present the goods for sale and the conductors collect from the customers before the latter get their goods. When the customers are satisfied they are glad to trade with the company again. If not, while they may have to trade with the company, yet they dislike to do so, and the relations between merchant and customer are not satisfactory.

After Mr. Pardee's remarks the meeting was entertained by selections from three different orchestras composed respectively of employees from the transportation, power plant, and shop and carhouses departments. The last-named orchestra performed on native bamboo instruments.

Safety Rally at Toledo

ON JAN. 23, in the Auditorium Theater, Toledo, Ohio, Marcus A. Dow, general safety agent of the New York Central Lines, spoke at a joint safety rally of the employees of the New York Central Lines, the Willys-Overland Company and the Toledo Railways & Light Company on the subject "Accident Prevention a Patriotic Duty." In connection with his talk on accident prevention Mr. Dow showed his safety film entitled "The Rule of Reason."

Mr. Dow summarizes the present safety situation in these words: "The prevention of accidents is important at all times both from a humanitarian and economic standpoint. To-day, however, with our country at war, it is of greater importance than ever that every consistent effort be made to conserve the lives of industrial workers and to prevent disabling injuries, because the killing and maiming of this vast army yearly is a serious drain on the man-power of the nation at a time when every available man is needed for the work that is to be done."

At the meeting the Overland Band played, and Hon. Cornell Schreiber, Mayor of Toledo, made a short address. Frank R. Coates, president of the Toledo Railways & Light Company, presided at the meeting.

Electric Railway as Usual a Public Benefactor

THE records of fifty years in the United States Weather Bureau show previously no such conditions as have existed recently in Chicago. The manner in which the street railway company kept open the main highways for vehicle movement of all kinds inspired many letters of appreciation and friendly editorial comment in the daily papers. Out of some 2000 miles of streets in the city, cars use one-fourth of the total. The fact that for days at a time no thoroughfares were open except those furnished with car lines brought thousands of vehicles onto the tracks. Snow was piled from 4 to 10 ft. high on each side of the moving cars and this left no roadway for other vehicles. The result was prolonged congestion and reduced car movement, the speed of course being reduced to that of the slowest vehicle.

LETTERS TO THE EDITOR

Publicity Always the Best Policy

SOUTHERN PUBLIC UTILITIES COMPANY
CHARLOTTE, N. C., Jan. 29, 1918.

TO THE EDITORS:

In the issue of Saturday, Oct. 14, 1916, the ELECTRIC RAILWAY JOURNAL carried a cartoon, the title of which was "The only time not to start a publicity campaign." This cartoon showed a street car carrying only the motorman and conductor, the center of attacks from the multitude along the street. Brick bats labeled "abuse," "demand," "lower fares," "complaint" and other things were being hurled at the car.

This cartoon and the accompanying subject matter attracted my attention at the time, and since then the lesson carried has been the guiding star in the policy of this company (Southern Public Utilities Company) in the matter of publicity.

Last week at Greensboro, N. C., I saw the value of the lesson more clearly than I had ever thought to see it. At that time and place representatives of the leading electric railways of North Carolina gathered for a conference on the matter of increased revenue. That additional revenue was a necessity was agreed upon before the conference, but the manner of bringing this condition of affairs into existence was the question to which these gentlemen at the Greensboro meeting addressed themselves.

One of the first things that the chairman of the conference [Robert Lee Lindsay, vice-president and general manager of the Durham (N. C.) Traction Company] said was that a comprehensive campaign of educational publicity was desirable. He commented upon the results of the fixed publicity policy of this company and that of the campaign recently waged in Greensboro by the North Carolina Public Service Company, under the direction of President Charles B. Hole, which brought about a ruling by the City Commissioners allowing that company to withdraw special rates and special tickets. He urged the inauguration of a campaign of education which would show to the people at large the necessity of being allowed to increase revenue.

This was thought to be a step in the right direction, but the representative of another company expressed the opinion that in the meantime his company and others would be losing money, that immediate relief is what is now desired.

Then the cartoon and accompanying subject matter, of which I spoke above, came again into my mind, and I realized more forcefully than ever before the accuracy of the position taken by the ELECTRIC RAILWAY JOURNAL nearly a year and a half ago.

Then again, as if in response to the demand of the occasion, the ELECTRIC RAILWAY JOURNAL in its issue of Jan. 19 of this year, carried a two-page signed statement, editorial, I suppose it might be called, along the same line. In this statement appeared this pertinent paragraph:

> The ability of the electric railway industry as a whole to do a profitable business depends absolutely on the state of the public mind toward that industry.

It seems to me that this paragraph was written especially and particularly for those electric railways which have never undertaken the education of the public concerning difficulties under which they operate, the matter of increased cost of material, labor, and all other costs of operation in which the public will show a decided interest when given an opportunity.

This leads me to return to the suggestion of a central publicity bureau of the American Electric Railway Association for the assistance of railways in just this sort of situation. I believe great service can be rendered the individual railway by the association in furnishing data for use in advertising matter, and still am of the opinion that the railways do not make use of the service now offered by the association. What is needed, to my mind, is the education of the electric railway companies to the necessity and advisability of educating the public *before there is the necessity for decisive action,* such as appears now to be the case with electric railways in North Carolina.

By educating the public I do not mean begging the question, by pleading with the people to give the railways added revenue, or a fair deal in legislation, or many similar matters, but as shown in your signed statement (pink sheet, Jan. 19), "through its passion for fair play, justice and good sportsmanship."

And in conclusion I want to violate the proprieties a bit by suggesting that electric railway management officials over the United States would do exceedingly well to not only subscribe for the ELECTRIC RAILWAY JOURNAL, but to read it and study it carefully, and put into operation many of its most excellent suggestions *before there is a necessity* for such action as is indicated. I deem it well worth the while of the highest paid executive in the country to give careful attention to these suggestions. If acted upon at the proper time they will in many cases eliminate the necessity of drastic action, and often unsuccessful results therefrom.

The publicity campaign for the education of the people as to the exact situation confronting electric railways in North Carolina has already been inaugurated, and if handled in the proper way the results will be all that could be hoped for.

But the wrong time to start a publicity campaign, as so graphically shown in your cartoon, is when the public is throwing bricks through your windows.

LEAKE CARRAWAY,
Director of Publicity.

Shall We Go Back to Cradle Suspension?

NEW YORK, Feb. 4, 1918.

TO THE EDITORS:

I have read with interest the article on "Experience with Interurban Car Axles" by A. B. Metcalfe of the Empire State Railroad, Syracuse. His road is not the only one which is suffering from axle failures of the kind which he describes. The cause of these troubles, which brings other ailments in their trains, is the faulty design of mounting the dead end of the motor on the axle without any vertical cushion or side play. The result is that the axle is constantly subject to severe hammer blows. The Empire State Railroad is not the only corporation suffering from these defects. This trouble will continue until a more rational method of motor suspension is general. JOHN DEE.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT

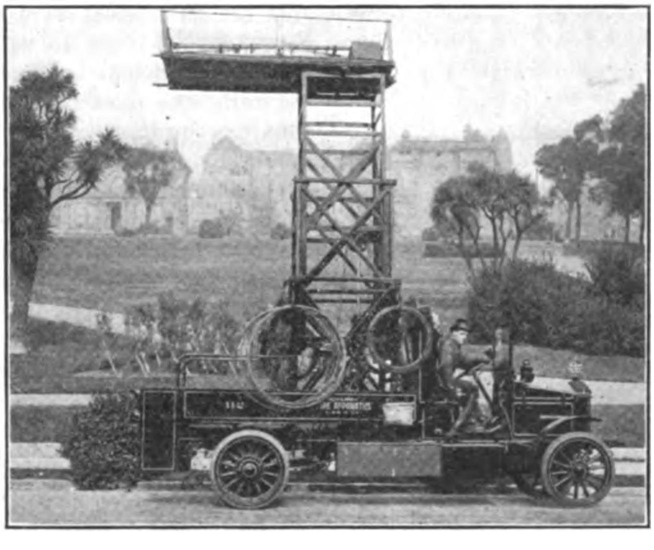
Auto-Tower Truck with Engine-Raised Tower

Three-Section Tower with Men in Place Raised in Ten to Twenty Seconds—Tower Can Be Raised and Lowered While Truck Is in Motion

By S. L. Foster
Chief Electrician United Railroads of San Francisco

THE United Railroads of San Francisco has recently developed and put into successful service for rapid and efficient overhead trolley line work an interesting type of auto-tower that is believed to be unique in its labor-saving method of tower hoisting.

The vehicle consists of a three-section tower mounted on a 2-ton Pierce-Arrow worm-drive chassis, the tower being raised and lowered by the standard hydraulic hoist of the Pierce-Arrow dump body. This form of ram cylinder hoist for each foot of lift requires two feet of rope and lifts the front end of the dump body two feet. The steel cables from the ram cylinder are wrapped around the hoisting drum of the standard Trenton tower. In its 3½ ft. of rise the hoist unwinds from the drum 7 ft. of its cable and at the same time winds onto the drum 7 ft. of the cable used to hoist the tower, thus raising the tower 7 ft. If a lesser or a greater rise of the tower is desired for this 3½ ft. of ram-piston travel, the relation between the diameter of the part of the drum on which the hoist cable is wound and the diameter of the part on which the tower cable is wound can be readily altered to secure any reasonable result.



AUTO-TOWER TRUCK WITH TOWER RAISED

In operating, oil is forced under the piston of the ram cylinder by a pump actuated by a dog clutch. This is connected by gearing with the main automobile engine shaft and controlled by a three-way valve. The first of the accompanying photographs shows the chauffeur with his right hand on the handle governing this valve located at the side of his seat just behind the Stewart warning horn. The tower can be raised, lowered or held at any height without moving from the driving position. Further, it can be raised on the way to the work and lowered while en route departing—an impossibility with the hand-operated crank on the horse-drawn rig.

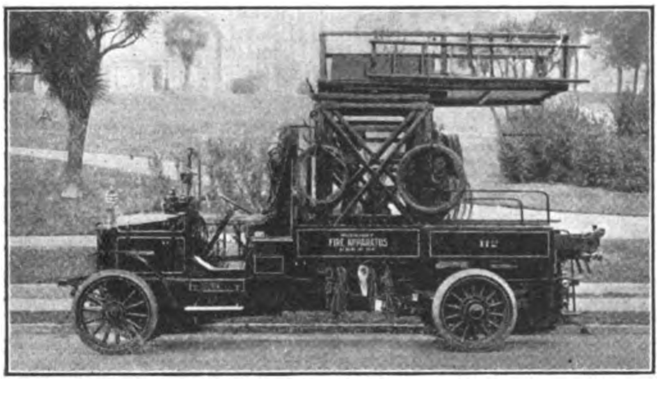
No oil reservoir is needed, as the oil pumped under the piston is drawn from above the piston, and, in lowering the tower, the oil is forced back into the original cylinder through a by-pass pipe. An automatic safety relief valve in the piston is opened when the piston of the ram cylinder approaches the head of the cylinder, thus preventing any excessive lift of the tower from inattention of the chauffeur.

There are many advantages in the three-section tower. It is stronger than the two-section type, as the light top section is reinforced by the intermediate section 2½ ft. further up in the later three-section type than in the older two-section one, and the former is thus more resistant to strains from pulling out long lengths of trolley wire. Also, in this later type, the platform when down is 12 in. lower than with the two-section tower and when raised is 16 in. higher. These differences can be readily varied to suit the taste, as already explained. The construction of the three-section tower lowers the center of gravity, already lowered by the small-wheeled, heavy auto chassis, reduces the danger of overturning on rounding curves, permits higher speed and enables the workmen to reach the 22 ft. high trolley wires at steam railroad crossings and the tops of side poles readily.

There are also many advantages of the motor-driven hoist for the tower as compared with the old crank and ratchet appliances. It saves time and the physical energy of the men, raises the tower in from one-sixth to one-third the time, lowers it three times as rapidly and eliminates all danger of the crank handle slipping from the workman's grasp and breaking his arm or striking his head, as has happened in the past on the manually operated hoists of the horse-drawn wagons. The men formerly engaged in tiring themselves out on the crank raising the tower and then leisurely climbing to the raised platform, now mount the platform when down and are elevated to their work without effort. Thus time is saved and the men are more alert and energetic in the work that counts. The loaded three-section tower can be raised by the hydraulic hoist in from ten to twenty seconds, whereas by hand the empty two-section tower ordinarily consumed from sixty to seventy-five seconds. The hand crank means of hoisting is always available if the power mechanism fails.

Attention is directed to San Francisco's tropical winter background, seen in the illustration. The following features should also be noted: The portable forge at the rear of the vehicle in one picture and the suspended solder pot in the other; the "Desert Bag," in which the men carry their supply of fresh, cool drinking water; under the "Desert Bag" the long box, with its hinged side for ready emptying of scrap material; the box in the rear for the men's waterproof coats; the row of hooks for hand lines, tie wires, slings, etc., under the "Auxiliary Fire Apparatus" sign; the shielded siren under the license plate; the "spotlight" on the dash for night work on poles; the "J. M." fire extinguisher under the spotlight; the double hooks for two extension ladders along the side of the machine; the use of the ram cylinder of the hoist as a standard on which to install radiating, superimposed metal arms equipped with hooks of trolley wire for supporting and at the same time keeping separate and readily accessible various kinds of material like cap and cone bodies, curve hangers, pole bands, eyebolts, washers, links for use on porcelain insulators, linemen's "spurs," wood-strain insulators, frogs, 35-deg. angles, etc.; the double material and tool bins back of the tower and the charcoal bin under the floor; the tool boxes on the platform of the tower; the plentiful array of hooks all around on the lower tower section on which to hang blocks, bolt cutters, coils of trolley wire, strand, feed and cable wires, coats, etc. There is also a drawhead in the rear for ready attaching of tongues of formerly horse-drawn vehicles such as ornament hoist, derrick or trolley gig.

It should be stated that the departure from parallelism between the cables going from the sheaves at the top of the piston rod of the ram cylinder and the piston rod, as appearing in one of the photographs, was found to cause chattering of the piston rod when nearly out. This has been remedied since taking the photographs by installing two idler sheaves at the top of the ram cylinder to hold these cables to true parallelism with the piston rod.



TRUCK WITH TOWER IN RUNNING POSITION

The standard Pierce-Arrow 2-ton chassis wooden protecting hood for the chauffeur was replaced by a two-bow top for use in our rainy winters and entire removal in our rainless summers, so that the chauffeur could the more readily hear the verbal or whistled orders from the men aloft. The swinging leaf of the tower is worked projecting over the rear of the vehicle for the same reason that the hood was removed, namely, to facilitate verbal communication between men aloft and the chauffeur and also because in twenty-seven years of tower-wagon experience there has never yet been a case of injury to the driver by anything falling on him.

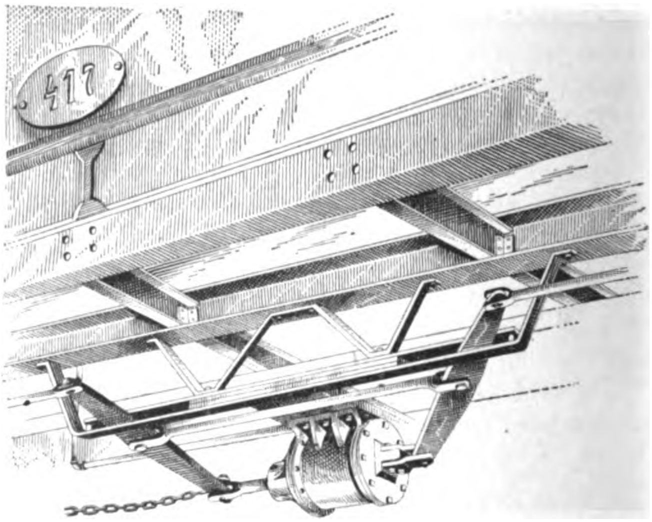
Two improvements possible on the auto tower as at present equipped are the application of a self-starter and the use of an as yet undeveloped device for heating a pot of solder. The device sought should be lighter and simpler than the heavy charcoal forge, but equally as satisfactory and as rapid in results in our windy climate. Gasoline consuming appliances have so far proved unreliable here, compressed gas consuming appliances unequal to the task and electrical appliances undeveloped.

Insuring the Action of Brakes on Double-Truck Cars

By F. J. Foote

Master Mechanic, Ohio Electric Railway, Columbus, Ohio

THE failure of one main brake rod on double-truck equipment when the loss of power prevents reversing the motors is likely to result in a serious accident, especially when it occurs on a down grade. To insure against this condition, we have installed on most of the cars of the Ohio Electric Railway a simple device, the application of which can be seen from the accompanying sketch. Two 3-in. steel straps, ⅞ in. thick, were bolted together with one or more similar straps of shorter length between them, and fastened to the car sills set on a level with the axis of the air cylinder. This provides slots in which the cylinder levers move during all normal braking, and in case a main brake rod fails, the motion of the lever it is connected to is definitely limited so that force can still be exerted on the other brake rod. In other words, it supplies a point of support for the affected cylinder lever to replace the reaction that would be transmitted from the brakeshoes through the disabled rod.



STOPS FOR BRAKE LEVERS IN CASE ONE MAIN BRAKE ROD FAILS

Such a device for this purpose is easy of application and inexpensive. The bracing can be done in different ways, using any suitable material which is on hand, the only requirement being that it be strong enough to withstand the severe strain.

Car Axles, Their Design, Manufacture and Service

PART II—ANALYSIS SHOWS THE DESIRABILITY OF ELIMINATING ABRUPT CHANGES IN SECTION

BY NORMAN LITCHFIELD

IN THE issue of this paper for Feb. 2 we discussed the method of calculating the maximum stresses in a car axle, illustrating the theory by applying it to one of the A. E. R. E. A. standard axles. Having thus determined the magnitude of the stresses the next point to be settled is whether, with a given steel, there remains a sufficient safety factor to give a safe axle, by that term meaning one which will be free from failure during its life as determined by the wear of the journal.

It is evident that we cannot state absolutely that the stress as figured represents actually the stress in the axle under the conditions in which it operates. We can, however, measure each axle by the method and determine by experience and analysis what stresses when so calculated have produced axles that have operated satisfactorily and what stresses have existed in axles that have failed.

LESSONS OF THE MASTER CAR BUILDERS' REPORT

The M. C. B. committee in the report refererd to earlier reported as follows:

"Breakage may occur as the result of poor material, bad design in respect to shape, the spreading of an initial crack, *or from repeated applied* stresses above a safe limit. In Wöhler's celebrated series of experiments upon the effect of repeated stresses in small bars, he found that, where the strains alternated between tension and compression, the outer fiber stresses might be safely taken as 17,000 lb. per square inch for iron, and 23,000 lb. per square inch for steel, without limiting the life of the bar. But if the stresses exceeded these limits, fracture would always occur if the number of repetitions of stress were sufficient.

"Again, in large bars, such as car axles, where the extreme or outer fibers are a considerable distance from the neutral axis, and where the material is often far from homogeneous throughout, it is reasonable to suppose that strains are not transmitted symmetrically in all its parts, and some of the fibers may bear a larger proportion of the total stress than would occur in an even distribution. In this way the elastic limit may be locally exceeded with a very moderate total stress only. Professor Bauschinger determined what he called the 'natural elastic limits' of a bar in tension and compression. These limits he defined to be the limiting load to which a bar of the same material can be strained repeatedly in tension and compression without breaking, when the load is repeated sufficiently often, as determined by Wöhler. The 'natural elastic limit' is considerably below the elastic limit as ordinarily determined. The explanation of this fact as given is that the welding, forging or other manufacturing process to which a bar has been subjected temporarily raises its elastic limit, which is again lowered to its true value under the influence of alternating stresses.

"There seems to be no evidence to show that, when the fiber stresses are kept below the natural elastic limit, any apparent change in the structure will occur before the axle is condemned by reason of being worn out at the journals.

"Taking the fiber stress calculated (as explained in the M. C. B. report) it was found that a large number of axles of one design had broken where the fiber stress was 28,000 lb. per square inch, these axles having been in service from four to nine years. Where the fiber stress was 23,000 lb. or less, the records show that axles have been practically free from failure by breaking."

The committee concludes that "if a fiber stress of 22,000 lb. per square inch is taken for the portion of the axle between the wheels, and the proper material is provided, a safe design will be the result without much surplus material."

Since the day of this very remarkable and original report the development of the automobile and the aeroplane, of ordnance, projectiles and armor plate, has caused tremendous strides to be taken in the manufacture of steel and in the knowledge of the qualities best suited for different service. In the main, however, the basic facts given in that report remain true, namely, that metal in a given condition remains in the same molecular condition indefinitely, the so-called "crystallization" of steel being non-existent; and that the life of the axle under repeated alternating stresses increases enormously as the maximum stress is reduced in proportion to the elastic limit of the material used. The latter fact is well illustrated in a paper presented by Howard before the American Society for Testing Materials on "Endurance of Steel," and printed in Vol. 7, 1907, of the *Proceedings* of that society. The graph given in Fig. 3, reproduced from that article, shows the progressive gain in endurance of steel under alternating (rotating) stresses as the loads are reduced, showing that with a load stressing the specimen to its elastic limit (60,000 lb. per square inch) the steel failed after 12,490 revolutions. When the load was reduced so as to give only 30,000 lb. per square inch stress (50 per cent of the elastic limit) the steel stood up for 76,326,240 revolutions without failure. The load on the same specimen was then increased to 60,000 lb. per square inch and the steel failed after 8100 revolutions.

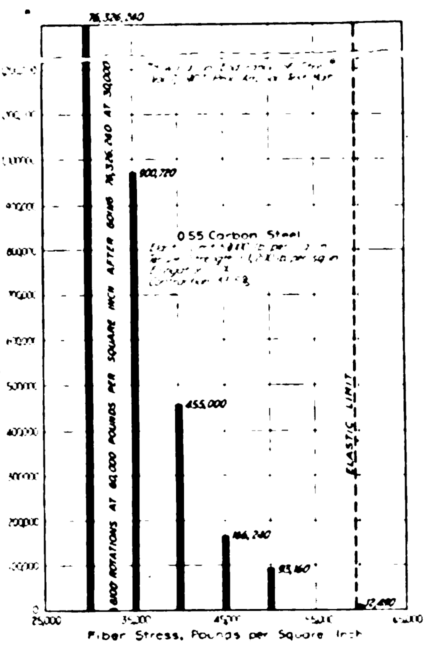


FIG. 3—DIAGRAM SHOWING PROGRESSIVE GAIN IN ENDURANCE OF STEEL AS LOADS ARE REDUCED

Assuming, then, uniformity in the steel and proper design of axle, it is generally agreed that the life of the axle will increase as the ratio between the maximum stress and the elastic limit is increased. It then remains to determine how low a figure must be selected for the maximum stress. In the M. C. B. report this was given as 22,000 lb. per square inch for the freight-car axle under consideration. It will be remembered that in the committee's calculation an increase in load equal to 26 per cent of the weight on the journals was included to allow for vertical oscillation. Twenty-two thousand pounds per square inch stress thus calculated is equivalent to 17,500 lb. per square inch without making allowance for vertical oscillation. For passenger-car axles it is considered good practice on steam roads to make the limit 15,000 lb. per square inch. This, it will be noted, is on the two assumptions of center of gravity 6 ft. above the rail and centrifugal force just sufficient to overturn the car (40 per cent of the weight). For electric-car service, with its sharp curves, high acceleration and braking rates, gear vibration, etc., the lower center of gravity as found in Fig. 1 (page 235, Feb. 2 issue) should be considered together with force required to overturn the car.

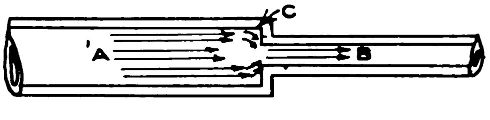


FIG. 4—FLUID ANALOGY OF ABRUPT CHANGE IN FIBER STRESS IN AXLE

A number of axles in electric service in which the stress ran between 22,000 and 23,000 lb. per square inch failed after about 250,000 miles, while another lot of same character of steel, in which the stress ran about 18,000 lb. per square inch, gave satisfactory service throughout their life.

STRESS INTENSITY SHOULD NOT CHANGE ABRUPTLY

Referring to Fig. 2 again (page 236, Feb. 2 issue), it is seen that the maximum stress in the electric railway axle shown is 17,654 lb. per square inch, or something less than that in the axles above cited which gave good service. A closer study, however, shows that the design is not a good one, on account of the abrupt changes in the intensity of the stress, particularly at the point of maximum stress, where it is 11,604 lb. per square inch in the wheel seat and 17,654 lb. per square inch immediately alongside it at the motor bearing.

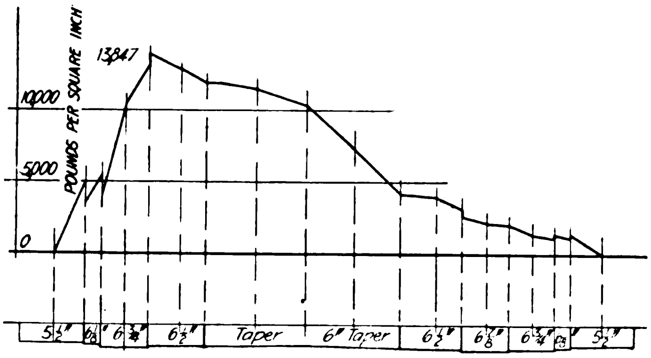


FIG. 5—STRESS DIAGRAM DRAWN FOR AXLE MODIFIED FROM A. E. R. E. A. DESIGN

It may be asked why such a change in stress is undesirable. A good method which has been used to make this clear is the use of the analogy of the flow of water through an abruptly restricted section of pipe, as shown in Fig. 4. In the large pipe the velocity at *A* is V, which in the small pipe becomes V_1, greater in inverse proportion to the squares of the diameters of the pipes. At *C* it is evident that there is a violent local action, due to the rapid change in velocity at that point. A small fillet does not make the transition gradual enough to prevent the likelihood of localization of stress at this point.

A modified design is shown in Fig. 5, which would require boring out the motor brasses to the amount shown, and enlarging the journals. The slight reduction in the wheel and gear seats is not sufficient to cause any loss in the holding power of these parts on the axle. The stress diagram given in Fig. 5, in comparison with that in Fig. 2, shows how much more evenly the stress is distributed than in the standard axle.

Such a design is desirable, for no improvement in material or even reduction in maximum stress will make up for poor design. Thus, where the conditions are such that it is impossible to increase the minimum section so as to bring the stress within the limits of good practice, special care should be taken in the design to eliminate sudden and violent changes of stress as far as possible, as well as to use extra-high-grade material.

The use of keyways is also very detrimental for a similar reason, and as experience has clearly shown in rigid service that they are not necessary in order to maintain tight fits of wheels and gears, they should be eliminated.

The Use of Ball Bearings on Electric Railways

Series of Tests Conducted on Berlin Street Railways Demonstrates Superiority of Ball Bearings Over Plain Bearings

THE Berlin street railways recently carried out a series of tests on cars equipped with ball bearings, as described in a late issue of *Electrotechnik und Maschinenbau.* These tests were made under conditions involving the various phases of street railway operation ranging from very low speed in heavy traffic to high-speed non-stop runs of several blocks between stops. The results of six round trips with four cars—one of which had plain bearings and the other three ball bearings—showed an average saving in energy consumed by the cars with ball bearings of 8 per cent over that consumed by the car with plain bearings.

The tests were continued during the night with the same car with plain bearings and two of the cars with ball bearings. Because of the absence of traffic and the elimination of some of the stopping at switches the consumption of energy during the six round trips was more evenly distributed and also somewhat less than during the previous tests. The results of the six round trips was an average saving, by the cars with ball bearings, of 8.8 per cent of the current consumed by the car with plain bearings. The tests continued with trailers showed an average saving of 7.6 per cent with ball bearings.

Repeated tests showed that the values for each of the cars fluctuated according to the motorman, the roadbed and the weather, and probably also because of different conditions in the various bearings. One of the peculiar results of the tests was the discovery that it took a motorman from a quarter of an hour to half an hour

BALL-BEARING-EQUIPPED CAR AFTER EIGHT HOURS' CONTINUOUS SERVICE. BEARING TEMPERATURE 35 DEG. C.

	Immediately on Arrival of Car	After Five Minutes	After Ten Minutes	After Thirty Minutes	After Two Hours	After Two Days
Force required to move car, pounds	159.	154.	150.	151.	152.	150.
Friction resistance, pounds per ton..	11.7	11.4	11.1	11.15	11.2	11.1

PLAIN-BEARING-EQUIPPED CAR AFTER SIX HOURS' CONTINUOUS SERVICE. BEARING TEMPERATURE 43 DEG. C.

Force required to move car, pounds	408.	463.	485.	496.	489.	494.
Friction resistance, pounds per ton..	29.8	33.7	35.3	36.1	35.6	36.0

to become accustomed to the easier running of the car, and to judge his current consumption accordingly. Another unexpected result was the tendency of the motorman to permit the car equipped with ball bearings to overrun stopping places, because of too late application of the brakes. It was also found that the energy saving depends to a great extent upon the distance between stops. With a run of two or three blocks the current can be cut out sooner, resulting in a longer period of coasting on the ball-bearing-equipped car than on the car not so equipped. As the length of run is increased the difference between the coasting periods of the two cars is also increased.

One of the most important advantages of cars equipped with ball bearings is the ease with which the empty cars can be rolled back and forth by hand in the terminals and repair shops. At the instant of starting the car the ball bearing shows its greatest saving in energy consumption, for once the car is in motion the saving is much less.

To determine experimentally the force required to move a car, a dynamometer was inserted between the pulling power and the car. The average of ten separate tests was recorded as representative of certain cars, and the results show that with cars weighing 13.7 tons empty it took an average force of 10.6 lb. per ton and 37.8 lb. per ton respectively to move cars with and without ball bearings. These tests were made on cars which had been standing idle for two days.

Further tests made on the German railways to determine any change in the force required to move the two types of equipment after a period of continuous service gave the results shown in the tables above.

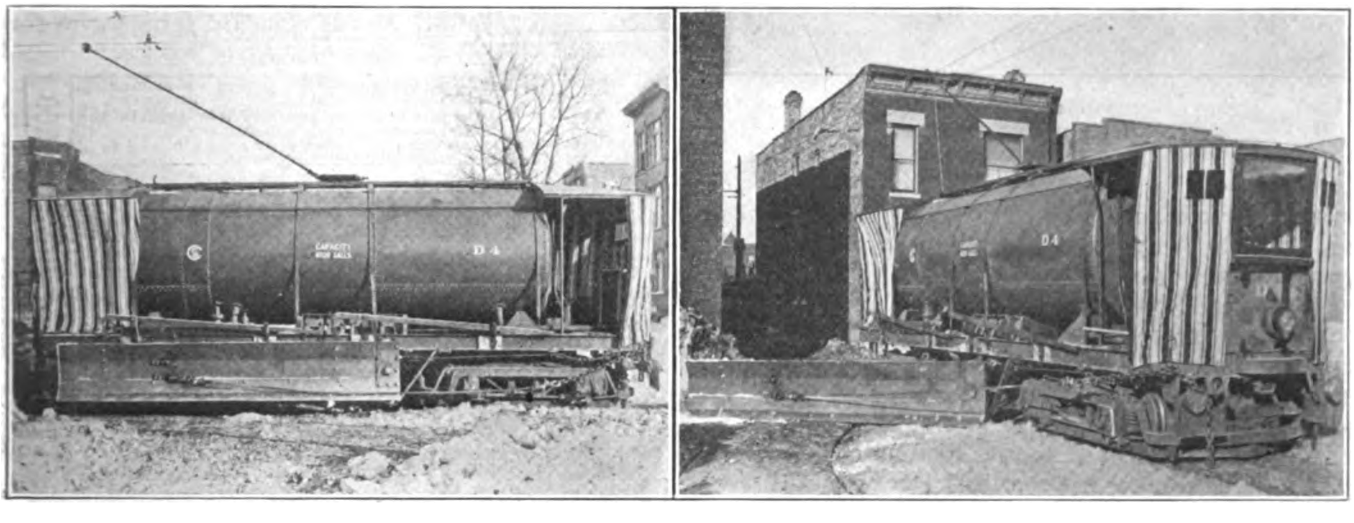
Comparison between the figures shows that on the ball-bearing-equipped cars greatest resistance occurred immediately after stopping, decreasing by more than 5 per cent within ten minutes, while the other car showed the smallest resistance while warm and increased by nearly 20 per cent within ten minutes.

Sprinklers and Work Cars Make Good Snowplows at Chicago

Wings Hinged to Car Side Sills Prove Effective as Supplementary Snow-Fighting Equipment on Chicago Surface Lines

THE snow equipment of the Chicago Surface Lines at the time the first storm broke this season consisted of ninety-six sweepers, ten power plows, forty-nine wing plows and eighty-one drag plows. These were so distributed as to give the best results in taking care of the thousand or more miles of single track within the city limits. The storms beginning on the night of Jan. 5 were of exceptional severity and the need of additional emergency equipment was impressed on the rolling stock and shops department of the company.

Lying in the various car stations were numerous sprinkling cars, put away for the winter months. Seven of these double-truck cars, equipped with four GE-80 motors each, have now been furnished with wing plows and added to the winter equipment. The wings are 15 ft. long and 30 in. high, the weight being 1500 lb. Each is constructed of 3-in. oak covered with sheet steel on the face. At the bottom is a steel plate $\frac{1}{2}$ in. x 12 in. The wing is curved at the top and bottom so as to keep snow rolling when in action. It is best operated at an angle of 45 deg., being held in position by a $\frac{3}{4}$-in. chain or cable. The stress on the plow when bucking heavy snow embankments is indicated from the fact that a 24-ft. chain was stretched 32 in. when in action.



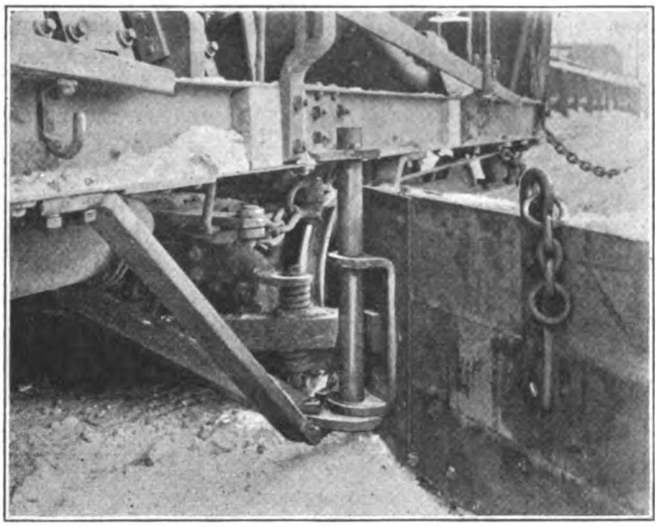
SPRINKLER CAR EQUIPPED WITH WINGS FOR SNOW FIGHTING—AT LEFT WING FOLDED AGAINST SIDE OF CAR, AT RIGHT WING EXTENDED AT ANGLE OF 45 DEG.

The hinge connection and heel of the plow are so arranged that the wing is hinged on a $2\frac{3}{4}$-in. shaft by means of a huge U-shaped forging. The wing is pivoted to this forging with a 2-in. bolt. This leaves the wing free to move up or down if it strikes an obstacle. The heel of the plow is carried 3 in. above the rail. One of the wings is attached to each side of the sprinkler so that it can be used in either direction. The wings can be raised, when not in use, by means of a lever and swung in parallel to the car.

For the protection of the operating crew a movable vestibule has been placed on either end of the car. The entire storm equipment is easily detachable so that the car may be converted for summer use.

The first experiment in equipping the sprinklers was made with a shorter and lighter wing, the length being 14 ft. and the weight 1000 lb. To make this wing effective, however, it was necessary to put weight on the outer end. At first four men sat on it to keep it down while operating. Later 400 lb. of axles were attached to the extreme end to take the place of these men. With the improved type of plow this is unnecessary.

Another combination plow has been developed by the engineering department, consisting of two work cars permanently coupled, each having a wing attachment which can be extended from 12 ft. to 20 ft. The wing of the forward car is arranged to sweep the top snow from heavy embankments. The wing on the next car, set closer to the rail, scrapes the snow nearer to the ground level.



HINGE OF WING ON SPRINKLER EQUIPPED AS AUXILIARY SNOW PLOW

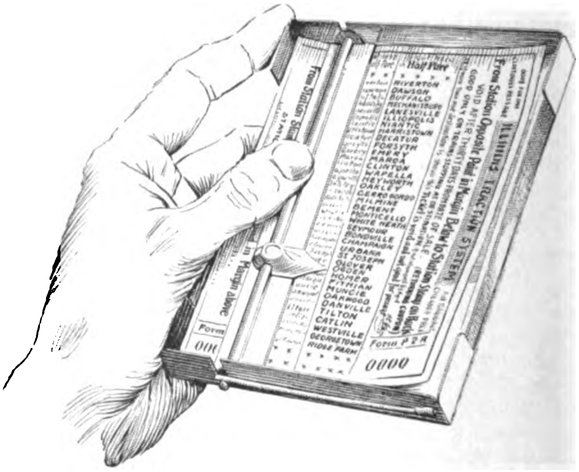
To give additional power to this fighting machine two other work cars have been attached at the rear, thus giving a combined force of 640 hp. A buzzer system is installed permitting signals to be sent from the leader to the followers so that power may be applied or cut off on all simultaneously. This combination equipment, of course, is used only on the widest streets and in locations where snowbanks are unusually high. Some banks over 8 ft. high were pushed back from the tracks. It has proved quite effective in opening up lines in the sparsely-settled districts of Chicago.

Tests made in a number of small isolated power plants by the Arkansas Valley Railway, Light & Power Company have shown that from 12 to 20 lb. of coal per hour is required to produce 1 hp. This is contrasted with the development of a horsepower-hour from less than 3 lb. of coal in the modern steam turbine plant of the same company.

New Ticket Box-Cutter for Use on Interurban Lines

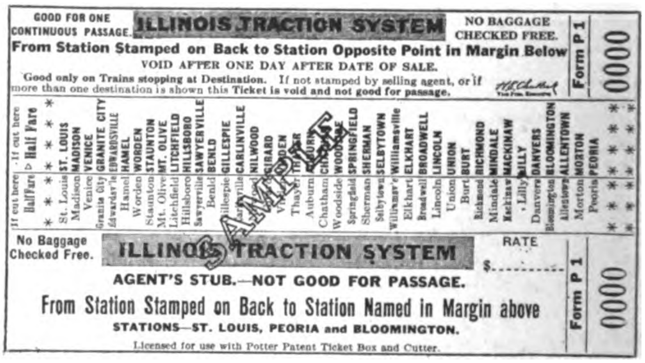
THE apparatus shown in the accompanying illustration is known as the "Potter Ticket-Box Cutter." In appearance it greatly resembles a transfer issuing box, but in this case is for indicating the destination on tickets of interurban lines.

The ticket stock is the same as that for transfers, and the names of the stations are placed in a vertical column in their proper order. To issue a ticket the pointer is placed on the name of the station to which the passenger wishes to travel, the ticket is drawn back over the sharp point and torn along the straight edge. This leaves a V-shaped cut to indicate the destination. The station at which the ticket is purchased is stamped on the back in the usual way. Either round-trip or one-way tickets can be issued in this manner.



TICKET BOX-CUTTER WORKS LIKE TRANSFER HOLDER

Some of the advantages claimed for this arrangement are as follows: As one standard form serves for all local and through tickets, any ticket stock can be reduced 75 per cent; tickets can be purchased in much larger quantities; the time necessary to issue one of these tickets is the same as that of issuing a card ticket from the case; as a duplicate agent's stub is retained for every ticket issued, accounting for general ticket-stock records and for auditors is materially reduced.



GOOD FOR ONE CONTINUOUS PASSAGE. **ILLINOIS TRACTION SYSTEM** NO BAGGAGE CHECKED FREE.
From Station Stamped on Back to Station Opposite Point in Margin Below
VOID AFTER ONE DAY AFTER DATE OF SALE.
Good only on Trains stopping at Destination. If not stamped by selling agent, or if more than one destination is shown this Ticket is void and not good for passage.
Form P 1 0000

If cut here ▷ Half Fare
ST. LOUIS, MADISON, VENICE, GRANITE CITY, EDWARDSVILLE, HAMEL, WORDEN, STAUNTON, MT. OLIVE, LITCHFIELD, HILLSBORO, SAWYERVILLE, BENLD, GILLESPIE, CARLINVILLE, NILWOOD, GIRARD, VIRDEN, THAYER, AUBURN, CHATHAM, WOODSIDE, SPRINGFIELD, SHERMAN, SELBYTOWN, Williamsville, ELKHART, BROADWELL, LINCOLN, UNION, BURT, RICHMOND, MINDALE, MACKINAW, LILLY, DANVERS, BLOOMINGTON, ALLENTOWN, MORTON, PEORIA

If cut here Half Fare
St. Louis, Madison, Venice, Granite City, Edwardsv'le, Hamel, Worden, Staunton, Mt. Olive, Litchfield, Hillsboro, Sawyerville, Benld, Gillespie, Carlinville, Nilwood, Girard, Virden, Thayer, Auburn, Chatham, Woodside, Springfield, Sherman, Selbytown, Williamsv'e, Elkhart, Broadwell, Lincoln, Union, Burt, Richmond, Mindale, Mackinaw, Lilly, Danvers, Bloomington, Allentown, Morton, Peoria

SAMPLE

No Baggage Checked Free. **ILLINOIS TRACTION SYSTEM** RATE $..........
AGENT'S STUB.—NOT GOOD FOR PASSAGE.
From Station Stamped on Back to Station Named in Margin above
STATIONS—ST. LOUIS, PEORIA and BLOOMINGTON.
Licensed for use with Potter Patent Ticket Box and Cutter.
Form P 1 0000

SAMPLE OF TICKET USED IN BOX-CUTTER

Patent protection has been applied for on this ticket cutter by its inventor, W. P. Potter, general passenger agent, Illinois Traction System, Springfield, Ill., on which system it is stated the cutter is working out very successfully.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

A Commissioner's Woes

Not Since Days of Mayor Gaynor and Mr. Whitridge Has New York Enjoyed a Letter Such as This

Seymour Van Santvoord, chairman of the Public Service Commission of the Second District of New York, resigned on Feb. 1, the day on which his term of office expired. In a letter to the Governor Mr. Van Santvoord said in part:

NOBLE ORDER OF HEAD-HUNTERS

"Even if under the stress of weightier matters you had overlooked the fact that my term of office expires on Feb. 1, it is inconceivable that the Most Noble Order of Head-Hunters has not recalled it to your mind, and thus I have been both surprised and disappointed that Your Excellency has not seen fit either to advise me when I am to realize the joy of welcoming my successor, or to honor me with any suggestion whatsoever of your wishes in the matter.

"With reluctance and regretfully I am thus compelled to assume that you have classed me with those who, for the sake of the salary, are willing to cling to an outworn honor and the shadow of a bygone service until the scales of expediency shall have been adjusted to that nice balance which, in the decadent days, appears to be a *sine qua non* in the choice and confirmation of the appointee to an important State office. Any such statement is as foreign to me as the idea is abhorrent; if a contrary impression has been created by my four years of painstaking and conscientious service—commonplace although it may have been in other respects—I can understand something of the chagrin, if not actual bitterness, with which Mr. Straus in acceding to your request nevertheless declared that a member of the Public Service Commission is indeed fortunate who can retire from office with even as good a reputation as he enjoyed when he undertook it.

LIFE 'ONE DEMD HORRID GRIND'

"I think it must be plain to you that no tawdry salary would permit me to stay lashed to this Ixion's wheel for one moment longer than the imperative sense of duty commanded. And no less from what I have implied than from what I have stated, you can readily understand that since for me life has become 'one demd horrid grind'—to borrow the weird but expressive imagery of the immortal Mantilini—I have been sustained alone by the Star of Hope which the Legislative Manual expressly states is due to arise in my official horizon on Feb. 1, 1918.

"Governor, Governor, why did you so thoughtlessly, how could you so unfeelingly, refuse to a suffering soul, who has realized the vanity of human aspirations and the nothingness of human greatness, the long-coveted mandate, 'Thou faithful servant, go in peace'—or otherwise even, if only permitted to go without actual dishonor? What evil have I done that thou, my friend and respected superior, shouldst deliberately withhold the word of hope which would have cheered my drooping spirits and the ray of light which would have guided my eager steps toward that chapel of official forgetfulness termed 'ex' for the consolations of which, in the mercy of Providence you yourself may sometimes anxiously yearn.

"With unaffected sympathy for the sorrows of the next chairman, and with heightened respect for the sorrows of my predecessors, I remain—shall I say for the last time?

Carhouse Fire in Wheeling

The Bay Island operating carhouse of the Wheeling (W. Va.) Traction Company and twenty-nine double-truck air-brake passenger cars and one new work car, all 5 ft. 2½ in. gage were destroyed by fire, probably incendiary, at 2 a. m. on Feb. 4. The company is now operating about 75 per cent of service. The Jewett Car Company has had fourteen double-truck cars under construction for the company for some time and completion of this rolling stock will be hastened. The railway is looking for complete cars of broad gage for temporary use and will arrange speedily for the permanent replacement of the equipment.

New United Engineering Society Officers

The following officers were elected for the ensuing year, at the annual meeting of the trustees of the United Engineering Society, held on Jan. 24:

President, Charles F. Rand, member of the American Institute of the Mining Engineers.

First vice-president, Calvert Townley, member American Institute of Electrical Engineers.

Second vice-president, Robert M. Dixon, member of the American Society of Mechanical Engineers.

Treasurer, Dr. Joseph Struthers, member of the American Institute of Mining Engineers.

Secretary, Alfred D. Flinn, member of the American Society of Civil Engineers.

Chairman of the finance committee, J. Vipond Davies, member of the American Society of Civil Engineers.

West Side Report Ready

Committee Which Has Been Considering Removal of Tracks from Surface Reports to Legislature

The report of the Commission on West Side Improvement, which was submitted to the Legislature of the State of New York on Jan. 31 recommends the appointment of a commission of seven members with ample power to build one or more tunnels under the Hudson River, either with public money or by some arrangement with private capital, and to make similar arrangements for a terminal on the West Side with zone connections, which the railroads serving this city shall build themselves or be compelled to use on a co-operative basis if built by others.

A bill repealing all of the laws heretofore enacted in relation to the West Side improvement was sent to Albany with the report and was later introduced into the Legislature. The purpose of repealing the present laws was to clear up all legal entanglements.

OUTLINE OF IMPROVEMENTS

A brief outline of the things the proposed commission should do in order that the West side problem may be successfully solved provides for:

A subway or elevated terminal system on the West Side extending south from Sixtieth Street to Canal Street or further as traffic conditions may require, with intermediate zone stations, the system to be used by all railroads.

One or more freight tunnels under the Hudson River connecting the terminal system with classification yards in New Jersey.

Tracks of the New York Central Railroad Company should not extend east of their present location and should be covered and depressed to a depth to be determined by engineers. All of the improvements along the river front from Seventy-second Street to Spuyten Duyvil should not be permitted to interfere with parks and residential features.

The tracks of the New York Central Railroad on the West Side should be removed from grade. Steam as a motive power should be eliminated.

Public Service Commissioner Hervey said that the report did not reach the kernel of the situation; that it involved the removal of all the safeguards which the Governor and Legislature had placed around valuable public rights on the West Side, and that if the report was accepted the whole subject would have to be reopened, with no prospect of anything being accomplished for some time.

New Franchise for Montreal Tramways

Review of Provisions of Contract for Thirty-five-Year Franchise Signed by Representatives of the City and the Company

In the contract prepared by the Tramways Commission for the city and the Montreal (Que.) Tramways, and signed by representatives of both, as submitted to the Quebec Legislature on Jan. 30, the company receives a franchise until March 24, 1953, for a surface railway system. The rights, privileges and franchises possessed already by the company in the city are annulled, and any that it possesses in other municipalities or will possess will be annulled by the mere fact of these territories being annexed to the city. In such cases the annexed territories would fall under the terms of the new contract.

COMMISSION FOR CITY

To obviate the incessant bargaining and bickering between the city and the company, a permanent tramway commission for Montreal is to be created, with jurisdiction over all the lines of the Montreal Tramways, or any of its subsidiaries, so far as finances, operation, extension and disputes are concerned. This commission, which will be appointed as soon as the new contract is put in force, is enjoined within sixty days to set a uniform fare within the city limits and an additional territory that will wipe out in various outlying districts the double fares now obtaining. The right of transfer may still be kept, but the commission is instructed to enforce transfers in which will be punched the exact point of transfer, instead of the latitude which the present transfers permit.

Among other changes made obligatory, or within the power of the commission to permit, are the formation of labor unions by the employees, the transportation of freight at times and under regulations of the commission, and the giving of an autobus franchise to the tramways whenever the commission feels that circumstances justify it.

CAPITAL VALUE $36,286,295

The capital value of the company is placed at $36,286,295, and the company cannot pay more than 10 per cent on this fixed capital. The amount per revenue car mile it can spend on operation costs will be fixed by the commission, and the establishment of various funds is ordained, as follows: A fund of $500,000 to be created by $100,000 instalments in five years to pay off old debts and excesses in the operating fund beyond the amount set each year by the commission; a maintenance and renewal fund; a tolls reduction fund; and a reserve contingency fund. An annual sum of $500,000 is to be given to the city, and when everything else is provided for, including dividends of the company, the surplus is to be divided as follows: 30 per cent to the city, 20 per cent to the company and 50 per cent for the reduction of fares. Whenever the latter fund passes $2,500,000 it will be applied to the reduction of fares, and that will continue to be the case through the life of the contract.

In the second article the Montreal Tramways Commission is created as a controlling permanent body. The third article gives it three members to be named by the Lieutenant-Governor-in-Council immediately after the contract goes into force. The president and vice-president will be named by the government as well. Any vacancy will be filled from Quebec in the same manner as soon as such vacancy is known to the government, but the fact of there being a vacancy will not prevent the other members from exercising their functions. Each member is to be appointed for ten years, but members can be removed for cause by the government.

APPEAL FROM COMMISSION DECISIONS

Two members make a quorum of the commission. The remuneration will be fixed by the government and paid monthly. The commission is allowed to make its own rules, which will be obligatory as soon as the Public Utilities Commission has approved of them and the city and other municipal corporations have been notified. Appeals from the decisions of the commission can be taken by either party to the contract or by any municipality interested to the Public Utilities Commission on all questions of law and of competence with reference to the contract and all decisions of the commission. The appeal thus taken is final except on questions of law.

RATES OF FARE

Fares in force from the date of the contract, in as well as outside of the city, which the company is authorized to collect, are to continue in force until they are modified by the commission. Within the uniform rate territory, as well as in other municipalities, the commission is to fix different tariffs for all passengers at certain hours of the morning or night, and it may fix higher tariffs for night hours from midnight to 5 a. m.

The commission may establish for school children or apprentices a lower tariff, which shall apply only during week days, from 8 a. m. to 6 p. m. for school children and for apprentices from 6 a. m. to 7 p. m. Children less than five years old are to be carried free.

The amount to be allowed for operation is to be based on revenue car-miles, exclusive of carhouse and car-yard miles. This sum will be known as the operating allowance, and will cover operating expenses and all taxes levied against the company. The expenses of the commission and defense and settlement of claims are also to be charged to this account, and the company is also obliged to hold a certain sum in reserve, to be determined later, for the settlement of such suits and claims as may be carried over the operating year.

The commission is annually to determine the amount of the operating allowance. If in each year the company has not exceeded its operating allowance then the commission is to permit the company to take out of gross revenues a sum to be known as the operating profit, which is to be equivalent to one-eighth of 1 per cent on the total average capital value for that year, and such operating profit is to belong to the company. If, on the other hand, there has been an excess expenditure, this must be covered from gross revenues, or if more than one-eighth of 1 per cent, it must be made up from the guarantee fund.

NO DIVIDENDS OVER 10 PER CENT

During the life of the contract the company is prohibited from paying dividends in excess of 10 per cent. The city is to receive out of gross revenues over and above all other amounts to which it may be entitled, the sum of $500,000 a year during the continuation of this contract, payable quarterly. A contingent reserve fund is also provided for by the deduction of 1 per cent from gross revenues, until such fund shall amount to $500,000.

A tolls reduction fund is to be instituted, and if at the end of any year this fund exceeds $1,000,000 the commission may reduce the fares on the tramways. Reduction of fares is to be obligatory when the tolls reduction fund reaches $2,000,000, such reduced fares to remain in force until such time as the commission deems it necessary to increase them again. If the tolls reduction fund continues to increase, and reaches a further sum of $2,500,000, fares are to be further reduced.

RIGHT OF EXPROPRIATION

On March 24, 1953, and at the expiration of every subsequent five-year period, the city is to have the right, after six months' notice given to the company within the twelve months immediately preceding March 24, 1953, to appropriate for itself the railway plant, etc., of the company within and without the limits of the city, by paying the value fixed by arbitrators and 10 per cent over and above the estimate. Such arbitrators are to be appointed, one by the city, one by the company and the third by a judge of the Superior Court sitting in and for the district of Montreal.

Should the city exercise the right conferred upon it by the purchase clause, it is agreed that the valuation of $36,286,295, fixed by the present contract, shall in no way bind the arbitrators in establishing the purchase price payable by the city. The purchase price is also to comprise all privileges, rights and franchises of the company in any municipality wherein the assets so acquired are situated, and the city is not to pay for the value of such privileges, but is to have the right to operate the system of tramways so purchased in any municipality in which railway property of the company is located.

Advisory Council on Labor

New Body Will Formulate Program and Recommend Administrative Machinery on Every Phase of Employment Problem

Reports from Washington indicate that the recent appointment of an advisory council to the Secretary of Labor is of far more importance, broadly speaking, than some of the events to which the daily papers have given far greater space. The council is expected to determine the policy which shall keep labor and capital working together during the war. Incidentally, if the work of its members is far-seeing—as the constitution of the council gives warrant for expecting—it should have a tremendous influence on the socio-economic conditions under which we shall live after the war. Briefly the program includes:

THE PROGRAM

1. A means of furnishing an adequate and stable supply of labor to war industries. This would embrace:
   - (a) Satisfactory system of labor exchanges.
   - (b) A satisfactory method and administration of training of workers.
   - (c) An agency for determining priorities of labor demand.
   - (d) Agencies for dilution of skilled labor as and when needed.
2. Machinery which will provide for the immediate and equitable adjustment of disputes in accordance with the principles to be agreed upon between labor and capital and without stoppage of work. Such machinery would deal with demands concerning wages, hours, shop conditions, etc.
3. Machinery for safeguarding conditions of labor in the production of war essentials. This to include industrial hygiene, safety, women and child labor, etc.
4. Machinery for safeguarding conditions of living, including housing, transportation, etc.
5. Fact-gathering body to assemble and present data collected through various existing governmental agencies or by independent research to furnish the information necessary for effective executive action.
6. Publicity and educational division which has the function of developing sound public sentiment; securing an exchange of information between departments of labor administration; and promotion in industrial plants of local machinery helpful in carrying out the national labor program.

The first four divisions cover matters familiar to all manufacturers, contractors and engineers. Subdivisions (b), (c) and (d) of function (1) represent activities made necessary by the war. The true significance of the establishment of the body is appreciated when attention is directed to the sixth division, and when one recalls the activities of the labor division of the British Ministry of Munitions and the influence that its work of the same broad scope has had on industrial England.

Incidentally, it may be said that the council last week recommended to the Secretary of Labor (1) the organization of a board to formulate an arrangement for ending strikes, and (2) the centralization in his department of the industrial service divisions of the various branches of the war machine. Both plans have been approved by the secretary. The first of them is absolutely essential if co-operation is to replace strife.

The council is headed by John Lind, former governor of Minnesota, and envoy to Mexico, representing the public. Waddill Catchings, president of the Sloss-Sheffield Steel & Iron Company, and of the Platt Iron Works, and A. A. Landon, general manager of the American Radiator Company, represent the employers. Labor's members are John B. Lennon, treasurer of the American Federation of Labor, and John J. Casey, former member of Congress. Dr. L. C. Marshall, of the University of Chicago, is the economist member and Agnes Nestor, Chicago, represents women.

Rapid Transit Plan Explained

Engineer Makes Address Outlining Plans for Future Transit Construction for Detroit

H. M. Brinckerhoff of Barclay Parsons & Klapp, New York, N. Y., who reported on a system of rapid transit for Detroit, addressed the members of Detroit Engineering Society recently.

By maps and lantern slides he illustrated the subway and overhead rapid transit system which he claimed could be completed by 1950, at which time he predicted Detroit would have a population of 2,000,000 and a ground area of 150 square miles. Mr. Brinckerhoff is reported to have said:

$29,000,000 OUTLAY

"It is not expected to put through this project, which would mean an initial outlay of about $15,000,000 by the city and $14,000,000 by the local railway, at this time when war has raised the costs of all construction work. But it takes years before a plan can be fully worked out and agreements signed. By that time the war will be over.

"If rapid transit facilities are not provided people will be forced into tenements. Woodward Avenue cars are now carrying 4,640,000 passengers per track-mile per year. The only line carrying more is the New York subway with 4,970,000. Forty per cent of the riders on Woodward Avenue travel more than 3 miles, which places it in the rapid transit class.

SURFACE CARS FOR SHORT HAULS

"We need the surface cars for short hauls, with transfers to both subway and overhead lines for longer hauls, these latter lines also taking care of the interurban lines. By a partnership agreement between the city and the Detroit United Railway, operating the local city railway lines, the proposed system, which will give maximum service to all, will be completed in thirty years and in time will all revert to the city."

Mr. Brinckerhoff's plan is for subways on Woodward Avenue from the river to the boulevard, a short cross-town spur at Gratiot and another at the boulevard; elevated railroads to continue the subways up Woodward Avenue and out Fort, Michigan, Grand River, Gratiot and Jefferson, with additional lines running from the river to the boulevard on the west side and from the boulevard out Hamtramck on the east.

Toledo Report Filed

Twenty-five Year Franchise Proposed for Community Traction Company With 6 Per Cent Return.

The Street Railway Commission of Toledo, Ohio, filed its report with Mayor Cornell Schreiber on Feb. 1. It has been two years in course of preparation. The signatures of the members of the commission are attached, with that of Judge Ralph Emery, who acted as attorney, but the name of Henry L. Doherty, chairman of the board of the Toledo Railways & Light Company, does not appear.

The report provides for a twenty-five year franchise to be granted to a so-called community traction company, which it is proposed to organize to succeed to the ownership of the railway property of the Toledo Railways & Light Company. The stock is to be held by trustees for five years, and during this period Toledo citizens may purchase it on the installment plan at $10 per share.

6 PER CENT RETURN PROVIDED

It is proposed to fix the rate of fare so that the stockholders will receive dividends of 6 per cent on their holdings, with a premium of 10 per cent in the event the city purchases the property. A sliding scale of fares from a 5-cent maximum, with free transfers, down to ten tickets for 25 cents, with a 1-cent charge for transfers, is provided. The dividends and margin for the purchase of the property will have to be worked out between these two extreme limits.

Provision is made to the effect that the city may lease, operate and eventually own the street railway property by paying 25 per cent of the purchase price down and 2 per cent annually on the principal and 6 per cent dividends to the stockholders.

Railway Taxes Lifted

The prosperity of Japan is such that taxes are being reduced on local transportation in the cities. Mr. Shoda, Minister of Finance, announced on Nov. 29 that all railroads and electric railways in the Empire, exceeding 100 in number, had presented a petition for relief from transportation taxation, and that the Ministry had decided upon its cancellation. A bill for doing away with this tax was introduced in the last Diet, but did not pass. The tax was levied among the first of special war measures to raise revenue during the Russo-Japanese war, and has remained in force for twelve years. The receipts therefrom amount to $2,500,000 annually, of which Tokio lines pay almost $1,000,000. When the tax is cancelled, city tram fare in the capital will be reduced one-half cent on each trip.—*Financial America.*

Recommends Service at Cost for Massachusetts

Committee Which Investigated Electric Railway Situation Reports to Legislature in Favor of Plan Proposed by Investors

The street railway investigation commission, appointed last year to study the electric transportation situation in Massachusetts, filed its report this week with the Legislature. The chief recommendation of the majority of the commission is that a service-at-cost plan be adopted under which fares would automatically rise as income declined and vice versa. The plan should embody the following fundamental features, the report says:

1. Establishment of a sliding scale of fares, so arranged that when the schedule of fares in operation does not yield a revenue sufficient to pay the cost of the service the next higher schedule of fares shall become effective, and when the fares yield a revenue greater than the cost of the service, a corresponding decrease in the rate of fare shall be made.

2. Creation of a reserve fund, which shall serve as a balance wheel in the system, so that a rapid fluctuation of fares due to seasonal or other conditions may be eliminated.

3. Establishment of a depreciation and maintenance fund, so that the electric railway properties shall be kept up at all times to the proper operating efficiency.

4. Provision for the rehabilitation, extension and improvement of lines during a period of years following the acceptance of this plan.

5. A director to be appointed by the governor of Massachusetts to the board of directors of each electric railway operating under this plan.

6. Supervision of the electric railways accepting this plan by district representatives, appointed by the governor or by the Public Service Commission; expenses of such supervision to be borne by the companies, but in no case to exceed a certain fixed percentage of operating expenses.

7. Provision for arbitration proceedings relative to certain conditions which might arise.

8. Provision whereby the State, or any political subdivision thereof, may purchase the entire property of a company, accepting this plan, at its determined investment value, or under any other provision of existing or future statutes.

9. A return to the investors of 6 per cent per annum on a fixed investment value. The amount of such investment value to be determined by the Public Service Commission and to include such sums as have been prudently and honestly invested and conserved with proper diligence due consideration being given to the present physical condition of the property. The investment value from time to time to be increased by such sums as the commission shall certify have been prudently spent and are properly chargeable to capital.

10. The acceptance of such a plan to be optional with the individual companies.

11. Legislation allowing the Boston Elevated Railway (including its leased lines) to accept this plan.

12. In case the service-at-cost plan is accepted by any company, such funds as the Public Service Commission shall consider necessary for the establishment of the reserve, depreciation and rehabilitation funds or for improvements immediately necessary, shall be raised by an issue of capital stock, either preferred or common.

OTHER RELIEF RECOMMENDED

The investigating commission further recommends:

1. That jitneys be declared common carriers and placed under the supervision of the Public Service Commission.

2. That electric railway companies be allowed to operate motor vehicles (not running on rails or tracks) as auxiliaries or feeders.

3. That authority to grant permits to electric railways to become common carriers of newspapers, baggage, express matter and freight, now vested in local authorities, be transferred to the Public Service Commission.

4. Abolition of the commutation or excise tax and passage of an act requiring electric railways to maintain in good repair but not to renew or replace the paving, upper planking or other surface material or the base thereof between the rails and tracks, and in the case of unpaved streets for 18 in. outside the rails.

5. That if a municipality refuses to grant an electric railway permission to alter its tracks in order that a more improved type of equipment may be used, the right of appeal shall be had to the Public Service Commission.

6. If an alteration is made in the location of electric railway tracks in highways no portion of the expense shall be borne by the railway except when such alterations are made upon petition of the railway.

7. That electric railways shall not be obliged to bear any expense in connection with alterations, strengthening or construction of bridges or the approach thereto.

Messrs. Gibbs, Hays and Forbes signed the report but presented dissenting statements advocating reduction in subway and tunnel charges now paid by the Boston Elevated. Messrs. Worrall, Bunting and Donovan filed dissenting reports. Mr. Bunting advocated public ownership, the majority having held that such would be unwise at this time. Mr. Worrall submitted a "service-at-cost" plan of his own which provides for a railway commission of three members appointed by the Governor.

As a result of its investigation, the commission concluded that the following causes have contributed to the present unsatisfactory situation relative to the railways of Massachusetts: Depreciation of the purchasing power of the nickel; growth of the automobile business; taxation and highway maintenance requirements; improvement of facilities; non-paying lines; failure to provide for depreciation and obsolescence, and lack of co-operation between the railways and the public.

In connection with the recommendation of a service-at-cost plan, the commission did not present a definite bill, since it did not deem it expedient, at this stage, to submit a bill limiting the plan to any particular set of provisions.

Coal-less Monday Order Continues

Public Utilities Show Savings in Coal of from 21 to 25½ per Cent from Order

Dr. H. A. Garfield, the fuel administrator, William G. McAdoo, director general of railways, and several State fuel administrators who met in Washington for conferences on Feb. 4, 5 and 6, have decided to continue in effect the orders preventing industry on Mondays, notwithstanding the fact that previous authoritative information to the Washington correspondents had been that the order would be rescinded.

In making public this decision continuing the order, Dr. Garfield called attention to the fact that a "change in weather conditions" which is hoped for of a favorable character must take into consideration the question of the possibility of floods when the thaws followed the present period and condition of snow and ice. Flood conditions, he said, must be figured in weather conditions, and the apprehension now exists in Washington that flood conditions may tie up transportation of coal as badly as snow and ice have tied it up.

In referring to the effect of the closing order Dr. Garfield said, in part:

"The effect of the closing order is not easily measured statistically, the more so because of extraordinary weather conditions, but the State fuel administrators reported that substantial savings had been effected. The most exact estimates were submitted by the secretary of the National Committee on Gas and Electric Service. These figures were furnished by the electric light, power and gas companies of twenty-nine of the largest cities of the country. The weighted average of the saving during the five days from Jan. 17 to 22, inclusive, was 21.2 per cent, while the saving for Monday, Jan. 28, was 25.5 per cent of the amounts usually consumed. Mr. Garfield is also informed by the secretary of the National Committee on Gas and Electric Service, Mr. Elliott, that the public utilities concerned did not consume on other days appreciably more than the normal amount of coal as a result of the shutdown. It is estimated that the public utilities reporting furnish a fair index of the general saving in the communities involved."

In consequence the Monday closing order will be continued until such time as the change in weather and resulting improved transportation conditions warrant its suspension. A close watch will be kept upon conditions, however, and further consideration will be given to the subject as soon as there is reasonable assurance of relief. It is also hoped that, with the shut-down on Monday, Feb. 11, and the closing in many States on the day following, Lincoln's Birthday, it will be possible thenceforth to rely upon embargoes and the preference in movement of food and fuel ordered by the director general of railroads.

Strike in St. Louis

Trainmen of United Railways Demand More Pay and Recognition—Joined by Shop Workers

The striking employees of the United Railways, St. Louis, Mo., on Feb. 5 awaited action from the board of directors of the company who were in executive session. It was not expected that the result would be known until late on Feb. 5, possibly not until Feb. 6. Pending the meeting of the board of directors on Feb. 5 the railway refused on Feb. 4 to send representatives to the conference called for the afternoon of Feb. 4 in the Mayor's office.

It is stated that the company is opposed to the recognition of the union, but is willing to arbitrate the question of wages and hours. It was announced on Feb. 5 that many men who went out were asking to be taken back. Some of these men were assigned cars immediately. Ninety-two cars out of the normal 1100 were being operated on the principal lines on Feb. 5. During the morning hours, car windows were smashed, trolley wires were cut and spikes driven between the track and the guard rails in an effort to derail cars. Rioting occurred at several points and many persons were hurt. It is understood that the strike could be adjusted quickly but for the question of the recognition of the union by the railway.

The electrical workers and more than 250 shopmen joined the trainmen on Feb. 5. They demand eight hours and a new wage scale.

Legislation to Protect Women

It seems more than likely that the employment of women as conductors on the surface lines in New York City and as guards in the Brooklyn subways will result in the passage of legislation in their interest at the session of the Legislature now in progress. Already several bills looking toward these ends have been introduced. The measures are all more or less along the same general lines. They would fix the hours of labor and prescribe an age minimum. The bill introduced in the Senate by Mr. Nicoll would, for instance, provide:

"No female minor under the age of twenty-one years shall be employed in the operation of any street, surface, elevated or subway railroad within this State, and no woman employed in the operation of any such railroad shall be allowed or permitted to work more than nine hours in any one day, or more than six days or fifty-four hours in any one week, or before 6 o'clock in the morning or after 10 o'clock in the evening of any day, nor shall any woman be knowingly so employed within four weeks after she has given birth to a child."

News Notes

Paving Case Goes Against Company.—The Supreme Court of Ohio ruled on Feb. 1 that, under the Tayler franchise, the Cleveland Railway is liable for the cost of paving the Superior Avenue viaduct. The court said that if there was any doubt about the construction or application of the franchise the city should prevail. The court held that the replacing of blocks constituted repair and not repaving. For this reason the company must stand the cost.

No Hearing on Tax Appeals.—Upon agreement between Frank S. Katzenbach, Jr., counsel for the Trenton & Mercer County Traction Corporation, and Charles E. Bird, counsel for the City of Trenton, N. J., there will be no hearing in the matter of the appeals being taken by the company from the assessments of the property for taxing purposes. Both attorneys appeared before the Mercer County Tax Board and offered that the testimony taken in the case of the appeals last year be considered the same as having been taken in the present case. The 1916 appeals are now before the State courts. The company lost in the 1915 appeals.

Municipal Railway Appropriation Bills Go Over.—At a recent meeting of the City Council of Seattle, Wash., two appropriation bills introduced in Council on Sept. 17 transferring $12,000 from the general fund and the light department depreciation fund respectively for the completion of the Ballard extension of the municipal railway were indefinitely postponed. Judge Calvin S. Hall, in a suit brought by Theodore S. Haller, held that money could not be appropriated from either of these funds for the construction of a railway. It was on this decision that the plan to extend the railway was temporarily held up until utility bonds authorized for the purpose by the Council could be marketed.

Navy Still Needs Binoculars.—The navy is still in urgent need of binoculars, spy glasses and telescopes. Several weeks ago an appeal through the daily press resulted in the receipt of more than 3000 glasses of various kinds. But this number is wholly insufficient. Articles should be forwarded by mail or express to Hon. Franklin D. Roosevelt, assistant secretary to the navy, Naval Observatory, Washington, D. C., by whom they will be acknowledged. Those not suitable for naval use will be returned to the sender and those accepted will be returned at the termination of war, although it is impossible to guarantee them against damage or loss. The government will pay $1 for each article accepted, which sum will constitute the rental price or in the event of loss the purchase price of such article.

A Painter the Latest Regulator.—Alderman W. H. Zeiser, a painter by trade and chairman of the committee on railways of the new Board of Aldermen of Louisville, Ky., has proposed a bill for the appointment of a city street railway commissioner to act as technical adviser to the city in matters affecting fares, quality and quantity of service, and transfers, etc., the installation of separate accommodations for white and colored passengers or the operation of separate cars, the creation of a board of arbitration to settle differences between the commissioner named above and the company, and a stipulation that the city, on failure of the company to obey the board of arbitration, shall deprive it of use of the streets.

Plea for Minnesota Line.—W. L. Luce, head of the Electric Short Line Company, known as the Luce Line, a gasoline-electric line extending from Minneapolis to Hutchinson, Minn., has asked the Senate committee on interstate commerce at a hearing in Washington to take over the line along with other railroads. Mr. Luce fears that if the line is not taken over by the government the company will lose practically all the through business. Because the line is now a mile shorter than one steam line and 15 miles shorter than another between Minneapolis and Hutchinson it has been getting delivery of through freight to and from all Chicago lines. It is Mr. Luce's belief that with these long lines taken over by the government the physical advantage would count for naught. The Luce line is 60 miles operated and 75 miles right-of-way.

Association Meeting Programs

Wisconsin Electrical Association

The annual convention of the Wisconsin Electrical Association will be held in Milwaukee, Wis., on March 27 and 28, with headquarters at the Pfister Hotel.

Midwinter Convention of A. I. E. E.

The American Institute of Electrical Engineers will hold its sixth midwinter convention at the United Engineering Societies' Building in New York City, on Feb. 15 and 16. After the opening remarks of President E. W. Rice, Jr., president of the General Electric Company, the first session will be devoted to discussion on the rating and selection of oil circuit breakers. The other sessions will be largely taken up with scientific matters. Mr. Rice will speak also at an informal dinner at the Cafe Boulevard at 6.30 p. m. on Friday.

Financial and Corporate

War Finance Bill Presented

Plan for Federal Financing Corporation —Currency Comptroller Says Utility Credit Must Be Preserved

The war finance corporation bill prepared by Secretary McAdoo was introduced in Congress on Feb. 4. As noted last week, this bill contemplates the creation of a $500,000,000 corporation to make loans and advances to essential industries and otherwise assist in private financing.

In commenting upon the bill Mr. McAdoo says:

"Many instances have been brought to the attention of the Secretary of the Treasury and of the Federal Reserve Board where railroads, public utilities, power plants, etc., have been prevented from obtaining the necessary advances to enable them to perform vital service in connection with the war because the bank credits, ordinarily available to them, are being absorbed by the government itself.

"It is believed that the proposed bill has been wisely and conservatively conceived as a war measure to give relief from this condition during the period of the war. The banks of the country would, no doubt, scrutinize with the utmost care both the loans themselves and the security therefor, and would exercise their individual judgment upon the borrower's credit before assuming a liability for the amount of the loan. They would be under the necessity of advancing, out of their own resources, 25 per cent of the amount loaned. The bill would authorize advances to a bank of only 75 per cent of the amount loaned by the bank to a war industry.

"It is confidently believed that the mere existence of the machinery which this bill would establish would of itself maintain confidence to such an extent that the aid of the corporation would only in relatively few cases be called for, and that the banks would be able to take care of the requirements of this class of borrowers and be ready to do it knowing that in case of need loans of that character would be available for rediscount.

"The provision permitting direct loans by the corporation in exceptional cases for not more than five years is intended to provide for those rare cases where it may be made to appear to the corporation that a meritorious borrower is being unwisely discriminated against by the banks.

"The bill provides for approval by the corporation, through a system of licenses, of issues of securities in excess of $100,000 with a view to preventing the use of capital in unnecessary expenditures during the period of the war. This is of great importance in order to conserve the supply of new capital and make it available for government loans and essential war purposes."

In his report for 1917 the Comptroller of the Currency, John Skelton Williams, emphasizes the importance of maintaining the efficiency and credit of utilities. If such enterprises are allowed to sink into inefficiency, he states, much of the most important war work of the government will be crippled or paralyzed. Continuing, Mr. Williams says:

"The first and most direct relief to the utilities can be given by the state commissions and municipal and local authorities, with the broad-minded cooperation of the people generally. It is essential that forebearance and consideration be exercised by these, and that the corporations also be permitted to make such additions to their charges for service as will keep them solvent, protect their owners against unjust loss, and give them a basis of credit on which they may obtain the funds with which to meet the strain put on them by the government's needs. The breaking down of these corporations would be a national calamity."

Another Road Junked

The Alton & Jacksonville Railway, Alton, Ill., went out of business on Jan. 31, and the entire property will be sold as junk by its owner, John J. Cummings, Chicago. The last car left Alton at midnight, and it was said that wreckers were prepared to tear up the tracks at Jerseyville the following day.

The road, which is about 21 miles in length, said to represent an original cost of $500,000, never succeeded as a financial venture and five years ago a protective committee of bondholders forced a receivership. Later Mr. Cummings obtained the property. The Illinois Public Utilities Commission last December issued an order directing the road to cease operations.

The case of the company before the commission was reviewed in the ELECTRIC RAILWAY JOURNAL of Feb. 2, page 248.

New Bay State Issues

Judge Dodge of the United States Court on Jan. 31 issued three orders in the case of the Bay State Street Railway, Boston, Mass., in the hands of W. B. Donham as receiver, as follows:

1. The receiver is authorized to execute the permanent equipment 6 per cent collateral gold notes to the Old Colony Trust Company, as trustee, and is authorized to set aside and deliver the permanent notes in exchange for the temporary receipts for such notes now outstanding to the amount of $1,308,000.

2. The receiver is authorized to settle suits or claims for personal injuries or damages to property arising out of accidents or occurrences prior to the appointment of the receiver, the amount not to exceed $50,000 in the aggregate.

3. The receiver is authorized to pay out of funds on hand $30,000 of the principal of the mortgage of the Brockton & East Bridgewater Street Railway maturing on Feb. 1 and also the sum of $39,240 interest on the car trust notes of the Bay State Street Railway due on Feb. 1.

Another Seattle Tax Proffer

Puget Sound Company Repeats for 1917 Its 1916 Offer, Now Being Reviewed by the Courts

The Puget Sound Traction, Light & Power Company, Seattle, Wash., proposed to the city of Seattle on Jan. 23 that it pay $72,443, representing 2 per cent of its gross railway earnings for 1917, under the same conditions that payment of $64,387 for 1916 was tendered a year ago. These figures indicate that the company's gross earnings for 1917 were $3,622,175, as compared with $3,219,389 for 1916.

In December, 1915, after the company had petitioned the Public Service Commission to be relieved of certain of its franchise obligations, including the payment of 2 per cent of its gross earnings to the city, the paving of rights-of-way, and any portion of the cost of bridges, a conference with Mayor H. C. Gill resulted in an agreement that planking should be done in lieu of paving, and that in the event the relief sought was granted by the Public Service Commission the amount of gross earning tax for that year should be refunded.

On Jan. 13, 1917, the company tendered payment of $64,387 with the stipulation that the litigation started by the city to force compliance with the paving provision be dismissed, or withdrawn until final adjudication of its petition for relief. This payment was for 1916 earnings. The Council refused to accept payment under those conditions as agreed to at the conference with the Mayor in 1915, and the amount was returned to the company. The city then brought a suit to recover the amount. Payment of the 1917 tax is tendered under similar conditions.

The Tacoma Railway & Power Company and the Pacific Traction Company, both subsidiaries of the Puget Sound Traction, Light & Power Company, operating in Tacoma, Wash., recently tendered the City Comptroller of Tacoma a check for $11,111, covering 2 per cent of the gross earnings on their passenger traffic, and 5 per cent of their freight and power business during the last six months. The $11,111 exceeds the previous semi-annual payment to the city by about $500; while the passenger earnings showed an increase for the city of $1,000, the freight and power earnings show slight decreases. The company apparently is not through with its protest made to the Public Service Commission last year, in which it was attempted to show that the city's tax on the gross earnings of the local companies was illegal.

New British Financing

Government Borrowings in 1917 Completely Overshadow All Other Capital Issues for that Period

With the continuation of strict supervision by the Treasury over new capital issues in Great Britain, the record of 1917 borrowings published by the London *Economist* is one almost entirely of government loans. Indeed, the amount of new capital raised for industrial purposes was only one-half of 1 per cent of the total.

The tramway and omnibus lines in 1917 raised £100,000 of new capital, as compared to nothing in 1916 and £432,500 in 1915. The accompanying table gives the details of 1917 new financing:

1917 CAPITAL ISSUES IN GREAT BRITAIN

	1916	1917
British governm't loans	£554,071,100	£1,297,819,700
Colonial government loans	6,000,000	13,870,700
Foreign government loans	15,000,000	nil
British municipal loans	495,000	nil
British railways	1,679,000	nil
Foreign railways	384,000	nil
Mining cos.—		
Australian	7,500	nil
Other mines	15,000	nil
Merchants, etc.	102,500	nil
Manufacturing	1,449,300	1,377,900
Rubber	15,600	3,100
Oil	1,573,500	1,125,000
Iron, coal, steel, etc.	1,275,000	881,500
Electric lighting, power, telegraphs, etc.	102,400	214,000
Tramways and omnibus	nil	100,000
Motors	381,300	554,200
Gas and water	16,400	nil
Hotels, theaters, etc.	7,000	nil
Patents	27,000	nil
Docks and shipping	800,000	nil
Banks and insurance	275,000	1,500,000
Miscellaneous	1,259,800	1,149,900
	£585,436,400	£1,318,596,000

New York Earnings

Revenues of the Metropolitan Carriers Show Increase, but the Net Income Stands Still

Operating expenses, taxes and interest costs are still eating up gains in operating revenues. One indication of this is the reports of electric railways operating in New York City. Returns to the Public Service Commission for the First District show that the financial results for the quarter ended Sept. 30, 1917, with changes from 1916 were as follows:

Railway operating revenues	$26,188,616	*$2,518,396
Operating expenses	14,804,537	*1,804,977
Net corporate income	2,261,221	†721

*Increase. †Decrease.

The railway operating revenues of the Hudson & Manhattan Railroad for the quarter ended Sept. 30 amounted to $1,016,368, an increase of $100,749; net corporate income, $104,940, an increase of $7,279. Interborough Rapid Transit Company—operating revenue, $8,909,808, an increase of $519,719; net corporate income, $628,673, a decrease of $619,727. Manhattan surface roads, including the New York Railways, the Third and Second Avenue lines and other carriers—operating revenue, $5,404,480, an increase of $945,231; net corporate income, $285,176, an increase of $440,782. Brooklyn Rapid Transit System—operating revenue, $8,288,813, an increase of $434,505; net corporate income, $1,176,738, an increase of $37,015. Bronx surface roads, including the Yonkers and Westchester lines—operating revenues, $1,472,270, an increase of $518,819; net corporate income, $54,717, an increase of $192,906. Queens surface roads (except B. R. T.)—operating revenue, $743,151, a decrease of $39,706; net corporate deficit, $32,395, a decrease of $22,655.

Milwaukee Purchase Proposed

Electric Railway & Light Company Desires to Take Over Light, Heat & Traction Company

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has filed an application with the Wisconsin Railroad Commission for authority to purchase the equipment and business of the Milwaukee Light, Heat & Traction Company, the property of which it now operates.

HOW THE COMPANY IS CAPITALIZED

The company says in its petition that it has negotiated for the purchase of the property for $12,271,321. It is set forth in the petition that the bonded indebtedness of the Milwaukee Light, Heat & Traction Company is $4,921,493. The company owes the Milwaukee Electric Railway & Light Company the sum of $4,502,167. It has outstanding in notes unpaid the sum of $600,000. Other liabilities aggregate $113,969. The Milwaukee Electric Railway & Light Company proposes to issue $2,312,716 in common stock, with which to make up the purchase price of the property, the purchasing company assuming the bonded indebtedness and other liabilities of the company.

PROPERTY VALUE $12,271,321

The valuation of the property of the Milwaukee Light, Heat & Traction Company is based on that made by the Wisconsin Railroad Commission on Jan. 1, 1914, plus $2,100,681 spent on improvements and betterments since that date. The petition sets forth that the true value of the property to be purchased is $12,271,321, subject to the funded debt of $4,921,493 and the other outstanding liabilities, and the petition concludes with the prayer that the Milwaukee Electric Railway & Light Company be authorized to purchase the property at the price named and to issue additional stock to the value of $2,312.716.

HEARING TO BE HELD SOON

The Railroad Commission will hold a hearing on the petition within a short time.

The Milwaukee Electric Railway & Light Company has also filed a petition for authority to issue $4,000,000 of bonds for the purpose of refunding bonds soon to fall due.

Changes in Missouri Line

Several New Directors and a New Chairman of the Executive Committee Elected

The annual meeting of the Kansas City, Clay County & St. Joseph Railway, the Missouri Short Line, was held in Kansas City on Jan. 14 at which time changes in the board of directors and the executive committee were made as noted below:

Thomas A. Reynolds, formerly chairman of the executive committee, has been elected vice-president of the National City Company. He has resigned as a director of the railway and as chairman of the executive committee. Allen G. Hoyt, New York, was elected a director, and was also elected chairman of the executive committee succeeding Mr. Reynolds. C. C. Chappelle, New York, has resigned from the executive committee. William L. McKee, New York, succeeds Mr. Chappelle on the committee. Robert Maydock was elected a director of the company succeeding Clement R. Ford, Boston, Mass., who has gone to war. Others of the thirteen directors were re-elected. The officers of the company re-elected were as follows: Phillip Saltonstall, president; John R. Harrigan, vice-president and general manager; William S. Tuley, secretary and treasurer.

A Turn for the Better

Stockholders of Central California Company Assessed, but Prospects for Future are Greatly Improved

The directors of the Central California Traction Company, San Francisco, Cal., have imposed an assessment of $5 a share on the 1,000,000 of preferred and 2,675,300 shares of common stock outstanding. This assessment, which is payable immediately, becomes delinquent on Feb. 25, with March 20 as the sale day. A letter to the shareholders says:

PROSPECTS FOR THE FUTURE

"After years of unprofitable operation, due to unjust jitney competition and other reasons, the business has taken a turn for the better. Jitneys have been regulated and an agreement between our company and its bondholders has become effective, which reduces their interest demands. Our freight tonnage alone has increased about 35 per cent over previous years. As a result, for the first eleven months of the last calendar year, instead of a loss of $88,101 during a corresponding period in 1916, we show a profit of $6,011. We must further increase the earnings of the company.

"The government has asked our assistance in moving freight to, and relieving traffic on, trunk lines now under its control. To do this we must increase our equipment, improve our trackage and restore our credit by paying some of the floating indebtedness. These are the reasons that have actuated the board of directors in levying the $5 assessment."

Financial News Notes

$2,700,000 New Cleveland Stock.—Subject to approval of the State Utilities Commission, the Cleveland (Ohio) Railway soon will offer to holders of record as of March 1, an issue of $2,700,000 new stock at par pro rata. The right to subscribe is to expire on March 15.

Move to Dismiss Receivership Suit.—A motion has been made in the United States District Court at St. Louis, Mo., by the United Railways, that city, and other defendants looking toward the dismissal of the suit filed by J. W. Seaman, seeking a receivership for the company. The company maintains that Mr. Seaman has alleged no valid cause for naming a receiver.

New Issues for Kansas City Railways.—The Kansas City (Mo.) Railways has been authorized by the Missouri Public Service Commission to issue $1,151,830 of additional capital stock. This amount represents the improvements which have been made since May 1, 1915. The commission has also authorized the company to refund $6,588,400 of 5 per cent bonds with two-year gold notes bearing 6 per cent interest and dated Feb. 1, 1918.

New West Penn Power Notes.—A. B. Leach & Company, Halsey, Stuart & Company and the Continental & Commercial Trust & Savings Bank, Chicago, are forming a syndicate to underwrite a new issue of $1,500,000 two-year 7 per cent collateral gold notes of the West Penn Power Company. The new issue is to provide funds to complete the installation of power-generating machinery at the company's new plant at Windsor, W. Va., and for other purposes.

Rights and Privileges Sold. — The trackage and rights of the old San Angelo (Tex.) Power & Street Railway Company have been sold by the city of San Angelo to the San Angelo Light & Power Company for a cash consideration of $600. The property of the old traction company recently came into possession of the city of San Angelo under an agreed judgment of the Tom Green County District Court. The purchase secures for the new street railway of San Angelo all the trackage rights and other privileges owned by the old company.

Beech Grove Line to Be Continued.—The Beech Grove (Ind.) Traction Company, which operates an electric railway between Indianapolis and Beech Grove, has continued in business. An arrangement has been made whereby Guy Rutledge, who had been operating a line of jitney buses between the city and Beech Grove, discontinued the bus line and became superintendent of the railway. A receiver was recently appointed for the company, as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 15, and it is said that affairs are working out well under the receivership.

Springfield (Ill.) Deal Disapproved.—The Board of Public Utility Commissioners of New Jersey has denied the application of the Union Railway, Gas & Electric Company to absorb the Springfield Railway & Light Company. Both are holding corporations, chartered in New Jersey, but the interests involved are mostly in Illinois, Indiana and Wisconsin. By the terms of the application the Springfield company would cease to exist and the stock would be cancelled, and the capital of the Union company, which is $15,000,000, would not have been increased.

Meeting Bay State Coupons.—The committee representing the holders of 4 per cent refunding bonds due in 1954 of the Boston & Northern Street Railway and the Old Colony Street Railway, controlled by the Bay State Street Railway, Boston, Mass., have completed arrangements whereby the amount due on the Jan. 1, 1918, coupons will be advanced by the depositary to depositing bondholders. Although receiver's certificates have been authorized for payment of this interest the sale of these has been delayed, and it has been deemed advisable to make the foregoing arrangement.

Unprofitable Road to Be Sold.—The property of the Parkersburg & Ohio Valley Electric Railway, Parkersburg, W. Va., is to be offered for sale at auction on Feb. 28 at Parkersburg. The sale is scheduled to take place at the Federal court house at 10 a. m. V. B. Archer is the special commissioner who will conduct the sale. The road extends from Sistersville to Friendly, a distance of 5 miles. It has been doing an unprofitable business, and last December Charles E. Williams, receiver of the company, in a petition to the United States District Court at Parkersburg, recommended that the line be dismantled and its effects sold at public auction.

Proposed Reorganization Upheld.—Judge M. T. Dooling in the United States Court at San Francisco, Cal., on Jan. 24 decided against the contention of two holders of the underlying bonds of the Northern Electric Railway, Chico, Cal., that they should be allowed better terms than were accorded them by the new reorganization plan. Proceeds from the sale are planned to be distributed as follows: 16 per cent to the holders of $6,000,000 of overlying bonds; 59 per cent to the holders of $3,800,000 of underlying bonds on the main line; 12½ per cent to the holders of $750,000 in bonds on the Sacramento & Woodland branch, and 12½ per cent to the holders of the $750,000 bonds on the Marysville & Colusa branch.

Lancaster Consolidation Proposed.—Application has been filed with the Public Service Commission at Harrisburg for approval of the consolidation of seven Lancaster County electric railways into a new corporation, to be known as the Conestoga Traction Company. The companies to be merged are Lancaster Traction Company, Lancaster Railway, Lancaster City Railway, Lancaster & Lititz Railway, Columbia & Ironville Railway, Columbia & Donegal Railway and the present Conestoga Traction Company, which is a subsidiary of Lancaster County Railway & Light Company, having an authorized capital of $1,500,000 of common stock and $1,000,000 of 5 per cent cumulative preferred stock.

Financial Readjustment Likely.—It is reported that a new company is to be formed to take over the St. Paul (Minn.) Southern Electric Railway and to extend it after the war through southern Minnesota. The Interurban Construction Company held $360,000 or a majority of the first mortgage bonds of the company. There are said to be $72,000 of second mortgage bonds outstanding. Payment of interest on the first mortgage bonds was defaulted last summer. Committees of both classes of bondholders were then formed and a readjustment of the finances without the need of foreclosure now appears to be in prospect.

Changes in Lewisburg Property.—According to information just now available, the property of the Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va., was last June placed in the hands of R. M. Sell as receiver. This action followed an application to the Public Service Commission for permission to discontinue operation and abandon the line, the application being contested before the regulatory body. In the autumn certain business men in Lewisburg purchased the stock, assumed the liabilities and continued operation without the receiver. On Jan. 5, the property was sold under a trust deed held by local banks, and the same business men bought the road at a sum sufficient to cover all indebtedness.

Board Opposed to Lease Agreements.—Holding that the rental paid by the Morris County Traction Company, Morristown, N. J., to the Morris Railroad for about 2½ miles of lines between Madison and Morristown is unreasonable and inequitable, the Board of Public Utility Commissioners has refused to approve a trackage agreement entered into between the two companies on Oct. 2, 1913. The fact that this agreement had not been previously submitted to the board for approval as required by statute, was brought to light last November in the course of a hearing upon the application of the traction company for the approval of an issue of income debenture bonds. Before passing upon the proposed bond issue, the commission insisted that the company should seek approval of the trackage agreement. This was done on Dec. 5 last. The commission says that all expenses of operation should be borne directly by the traction company, if that company was to be credited with the entire amount of operating revenue, inasmuch as it would be practically impossible to determine what proportion of the gross operating revenues was assignable to the railway property.

Traffic and Transportation

General Relief Petition

Utilities of Illinois Consider Putting Their Case Before Commission in a General Application

One or two conferences have been held between the Public Utilities Commission of Illinois and representatives of important operating utilities, the result of which has been an informal understanding that the commission will entertain a blanket petition from all of the public service companies in the State asking for some sort of emergency relief because of abnormal war conditions. Should such relief be granted by the commission it is then understood that each individual case will be investigated by the commission and the justness of the new charges will be decided by that body.

It is regarded as likely that a blanket petition will be presented to the commission by the Illinois Electric Association as representing the electric light and power companies in Illinois the Illinois Electric Railway Association as representing the railways and the Illinois Gas Association as representing the Illinois gas companies. Meanwhile, applications have been filed with the commission by certain subsidiaries of the Illinois Traction Company asking for specific relief. These petitions are referred to elsewhere on this page, the names of the individual applicants and other facts being given.

APPEAL TO PUBLIC FOR SQUARE DEAL

All three of the associations mentioned previously have united in a direct newspaper appeal to the public of the State to give the utilities a fair deal in the matter of rapidly increasing costs of operation with a steady and unflexible revenue account. They point out that the utilities should be protected against losses which will ensue if they are not permitted to earn a revenue commensurate with their greatly increased operating expenses. The appeal has appeared in a number of prominent Illinois daily papers. It brings out pertinent facts with which a fair minded public should be acquainted if it is to see that the utility companies have a fair and impartial trial before the bar of public opinion.

High Water Stops Traffic

High water from the Ohio River caused the practical suspension of operation on all interurban lines in the vicinity of Cincinnati on Feb. 1. Water invaded the power station of the Interurban Railway & Terminal Company at Coney Island and the lines to New Richmond, Bethel and Lebanon were rendered idle. Service on the Cincinnati, Georgetown & Portsmouth Railway between Mount Washington and Cincinnati was abandoned, although operation over the remainder of the line was maintained. Tracks of the Cincinnati, Lawrenceburg & Aurora Electric Street Railway were inundated in several places, but cars were kept in operation to Lawrenceburg. Aurora service was abandoned. Electric railway service in Cincinnati was interrupted, but every effort was made by the traction companies to handle passengers over the flooded points.

Another Fare Increase Allowed in Illinois

The Public Utilities Commission of Illinois has authorized a substantial increase in the fares of the Chicago & West Towns Railway, Chicago, Ill. The revised schedule was based upon a valuation of the road's property, but the usual careful field check was dispensed with. The evidence showed that the road was in the hands of a receiver, had never paid dividends, that the interest on the funded debt and receiver's certificates had not been met, and that there was little chance for the road earning a fair return upon any sum approximating a reasonable value. The order says, in part:

"From the foregoing it seems clear that petitioner has for many years furnished service to these communities without an adequate return upon its investment. To such a return it undoubtedly has right, and it seems only fair that opportunity be given petitioner to earn increased revenues by means of increasing the rates to be charged for its services."

The increased cost of material and supplies and of wages was considered in fixing the increased rates.

Advance in Class Rates

The Interstate Commerce Commission has ordered that the rates as specified in the recent application of the Cincinnati, Georgetown & Portsmouth Railroad, Cincinnati, Ohio; Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., and Fort Wayne & Decatur Traction Company, Decatur, Ind., be approved for filing without formal hearing. The companies petitioned the commission to approve the filing of class and commodity rates similar to the present effective steam railroad rates in the same territory for like distances which were established in conformity with the previous decision of the commission. This the commission approved on the ground that the rates proposed for the electric lines would result in a greater uniformity of charges in the territory affected. It is said that the new tariff for the electric railway means an advance in general of about 15 per cent.

I. T. S. Seeks Increases

Railway, Light and Power, and Gas Companies All Apply for Permission to Advance Charges

An increase in the rates for city railway service, as well as for electric lighting and gas service, is asked for in a petition filed by thirteen subsidiary companies of the Illinois Traction System, Peoria, Ill. The bill was presented to the Public Utility Commission of Illinois on Jan. 31. Henry I. Green, Urbana, Ill., counsel for the companies, filed the bill. A straight 5-cent fare is asked in every community served by railways except Jacksonville and Cairo, where a 6-cent rate is asked. The elimination of all coupon books and quantity sale of tickets at reduced rates is also included in the bill. The increase in electric lighting service proposed is from 6 to 20 per cent, depending upon the community, while an increase of from 5 to 25 cents per 1000 cu. ft in gas rates is asked.

THE THIRTEEN APPLICANTS

The companies uniting in the bill are the Peoria Railway, the Quincy Railway, the Urbana & Champaign Railway, Gas & Electric Company, the Urbana Light, Heat & Power Company, the Clinton Gas & Electric Company, the Cairo Electric & Traction Company, the Bloomington & Normal Railway & Light Company, the Danville Street Railway & Light Company, the Decatur Railway & Light Company, the Jacksonville Railway & Light Company, the Galesburg Railway, Lighting & Power Company, the Northern Illinois Light & Traction Company, Ottawa, and the Madison County Light & Power Company, Edwardsville.

EMERGENCY INCREASE ASKED

The petition recites that owing to the present abnormal conditions caused by the war the companies are in need of immediate relief in the form of increased rates for all public utility service rendered. The companies request further that the commission grant the emergency increase at the present time with a hearing at the discretion of the commission at a later date, when the local conditions affecting each company will be taken up. The companies agree to abide by the decision of the commission, and if any of the proposed rates are found unjustified they agree to make rebates to the consumers. Separate schedules are filed in the case of each company.

HEARING SET FOR FEB. 19

The commission has set Feb. 19 as the date for the hearing upon the petitions filed by the thirteen companies previously mentioned for an increase in rates.

After a full hearing in the case of the Danville Street Railway & Light Company, Danville, the commission has issued an order permitting the company to eliminate ticket fares. Heretofore eleven tickets were issued for 50 cents by the Danville company, or 100 tickets for $4.

Failure of Service in Waterbury

Connecticut Commission Sounds Note of Warning—Commission and Public Expect Results Despite Unfavorable Conditions

As a result of its inquiry in the service furnished by the Connecticut Company in Waterbury the Public Utilities Commission has issued the following order:

"The Connecticut Company is hereby ordered and directed to furnish and provide at least forty cars suitable for winter service in and for electric railway service in the city of Waterbury and its suburban lines, on or before Feb. 5, 1918, and to furnish and provide eight additional cars for such service on or before Feb. 12, 1918, and within fifteen days thereafter to furnish and provide at least an additional 20 per cent of the number of cars hereby required, to insure reasonably adequate electric railway facilities for said service.

"The Connecticut Company is further ordered and directed on and after March 1, 1918, to maintain at least fifty-eight cars in good serviceable condition for said service."

In its finding the commission said:

"On Jan. 23, 25 and 26 a member of this commission was in Waterbury, examining into service conditions of the Connecticut Company. On Jan. 28 the Aldermanic committee of the city of Waterbury held an informal conference with the commission, relative to the Connecticut Company service in that city. During the last few days the commission has written to and had interviews with officials of said company, pertaining to said service.

SERVICE COLLAPSE

"From all of the foregoing it appears and is found that there has been a general breaking down—in fact, almost a collapse, of the electric railway service in Waterbury during the last week, and that the partial service now being rendered is wholly inadequate to the public need.

"Ordinary service conditions in Waterbury require at least twenty-four cars in commission during normal service hours and at least forty-eight cars in commission during the so-called rush hours. The maximum number of cars in commission during some of the days of the last week, including rush hours, did not exceed fourteen.

"The inadequacy of service is due to lack of proper maintenance of cars and equipment and lack of sufficient cars in serviceable condition for operation. We further find that the Connecticut Company has sufficient cars capable of being put into serviceable condition for winter use in the city of Waterbury.

"Owing to the condition which the Connecticut Company has permitted its plant and equipment to arrive at in Waterbury, and owing to the imperative demands for immediate relief, we deem it advisable to issue an order based on the facts already familiar to the commission, without the delay of formal petition and public hearing. We therefore ask the Connecticut Company to waive any informality and to accept the finding as an official and binding order of this commission, and immediately after receipt thereof to notify this commission of its acceptance."

COMPANY HELD RESPONSIBLE

The letter of the commission to the company read in part as follows:

"Unusual conditions require unusual, special and even drastic efforts and remedies to meet them successfully. In this crisis of corporate and national emergency, an added duty and obligation rests upon your company, an obligation which is not met in the ordinary slow routine of applying the usual remedies, but by the prompt exercise of every possible and extraordinary means that may be used to correct the situation and prevent a similar recurrence at Waterbury or elsewhere in your territory.

"It appears from what information this commission has at hand, that the present principal difficulty in Waterbury is a general breaking down of the rolling stock, motors, etc., and the imperfect condition of roadbed (due largely to winter storms) for successful operation. This is a condition that proper care and maintenance would have largely if not wholly prevented, and under ordinary circumstances would be entirely inexcusable.

"A person or corporation undertaking to do business at the present time, under the abnormal conditions, must be prepared to meet these conditions and compete with all adverse circumstances. This is particularly true of a utility company, especially when such company has had no financial handicaps placed upon it by public regulation.

"Our commission is very much disturbed over what has happened in Waterbury and what may happen in Bridgeport and other populous centers unless immediate and extraordinary remedies are applied. We insist upon and shall expect the Connecticut Company to use every means within its power promptly to restore at least normal service in Waterbury, to safeguard and improve its service generally, and to be so prepared to meet the abnormal conditions and demands as to prevent elsewhere any such breakdown as now exists in Waterbury.

"We realize the difficulties confronting the company and say what we have said in a friendly but authoritative manner and will be glad to co-operate or counsel with you if you desire, bearing in mind the familiar adage, 'Action speaks louder than words,' and that results are what our commission and the public have every reason to expect."

North Carolina Roads Need More Revenue

Informal Conference to Consider How Best to Secure Increased Revenues—Publicity to Play Its Part

Representatives of the electric railways in North Carolina met at Greensboro on Jan. 24 on call of Robert Lee Lindsay, vice-president and general manager of the Durham Traction Company, and spent the entire day considering ways and means of increasing the revenues. That the revenues need to be increased at the very earliest possible moment was agreed, but the manner of accomplishing this was the question which received the most serious consideration.

The conference was an informal one, but for the purpose of proceeding in an orderly manner Mr. Lindsay was elected chairman and Leake Carraway, director of publicity for the Southern Public Utilities Company, Charlotte, secretary. The representatives of each railway in attendance spoke of conditions prevailing in his city and pointed out the necessity for increased revenues.

RATES RAISED IN GREENSBORO

Charles B. Hole, president of the North Carolina Public Service Company, with headquarters at Greensboro, reported that he had placed the real situation frankly before the commissioners of his city, and that the commissioners had voted to allow the railway to withdraw from sale all reduced-rate or special-rate tickets, despite the fact that the franchise of the company specified that certain special-rate tickets must be furnished by the company. He had proved that unless the rules requiring the sale of tickets were rescinded the company would continue to lose money. It was President Hole's opinion that when a railway went to the law-making body of a city with clean hands and showed the necessity for relief, there would be no difficulty in securing that relief. Mr. Hole advertised in the daily press the real situation that confronted the railway, and the people offered no objection to the action of the commissioners in allowing the withdrawal of special rates. He estimated that the withdrawal of the special-rate tickets would at least make it possible for the company to break even. The flat fare for Greensboro was referred to previously in the ELECTRIC RAILWAY JOURNAL for Jan. 19, page 158.

Mr. Lindsay reported that no special rates were in effect at Durham, but that his company was considering the advisability of making a charge for transfers. He admitted, however, that the layout of his system was such as to raise some doubt about the advisability of this procedure.

H. H. Carr, vice-president and general manager of the Carolina Light & Power Company, Raleigh, expressed the opinion that immediate relief was necessary and that, while a publicity campaign to acquaint the people with the facts might be a good thing, railways in general could not wait the result of such procedure before asking for relief. He urged that the entire matter be laid before the State Corporation Commission at the earliest possible moment, with a request for some ruling which would prevent the further loss of money.

It was finally determined, however, to begin at once for the entire State a systematic campaign of educational publicity similar to that conducted by the Southern Public Utilities Company for the last three years. An arrangement was made for exchange of advertising matter between companies.

I. T. S. Flat Fare

On Feb. 11 Company Will Place in Effect Recently Allowed Two-Cent Rate

The new passenger tariffs recently approved by the Public Utilities Commission of Illinois will be inaugurated by the Illinois Traction System on its electric railway lines on Feb. 11.

The tariffs, which have been filed, provide for basing ticket fares at 2 cents per mile, and the discarding of the former 5-cent zone system. In its application to the commission the company showed that the new method of basing passenger fares would not increase the revenue and that all fares would be practically the same as at present, except that the change would remove certain discriminations established by the old zone system of collection.

Under the new tariffs the company is also authorized to collect 2½ cents per mile from passengers who pay a cash fare aboard the train, where they board the train at an open agency station. This is the same rule observed by steam railways, except that their cash fare charge is 3 cents per mile. The company anticipates that this rule will encourage buying of tickets at the stations and thereby greatly relieve conductors, who are now especially burdened because of war tax collections required on all cash fares. For the convenience of passengers whose destinations is a regular crossroads stop the company will place a new form of ticket in all agency stations.

Will Appeal Portland Case

The city attorney of Portland, Ore., will appeal to the courts from the recent order of the Public Service Commission, granting the Portland Railway, Light & Power Company the right to charge a 6-cent fare. Commissioner Kellaher introduced a resolution in the City Council, asking permission to engage another attorney to assist in the case, and setting forth that "there exists among the citizens of Portland a fixed belief that the action of the Public Service Commission is antagonistic to the interests of the citizens, and permits the company to violate its contract obligations, and is illegal and void."

Efforts Bent Toward Relieving Buffalo Traffic

More Intensive Use of Belt Line, Electrification of That Line in Immediate Future and Construction of Subways Urged

Immediate construction of a system of subway terminals in the congested business section of Buffalo, N. Y., is recommended by the municipal traffic board appointed by the Mayor to investigate the electric railway problem. Plans for the proposed subways and subway terminals have been prepared by the city engineer and the recommendations have the approval of the new street railway commission and members of the City Council.

John C. Brackenridge, who has been engaged by the municipal authorities to investigate traffic conditions on local lines of the International Railway, has been asked to consider the proposed subway plans and to report as quickly as possible to the Council. It is proposed that the subways be constructed by the city and leased to the International Railway at a figure which would carry the interest charges and eventually retire the bonds.

TWO SHORT SUBWAYS SUGGESTED

Two short subway systems have been suggested with loading terminals at Lafayette Square and Niagara Square in the heart of the retail shopping district. Cars would enter the subway on the east side of Main Street at a point about four blocks from Main Street and would continue through the subway to a point about four blocks west of Main Street. Loops would be constructed under Lafayette Square and Niagara Square and loading terminals would be built at these points. All eastbound and westbound surface tracks would be removed in the downtown section and the only tracks would be north and south. Thomas Penney, vice-president and general counsel of the International Railway, is a member of the municipal traffic board which presented the plans for the proposed subway.

In addition to making this recommendation, the board criticised the general layout of the company's lines. It said that the haphazard connection of lines at the time competing companies were absorbed in Buffalo was partly to blame for the present traffic situation. The general revision of electric railway trackage throughout the city is recommended.

The recommendations of the municipal traffic board are separate from the investigation of the electric railway problem now being made by Mayor George S. Buck and the municipal railway committee under the direction of Mr. Brackenridge. At the last meeting of the railway committee, the city attorney was directed to inquire into the procedure necessary to bring an action in the Supreme Court of Erie County to abrogate the franchise of the International Railway. In addition Mr. Brackenridge was instructed to find out what orders and recommendations of the Public Service Commission had been ignored by the railway.

In another report to the City Council on traffic questions Mr. Brackenridge said that the police department should make every effort to stop the wrecking of cars at industrial plants. He pointed to two specific instances where windows were broken and rolling stock otherwise damaged by passengers who were unable to board cars at the Pierce-Arrow Motor Company plant.

ELECTRIFICATION OF BELT LINE URGED

Electrification of the double-track steam belt line service around Buffalo is recommended by Mayor Buck. Several conferences have already been held by the Mayor with officials of the New York Central Railroad in regards to the electrification of the belt line service but no agreement has been reached. The Chamber of Commerce has sent an appeal to Director General of Railroads McAdoo urging him to require the New York Central Railroad Company to put on additional trains to carry workers to and from the large war industries in the district that is served by the company.

In replying to charges made by the Mayor, E. J. Dickson, vice-president of the International Railway, sent a long statement to the municipal railway commission showing how the company was making every effort to handle the transportation problem resulting from recent severe snow storms and the loss of forty-seven cars in the Forest Avenue carhouse fire. In his statement Mr. Dickson said:

"While the number of crippled cars is still large, we installed 244 pairs of wheels during the week ending Jan. 25; 322 armatures and 847 fields. In addition we have extra men inspecting motors, controllers, truck brakes and car bodies. All worn parts are being rapidly replaced. Many cars are out of service due to car-door failures, but we are now inclosing door mechanism with canvas shields. We have also had a large number of failures from broken journals and truck parts which were due to an accumulation of ice outside of the rails."

TYPES OF CARS DESTROYED

In explaining the types of equipment destroyed in the Forest Avenue carhouse, Mr. Dickson said that twenty-five cars were of the double-end type, the heaviest cars operated by the company on its city lines; eighteen were of the near-side pay-as you-enter type and three were of a small size double-end type. Two large snowplows, two track sweepers and one work car were also destroyed. Mr. Dickson told the committee he did not believe it would be practicable to operate open cars because of the extreme cold weather. The members of the committee were assured by Mr. Dickson that they would be kept informed weekly of the condition of the company's equipment.

Meeting an Emergency

Open Cars to Be Operated for Ship Works As a Means of Immediate Relief

The Public Service Commission for the First District of New York, on the application of Capt. C. S. Bookwalter, district officer of the United States Shipping Board, has issued permission to the Richmond Light & Railroad Company to operate open cars for the transportation of shipbuilding workers from St. George, S. I., to the shipbuilding plants on the north shore of Richmond. The company has all of its other equipment in use, and in view of the present emergency the commission agreed to permit the operation of the open cars for the transportation of the thousands of ship workers. The full regular equipment of the company will be left in service for the conveyance of the regular passenger traffic of the line and efforts will be made to restrict the use of the open cars solely to the shipbuilders. The commission gave its approval on motion of Commissioners Charles Bulkley Hubbell, after ex-Justice William L. Ransom, counsel to the commission, had stated that the company did not have sufficient closed cars to meet the abnormal demand.

Puts Song into His Work

Minneapolis Has a Ragtime Conductor Who Has Set the City to Singing His Rhymes

The left gate in; the right gate out,
And you've really nothing to worry about.

Thus blithely caroled "No. 1260," ragtime conductor on the Chicago and Fremont line. Not alone is "1260" urbane, polite and watchful, but he is entertaining. Women with fretful children wait for him; tired business men greet him with a smile and young girls chew their gum blissfully and try to remember his rhymes. Commonplace is discarded by the rhythmic "1260," for he is the true poet, seeking to scatter bits of happy and timely roundelay as a part of his daily toil.

The car approaches a transfer point:

Ladies and gents, this is the time
To change cars here for the Hennepin line

suggests "1260." Some one lagged a bit getting aboard:

Come on, good folks—don't be slow,
Hop on the car—come on—let's go,

is his admonition.

As the Chicago avenue curve is approaching, comes then the caution:

A curve is coming—to prevent mishap,
All those standing—grab a strap.

An old lady stood in the aisle, and near her a young mother with a child; "1260" threw a sharp glance in their direction, thought a second, and sang:

The gents will stand and the ladies sit down,
And we'll all be polite in this man's town.

Starting through the car, the happy "1260" reminded:

The conductor is coming to get your fare,
A nickel is needed—a dime for a pair.

Take one trip with ragtime "1260" and you'll always wait for his car. "Some" conductor—"some" songster. —Minneapolis *News*.

Transportation News Notes

Skip-Stop Trial in Des Moines.—The Des Moines (Iowa) City Railway is giving the skip-stop plan a month's tryout on its University line.

One-Man Cars for Short Seattle Line.—The Seattle & Rainier Valley Railway, Seattle, Wash., has petitioned the City Council for permission to operate six reconstructed one-man cars. The petition has been referred to the public utilities committee.

Will Eliminate One Hundred Stops.—City Commissioner William Burk, of Trenton, N. J., and City Engineer Abram Swan have been selected by the City Commission to pass judgment upon the list of 100 stops the Trenton & Mercer County Traction Corporation intends eliminating to increase further the efficiency of its local service in the city of Trenton.

Metal Tickets for Dallas.—Metal tickets to be used by the Dallas (Tex.) Railways have been received by the company. They will be used as soon as the new cash fare boxes can be installed. The company received metal discs of three sizes, one for the regular tickets now sold at twenty-two for $1, one for the half-fare students' tickets and one for the regular half fare tickets for children under twelve years of age.

Accident in Champaign.—A car of the Illinois Traction System which stalled on the University Avenue crossing of the Illinois Central Railroad, Champaign, Ill., was struck in the center by a freight train, pushed over the crossing and turned upon its side. All but two of the nine passengers were on the south side of the car, and to this is attributed the fact that there were no fatalities. Two men were seriously but not dangerously hurt.

Increase Asked by Marion Company.—The Marion & Bluffton Traction Company, Bluffton, Ind., has filed a petition with the Public Service Commission of Indiana asking authority to increase its rates for passenger fares from 2 cents a mile to 2½ cents a mile. The company has also asked authority to discount the round-trip fare to the extent of 5 per cent of the total charge of the fare both ways. It would charge 2 cents a mile for commutation books under this petition.

No Unrestricted Jitneys in Portland.—The City Council of Portland, Ore., on Jan. 23 agreed to support a proposal to submit the question of the operation of jitneys in Portland to a vote of the people at a special election in April. This action was taken after Commissioner Kellaher had received no support from the Council in his move to turn the jitneys loose at once, free of all regulation, as a result of the recent action of the Portland Railway, Light & Power Company in raising the city fare to 6 cents.

Crosstown Service Abandoned.—The Des Moines (Iowa) City Railway has abandoned crosstown service. For several years the company maintained crosstown service east and west. Delays in the service and the proposed rebuilding of lines this spring caused R. G. Smock, city railway supervisor, to recommend to the officials of the company that the crosstown service be eliminated. Lines are now operating individually on the Fair Grounds-Douglas Avenue and the Ingersoll-Valley Junction routes.

Free or Donation Buses Allowed.—According to an ordinance passed by the City Council of Tacoma, Wash., recently, free or donation buses will be allowed to operate in that city. The ordinance provides that all operators of the free or donation jitneys shall take out permits from the city clerk's office, and shall keep on file a bond of $2,500. No fare is fixed, patrons or the buses donating whatever they please. The ordinance defining and regulating the new form of transportation in Tacoma was introduced by Mayor A. V. Fawcett. The measure received the unanimous vote of the Council.

Something a Little Different.—The uniform of the women employed on the cars of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., is of navy blue cloth with a distinctly military cut, resembling the dress uniform coat of the Marine Corps though without the brass buttons. The collar is ornamented by gold initial letters of the company. There is a military cap and skirt to match the coat. The skirt is short enough to permit quick movements. Most of the other surface and tunnel lines are affecting a khaki uniform with wrap leggings for the young woman conductor or guard.

Increase in Fares for Washington Buses.—After careful consideration of the suggestions submitted in writing and of all the testimony adduced at a public hearing in regard to the operation of motor vehicles in Washington, D. C., the Public Utilities Commission of the District recently decided: "*First*, that the rate of fare to be charged by the operators of such motor vehicles should be increased; *second*, that this increased rate should apply within a definite area approximating that embraced within a radius of 4 miles from the White House; *third*, that an additional fare should be authorized to points outside of said area; *fourth*, that so much of Order No. 224 relating to the use of certain streets in the congested business area be amended so as to permit the streets mentioned therein to be used by motor vehicles during the hours of non-rush traffic on the electric railway lines." The commission entered an order on Jan. 2 in accordance with the finding at which it arrived.

Personal Mention

O. P. Chubbuck, superintendent of shops of the Illinois Traction System at Decatur, has resigned.

James A. Connell has been appointed auditor of the Albany (N. Y.) Southern Railroad, to succeed T. H. Blaikie.

J. S. Murphy has been appointed superintendent of the power station of the Ithaca (N. Y.) Traction Corporation to succeed C. B. Hudson.

H. F. Vokes has been appointed chief engineer of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., to succeed D. E. Crouse.

Robert S. Tomkins has been appointed assistant treasurer of the Public Service Railway, Newark, N. J., to succeed Robert D. Miller, deceased.

Edward Fitzgerald has been appointed roadmaster of the Central New York Southern Railroad Corporation, Ithaca, N. Y., to succeed J. J. Welch.

George Baker, formerly general superintendent of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., has been appointed assistant general manager of the company.

Seymour Van Santvoord, Troy, chairman of the Public Service Commission for the Second District of New York, retired from the commission on Feb. 1 by virtue of the expiration of his term.

J. R. Savage has been promoted from the position of chief engineer of the Long Island Railroad, New York, N. Y., and subsidiary companies to that of general manager, to succeed J. A. McCrea.

L. V. Morris has been appointed chief engineer of the Long Island Railroad, New York, N. Y., and subsidiary companies to succeed J. R. Savage, who has been appointed general manager of the company.

Weldon F. Weston has been elected first vice-president of the Mount Beacon-on-Hudson Association, which operates a cable incline railway to the top of Mount Beacon, N. Y. He succeeds Albert Merrill.

M. H. Aylesworth, a member of the Public Utilities Commission of Colorado, has been appointed assistant to S. R. Inch, the newly-elected vice-president of the Utah Light & Power Company, Salt Lake City.

James Harmon has been appointed safety manager for the Kentucky Utilities Company, the Interstate Public Service Company and other adjacent Middle West Utilities Company properties, with offices in Louisville, Ky.

Thomas F. Fennell, Elmira, has been named by Governor Whitman to succeed Seymour Van Santvoord as chairman of the Public Service Commission of the Second District of New York. He is now a Court of Claims judge.

Franklin T. Griffith, president of the Portland Railway, Light & Power Company, Portland, Ore., has been selected for the position of State Director of the United States Public Service Reserve, by I. W. Litchfield, associate director of the service.

W. C. Swisher, supervisor of safety of the Denver (Col.) Tramway, has resigned to assume the position of general claims attorney for the Kansas City (Mo.) Railways. He has been an employee of the tramway since June, 1910, and the work of his department has been very effectively handled under his direction. Mr. Swisher was born at New Madison, Ohio, in 1878. After he was graduated from the University of Michigan in 1900, Mr. Swisher went to Colorado and began the practice of law in Victor. The following year he became connected with the Rock Island Railroad. He served in the office of the general claims attorney at Chicago, and two years later was transferred to Santa Fe. He was later appointed claim agent for the Texas lines, with headquarters at Amarillo, where he remained until September, 1909. Upon his departure from the Denver Tramway, officials of the company presented Mr. Swisher with a wrist watch as an expression of the good fellowship which has always existed between Mr. Swisher and his associates there.

W. C. SWISHER

Sydney L. Wright, president of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., which controls the Trenton, Lawrenceville & Princeton Railroad, has been elected president of that company to succeed W. R. Wright.

J. D. Barnhart, formerly master mechanic at the Granite City shops of the Illinois Traction System, has been appointed superintendent of shops of that company at Decatur, in charge of repairs to all interurban equipment, succeeding O. P. Chubbuck.

Emil G. Schmidt, president of the Des Moines (Iowa) City Railway and the Interurban Railway, Des Moines, has been made vice-president of the German-American Patriotic Association, organized at Des Monies by the Iowa State Council of Defense.

Joseph W. Folk has sent to the Interstate Commerce Commission his resignation as the commission's chief counsel, to take effect before Feb. 15. Mr. Folk will return to his home in St. Louis to become general counsel of the Chamber of Commerce there.

A. F. Smith has been appointed engineer of maintenance of way of the Lehigh Valley Transit Company, Allentown, Pa., and the Phillipsburg (N. J.) Transit Company and the Easton (Pa.) Transit Company, subsidiary companies, to succeed Charles E. Jenkins.

George W. Strack, Jr., who has been a member of the bureau of safety's force of the Middle West Public Utilities Company, Chicago, Ill., for four years, has been made safety agent for the Central Illinois Public Service Company, controlled by the Middle West company.

Robert Tillman Johnson, inspector in charge of transportation of the Owensboro (Ky.) City Railway, has been appointed superintendent of the company. He succeeds G. Raymond Millican, who has been made superintendent of the properties of the Evansville (Ind.) Railways.

Roy Crandall, publicity agent for the Buffalo (N. Y.) General Electric Company, has been appointed advertising agent for the International Railway, Buffalo. This is a new position created by E. G. Connette, president of the company. Mr. Crandall will continue with the Buffalo General Electric Company. He was formerly engaged in newspaper work.

W. E. Titus, whose appointment as superintendent of the Easton (Pa.) Transit Company was noted in the ELECTRIC RAILWAY JOURNAL for Dec. 1, 1917, will act in a similar capacity with the Phillipsburg (N. J.) Transit Company, both companies being controlled by the Lehigh Valley Transit Company, Allentown, Pa. Mr. Titus succeeds H. H. Patterson with both companies.

George H. Losey, assistant general superintendent and electrical engineer for the Indiana Railways & Light Company, Kokomo, Ind., has resigned to become connected with the Great American Refining Company at Tulsa, Okla. Mr. Losey has been with the Kokomo company for the last ten years in various engineering capacities. He started in the meter department and advanced through a line of promotions. He was graduated in the electrical engineering course at Purdue University.

R. W. Tassie, who has been assistant electrical engineer of the Havana Electric Railway, Light & Power Company, Havana, Cuba, has been promoted to the position of electrical engineer, succeeding C. H. Sanderson. In his present position Mr. Tassie has charge of the electrical and commercial engineering work of the company. During the last six years, since he went to Havana, he has occupied several positions with the company leading logically to his present one. Mr. Tassie, who is a native of Australia, came to this country to study electrical engineering and graduated in the course in this subject at Cornell University in 1909. In his senior year he was elected to the Sigma Xi Society, an indication of his ability in scientific work, and he was very active in the Cosmopolitan Club, which is a powerful organization at Cornell. He has also recently been transferred to the grade of member in the American Institute of Electrical Engineers.

Obituary

Richard L. Jennings, a former superintendent of the old Brooklyn City Railroad, now included in the Brooklyn Rapid Transit System, is dead. He was latterly in the real estate business, but had been retired for some years. Mr. Jennings was born in Iowa eighty-six years ago. He entered railroad work in Brooklyn more than sixty years ago. He is said to have sent the first car out under electrical power in Brooklyn. Altogether, Mr. Jennings was connected with railroading for forty-five years. He was a Civil War veteran.

William Temple Emmet, a member of the Public Service Commission of the Second District of New York since March, 1914, died on Feb. 4. He was State Superintendent of Insurance for two years, beginning in February of 1912. Mr. Emmet was born in New Rochelle in 1869, was educated at St. Paul's School, Concord, N. H., and at Columbia University. He was admitted to the bar in 1891. He practiced in New Rochelle for several years and then opened an office in New York. He was active in politics both in and out of Tammany Hall for a number of years, but was defeated for the State Senate from the Bronx in 1903.

Fernand de Tranaltes, assistant engineer of construction of the New York (N. Y.) Railways, is dead. Mr. Tranaltes was forty-nine years old. He was graduated at Cooper Union with honors and began active service as leveller on the Union Pacific Railroad, later returning to New York to engage as engineer with the contracting firm of J. D. & T. E. Crimmins. In August of 1890 Mr. Tranaltes began on the preliminary surveys for the Broadway cable road and continued in the engineering corps of the railway during the construction of Broadway, Columbus Avenue and Lexington Avenue cable roads until about 1895, when he was recommended by the president of the railway to put through the construction of the electric railways on Staten Island. After completion of this work Mr. Tranaltes resumed work with the railway engineer corps of the New York Railways on construction.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Franchises

Tulsa, Okla.—Because of the opposition of First Street property owners to the construction of an interurban line on that thoroughfare, the Mayor and Board of City Commissioners refused to take any definite action in the matter of granting or denying the request of the Oklahoma Union Railway for a franchise through the city for the Sapulpa-Collinsville line. The board is willing to submit the matter to a vote of the people. In that case a decision will be rendered at either the primary or city election, both of which are held in April.

Chester, Pa.—Application has been made to the City Council of Chester by the Chester & Philadelphia Railway for permission to lay additional tracks on Crosby and Fourth Streets to relieve the traffic congestion which exists on the line between Chester and Philadelphia.

Track and Roadway

Arkansas Northwestern Railroad, Bentonville, Ark.—The Benton Chancery Court has issued an order directing the Arkansas Northwestern Railroad to remove its tracks and ties in Bentonville. Operation was suspended on this line some time ago.

Pacific Electric Railway, Los Angeles, Cal.—Surveys have been begun by the Pacific Electric Railway for an extension to connect the line from South Los Angeles with the line to El Segundo.

Connecticut Company, New Haven, Conn.—Plans are being considered by the Connecticut Company for the extension of its Dixwell Avenue line in Hamden.

***Macon, Ga.**—It is reported that government engineers are surveying along the right-of-way of the old Macon & Augusta Railroad to Camp Wheeler, about 5 miles.

Peoria & Chillicothe Electric Railway, Peoria, Ill.—At the annual meeting of the Peoria & Chillicothe Electric Railway held recently, assurance was given by officials of the company that the line between Peoria and Chillicothe will be built as soon as steel and materials can be purchased. E. A. Mitchell, Chillicothe, was re-elected president; John F. Lynch, vice-president; W. E. Emery, secretary; A. H. Black, assistant secretary, and E. A. Mitchell, treasurer. [April 28, '17.]

Des Moines (Iowa) City Railway.—The 1918 extensions to be made by the Des Moines City Railway were recently decided upon at a conference between the city engineer, the city car supervisor and W. L. Wilson, engineer maintenance of way of the company, as follows: The Crocker Street line will be extended on Twenty-fourth Street from Ingersoll Avenue to Center Street; on Center from Twenty-fourth to Thirty-first, on Thirty-first from Center Street to Crocker Street, on Crocker Street from Thirty-first to Forty-seventh Street. The Walker Street line will be extended from East Twenty-fourth Street to Twenty-ninth Street. The Euclid Avenue line will be extended on Second Street to Amherst Street, on Amherst from Euclid Avenue to Hull Avenue, on Hull Avenue to East Ninth.

Inter Urban Railway, Des Moines, Iowa.—Construction has just been completed of an additional mile of double track by the Inter Urban Railway on its Camp Dodge line. There remain but 3 miles of construction to make the entire line to Camp Dodge double-tracked.

Ware & Brookfield Street Railway, Ware, Mass.—J. Edward Brooks, president of the Ware & Brookfield Street Railway, ordered the discontinuance of operation on the Gilbertville and West Brookfield divisions on Feb. 3, as the line has been a losing proposition.

St. Paul Southern Electric Railway, St. Paul, Minn.—If the tentative plan for the reorganization of the St. Paul Southern Electric Railway goes through the likelihood is that the road will be extended through Southern Minnesota.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The City Commission has requested the Trenton & Mercer County Traction Corporation to remove its feed wires and cables running from the power house on Lincoln Avenue to North Clinton Avenue and install them underground. The commission asks that the work be done as soon as the weather permits.

Batavia (N. Y.) Traction Company.—It is reported that the Batavia Traction Company is considering the extension of its line to Horseshoe Lake.

Brooklyn (N. Y.) Rapid Transit Company.—At the direction of Borough President Maurice E. Connolly, work has begun on the completion of plans for the extension of a crosstown trolley line from the Williamsburg Bridge plaza in Brooklyn to the Queensboro Bridge plaza in Long Island City. In the preparation of these plans he has directed that consultation be had with the officials of the Brooklyn Rapid Transit Company and of the Manhattan & Queens Traction Company, both of which may join in the operation of the line if it is built. As soon as the plans are completed application will be made to the Board of Estimate and the Public Service Commission for a franchise. It is proposed that the line start at the Williamsburg Bridge plaza and extend to Driggs Avenue, to Manhattan Avenue, to Greenpoint Avenue and here cross the Blissville Bridge to Van Dam Street, and through Van Dam Street to the Queensboro Bridge plaza.

Pittsburgh (Pa.) Railways.—An order was made in Common Pleas Court on Feb. 1 requiring the Pittsburgh Railways to remove its tracks and trolley poles from two lots owned by it on California Avenue, and an injunction was issued restraining the company forever from placing tracks, poles or buildings within 40 ft. of California Avenue.

Columbia (S. C.) Railway & Navigation Company.—This company has completed a survey for its contemplated interurban railway from Columbia, via Lexington and Saluda, to Greenwood, S. C., about 75 miles, but construction is deferred.

Dallas (Tex.) Railway.—Rails are en route to Dallas in sufficient quantity to allow for the extension of the Second Avenue and of the Colonial Avenue railway lines of the Dallas Railway. These extensions have been approved by the city and are expected to be the first the company will make under its new status with the city. The date of the arrival of these shipments, however, is problematical under the present condition of transportation lines. It is proposed to double-track Second Avenue from Parry Avenue to the city limits and to double-track Colonial Avenue, where the double-track now ends, to the city limits. All of the trolley wire on its Oak Cliff line is being replaced by new wire.

Houston (Tex.) Municipal Railway.—It is reported that the Houston Municipal Railway will build a 60-ft. plate girder bridge, 400 lin. ft. of standard trestle and 1000 lin. ft. of temporary trestle in connection with its proposed 4-mile line from a connection with the International & Great Northern Railroad to the plant of the Sinclair Gulf & Refinery Company. R. E. Sands, city engineer. [Jan. 26, '18.]

San Angelo Power & Street Railway, San Angelo, Tex.—The property of the San Angelo Power & Street Railway has been sold by the city of San Angelo to the San Angelo Light & Power Company. It is expected that the line will be placed in operation during this year.

San Antonio, San Jose & Medina Valley Interurban Railway, San Antonio, Tex.—The operation of electric cars has been temporarily discontinued by the San Antonio, San Jose & Medina Valley Interurban Railway, which operates a line between San Antonio and San Jose, and the company is operating automobiles until it can arrange finances for rebuilding the track and equipment.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A large delegation of citizens of West Seattle recently appealed to the City Council for better car service, with the suggestion of the construction of a railway line on Avalon Way, shortening the route of the Faunteleroy line, and cutting out a number of stopover switches. Several years ago, the Council granted the Puget Sound Traction, Light & Power Company a franchise on Avalon Way. This was vetoed by Mayor Cotterill, who was in office at that time. A second application was withdrawn by the company when Youngstown citizens filed objections. The situation has now changed so that the line can be built without interfering with Youngstown service. The delegation stated that the company has agreed to build the extension, if a franchise can be secured.

Seattle, (Wash.) Municipal Railway.—It is expected that operation of the Seattle Municipal Railway, Division A, into Ballard, over the Fifteenth Avenue N. W. bridge, will be begun during this month. Upon the opening of this extension municipal cars will be operated on Fourth Avenue as far as the County-City Building at Jefferson Street, by common-user agreement with the Seattle & Ranier Valley Railway. Because of the light construction of the Loyal Heights Electric Railway, which has been taken over by the city, it will be impossible to operate the city's large cars over that line, so that between the County-City Building and the north terminus at Thirty-second Avenue N. W. and West Eighty-fifth Street there will be a transfer of passengers to and from large and small cars at West Sixty-seventh Street and Twenty-second Avenue N. W.

Puget Sound Electric Railway, Tacoma, Wash.—On the Tacoma-Puyallup Short Line of the Puget Sound Electric Railway the damage done by recent floods and washouts was so serious that it may cause either rebuilding or abandoning the line. When the Short Line was built the company constructed breakwaters and strengthened the river banks to protect the interurban bridge near Tacoma. Pierce County later put through some improvements altering the channel of the river at this point, but took no precautions to protect this channel from future changes. The late floods cut an entirely new channel, however, destroying the approach, wrecking the bridge and leaving it stand useless over the abandoned channel. The loss is so great that the company now fears that it may have to abandon the Short Line, although this has not been definitely settled.

Tacoma (Wash.) Municipal Railway.—It is reported that the Tacoma Municipal Railway will be double-tracked from the east end of the viaduct to the Todd shipbuilding plant. Operation has been begun over the Taylor Way extension of the line from Eleventh Street on Taylor Way to Lincoln Avenue.

Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va.—The property of the Lewisburg & Ronceverte Railway has been taken over by local interests, and it is stated the line will be extended into Lewisburg.

Shops and Buildings

Southern Pacific Company, Los Angeles, Cal.—Plans are being made by the Southern Pacific Company for the remodeling of its timber-preserving plant at West Oakland, Cal., at an estimated expenditure of $350,000. The improvement includes the reconstruction of the track layout, the filling in of a portion of the bay to provide room for expansion and the installation of modern timber-treating equipment.

Georgia Railway & Power Company, Atlanta, Ga.—Work has been begun by the Georgia Railway & Power Company on the construction of a new passenger station at Camp Gordon.

Lake Shore Electric Railway, Cleveland, Ohio.—It is reported that the Lake Shore Electric Railway is considering the construction of a new interurban station at the present site on Erie Avenue, Lorain. Plans drawn up some time ago by the company call for a $65,000 station.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, William S. Twining, director, until 12 o'clock noon on Feb. 14 for the following work appurtenant to the Frankford Elevated Railway: Contract No. 541—Plumbing installations in station buildings at Torresdale Avenue and Tioga Street; Contract No. 542—Electric installations in station buildings at Torresdale Avenue and at Tioga Street. Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

Wheeling (W. Va.) Traction Company.—The Bay Island carhouse of the Wheeling Traction Company, containing twenty-nine double-truck passenger cars and one work car, was destroyed by fire on Feb. 4. The company will replace the equipment at once.

Power Houses and Substations

Chicago, Milwaukee & St. Paul Railway, Chicago, Ill. — The substation of the Chicago, Milwaukee & St. Paul Railway at Cle Elum has been completed, and is ready for the machinery. The structure is 104 ft. x 75 ft., of concrete and brick. It will house two generator sets, two transformers and a complete set of switches to receive and distribute 100,000 kw.

Quincy (Ill.) Railway.—This company has installed a new 1000-hp. boiler in its power house.

Brooklyn (N. Y.) Rapid Transit Company.—The proposed addition to its generating station at Kent Avenue and Division Street, which the Brooklyn Rapid Transit Company proposes to erect, will be about 275 ft. x 303 ft., one and six stories high. The cost of the addition is estimated at $500,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Snow and Ice Removal Equipment in Brisk Demand

Electric Roads Seemingly Slackers in Storm Preparedness—Scrapers, Cutters, Torches on Call

Surprising as it may seem, and accepting the word of several manufacturers and sales agents for the fact, the electric railways are as a rule poorly equipped to combat snow and sleet storms. Makers of this equipment add that orders for snowplows are usually placed in the spring or early summer, with deliveries in the late fall. Emergency calls are evidently not reckoned upon, for it is seldom that any snowplows are kept in stock. This winter, however, the demand was abnormal, and purchasing agents and traffic superintendents appeared to be dumfounded when, on inquiry, they found no plows were to be had until the regular selling season. This practice is ascribed to trade usage.

Other snow-fighting and ice-clearing equipment was on the market, however, and judging from reported sales a lively business was transacted. A company that specializes on good roads apparatus states it has had a very large demand for its snowplow attachment. In fact, this concern frankly says: "We stocked up with a very good supply of attachments. The demand, however, owing to heavy snowstorms that have prevailed in all sections of the country, has been abnormal. At the present time we are almost entirely out of stock. We are likely to do quite a lot of business within the next month or two."

Every appliance that would clear away snow and ice has sold this year more quickly than for many years. Scrapers and cutters were especially in demand. A horse-drawn machine, that removes snow as the wheeled and drag road scraper does in handling dirt, has been particularly efficacious on railways in city streets. The manufacturer said if conditions had been normal and he could have secured materials promptly, he would have sold several times as many machines as he was able to put out. "Unfortunately," he continued, "conditions this winter have operated to make it a difficult matter to do business. It has been hard to get materials, and the continual freight embargoes have made it almost impossible, in many cases, to deliver goods."

Yet another device, that is selling better than for many years, is a cutter of flanged teeth that can be attached to the under side of the snowplow beam. The attachment cuts down the devil-strip of ice between the tracks to a point that will clear the motor boxes, and thus save energy and wear and tear on the boxes and cars. It is said to be used to a great extent on New England traction roads. It is designed for city street track work. There has been no advance in price since May last. Deliveries are shipped out of stock—made up in off season—and go via express, unless embargoes intervene.

THAWING OUTFIT SALES LARGE

Torches or thawing outfits have also been on brisk call. A company specializing on these goods states they are adapted for thawing out frogs, switches, derails, throw rods, air brakes and switch boxes, also melting ice from interlocking plants, pipe line and pipe carriers, brake beams and fenders. The last advance of 10 per cent in price was made on Dec. 1 last. Raw material is hard to obtain. Deliveries are fair—in two or three weeks by express now, when shipments are accepted. A longer time is required when special sizes are ordered, although five standard patterns are carried.

One maker of sleet cutters, of which mention was recently made in the ELECTRIC RAILWAY JOURNAL, observed that in his experience few electric roads take the obvious precaution of keeping a stock in their carhouses for immediate use when necessary. They take a chance. This condition or frame of mind is further illustrated in the case of one of the Eastern roads. When the late snow storms tied up its track the two snowplows of the company were too small—totally inadequate—to meet the emergency. Its cars could make no headway on the snow-filled roadbed and, in several instances, were stalled all night with belated passengers aboard. The Public Service Commission subsequently recommended the purchase of six efficient snowplows.

Car Wool Waste Higher

Supply and Delivery in Fair Condition —China Chief Source

Car wool waste, on certain grades, was advanced 1 to 2 cents a pound on Feb. 1. The supply is fairly good. With the close of the Russian and Mediterranean markets, the chief source of raw material, China is now the main reliance for the cheaper wools obtained from the fleece of its long hair goats. This description of waste is used for packing car journals, and it must therefore be superior in quality to cotton waste. The grade with a long staple is the best, and this is a by-product in the manufacture of the cheaper carpet wools and yarns. Deliveries are fair.

Devices for Averting Trouble with Frozen Air Brakes

Severe Cold Weather Has Increased Sales—More Widely Known and Used This Winter

Any device adapted to keeping equipment in operative condition at this time has seasonal interest. Manufacturers of an "air rectifier," which is a device for overcoming what is known in railway work as "frozen air" in air brake systems, report it as commanding uncommon sale during this unusually severe winter. Briefly, the device automatically supplies to the air-pipe system, when needed, the requisite amount of alcohol, or a similar non-freezing liquid, in the form of a vapor or spray. This lowers the freezing temperature of the fluids or vapors in the pipes and cylinders and keeps them from clogging.

This year the distributors of the device advise that recent orders have been received from the Omaha & Council Bluffs Street Railway; Gary & Interurban Railroad; Charles City Railway; Springfield (Mass.) Street Railway; Terre Haute, Indianapolis & Eastern Traction Company; East St. Louis & Suburban Railway; New York State Railways; Lincoln Traction Company; Mahoning & Shenango Railway & Light Company, and the Lackawanna & Wyoming Valley Railroad. The Philadelphia Rapid Transit Company is also reported as testing the system. Prices have not been increased recently and deliveries are subject to the embargoes in the Eastern territory.

The manufacturers of a widely-known air brake have an entirely different method of obviating frozen brakes, consisting of auxiliary pipes or air-storage tanks, with which electric surface cars are equipped. New as well as old rolling stock, on which air brakes are installed, may be so fitted up. This appliance has been in active demand throughout the winter and particularly now; and its use is increasing throughout New York State, Pennsylvania, New England, the Middle West and Northwest—wherever low or freezing temperatures are encountered. The coils, in connection with the cylinder or reservoir, keep the brakes in workable condition at all degrees of cold, as they are automatic in action. No change in prices has occurred, and deliveries are as dependable as freight congestions everywhere will permit, the very conditions that make for better business having greatly delayed delivery. However, this complaint is general

Car Equipment Material Moving Along Better Lines

Advance in Prices—Deliveries Blocked by Embargoes—Business Outlook Far from Pessimistic

Reports from many sources are more encouraging than for months before, and an observer finds it difficult to escape the conviction that business with manufacturers and distributors of railway material and accessories is improving. It is evident that traction companies have been reducing their buying disbursements to a minimum in order to make as favorable a financial statement as possible at the end of the year. A number of representative firms in the east state that January was better, from a selling point of view, than any month in the preceding half year. In car equipment and supplies buying is along more liberal lines, if such a term is permissible under existing conditions. Shipments in the Eastern territory are practically at a standstill on account of the embargoes from Pittsburgh to the seaboard. Deliveries are consequently problematical.

Transformers, converters, controllers and motors, with no change in price, are not deliverable under five months. Circuit breakers have been going up from time to time, the last advance being on Nov. 27. Some types have remained untouched, and no further increase in price is anticipated for the present at least. Sales are reported as heavy by a leading manufacturer, especially for large capacity breakers. Car hood breakers are selling fairly well, principally for replacements, maintenance and breakages. Deliveries are from three to four months slow, the embargoes being extremely bothersome along the Atlantic seaboard. Express shipments are from three to four times longer in reaching destination than normally!

A widely-known manufacturer of circuit breakers and other staples in electric railway accessories, while declaring the demand was strong, added the plant was so filled up with war material products of a special character that no orders for breakers were being accepted or even considered. Deliveries are behind six to eight months, and other railway appliances here on delivery fourteen months. The situation is deplorable in this respect, but it is beyond remedy just now.

CAR HEATERS HIGHER.

Recently a 10 per cent advance was put into effect on a certain make of car heaters, but heretofore the price in the experience of this firm, had not followed the upward revisions in the metal market. Deliveries by this concern are ordinarily from four to five weeks, either by freight or express. Shipments are suspended by the blanket embargo. In one instance this concern offered a large quantity of heaters to a railroad company for shipping eight times, to have it refused. Goods are ready to go out from the factory in a few days, but transportation facilities are lacking. A rush order for a Connecticut point was sent from New York by auto truck, the consignee paying all expenses. Sufficient raw material is in stock, according to this producer, to take care of ordinary business; but if a large order came along it would be impossible to fill on guaranteed delivery. The cost of resistance wire is now said to be from 300 to 400 per cent higher than normally and difficult to obtain.

AIR-BRAKE DEMAND NORMAL.

Air-brake conditions are said to be almost normal so far as demand and supply figure. Several fairly large orders are being looked upon as certain to materialize in due course for replacements caused by the recent loss of rolling stock of several companies by fire and other accidents. The market in traction air brakes is active when the purchase of new cars is contemplated or decided upon, a situation the present time does not reflect. No price advances have been made since October last and none is anticipated. Standard brakes are promptly deliverable out of stock, providing shipping facilities are available. On special sizes deliveries are at the convenience, to a considerable extent, of the factory.

For gears and pinions a brisk demand is reported. Traction lines usually carry a pretty fair stock, but sales are steady. No change in quotations are furnished, the difficulty being in getting material. Labor is the most troublesome factor at present. Skilled workmen are scarce. Deliveries are behind from five to six months and even a year. Goods go out as soon as fabricated. There is no reserve stock to draw on. In this line buying has been improving, the last half of January having been much better than the first two weeks. The outlook is also promising, an opinion probably based on a few railways having been conceded a higher fare.

Street railway metallic filament lamps of 23, 36 and 56-watt sizes are in fair delivery. An increase of 10 per cent was made on Jan. 1, as previously announced in the ELECTRIC RAILWAY JOURNAL. The demand is normal and steady, with a slight increase at points reached by direct factory shipment. Manufacturers are just about meeting the demand, accepting the statement of a large producer, who also stated that there was, however, no accumulation of stock and no diminution in production. Breakages figure largely in replacement. The purloining of lamps by passengers is also claimed as a factor, but this is being overcome to a certain extent by using a locked socket.

Car seats, only ordered for new rolling stock now almost impossible to obtain excepting on long delivery, are therefore not active. A sharp demand for second-hand seats is noted and the market is about cleaned up. In a few weeks an advance on the entire line of new seatings will be made, to become effective immediately as announced.

Fare boxes of the improved types are gradually being installed in the metropolitan territory. The demand is increasing and manufacturers are looking for their general adoption on the principal lines. Deliveries are prompt if transportation can be engaged. A carload came in from the West recently in ten days which is good time. Prices are unchanged.

Slack adjusters and lightning arresters are selling well. A recent order for more than 4000 adjusters was placed last week by the Philadelphia Rapid Transit Company. The government recently closed a contract for 6000 lightning arresters of a special type to be sent to France.

Ventilators, cord, curtains, shades, springs and general hardware, glass and similar accessories, indicate normal conditions, dependent largely on the new rolling stock situation. About two weeks ago car curtains here advanced 5 per cent. Car springs are in moderate sale, the difficulty is to obtain steel. Deliveries are reported as dependent on the elasticity of embargoes and the release of shipping facilities.

Iron and Steel Production Hard Hit

Transportation Tie Up Resulting from Weather Conditions Cuts Output Practically in Half

With prevailing conditions in labor and transportation, the iron and steel producers have been particularly hard hit during the last few weeks. Weather conditions and embargoes have limited transportation considerably and reports are more pessimistic than they have been. The heavy and frequent snow falls since the beginning of the year have practically demoralized traffic, and mills are finding it more difficult than ever to secure supplies. Large steel companies have closed up work and others have been running under reduced schedules, while authentic reports state that not more than half the blast furnaces in Pittsburgh are in operation. Some reports, however, place production of not more than 65 per cent.

It is, of course, quite evident that with the supply of iron and steel becoming lessened that the loss will fall almost entirely on the private consumer. In other words, those working on government orders will be made to feel this curtailment of production the least in all probability. The delay, therefore, in production and delivery of iron and steel products may not be expected to be lessened for some time.

Catalogs Wanted

W. R. Wood, acting assistant general superintendent of rolling stock and shops of the Rio de Janeiro Tramway, Light & Power Company, Rio de Janeiro, Brazil, desires to have manufacturers' publications, catalogs, descriptive matter, etc. Considerable new work is reported to be under way at Rio de Janeiro. Mr. Wood was formerly connected with the Third Avenue Railway, New York, N. Y.

Rolling Stock

Sheffield (Ala.) Company is reported as having ordered new cars to meet the increased demands for transportation of workmen to the government's great new nitrate plant at South Florence, Ala.

Dallas (Tex.) Consolidated Electric Street Railway has just received the twelve new passenger cars, constructed by the American Car Company, St. Louis, Mo. which was referred to in the ELECTRIC RAILWAY JOURNAL of Nov. 17, 1917.

Philadelphia (Pa.) Rapid Transit Company, within a couple of weeks, placed an order for 100 city passenger cars, similar to the ones now in service, with the J. G. Brill Company. This rolling stock purchase may eventually total 150, but not 200, as mentioned in last week's ELECTRIC RAILWAY JOURNAL. The Government, as surmised, initiated the order for the convenience of shipyards in the vicinity.

Wheeling (W. Va.) Traction Company had destroyed by fire, probably incendiary, on Feb. 4, its Bay Island operating carhouse and twenty-nine double-truck air-brake passenger cars, and one new work car, all 5-ft. 2½-in. gage. The company is now operating about 75 per cent of its service. The Jewett Car Company for some time has had fourteen double-truck cars under construction for the company and completion will be hastened. The Wheeling Company is looking for complete cars of the above gage for temporary use and will arrange equipment for permanent replacement speedily.

Trade Notes

China Products Company, Zanesville, Ohio, has acquired the manufacturing plant, merchandise, tools, fixtures and raw materials of the Virginian Potteries Company. The property was turned over on Jan. 30.

Crescent Electric Manufacturing Company, Pittsburgh, Pa., recently bought the entire stock of the Pittsburgh Armature Works.

Automatic Railway Company, New York, N. Y., has been chartered with a capital stock of $14,500 by L. H. Washburn, C. K. Allen and J. S. Wooster, 115 Broadway, New York City.

China Products Company, Zanesville, Ohio, has purchased the Virginian Potteries Company, its plant, manufactured products, tools, fixtures and raw materials. Possession was delivered to the new owners Jan. 10.

E. S. Fassett, formerly general manager United Traction Company, Albany, N. Y., has been elected director and secretary of Goldschmidt & Forbes, Inc., New York, dealers in metals and metal products. He will still remain sales manager of the New York Switch & Crossing Company, with which he has been connected for the last five years, but he will resign his connection with the Habirshaw Electric Cable Company, New York, with whose sales organization he has been identified for the last two or three years. Mr. Fassett was president of the New York Electric Railway Association in 1908-1909. He resigned from the United Traction Company of Albany in 1912.

E. S. FASSETT

Westinghouse Lamp Company, New York, N. Y., has removed its advertising department from 165 Broadway (City Investing Building) to the Park Row Building, 21 Park Row, opposite the General Post Office. It has taken a suite of offices on the sixteenth floor.

Wagner Electric Manufacturing Company, St. Louis, Mo., announces the opening of a service station at Seattle, Wash., to take care of this branch of its business in the State of Washington and the Northwest.

Arnold Company, constructing engineer, 105 South La Salle Street, Chicago, has discontinued its New York office at 111 Broadway.

John D. Stout has been appointed Chicago representative for the Terry Steam Turbine Company, Hartford, Conn. Mr. Stout was at one time assistant engineer of the Terry company and was recently transferred from the New York office, where he was assistant manager.

War Trade Board, Washington, D. C., has announced new regulations regarding exports. After Feb. 1 a new application form will be used in place of all forms hitherto in existence. It will be the only application form in use. Copies of the blanks, with information pertaining to their purpose and other directions pertinent thereto, may be had on application to the board.

New Advertising Literature

Pyroelectric Instrument Company, Trenton, N. J.: Has circular No. 9 descriptive of Northrup millivolter.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Leaflet 3986, descriptive of underfeed stokers, has been issued by the company.

General Electric Company, Schenectady, N. Y.: Bulletin 46,013, descriptive of switchboard-type instrument transformers, is being distributed by the company.

Manistee (Mich.) Iron Works Company: Bulletin 52, descriptive of Rees roturbo patent rotary jet vacuum pumps for surface condensers, is being distributed by the Manistee company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Vol. 1, No. 3, of "Railway Engineering Data." A reprint from the ELECTRIC RAILWAY JOURNAL on "Problems Confronting the Electric Railway Industry" is also being distributed.

RAILWAY MATERIALS

	Jan. 30	Feb. 6
Rubber-covered wire base, New York, cents per lb.		30-32
Wire, weatherproof (100 lb. lots), cents per lb. New York	29¼-34¼	28¼-34¼
Wire, weatherproof (100 lb. lots), cents per lb Chicago	33¼-38.35	38.35
Rails, heavy, Bessemer, Pittsburgh, per ton	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl	$2.25	$2.25
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.31	$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.32	$1.32
White lead (100 lb. kegs), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	50	49

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*None offering.

NEW YORK METAL MARKET PRICES

	Jan. 30	Feb. 6
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	27	27
Lead, cents per lb	6.75	7.00
Nickel, cents per lb	50	50
Spelter, cents per lb	7.92½	7.87½
Tin, Straits, cents per lb	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb	34-36	34-36

OLD METAL PRICES—NEW YORK

	Jan. 30	Feb. 6
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	17½	17½
Yellow brass, cents per lb	13¼	13
Lead, heavy, cents per lb	5½	5½
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$43.42	$42.42
Old carwheels, Chicago, per gross ton	$35.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, February 16, 1918 *Number* 7

First Beeler Unit Report Mutually Acceptable

THE announcement that both the Public Utilities Commission of the District of Columbia and the Capital Traction Company have found acceptable every one of the ten recommendations made by John A. Beeler in his first unit report on Washington traffic augurs well for the reception of later units. This report, as noted in the issue of Feb. 2, recommended for the congested district in Fifteenth Street, between Pennsylvania and New York Avenues, a one-half reduction in stopping places, double berthing, safety zones, front-end fare collectors, one-way traffic streets and other means of relief. Mr. Beeler is certainly to be commended for his constructive aid. Traffic reports suggesting such concrete practicable remedies for congestion are invaluable.

Just as the mouth of a river imperceptibly but surely fills up with silt until navigation is impossible, so is the traffic flow of a railway imperceptibly but inevitably impaired by increasing the number of stops here and there, allowing automobiles to park at new locations, ignoring the day-by-day growth of other vehicular traffic and so on. And as navigation can be restored to the river only by the radical use of a dredge, so can circulation be restored to an electric railway only by radically reducing the elements that impede car movement.

A municipality and its railway system are so intertwined that one cannot be highly efficient without the co-operation of the other. Washington is fortunate in having pointed out to it so clearly the points on which its co-operation is needed in order to insure more efficient transportation service. All it needs to do is to help.

Regulation in New York Has Not Broken Down

HAVE the Public Service Commissions in New York State outlived their usefulness? An answer seems unnecessary. But Senator George F. Thompson thinks that they have, and he, as public utility men know, is a fearless, eagle-eyed investigator of regulatory conditions! His choice of evidence, however, is not always happy. For instance, his remark in Albany last week that each commission is paid practically as much as the State Senate costs might lead some one to observe, without of course having any particular senator in mind, that the comparative salaries would often be a good indication of relative values.

What legislators in Albany seem prone to forget is the fact that the work of the commissions has been hampered sometimes by the appointment of men who gave only part-time to the work, or by the delay of the Governor in filling vacancies or the Senate in confirming appointments. According to Mr. Van Santvoord, who has just retired from the chairmanship of the Second District Commission, such delays have resulted in a serious piling up of cases. He suggests that the law should be modified to compel the Governor to send nominations to the Senate at least thirty days before the expiration of the terms of the outgoing commissioners. This would place the burden fairly on the Senate and would in general tend to promote continuity and dispatch in regulation.

The Senate might try to play politics and delay confirmation. Its record is not altogether commendable on this point. But if the Governor's appointments are wisely made, most of the work is done. Technical training is desirable for the members of a commission, along engineering, legal, financial and accounting lines, but we do not believe that a commissioner should be appointed solely for his technical ability. He must primarily have a judicial mind, fairness and competency as an investigator, fearlessness and honesty.

Good men are doubtless hard to secure, but it is part of the Governor's job to find them. They may be his political friends; they may be unknown to the politicians or to the public at large. These points are often raised by carping critics, but they are not vital. The only important question is—have the men under consideration the desired training and character? If so, they deserve appointment; if not, they don't.

The Old Order Changeth, Giving Place to the New

PERHAPS the steam railroad problem, so pressing at this moment, can be solved by the application to it of the principle underlying the partnership agreement between New York City and its rapid transit lines. This suggestion, made by Theodore P. Shonts before the Detroit Board of Commerce on Feb. 5, is of vital importance to the electric railway industry as well as the steam carriers. If the partnership idea is worth extending to the national transportation lines, it is worth applying in a much wider way to electric railways.

Mr. Shonts, from his intimate acquaintanceship with the dual contracts in New York City, speaks as an authority when he says that these embody principles that are capable of extension. Under the partnership idea utilities are able to secure the private capital which they need and the community to enjoy the benefits from any unusual profits. Maximum efficiency, without the evils of political management and operation, is what is meant by private operation and public participation in financing.

The partnership idea is spreading in the electric railway industry. In some cases, as in Dallas, the community has shown its financial responsibility by authorizing a flexible fare under a service-at-cost plan. Such a plan is now proposed for all of Massachusetts. In other cases, under a more elaborate partnership plan, the community has gone farther and furnished money for new rapid transit construction. A flexible fare and city money are both featured in the Philadelphia lease just adopted. Now the question is pending in another form in Boston, where the Massachusetts Public Service Commission has recommended a public guarantee of the return, public control and a fare increase for rehabilitation, in addition to the present private operation of city-owned rapid transit lines. Between these agreements and between these and older ones, details differ, but the fundamental idea is there—a community of city and railway interest in transportation development.

Progress, however, should be more rapid. The men who originated the partnership idea had vision. If, as Mr. Shonts suggests, we should hope for a similar vision in connection with the steam railroads, how much more should we hope for it in the electric railway industry! The day of rapid construction by private capital has passed, but the day of economic reconstruction with public co-operation is here.

Transportation and the War Construction Plants

A SUDDEN and very heavy demand has been made upon electric railways in several parts of the country for the transportation of workers to and from plants engaged in constructing ships or manufacturing munitions and other war supplies. For many reasons the present is not a very propitious time for railways to extend their facilities, but, worse yet, the traffic which the kind of transportation just mentioned produces is not of a variety which can be handled profitably under ordinary operating conditions.

The time is unfortunate for the electric railways because a succession of untoward events, all too familiar to the readers of this paper, have combined to make it difficult to give good service even to regular patrons. Shortage of men and materials, reasonable and unreasonable demands from labor for higher wages under stress of increased cost of living, automobile and jitney competition, growing street traffic congestion etc., combined with reluctance on the part of the public to allow increases in rates of fare, have operated to prevent amelioration of the present situation.

As regards the second point, the traffic is not desirable because it is largely of the peak-load variety, which is notoriously expensive to handle. For economic reasons the war plants must be individually very large, thus concentrating the workers in groups of enormous size. Furthermore, they must be located primarily with respect to convenience in securing materials and power, shipping products and protection of equipment from malicious damage. In general, sites meeting these requirements are some distance from present residence centers. Hence, either the workmen must be transported to and from their work or they must be housed near it. In the former case there is a severe tax on the local railway facilities.

Again, the tendency in all manufacturing centers is to follow established custom as to hours of starting or stopping work. Hence thousands of workers may require transportation at one time and are seriously inconvenienced if they do not get it. But to furnish it requires new track, and more cars, line wire, men, coal—all scarce as hens' teeth these days. Moreover, the service factor of the equipment which would be used to carry such workers to and from their work is low, so that it is used ineffectively; and ineffective use of men, money or material is inexcusable, if it can be avoided, in war time.

By the above we do not mean that the electric railways cannot and will not do their share of the transportation of workers to war plants, but the situation is outlined merely to indicate why this work is not easy or profitable. At many points they are loyally trying to do their part, usually under intense fire of criticism. More and better work in this line can undoubtedly be done even with existing equipment, but co-operation on the part of government, federal and municipal, and contractors will be required.

How the War Workers Can Be Cared For

THE best over-all solution of this special transportation problem will come through the application of the following principles: First, the workers should be housed as near their work as possible, preferably within walking distance. By walking they can save manpower on the cars, reduce the consumption of their own time in transit, and minimize the demand on the track facilities, thus releasing track for freight service. There is some tendency to locate housing centers at a distance from plants to permit the use of large tracts which can be laid out on a grand scale. Such a plan is undesirable from a transportation standpoint and should not be followed unless necessary for healthfulness or some other paramount consideration.

If we assume that housing centers are properly located, next comes an equitable division of transportation duty among railroads, electric railways, waterways and motor buses, particularly the two first named. For the purpose of insuring good freight facilities the war plants are necessarily located on or near steam railroads, and in some cases waterways also. There is thus usually the possibility of furnishing passenger steam railroad service for the workmen, although some slight modification of freight service may be necessary for this purpose. Electric railway service is so attractive and apparently so flexible that government officials are apt to feel that the steam roads should not be asked to discommode themselves as to freight handling in order to run the few trains necessary to get men to and from their work. Economically, however, steam trains should be used for this service when possible, as they utilize track and cars already existing, and also conserve men and materials. Thus, as compared with single-car electric units, a steam train can be operated with possibly 80 or 85 per cent fewer men. That is to say, a steam train of reasonable length can transport a rush-hour crowd of, say, 1500 men economically and with very little use of the track, whereas this would be a tremendous tax on the man-power of an ordinary electric railway.

So much for what the steam roads can and ought to do. Now for the electric railways. They are primarily in the passenger business and have a much more flexible equipment and organization than the steam roads. They must do their part, and we may assume that a considerable share will be allotted to them, but they need active co-operation. One essential is that the demand upon them should be distributed over as long periods as possible. Different establishments and groups in each establishment can be scheduled to begin and finish work at different times, thus widening and flattening the peak. Second, the electric railways can be helped in financing extensions of track and equipment. In addition there should be a clear understanding on the part of both the munition workers and their employees, of the difficulties which electric railways experience when they try to carry large bodies of men in rush hours. It would be desirable also if riding during rush hours on lines leading to war plants was restricted to actual workers, who could be provided with special tickets to identify them. Permission could also be given for the more efficient use of existing track, such for example as the belt line in Buffalo.

Nothing has been said regarding waterways and motor buses, which have their obvious place when available. The principal point is to realize that there are many factors involved in these special war transportation problems. The electric railways are endeavoring loyally to do their share in solving these problems, but they cannot do it all. The "powers that be," above all must be reasonable in their demands.

Loading at Large Industrial Points Calls for Special Provisions

METHODS of loading electric cars at large industrial plants constitute as important a problem, in its way, as that of staggered hours. If no plan is followed except that of "first come, first served," the results are most unsatisfactory from every viewpoint, while the dispatching of cars is delayed. The wide interest which attaches to this subject is shown by a number of letters which we have received in regard to an article which we published in our issue of Jan. 12, describing the methods followed at the Ford plant in Detroit.

Here, from 30,000 to 40,000 employees are handled in a period of an hour and a quarter, at one terminal, where a starter dispatches cars at intervals of about thirty seconds. These employees are formed in two lines and enter the cars in turn. The difficulty of keeping the men in line was overcome when the Ford Company discharged some of the most obstreperous. This is the feature of co-operation with the company which makes the scheme most efficient.

With the development of large industries supplying war material in many parts of the country, the conditions at Detroit might be duplicated elsewhere to advantage. It should not be difficult to get employers interested to the extent that they will exercise control over the behavior of their employees while loading at such points. This is but a fair return for special service and is in the interest of the passengers who are to be benefited. Another feature of the system at the Ford plant terminal is the practice of dispatching cars with less than a full load—thus allowing crews to pick up other passengers on the trip. This removes the criticism that special facilities are given in the interest of a few large employers. The lessons learned at Detroit before the war had caused congestion at many construction centers in this country ought to prove invaluable at the present critical juncture.

Special Freight Service Merits Equitable Rates

ONE difficulty which all companies meet in making a convincing presentation of a claim for higher freight rates is in determining and proving just what the service costs. Undoubtedly freight business has in many cases been built up as a side line and rates have been made on the basis of the increment in total cost caused by the increment in business. This, however, is fair neither to the passenger business nor to the freight business. The former has to bear the freight "overhead" as well as its own; the latter is not on its own feet, and the apparent profit which it produces may be largely fictitious. The freight business should pay its own way and the charges which are permitted to be made should be sufficient for this purpose.

An essential factor in determining costs and therefore legitimate charges is classification. As far as the transportation company is concerned it matters little what a package contains so long as it occupies a given car space, is roughly of standard form and is not excessive in value. It seems illogical, therefore, to charge different rates for packages in the same car when they are within the range suggested above. This is a point for which the Connecticut Company has contended, and successfully contended, as indicated in the decision recently handed down by the Connecticut Public Utilities Commission.

In its ruling the commission permitted the Connecticut Company to make a single classification for package freight, with suitable excess charges to cover extra risk of damage or extra value. The case has been fully covered from the news standpoint in these columns, but knowing that our readers would appreciate the company's point of view in the matter we have asked V. S. Curtis, secretary and general traffic agent of the Connecticut Company, to state this briefly. The result is an article printed this week. The ruling is attracting considerable interest, as is illustrated by the fact that the New England Electric Freight Association devoted its entire January meeting to discussing it and will continue the discussion at the February meeting.

As evidenced by the ruling referred to the company was not entirely successful in convincing the commission that it is giving a special service for which a considerably increased compensation should be allowed. Undoubtedly such conviction will come to the commission in due course. In the meantime the company is able to handle its business with less clerical routine than if the standard freight classification was required, and some financial relief has been provided also. As in other cases where there has to be a change in its customs, the public must be educated, and the process takes more or less time. Yet, in the end, the fact will stand out clearly that an electric railway can give a certain class of freight service which no other agency can furnish.

Bonus Plan Reduces Coal Consumption at Manila

By Dividing the Saving Effected with Power Plant Employees "Meralco" Is Able to Increase Wages of Eighty Men More or Less by About $700 per Month

By B. H. BLAISDELL
Chief Engineer of Power Plant, Manila (P. I.) Electric Railway & Light Corporation

DURING the early part of the year 1915 the management of this company had under consideration the inauguration of a bonus system of wages for the employees of the power plant, for the purpose of creating in them more enthusiastic interest in fuel saving which would lead to a lower unit cost of electrical energy generated.

A forty-eight-hour economy test of the power plant was made to determine the distribution of the heat losses and the amount available for conversion into electrical energy. The test, with all the accompanying specifications, instructions and data to be obtained, was planned by the J. G. White Management Corporation, the operators of the Manila property.

From a study of the data and results obtained from this test it was evident that considerable saving in fuel was possible without going to any great expense for improved equipment, by securing more careful, intelligent and efficient service from the power-plant employees.

EMPLOYEES TO HAVE ONE-HALF OF SAVINGS

With the exception of most of the engineers all of the employees are Filipinos who have obtained their experience and training almost wholly in this plant. To make these men more progressive and efficient, and less dependent upon the limited supervision of the engineers, it was evident that some special form of monetary reward for meritorious service must be adopted.

A simple increase in the weekly wage was certain to fail in bringing about any great or especially lasting improvement in economy. The reward must be in proportion to the service rendered in the saving of fuel. With this object in view, the management offered the power plant employees, beginning June 1, 1915, one-half of the value of the fuel saved due to effort on their part, the distribution of the bonus to be made monthly to cover such saving as had been accomplished during the preceding month.

Notices were posted explaining carefully every detail of the plan by which it was possible for the employee to earn extra compensation in proportion to his ability to reduce the consumption of coal and decrease the cost of coal to the company.*

The standard of fuel efficiency on which a saving was to be reckoned was set at 41,000 B.t.u. per switchboard kilowatt-hour generated, this being the average efficiency obtained during the forty-eight hour plant test above referred to.

It was only fair and proper that the saving in fuel be computed on a B.t.u. basis, since the company purchases its coal on this basis, all cargoes received being sampled and the heat value determined by an outside and neutral testing laboratory.

With the exception of the engineers, the distribution of the bonus was made to include all the power-plant employees, numbering about eighty, whether or not their duties were directly connected with the consumption of

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*Outline of Bonus System, M. E. R. & L. Co., for Power Plant Employees:

1. The standard basis of coal consumption per switchboard kilowatt-hour output shall be 3.50 lb. (Reduced March 1, 1916, to 3.325 lb.; July 1, 1916, to 3.20 lb.; July 1, 1917, to 3.15 lb., and Sept. 1, 1917, to 3.08 lb.)

2. The basis of 3.50 lb. of coal consumed per switchboard kilowatt hour output is based on a standard of 11,715 B.t.u. per pound of coal. This has been fixed on the results of the laboratory analysis made of Fushun coal used during the power plant economy test made March 3 and 4, 1915.

3. The standard basis of coal consumption based on B.t.u. per switchboard kilowatt-hour output shall be determined on the bases of (1) and (2), 41,000. (3.50 x 11,715.) (Reduced March 1, 1916, to 38,952 B.t.u.; July 1, 1916, to 37,488 B.t.u.; July 1, 1917, to 36,900 B.t.u., and Sept. 1, 1917, to 36,000 B.t.u.)

4. The coal consumed per switchboard kilowatt-hour output shall be determined by taking the actual weight of the coal consumed and adding thereto 1 per cent additional to cover possible errors or omissions in weighing, and possible losses of coal consumed in the pile by reason of spontaneous combustion.

5. Fifty per cent of the value of the coal saved on the basis of 3.50 lb. consumed per switchboard kilowatt-hour based on 11,715 B.t.u. per pound of coal, or 41,000 B.t.u. per switchboard kilowatt-hour output, determined by the coal consumed as per Rule No. 4, is to be distributed to certain participating employees of the power plant department as tabulated under Item 6 below.

6. If found practicable or desirable the watch making in a given month a better record than the same watch made during a preceding month, all conditions of operation being taken into consideration, is to receive an additional bonus, to be determined by the chief engineer of the power plant; and the watch making the poorest showing in the same month on the same basis is to be correspondingly penalized.

7. Bulletin boards are to be provided to keep employees posted regarding the basis of the distribution of the bonus and how applied, and the standing of each employee with respect to his participation in the bonus, in so far as it may be practicable or desirable to bulletin such information. If practicable the daily results, as affecting the different watches, should be posted for the information of the employees.

8. The chief engineer of the power plant, who is not to participate in the distribution of the bonus, is to determine the schedule of points to be allowed the different occupations of the different employees of the power plant based on the relative value of their services. He is also to establish a schedule of the penalties to be applied to the schedule of points. (Following is the latest list as modified to July 1, 1916.)

Payroll Classification Item Number	Occupation	Schedule of Daily points per Employee
1	Sub-Foreman	15
1	Chief coal checker	5
1	Asst. coal checkers	3
1	Clerk	5
3	Oilers and cleaners	2
4	Switchboard tenders	3
4	Switchboard helpers	2
5	Firemen	6
6	Coal passers	3
7	Water tenders	10
8	Boiler cleaners	3
8	Boiler cleaner helpers	2
9	Watchman	1
11	Other labor	1
12	Mechanic foreman	10
12	Mechanics	3
12	Mechanic helpers	2
12	Laborers	2
13	Construction and reconstruction	1
	Total,	79

9. A record of all penalties imposed is to be made, and the employee affected is to be notified at the time the record is made Employees are to have the right of an appeal from any penalty imposed, first to the chief engineer of the power plant, next to the assistant general manager.

10. The monthly distribution of the bonus is to be prepared by the power plant department, verified by the accounting department, and completed at the earliest possible date following the last day of each month.

11. The payment of the bonus on a day other than the regular weekly payday will be made at the earliest possible date following the last day of the month in which the bonus applies.

12. The company reserves the right to change the basis of the distribution of the bonus in any way it sees fit, or to discontinue it entirely.

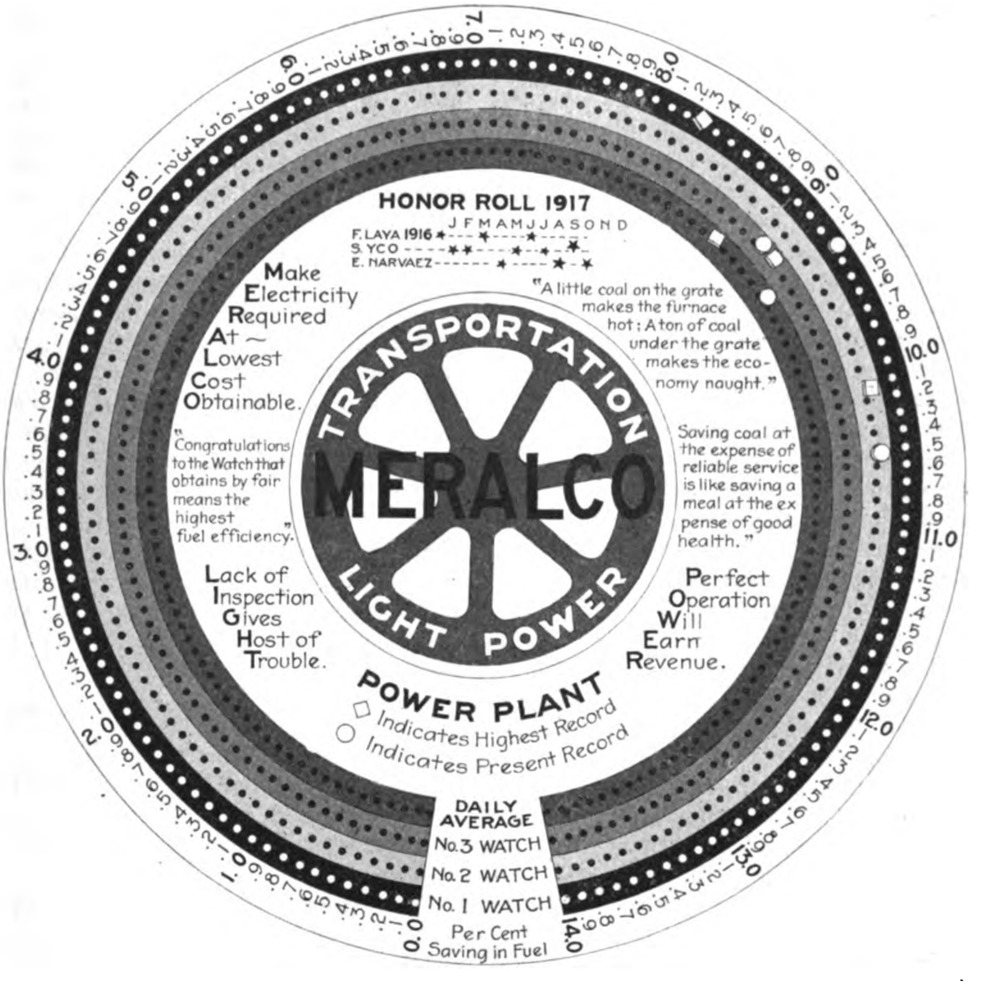
coal or the generation of steam, as an incentive not only to improve the boiler plant efficiency but to keep the electric generating equipment in the best condition for safe and economical operation.

In the plan of bonus system when first bulletined for the information of the employees, emphasis was laid upon the fact that the operation of the plan was contingent upon the continuous, efficient and economic operation of the power plant, with respect to the throwing in or out of the various units, or overloading to their detriment, in so far as the life, the cost and the upkeep of such units would be affected by wrong practices indulged in for the purpose of saving coal. Under no circumstances would the operation of the bonus system be permitted in any way to affect the reliability and continuity of the electric service which is furnished to the public.

Although all the employees participate in the bonus, the proportion received by each varies with his responsibility or the degree in which his duties offer an opportunity to save fuel.

Profiting by the experience of many companies that have adopted a bonus system of wages only to have it meet with dismal failure in a few months on account of trouble arising of a more or less serious nature solely because no provision had been made to retain discipline, the company provided against such a contingency by supplementing the bonus with penalties, the latter to be inflicted on employees breaking the established rules of proper conduct.

The plan as carried out credits each employee with a certain number of bonus points per day according to his position and opportunity to improve plant efficiency. For instance, a water tender receives ten points, a fireman six points, an oiler or coal passer three points, etc., through all the different classifications of employees. Should, however, an employee break a rule or otherwise misbehave, he is immediately disciplined by being penalized according to the magnitude of his offense. Absentees from duty do not receive points.


HONOR ROLL 1917
J F M A M J J A S O N D
F. LAYA 1916
S. YCO
E. NARVAEZ
Make Electricity Required At ~ Lowest Cost Obtainable.
"A little coal on the grate makes the furnace hot; A ton of coal under the grate makes the economy naught."
"Congratulations to the Watch that obtains by fair means the highest fuel efficiency."
"Saving coal at the expense of reliable service is like saving a meal at the expense of good health."
TRANSPORTATION
MERALCO
LIGHT POWER
Lack of Inspection Gives Host of Trouble.
Perfect Operation Will Earn Revenue.
POWER PLANT
□ Indicates Highest Record
○ Indicates Present Record
DAILY AVERAGE
No. 3 WATCH
No. 2 WATCH
No. 1 WATCH
Per Cent Saving in Fuel
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0

PEG BOARD, 18 IN. IN DIAMETER, USED IN STIMULATING COMPETITION IN FUEL SAVING AMONG POWER PLANT WATCHES

A daily record of the points received by each employee is posted where he can readily see whether or not he had succeeded in winning all the points he is entitled to for satisfactory service.

The total number of points credited to an employee during the month is a measure of his share of the total bonus earned during the month.

No attempt is made to foster competition between members of a "watch," but rather to encourage co-operation and a willingness to help each other that all may become equally proficient in fuel saving. However, a special inducement is offered to incite a sporting spirit of rivalry among the three watches, each to excell the others in fuel economy, by compelling the members of the watch making the poorest showing in B.t.u. consumption per kilowatt-hour, as compared with the best previous record of this watch, to forfeit 10 per cent of their bonus points to the members of the watch making the best showing.

The relative standing of the watches in per cent fuel saving covering a period from the beginning of the month to date is shown on a disk hung in a conspicuous place in the employee's dressing room. The information imparted keeps up a perpetual interest and enthusiasm in everyone concerned to do his utmost to make his watch rank first in fuel economy so as to receive an extra share of the bonus as hereafter described.

The disk is about 18 in. in diameter and is painted near its outer edge with four circular stripes of different colors. Black, green and blue stripes each represent the gage of efficiency of one of the watches, while the innermost (red) strips is the average gage of efficiency for the combined watches.

A scale denoting the per cent saving in fuel circumscribes the stripes, the latter being perforated at points corresponding to one-tenth of 1 per cent divisions of the scale. Into the perforations plugs are inserted, two for each stripe.

Round-headed plugs are inserted at points in the stripes opposite the scale readings which correspond with the average per cent savings in fuel obtained from the beginning of the month, while square-headed plugs are inserted at the points in the stripes to show the highest monthly records.

At the end of the month the watch obtaining the highest efficiency as shown by the relative position of its plugs wins 10 per cent of the bonus points of the watch showing the lowest efficiency as denoted by the position of its plugs. The watch obtaining intermediate efficiency receives the regular bonus.

The center of the disk is inscribed with the company's insignia together with appropriate mottoes to encourage economical and reliable service, and an honor roll which indicates by the placing of a star each month opposite the name of the watch boiler-room foreman winning the 10 per cent extra bonus.

It is doubtful whether topnotch economy could be obtained without pitting one watch against the others. Nevertheless herein lies a very great danger to the success and permanency of a bonus system of wages.

DISCIPLINE MUST COUNTERACT OVER-ENTHUSIASM

Enthusiasm runs so high at times that over-zealous men will attempt to accomplish by foul means what they fail to gain by fair means in order to win 10 per cent extra bonus for their watch. They will fight, tamper with the coal scales, slip coal by the checker, overload machinery and otherwise take undue risks in dropping steam pressure and water level or burning fires low just before the relieving watch comes on duty, in order to gain a trifle for themselves at the expense of their opponents and of over-all economy.

To discourage such misdirected effort, prompt and energetic action is taken in penalizing those guilty by depriving them of bonus points commensurate with their offense. The chief engineer of the plant, on receiving complaints from his assistants against men under their charge, imposes the penalties, the men however having the right to appeal to the assistant general manager and from him to the general manager.

This method of discipline has proved very successful in improving the general deportment and service rendered.

One of the most important matters pertaining to plant operation that demands serious thought and study is securing a proper check on the weighing of coal at the time it is being received and stored on the pile, as well as when the coal is reclaimed from the pile for daily consumption.

The Manila company employs a foreman, a coal checker and a number of assistants, who in conjunction with the coal company's checkers weigh the coal as it is being discharged from the barges. The chief engineer holds these men responsible for any shortage that subsequently may be discovered.

The weighing and registering of the barrows of coal delivered for consumption to the boiler plant is performed by the operating force of coal passers as they wheel the barrows across the coal scales, always, however, under the watchful eye of a regular coal checker.

This double checking of the daily coal consumption by two opposing forces is very important, in fact necessary, for the coal checkers, being responsible for any shortage, watch the operating men closely that they steal no coal in order to increase the apparent fuel efficiency and thereby their bonus.

Further, this method makes it difficult for "Meralco's" and the coal company's checkers to enter into a conspiracy to defraud this company, knowing that the fact will be discovered when the cargo of coal has been used.

That the results obtained in this respect are all that could be desired is affirmed by the fact that not 1 lb. of shortage has occurred in the coal pile since the inauguration of the bonus system two and one-half years ago.

SOME OF THE RESULTS SECURED

An improvement in fuel efficiency began to be realized immediately after the bonus system of reward for fuel saving had been established, and the economies subsequently obtained have been far greater than anticipated.

The firemen, who formerly were mere shovelers, gradually evolved into expert boiler operators, capable of distributing coal at the right time in the right amount and in the right place and to keep an even fuel bed of the proper thickness to give the best results.

In the old method of firing each fireman had certain furnace doors to fire and the resulting efficiency obtained in the different boilers varied according to the ability and interest taken by the individual fireman attending them. The improved method compelled the firemen to follow each other down the line of boilers, at periods depending on the load, firing alternate doors, thus insuring equal furnace operating conditions in all the boilers and higher economy due to the controlling influence of the more experienced firemen in showing up and correcting the faults in firing of the less experienced men.

The water tenders learned to adjust the damper to admit only the necessary air to the furnaces to economically burn the coal required for carrying the load. The frequent use of the Orsat apparatus for testing the flue gases materially assisted in determining the most economical damper opening for different hourly load conditions. The coal passers, also, became more careful when cleaning fires and ashpits to see that the least possible amount of coal was wasted in the refuse. Finally, the repair men increased both the amount and quality of the work performed, especially in the matter of cleaning boilers.

It became the practice to carry the greatest output possible on the most economical generating units and auxiliaries and to limit the machinery in service to that necessary safely to carry the load.

The actual saving in fuel based on 41,000 B.t.u. per kilowatt-hour, the standard set June 1, 1915, when the bonus system of wages was established, has improved during successive six-month periods as follows:

Second half year 1915	5.5 per cent	
First half year 1916	12.3 per cent	
Second half year 1916	15.3 per cent	
First half year 1917	15.2 per cent	
Second half year 1917	18.5 per cent	(estimated)

This remarkable improvement in fuel economy was not wholly due to extra effort on the part of the employees participating in the bonus system, but partly to improvements made in the plant, improved methods of operation and improved condition of equipment, largely due to the valuable engineering advice, instructions and co-operation of the J. G. White Management Corporation, the operators of the Manila property.

It would perhaps be fair to say that the results obtained were due to the efforts of the employees to the extent of approximately 50 per cent of the fuel economy effected, and approximately 50 per cent to the improvements in the plant and its operation for which the company is indebted to the J. G. White Management Corporation.

POWER PLANT IMPROVEMENTS

Some of the changes and improvements made by the company in the power-plant equipment and operation since the bonus system became effective follow:

1. The application of additional heat-insulating material of asbestos and magnesia to the piping, boiler drums and turbine casing.

2. The installation of a combination draft gage on each boiler so located that the boiler attendants can be guided by the indication of the gage as to the condition of the fuel bed and the proper adjustment of the air supply to the furnace.

3. The daily log sheets were improved as to include all data necessary to enable the supervising force to detect defects in operation and effect improvements.

4. The vacuum obtained at the turbine exhaust nozzle was increased by reducing the resistance offered to the exhaust steam entering the condenser. This was accomplished by removing certain condenser tubes so as to open up steam lanes to a large part of the condenser surface.

5. The practice of running extra auxiliary units for no other purpose than to safeguard continuity of service was discontinued without serious consequences.

6. Deflecting arches were installed in all furnaces to effect more complete combustion of the highly volatile coal used.

The economies resulting from the improvements mentioned above necessitated from time to time a reduction in the standard basis of coal consumption on which bonus for fuel saving was computed, according to provisions formulated in the original plan.

It was only fair to the company to lower the standard basis of fuel consumption at such times as improved efficiency had resulted from changes and improvements over which the men participating in the bonus had no control. At the same time it was necessary not only to take special care in explaining to all concerned the reasons for a change but to select a time for putting the lower standard of fuel consumption in effect when operating conditions were most favorable to economy. At such time there was the least liability materially to lower the amount of bonus to an extent which might cause dissatisfaction or suspicion that the company was not giving the employees a square deal.

Notwithstanding the reductions made in the standard basis of computing the bonus totaling 12.2 per cent, the employees have enjoyed an increasing income therefrom, amounting during 1915 to an average of $400 per month or 23 per cent of the wages; during 1916 an average of $600 per month or 35 per cent of the wages, and during 1917 an average of $675 per month or 39 per cent of the wages. Occasionally the bonus distribution exceeds $800, but this amount proves rather too generous as the increase in wages derived thereby is greater than the average employees' standard of living requires, resulting in many remaining off duty or requesting vacation leave for a few days, much to the inconvenience of the supervisory force and the resultant efficiency and reliability of the operation of the plant.

CONCLUSION

The bonus system of wages has now been in operation for about two and one-half years with the most gratifying results. The B.t.u. consumption per switchboard kilowatt-hour at the present time is nearly 25 per cent less than it was three years ago. The present saving in fuel cost, based on the latest standard of fuel efficiency put in effect Sept. 1, 1917, is 8.75 per cent. The company and the employees are equal partners, sharing alike the results obtained from fuel saving, a procedure which escapes the criticism that is sure to arise when a company appropriates the lion's share.

The plan of bonus, so successfully carried out without friction between the company and its employees, is due, in good measure, to the freedom it has enjoyed from the agitating influence of labor unions.

While the management, and especially the chief engineer of the power plant, has never wholly approved from a standpoint of principle the offering of a bonus or reward to employees as an incentive to put forth their best effort, the means employed in this plant with this end in view seem well justified, considering the great improvement in economy subsequently obtained and the benefits thereby derived by both the company and its employees.

The Ohio Electric Railway has put into effect a new schedule on all its divisions which provides for alternate limited and local hourly service. Through limited service between Columbus and Indianapolis will be continued. The new arrangement complies with the suggestion of the government for a reduction in the limited service and provides for the present necessity of reducing coal consumption in order to maintain regular operation.

Practical Traffic Relief Offered to Washington

Second Section of Beeler Report Recommends Eight Stops per Mile in the City and Six per Mile in the Suburbs—A Completely Detailed Schedule of Stop Spacings and Locations Is Embodied in the Report

THE second of the unit reports of John A. Beeler on Washington traffic problems was submitted to the Public Utilities Commission of the District of Columbia on Friday, Feb. 7.

In opening the report, the substance of which is given in the following paragraphs, Mr. Beeler pointed out that one of the chief difficulties with the service at present is the low rate of speed. While the cars are geared to run at a maximum speed of 20 m.p.h. or more, the actual rate of progress due to stops and slowdowns is but 8 m.p.h., and in the congested districts even less.

How Stops Affect Schedules.—The number of stops required per mile is for all practical purposes the factor that determines whether or not rapid transit is possible for the community served. A stop consists of three elements, all involving loss of time. The car must be slowed down from its running speed to standstill, it must stand for unloading or loading of passengers or waiting for signals, and finally it must start and again resume its speed.

As an illustration, consider an ordinary Washington street car capable of making 20 m.p.h. without stops. Require it to make eight stops of but five seconds each and the schedule speed is reduced to 10 m.p.h., or only one-half what is possible without stopping. Fourteen stops per mile will reduce the speed to 7 m.p.h.

"Stop at Every Block" Policy.—In an attempt to accommodate their patrons, the electric railways in Washington have for many years operated on the "stop at every block" plan. The result of this policy has been one of the potent factors that have slowed down the schedules, so that to-day the speed of some of the car lines is but little faster than a walk. This conserves neither the time of the patrons nor the finances of the companies, as the slow service is an economic waste for all concerned. The amount of power used, and hence the amount of coal burned in the power plant, is greater where many stops are made. It may be conservatively estimated that ½ lb. of coal is burned for each stop made, over and above what would be needed if the cars ran through.

Irregular Length of Blocks.—The blocks in Washington are marked by the irregularity of their spacing. Some of the original squares are as much as 940 ft. in length, while others are but 260 ft. On Pennsylvania Avenue they vary all the way from 710 ft. to 150 ft. On practically all lines similar conditions exist. Intersections formed by the avenues at acute angles add still more variety to the distances. In addition to the regular streets, the so-called minor streets laid out by property owners between those originally contemplated in the plan of the city add to the irregularity of spacing.

While the average distance between stopping places is extremely short, the actual distances vary so that in certain squares the walk necessary to reach a car stop is much above this average. Few persons complain about the walk to the nearest corner, regardless of the length of the block. As a result it may at once be inferred that no hardship will be incurred if the spacing is made to conform as nearly as practicable to the length of block which will give the best service to the public, regardless of whether a stop is made at every corner.

Proper Spacing of Stops.—It is not necessary for Washington to adopt any radical skip-stop or other program involving long distances between stops, or a plan that would call for the elimination of one-half of all the stops regardless of the length of the squares. But what is necessary and must be done before reasonably rapid transportation is possible is the equalization of the spacing on a rational basis. This will call for a spacing such that the distance will be sufficient for the cars to make a reasonable run without unduly increasing either the walking time or physical effort to reach the stopping places.

With the above ends in view, a plan for spacing the passenger stopping places on a basis of eight per mile in the city districts and six per mile in the suburbs has been worked out. This plan was presented by Mr. Beeler in elaborate exhibits. This arrangement will change the spacing from an average of about 377 ft. to about 660 ft. in the city. The maximum additional walk involved is equal to but one-half the increased distance, or 141 ft. As this will take less than half a minute at an ordinary walking gait it is readily seen that no serious hardship can result to anyone.

Practically every stopping place in the District of Columbia was examined, and care was taken to locate each stop where it will serve the greatest number, while conforming as nearly as possible to the recommended standard of spacing. In the suburban districts, where the number of persons using the cars is proportionately less, and where the residents are usually located in more or less compact groups, it is believed that the spacing of six stops to the mile will afford better service than a lesser distance. In a few stretches of country territory four stops per mile will be sufficient.

Distinct Signs for Stopping Places Necessary.—The locations for the stopping places must be clearly defined, so as to enable the passengers to be at the exact spot opposite the entrance when the car is brought to a standstill. This will save valuable seconds now lost while the passenger walks all or part of the length of the car. Traffic stanchions, raised platforms, or well-defined lines should mark the loading zones.

Better Time and Less Fuel.—Every schedule in the city will have to be rearranged. By the adoption of these stopping places the running time should be reduced by 15 or 20 per cent. This will cause a corresponding increase in service as soon as the new schedules are put in effect.

A saving of three stops per mile on each of the

Comparative Costs in Boston

Report of Mr. Beeler Shows Why Greater Use Should Be Made of Rapid Transit Operation in Subway and Elevated Facilities

According to the report presented by John A. Beeler to the Massachusetts Public Service Commission, as summarized in the ELECTRIC RAILWAY JOURNAL of Feb. 9, the cost of subways and tunnels in Boston is so great that they ought to be utilized in the most efficient way, and therefore rapid transit trains should be substituted for surface cars wherever feasible. In supporting this finding Mr. Beeler included in his report some valuable comparative costs which will now be added to the preceding summary. The accompanying tables show for the year ended June 30, 1916, the relative investments, income and trackage, as well as the income and outgo per dollar of business, for the rapid transit lines in Boston, for the surface lines using subways, tunnels and viaducts, and for the street surface lines.

The operating ratio for the rapid transit lines is 54.5 per cent, as compared to 67.1 per cent for the surface system. In Mr. Beeler's opinion the rapid transit costs show the necessity of increasing the revenues on such lines, as it is impossible to make them even self-sustaining so long as it requires more than three-quarters of every dollar received to pay taxes and provide a return on the investment.

The most expensive feature in the entire Boston system, however, is the use for surface car operation of certain rapid transit facilities which are separate from the rapid transit tracks, although operated in conjunction with them. These are the Boylston Street and Tremont Street subways, the Boston tunnel, the East Boston tunnel extension and the Cambridge viaduct. For these lines the investment represents $15.71 for each $1 of business, so that the receipts amount to but little more than 6 per cent upon the investment. The investment per mile of track is actually greater than that of the rapid transit system proper by $57,749.

Moreover, on top of the interest-carrying charges consequent to this tremendous investment, requiring practically 80 cents out of each $1, a 12½-per cent increase in the operating ratio occurs, owing to the employment of surface methods of operation instead of rapid transit. The former require 67.1 cents out of each $1, as compared to 54.5 cents on the rapid transit lines. Mr. Beeler believes that there is only one remedy for the situation, and that is to be found in the application of rapid transit operating methods to this portion of the property.

The most remarkable feature of the surface operation, says Mr. Beeler, is the fact that the car-mile earnings were 32.9 cents, in spite of the fact that practically one-half of the 41,400,000 car-miles were performed by the small, antiquated box cars and their open substitutes.

The only efficient type, the center-door stepless trailers, performed less than 5 per cent of the mileage. This, Mr. Beeler notes, largely accounts for the fact that the expense of operation per car-mile was 22.1 cents, resulting in the high operating ratio of 67.1 per cent. The company, however, made a 2.7 per cent profit on its surface line operations in 1916. This showed that it would have been better off had it not been necessary to construct rapid transit tunnels, subways, viaducts, etc.

COMPARATIVE COSTS IN BOSTON

	Rapid Transit Lines	Surface Subways, Tunnels and Viaducts	Street Surface Lines
Miles of track	36.85	14.88	471.97
Investment per mile of track	$1,401,777	$1,459,526	$89,806
Revenue per mile of track	$99,559	$94,030	$28,896
Investment per $1 of business	$14.08	$15.71	$3.10
Receipts per car-mile (cents)	28.4	32.9	32.9
Operating expense per car-mile (cents)	15.5	22.1	22.1
Income and outgo per $1 of business:			
Operating revenue	$1.000	$1.000	$1.000
Operating expense	$0.545	$0.671	$0.671
Taxes	0.056	0.056	0.056
Return on investment (5.06 per cent)	0.714	0.796	0.147
Total outgo, not including depreciation	$1.315	$1.523	$0.874
Deficit	$0.315	$0.523	$0.126
Current depreciation	0.094	0.071	0.071
Discarded property account	0.038	0.028	0.028
Total deficit	$0.447	$0.621	$0.027

The combined system of the Boston Elevated Railway had an operating ratio of 64.6 per cent, and car-mile earnings of 31.9 cents. The operating expense per car-mile was 20.6 cents. The total investment of $116,022,060 produced an operating revenue of $18,686,971, indicating an investment of $6.21 for each dollar of business. On the basis of $1 of business, the deficit for the whole company amounted to $0.121. This figure, as well as the ones preceding, is based on an average return of 5.06 per cent on the capital investment. This was determined by an analysis of the earnings for the last twenty years. At the present time, in order to earn 6 per cent on the Boston Elevated stock, this rate of return on the entire property must be obtained.

The total cost of service for each 5 cents' worth of gross revenue is shown by the following: Rapid transit lines, 7.23 cents; surface cars in subways, tunnels and viaducts, 8.10 cents; surface lines proper, 4.86 cents, and the combined system, 5.60 cents.

(*Concluded from page* 312)

1,500,000 car-miles operated per month represents approximately a saving of 1000 tons of coal, or 12,000 tons a year.

Suggested Stop Locations.—Mr. Beeler's exhibits in the complete report show the location of all passenger stopping places within the District of Columbia, with the approximate distances between stops. The average number per mile and the average distance between stops are also stated for each section. The present system of near-side stops has been generally adhered to, although numerous exceptions have been made where it is apparent that the far-side stop will serve better.

At junction points and at crossings of electric railway tracks the present stopping places have, in most cases, been retained. However, as schedule speed increases and passenger traffic develops, it may be found necessary or desirable to move some of the present stops out of the traffic throats, as has been recommended at Fifteenth Street and New York Avenue. The stops recommended for these junction points and crossings, therefore, must not be considered as final.

As the numerous stops at the Union Station present a problem different from anything else in the city, they have not been touched upon in this section of Mr. Beeler's report, but will be reported separately.

Combining Loads to Gain Economies of Large Units and High Diversity Factor—II

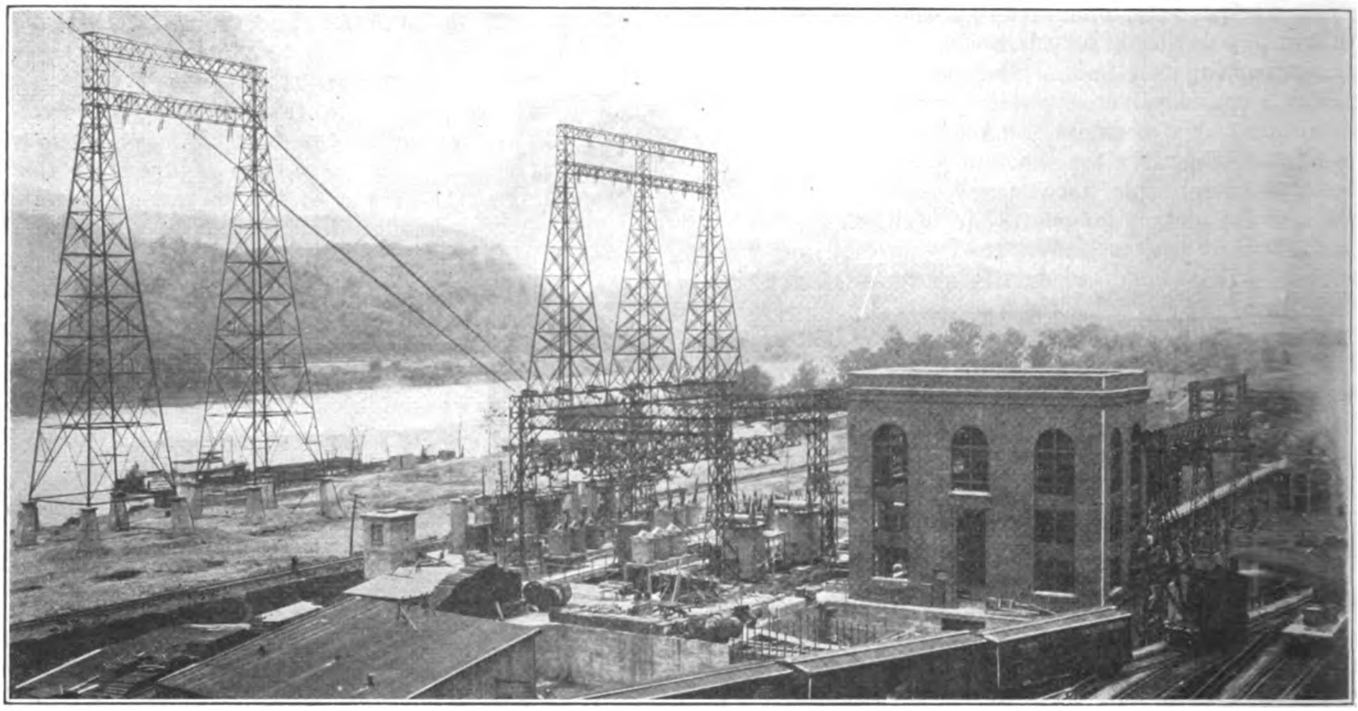


FIG. 1—SWITCH YARD OF AMERICAN GAS & ELECTRIC COMPANY, WINDSOR POWER PLANT

West Penn Power Company and American Gas & Electric Company Combined Generating Plant—Six Units and 200,000 Kw. Capacity—Water Supply System—Electrical Layout and Control Features—Distribution System of 11,000, 25,000, 66,000 and 130,000 Volts

THE general layout of the Windsor (W. Va.) power station, and the details of the boiler plant, were covered in the issue of this paper for Feb. 9. The remaining salient features are taken up this week.

The 30,000-kw. General Electric turbo-generator units are set in a single line through the power house and grouped in pairs with the steam ends of the two units adjacent to each other and directly over the condenser pits located between them. This arrangement brings the ends of the two machines requiring the most attention, as well as the Westinghouse condensing equipments for each pair, adjacent to each other, thus making for convenient operation. Both condensing equipments for the two machines are located in the one pit between and underneath the turbines. These condenser pits were placed 74 ft. deep below the main floor, primarily because the Ohio River at Windsor has a rise of 49.8 ft. from extreme low to extreme high water, and are served by automatic electric elevators.

The basement floor of the turbine room was placed just above high-water mark, and the main floor 18 ft. above this, while the floor of the condenser pit was built low enough so that the cost of pumping circulating water at low river stages would be a minimum.

The condenser pits are 25 ft. 6 in. wide by 91 ft. long.

Each condenser contains 50,000 sq. ft. of cooling surface and is connected to the turbine which it serves by a pipe 13 ft. in diameter. This exhaust connection was liberally designed and was provided with an expansion joint having a new type of mercury seal placed just above the condenser. The steel cross-members which support the condensers in the pits were placed about 15 ft. above the floor of the condenser well in order to leave space in the bottom of the pit for the air and water pumps. This arrangement of double-condenser pit and wide opening between machines in the turbine room has made it possible to utilize the 110-ton turbine-room crane for handling the condensing apparatus.

On account of the low cost of energy produced by the large units, practically all of the auxiliaries are motor-driven, dependence being placed on the economizers, with which each boiler is equipped, to maintain the heat balance. Two hydraulic air pumps driven by 200-hp. motors and two hot-well pumps driven by 100-hp. motors are supplied for each condenser. The hydraulic air pumps are installed on the platform in the condenser pit which supports the condenser, making a very short and efficient suction connection, while the hot-well pumps are located on the floor of the condenser pits underneath the condensers. The 50,000-gal.-per-minute motor-driven circulating pumps are located on the floor of the condenser well.

After passing through the condenser, the condensate is pumped through a primary heater in the upper part of the condenser and thence sent up into an open-type feed-water heater which is set on a platform immediately above the feed pumps. These pumps and one service pump are the only steam-driven auxiliaries in the plant. Two of these feed-water pumps are supplied for each unit, one of them being steam-driven and the other motor-driven. One motor-driven and one steam turbine-driven Worthington service pump serving the pair of turbo-generator sets is installed in each condenser well. These lift the water up into a steel service tank underneath the boiler-room roof, whence all service and make-up water is supplied.

All water drawn from this tank for use in the boilers is run through a settling tank and quartz filter before it flows into the feed-water heaters. This is the only treatment of the water required. Two separate paths for the water between the feed pumps and the boilers are provided in order to take water through the economizers, or deliver water to the boilers direct.

The complete water supply for the entire station is taken from the Ohio River through an intake crib which stands beside the condenser well between units Nos. 1 and 2, inside the turbine room. The water in the crib passes successively through bar iron grills, Chain Belt Company traveling screens and stationary screens to the rear chamber of the crib. From here it is taken through cast-iron pipes to the circulating pumps on the condenser-well floor, these pumps discharging directly into the bottom of the water box. For units Nos. 1 and 2, the intake for the circulating pumps is directly from the crib, while the circulating pump intakes for units Nos. 3, 4, 5 and 6 receive water through intake tunnels extended from the crib to the various machines. An extra heavy sluice gate operated by means of a hydraulic cylinder controls the flow of water to each circulating pump.

The discharge of circulating water from the condenser is made at the top and the water is delivered to the discharge well through a cast-iron pipe connecting with a discharge tunnel which lies adjacent to the intake tunnel part way to the river. From this point it is brought off at an angle in order to separate the discharge mouth from the intake.

The general arrangement of condenser equipment and intake crib permits the 110-ton turbine-room crane to be used for handling the screens in the crib. This turbine-room crane is equipped with a 15-ton auxiliary hoist which is used for this work. The traveling screens are mounted in a vertical position and so arranged that they can be raised or lowered to meet the conditions as the river rises and falls.

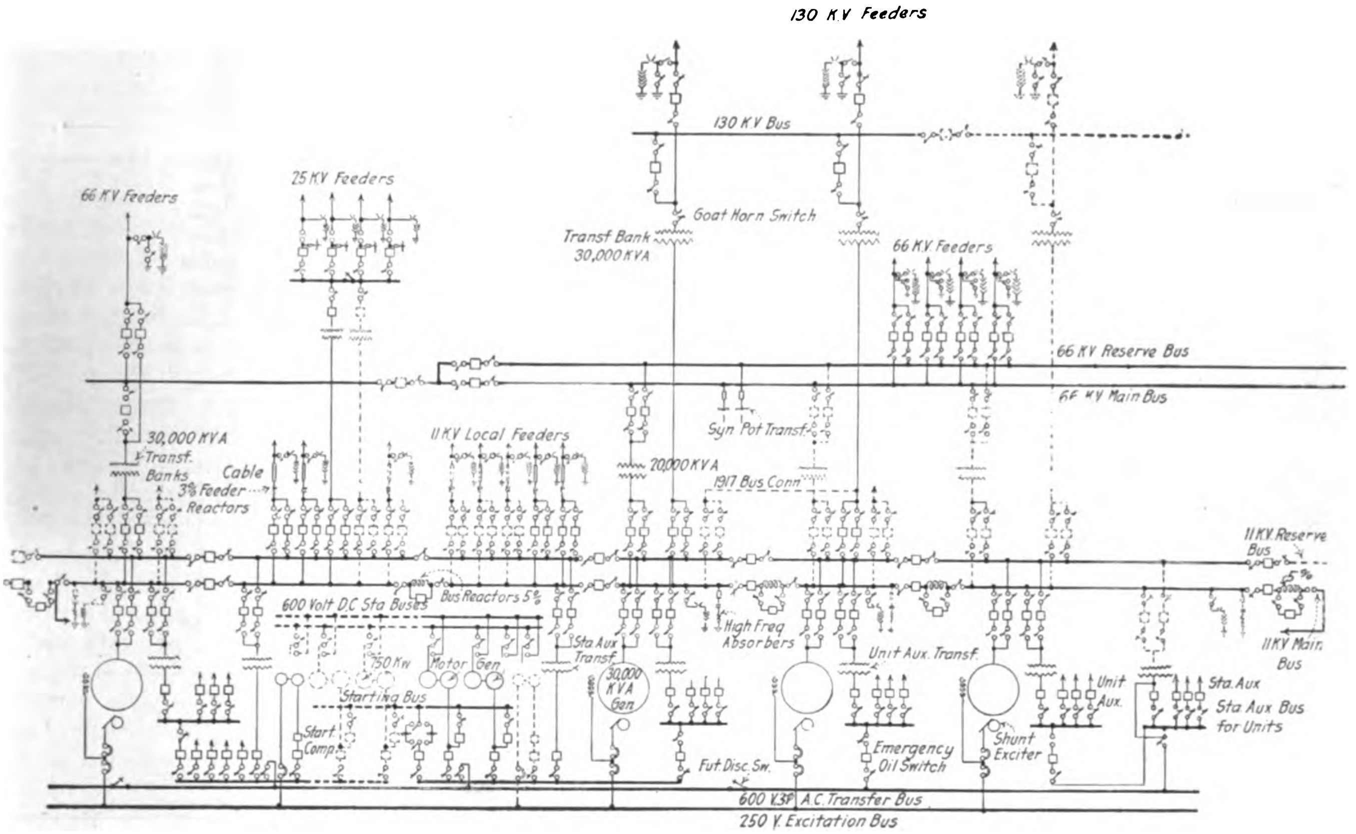

130 KV Feeders
130 KV Bus
Goat Horn Switch
Transf Bank 30,000 KVA
66 KV Feeders
25 KV Feeders
66 KV Feeders
66 KV Reserve Bus
66 KV Main Bus
Syn Pot Transf.
20,000 KVA
1917 Bus Conn
30,000 KVA Transf. Banks
Cable
3% Feeder Reactors
11 KV Local Feeders
11 KV Reserve Bus
5%
600 Volt D.C. Sta Buses
Bus Reactors 5%
High Freq Absorbers
Sta Aux Transf.
750 Kw
Motor Gen
Starting Bus
Start Comp
30,000 KVA Gen
Unit Aux. Transf.
Unit Aux.
Sta. Aux
Sta Aux Bus for Units
11 KV Main Bus
Emergency Oil Switch
Shunt Exciter
Fut Disc Sw.
600 V.3P. A.C. Transfer Bus
250 V. Excitation Bus

FIG. 2—SINGLE-LINE DIAGRAM OF MAIN STATION CONNECTIONS IN WINDSOR PLANT

ELECTRICAL LAYOUT OF WINDSOR PLANT

The generators in the Windsor plant are 60-cycle, three-phase, 30,000-kw. units with a generating voltage of 11,000. They are arranged for connection to a double-bus system, made up of a main bus and a reserve bus paralleling it. The former will be operated on the ring system, and while the reserve bus will not be operated as a ring at present, space has been provided to install the ring connection at a later date if this is thought advisable.

For each generating unit a bus unit is designed and equipped so as to limit the possible interchange of energy between bus sections to an amount well within the guarantee of the oil-switch manufacturer. This is accomplished by inserting a 5 per cent reactor between bus sections. These reactors may be cut in or out of the bus circuit by opening or closing a reactor short-circuiting switch. Whenever the generators are paralleled on the bus they are separated by these current-limiting reactors.

The control of the position of these reactor switches is accomplished automatically. The control circuit which is used for operating the reactor short-circuiting switch, and that for operating the generator switch on the main bus, are electrically interlocked so that if the generator switch is closed the reactor switch is open, and vice versa. This makes it impossible to parallel the generators on the bus without reactors between them, although provision has been made for the independent operation of these switches when this is necessary. This arrangement of current-limiting reactors and switch gears made it possible to keep well within the guarantee of the oil-switch manufacturer, without sacrificing close voltage regulation and without incurring undue expense. In addition to the reactors, a further protection against surges has been provided by the installation of a high-frequency absorber, which is in reality an oil-insulator condenser, having the function of relieving unusual disturbances and strains.

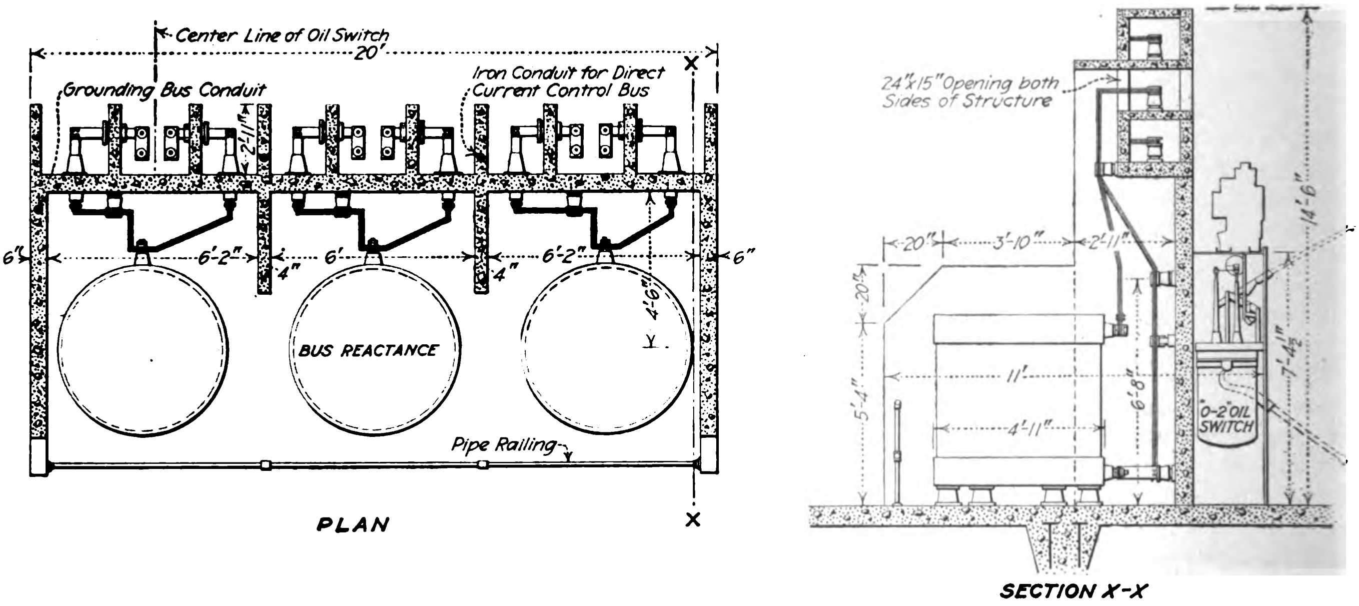


FIG. 3—PLAN AND SECTION OF BUS REACTANCE CONNECTIONS

The main 11,000-volt connections between the turbines and buses in the switch house are made through either of two 2000-amp. oil switches. The buses and switch-cell structures, which are of monolithic concrete construction, are placed on the main floor level. The 11,000-volt feeder reactors, potential transformers, lightning arresters, and excitation and control storage batteries are installed in the basement of the switch house, to which access is gained by a stairway at either end or in the middle of the building.

Exciting current for each generator is supplied by a 210-kw. exciter mounted on the end of the generator shaft. The rating of each exciter is sufficient to enable it to carry two generators in an emergency, since the power required for the maximum field of one machine is 140 kw. Emergency excitation is further insured by the installation of a 250-volt exciter bus which runs the full length of the station. Arrangements are of course made for connecting all machine exciters and all machine fields to this bus. A 150-kw., 250-volt motor-generator set, which was installed with the first two units, is also connected to this bus to overcome any shortage of exciter capacity. Space in the basement of the switch house has been set aside for the installation of an excitation battery which will be installed later on. A Tirrill regulator has been installed for each exciter and for the motor-generator exciter set.

For supplying energy to the auxiliary equipment, an 1800-kva. three-phase transformer, stepping down the voltage from 11,000 to 550, has been installed for each generating unit. It requires about 1500 kva. to supply the electrical requirements for the auxiliaries serving each unit. This does not include the stoker motors, since they are direct-current machines which are operated on 600-volt current supplied by motor-generator sets which also serve the crane hoists, automatic elevators and coal-handling equipment.

In addition to the transformer installed for each generating unit, two other 1800-kva. auxiliary station transformers are installed for supplying energy to motors about the station not directly connected with any particular unit. These transformers also serve the motor-generator sets which supply energy for the direct-current auxiliaries. All electrical equipment in the power station is of General Electric manufacture.

The control of all electrical equipment within the power house and the supply of 11,000-volt energy to the two individually owned high-tension yards of the two companies are centered in the operating room located between the turbine room and switch house. This room is separated from the turbine room by a glass partition which permits a view of practically the entire turbine-room floor. In this room are installed a benchboard, a vertical control switchboard, the Tirrill regulators and a log desk for the operators. The turbines, exciters and auxiliary transformers in the station are controlled from the benchboard, which is situated so that the operator is facing the glass partition as he works on the bench. The outgoing feeders are controlled from the vertical switchboard at the opposite side of the room, and the voltage regulators and curve-drawing instruments are mounted on pedestals in the center of the room. At one end of this room, also, is a battery board and behind it a motor-generator battery charging set. At the opposite end of the room is the 600-volt direct-current board. The station watt-hour meter board is located at the same end of the room as the battery board. Stairways at each end of the operating room communicate with the private offices above.

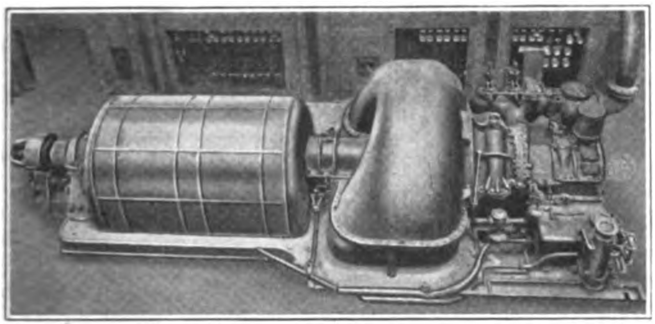


FIG. 4—ONE OF THE 30,000 KW. TURBO-GENERATOR UNITS NOW IN SERVICE

The function of this operating room as the control center of the entire plant was completed by the provision of devices for reading the temperatures of transformers in the high-tension yards, and the temperatures of important parts of the main generators. Alarm bells and signal lamps have also been installed in this room to warn the operators of any interruption in the flow of cooling water to the high-tension transformers.

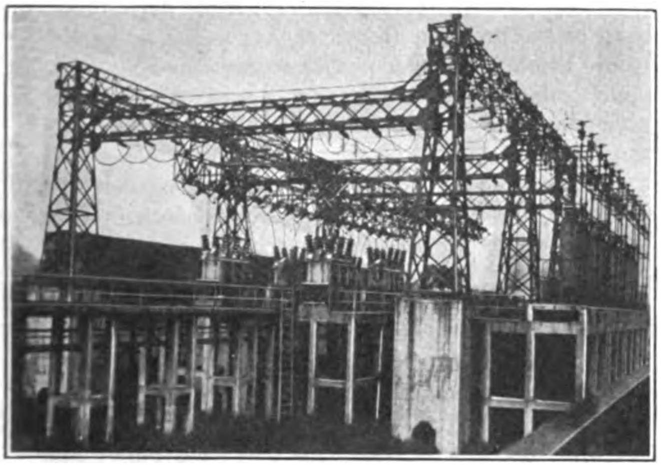


FIG. 5—OUTDOOR SUBSTATION AT WINDSOR PLANT

Energy is carried over the 11,000-volt cables underground from the power house to the two individually owned yards of the West Penn Power Company and the American Gas & Electric Company located at the north end of the power station. Here connection is made to 25,000-volt, 66,000-volt and 130,000-volt transformers for distribution over the several high-tension lines of the two companies. The local industries use 11,000-volt lines. Part of the West Penn lines operate at 25,000 volts, others at 66,000 volts. The latter will ultimately be operated at 130,000 volts, and the lines of the American Gas & Electric Company are operated at both 66,000 and 130,000 volts. All lines leave the high-tension yards on the radial plan, with arrangements made for parallel operation of two lines in case of emergency. It is understood, however, that radial operation is preferred and that parallel operation is purely an emergency measure. Each of the 11,000-volt feeders for the local industries is equipped with a 3 per cent current-limiting reactor which was selected to limit the current which might flow into a ground or "short" to a value well within the rating of the smallest oil switch in the circuit.

From the main 11,000-volt bus in each yard the energy which is to be transmitted at 130,000 volts leaves the yard from a 30,000-kw. bank of transformers which are tied in solid on the low-tension side. The 11,000-volt switches in the lines supplying these transformers are located inside the power station and meet the requirements of protection and control at the yard as well. In the yard a high-tension transfer bus has been installed, so that in case it is necessary to shut down one bank of transformers the load from any outgoing 130,000-volt line can be distributed over the remaining good transformers. All the 66,000-volt and 130,000-volt transformers are wound so that they may be interchanged and the 66,000-volt units may also be operated later at 130,000 volts. Further flexibility and assurance against interruption has been provided by installing lines for interconnecting the 66,000-volt buses in the yards of the two companies.

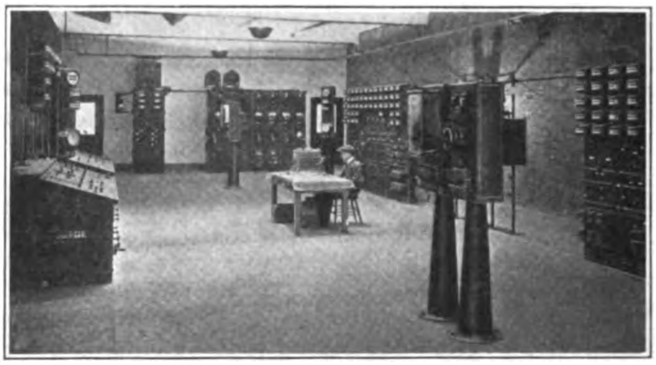


FIG. 6—SOUTH END OF WINDSOR PLANT OPERATING ROOM

In the American Gas & Electric Company yard, a double 66,000-volt bus was installed. At present this is connected to a 20,000-kva. bank of transformers and to all outgoing 66,000-volt lines. In the West Penn yard the 66,000-volt bus is operated normally only as a transfer bus, the energy being supplied by a 30,000-kva. bank of transformers. All outgoing high-tension lines are equipped with induction-type inverse time-limit relays. The transformers are protected by definite time-limit relays. The relays on the 25,000 and 66,000-volt lines are given a minimum setting of two seconds, while those on the 130,000-volt lines are set for three seconds. The transformer relays have a minimum setting of three seconds, and the 11,000-volt feeders have not yet been equipped with the relays. All electrical equipment in the American Gas & Electric Company high-tension yard is of General Electric manufacture, while that installed in the West Penn yard is of Westinghouse make.

The Asininity of Trying to Get Blood Out of a Turnip

The Public Relations Man Who Tries to Camouflage a Reactionary Chief Executive May as Well Try to Get Blood Out of a Turnip, Get Up Steam Without Heat, Lift Himself by His Bootstraps or Attempt Any Other Impossible Stunt

By THOMAS DREIER

SEVERAL years ago the new general manager of what had been a successful manufacturing institution asked me to help him create a new spirit in his organization.

"In the old days," he explained, "this house made so much money, and did it so quickly, that the spirit of service departed. The new owners have never cared either for the public or for their own workers.

"The place is honeycombed with hatred. The present directing head is a snarling sort of person. I am telling all this to you frankly because I want you to know how things are at the start. Our first job is to find out what sort of institution we want here. Our second is to put that spirit of service into the place which will make it regain the position it once held in the estimation of the public."

"We'll have to lie like sixty," the general manager added.

"Lie?" I questioned.

He laughed. "Let us put it this way: Our job is to play a trick on the heads of this business. The folks down the line are pretty good—most of them. They want to do the right thing, and are ready to do the right thing. A few will have to go eventually. Unfortunately, I am not in position to fire the real trouble makers. They are the owners themselves.

"They have a great deal of pride, though. They boast of their integrity and the value of their word. What I want you to help me do is this: We must get out a publication that will go to both the employees here and to the public. I want you to talk with the owners from time to time, and, like a good interviewer, suggest ideas to them which you will write up later, and to which they can attach their names without suspecting that the ideas did not originate with themselves.

"We'll have to get them on record before the public. I am playing the hunch that if we once compel them by suggestion to stand publicly for certain standards of service they will have to back up their promises with performance."

It certainly was an interesting suggestion. The new manager had just come from a distant city to find out why the business was not making the profits it had made years before. He had not been on the job long before he discovered that the trouble was not in the rank and file of employees, but in the executive officers themselves. It would not have helped the work any to tell all he knew to his new employers, so he tried to reform them by suggestion.

* * *

Well, for over a year we worked merrily away. The employees who were right at heart got right into line and helped. Others were gradually eliminated. Conditions improved. But not once did we feel safe. Just when we had patted each other on the back and thought we had put it over the owners would go on a rampage, and cuss some department head in the presence of others. Or some fool order would come shooting down from the inner sanctum which riled everybody up, but which the manager was powerless to help without pouring gasoline on the flames.

It certainly was uphill going. The manager would do something to win back a section of the public that had departed before his arrival, and then, just when right relations were being cemented, along would come one of those fool owners and jam some asinine scheme through which would destroy in a week the work of months.

One night, when the manager and I were dining at the club, he confessed that life was too short for him to spend it trying to perfect a policy and an organization for men who did not know the first principles of harmony and common decency.

"I have wanted to put this thing over as a matter of pride," he explained, "and I have wanted to prove that our suggestion plan is right. But what's the use? When the source of a stream is poisonous you cannot expect pure water until you get a long ways from that source. Running water purifies itself, but sometimes it has to run a dickens of a long way. I am inclined to think that the element of time will defeat us here. I am not going to break Methuselah's record as a long liver if I stay on this job, and only a Methuselah will have enough years to put it over right. Unless," he concluded, "we go out now and kill those sons of guns."

A short time after he was called to a bigger job, and I wiped one more client off my list of income producers.

That job paid me in two ways. It paid me in what I earned and it paid me more in what I learned.

* * *

When I was asked in New York, a few months ago, what a director of public relations for a street railway should do first of all, I answered without hesitation: "He must choose the right kind of president."

Emerson's famous statement that "An institution is the lengthened shadow of a man" is partially true. An institution is the man who directs it. His spirit is the spirit of his organization.

If you find an organization filled with mean, small-natured, narrow-gaged men, you will find at the head of it a mean, small-natured, narrow-gaged executive.

If, on the other hand, you find an organization where the department heads are personal friends, where those under them are good-natured and neighborly, where there is a spirit of harmony and good-will, you will find somewhere an executive power that expresses harmony and good-will and neighborliness.

All this leads me to say that in public-relations work it is not of first importance to have a weekly or a monthly or newspaper advertising, or any of the other publicity mediums. Street-railway men, for instance, discuss at great length the comparative merits of print paper and coated book, worry the lives of half a dozen printers getting estimates, ink their fingers and their faces in the agony of producing copy, and never once give a thought to the real essential—the spirit of the organization it is their purpose to advertise.

* * *

I yield to no man in my respect for the power of publicity. But much as I want money, there isn't enough money in any publicity job in the country to persuade me to attempt the impossible task of helping to create right relations between the public and a business institution (or any other kind of institution, for that matter) whose dominating spirit is not the spirit of service.

"How can I hear what you *say*," exclaimed Emerson, "when what you *are* keeps thundering in my ears?"

No matter what the skill of the publicity man, no matter what money he is given to invest, no matter how willing his employers are to give him a free hand, all he can do, camouflage as he will, is to advertise the organization as it is.

Some way or other, in ways too mysterious to explain, the truth will work its way into the publicity material—no matter how skillful a liar the writer may think he is.

Private business may get away for a little time longer with executives who have the public-can-go-to-hell spirit, and with executives who have as much regard for the feelings of their associates as a Boche has for the Belgians, but public utilities cannot do it.

The public has an uncanny way of getting a man's real number.

Like a boy in boarding school, he soon finds his rightful place and is forced to take it.

Those fellows in the old stories who used to travel incognito were wise. Think what many an executive would learn about himself that he ought to know for his own good if it were possible for him to change his form and associate on terms of equality with his own department heads.

One does not have to be pessimistic to say that there are some heads of businesses who would emerge from such an adventure with their bump of self-esteem changed into a deep and most depressing dent.

* * *

Therefore, the lesson to be learned from all this is that when you are tempted to indulge in a publicity and public relations campaign you should resist that temptation with all your strength until you are sure that the men who are in charge of the property on which the plan is proposed are right mentally and emotionally.

They may be experts in railroading, they may know all about costs and stocks and bonds and politics and God only knows what else, but if they haven't the spirit that wins and holds the respect and liking of their immediate associates, both above and below them, and if their dominant desire is not a desire to use all their power in giving service, the more nearly their publicity campaign imitates a whisper on a stormy night by the side of an angry sea, the better for everybody concerned.

Have the right spirit in the home office. Breathe it into the outside offices. Make it a part of the daily job for men to be decent and neighborly and helpful. Then you can start your work on the public with some assurance that eventually you will achieve success.

There is no sense sending the infantry over the trenches until you are prepared to support them with all the resources at your command—enough to give them some chance to win through.

There is no sense in printing papers and dodgers and posters, and the like, unless you have an organization placed back of that publicity that will carry out the promises made.

Every bit of publicity should be as sacred as a promissory note to a good business man whose credit is sacred to him.

There you have a practical ideal to work toward.

Rebuilding an Elevated Railway Under Regular Schedule Traffic

More Than $10,000,000 Has Been Spent on Manhattan Elevated Railway in Building Twenty-three Miles of Express Track, Involving the Erection of 50,000 Tons of Steel

THE meeting of the American Society of Civil Engineers, held in New York City on Feb. 6, was devoted to the presentation and discussion of a paper by F. W. Gardiner and S. Johannesson* on "Manhattan Elevated Railway Improvements." The paper was very elaborate and the reading of an abstract by the authors, with the aid of lantern slides, brought out discussion of a reminiscent nature. The following paragraphs cover some of the points in the paper which are of general interest:

The Manhattan Elevated Railway improvements authorized by the Public Service Commission of the First District, State of New York, involved in general the addition of a single continuous express track, with express stations, to the Second, Third and Ninth Avenue Elevated Railway lines operated by the Interborough Rapid Transit Company. The improvements provided for continuous express service during the rush hours downtown in the morning and uptown in the evening.

The work included the building of 23 miles of single track elevated structure, the erection of about 50,000 tons of steel, the building of 638 foundations and the construction or reconstruction of twenty-nine stations, most of the work being in city streets often congested with traffic. The traffic on the elevated railway lines was maintained according to the regular schedule throughout the period of construction.

The reconstruction work involved especially extensive track and structure changes at junction points and terminals.

At Chatham Square the Second and Third Avenue lines intersect. Before the reconstruction the Second Avenue trains continued to South Ferry and the Third Avenue trains to either South Ferry or City Hall. It was desired as a part of the reconstruction work to continue the Second Avenue line to City Hall. The new track layout has eight tracks through Chatham Square, two of which were placed overhead in order to avoid the danger and delays due to grade crossings. The Third Avenue tracks leave City Hall on the lower deck and after passing an island platform divide into three tracks, one being for express trains. The Second Avenue tracks leave City Hall on the upper deck, but later come down to the lower grade and also divide into three tracks. On the South Ferry branch, the Second Avenue line takes the old tracks past Chatham Square, and connects with the Second Avenue tracks from City Hall at the point where the express track begins. The Third Avenue tracks from South Ferry turn out from the old tracks and rising above this grade cross the Second Avenue line and run into the Third Avenue tracks from City Hall between the local and express tracks, later connecting with them.

Another junction of the Second and Third Avenue lines occurs at 129th Street and Second Avenue, where a yard for the two lines is located. From 125th Street to 129th Street on the Third Avenue line there existed, before reconstruction, three tracks, the center one being the uptown main track and one of the others a yard track. It was desired to retain these and add an express track. The new express track rises at 125th Street and continues above the center track to 129th Street to a junction with the upper deck Second Avenue tracks. On Second Avenue the three-track line divides into four at 125th Street, the outside two continuing at the lower deck and connecting with the yard and the local tracks of the Third Avenue line at 129th Street. The two inside tracks rise above the grade of the lower deck and connect with the express track of the Third Avenue line at 129th Street. This four-track line runs across the new Harlem River bridge, with two tracks on the lower deck and two on the upper deck.

There were several other junction points where conditions of this sort had to be met.

STEEL WORK ERECTED IN CONGESTED STREETS

New columns supporting the structure in the street were generally made 15 in. square, built up of two 15-in. channels, with flanges turned in, four angles and a web plate. Columns on the sidewalk, supporting station structure only, were generally built up similar to the track structure columns, but 12 in. square. Generally all columns had to be designed so that they could be erected under the cross-girder with the foundations, including the anchor bolts, in place.

For cross-girders plate girders were in general selected in preference to lattice girders, on account of the simplicity of design and the facility with which a load can be placed at any point on a plate girder without disturbing the uniformity of design. For track stringers plate girders were also usually used, but where it was desired either to keep the construction as open as possible and conform to the existing design lattice stringers were used.

The greater part of the work on the Manhattan Elevated Railway Improvements was in public streets often congested by traffic. Therefore the steel work, the total weight of which was about 50,000 tons, could not be stored in large quantities or for any length of time at the points where it was required for erection. The receiving points for steel in New York were the company's yard at 128th Street and the Harlem River, the dock frontage of which was increased by leasing adjacent property, and a dock front at Perry Street and the North River, which was leased for the purpose.

The material yard at 128th Street had an area of about 50,000 sq. ft. and a dock frontage on the Harlem

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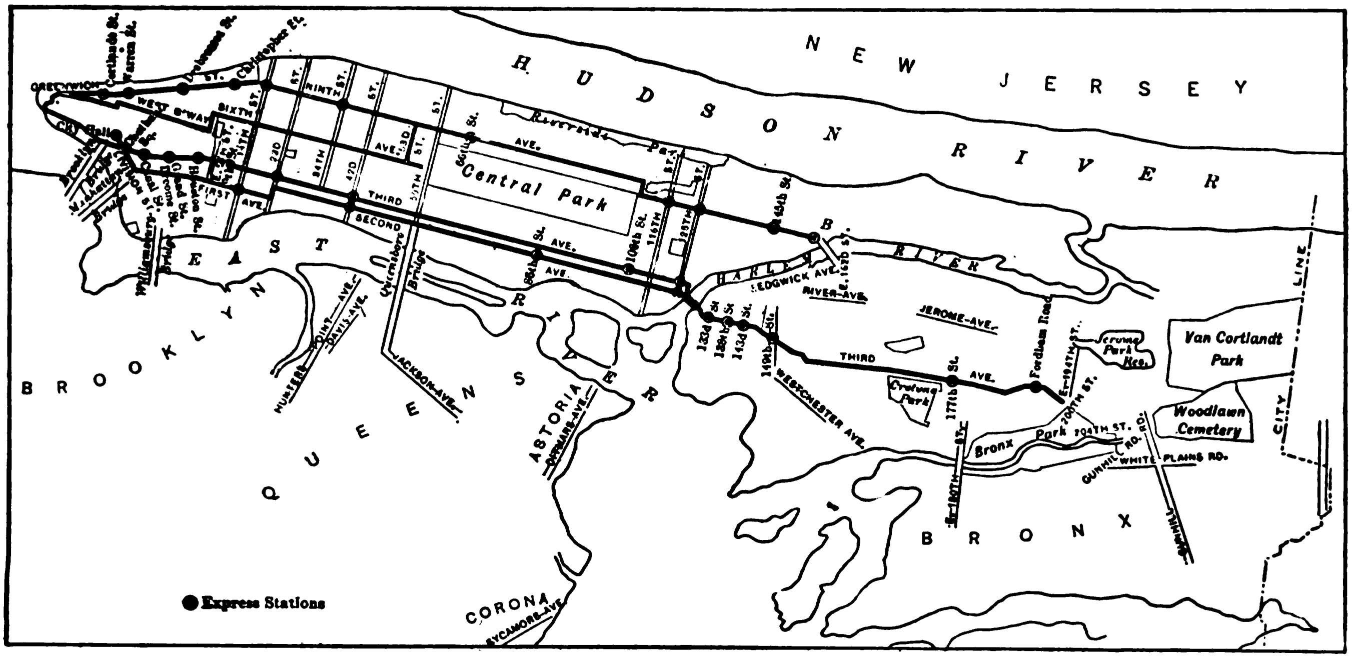
*For full text of the paper by Messrs. Gardiner and Johannesson see *Proceedings* of A. S. C. E., December, 1917, page 2042.

River of about 700 ft. The equipment consisted of a derrick with a capacity of 10 tons, used for unloading steel from the lighters and loading on the trucks, and a traveling derrick running on rails on the surface of the yard, used mostly to handle the track timber. A derrick set on the elevated structure adjacent to the yard was used for handling the track material, which was distributed mostly with work trains. All steel work for the uptown sections was delivered at the 128th Street dock and that required by the downtown sections at the Perry Street dock. As material was needed it was lightered from the railroad's yards to the company's docks, where it was stored temporarily until it could be trucked to the site of the work. Here it was deposited in the street until it could be erected, which generally meant that it remained in the street for only a day or two.



OUTLINE MAP OF ELEVATED LINES IN NEW YORK CITY—SOLID LINES SHOW SECTIONS IMPROVED

All riveting, drilling, etc., was done by compressed air, three stationary and thirteen portable compressors being used. The stationary compressors were of Ingersoll-Rand make, with Nagel locomotive-type, 100-hp. boilers. The portable compressors were of Chicago Pneumatic Tool Company or Ingersoll-Rand make, the capacity being 300 cu. ft. of free air per min. at a pressure of 90 lb. These were driven by 50-hp. electric motors, taking current from the contact rail of the existing railways. Although in some cases the erection of the steel structure was done with gin poles and jinnywinks, the greater part was done with travelers.

FOUNDATIONS CONSTRUCTED WITHOUT CONSIDERATION OF SUB-SURFACE STRUCTURES

The foundation work involved not only the construction of foundations for new columns at points where no columns existed prior to the reconstruction, but also the rebuilding of the existing foundations where investigation indicated that these were not sufficient to carry the added loading. A total of 638 new column foundations were constructed, 444 of which were at new and 194 at existing locations. The placing of foundations at a new location very frequently necessitated changes of gas and water pipes, duct lines, sewers, and other sub-surface structures, because the locations of the columns were determined by other factors and practically without considering the sub-surface structures even if their positions were known in advance.

The foundations were built of concrete, and were usually rectangular in plan. The top was slightly larger than the base of the column resting on the foundation. The sides tapered downward to the top of a rectangular footing which had vertical sides varying from 1 ft. to 2 ft. in depth and a horizontal offset all around, varying from 6 in. to 12 in. The bottom area of the foundation depended on the load on it and the carrying capacity of the soil, but was generally not less than 7 ft. square. Usually the size was 9 ft. or 10 ft. square. The standard depth was 15 ft. below the street surface.

The concrete used for the foundation was mixed in the proportion of one part of Portland cement, two and a half parts of sand and five parts of stone, graded to a maximum size of 2 in. On account of the long distance between the different points where the foundations were placed, and the comparatively small quantity of concrete required at each point, the mixing was usually done by hand.

"MEZZANINE" AND "HUMP" STATIONS USED

Wherever conditions permitted one or other of two standard types of express stations was adopted. One type, which required entire rebuilding of the existing station, has two island platforms, between which is the express track, with a local track on the outside of each platform. A mezzanine floor below the track structure connects the island platforms with the stairways to the street.

The second type of construction known as the "hump" station was used where there was not sufficient head room to provide the mezzanine floor. This type involved the raising of the middle express track above the level of the local tracks and the building of platforms to serve the higher level. A maximum grade of 3 per cent was used for the ascending express track.

The stations remodeled or rebuilt were designed with an understanding of the fact that passengers arriving to take a train generally come singly or in small bodies, while on the other hand passengers discharged from a train are ready to leave a station in a body. The latter condition requires that the exits to the street be as direct as possible, without doors to obstruct passage.

The stations of both the "mezzanine" and "hump" types, as previously described, are provided with toilet rooms, which together with the ticket office are heated. Other rooms are not heated, as in that case it would be necessary to provide doors which would interfere with the progress of passengers. The platform construction consists of platform girders, on top of which are placed I-beams, carrying the wooden floor joists. The platforms are covered with canopies for either part length or full length, according to the traffic conditions and the location of the station buildings.

Throughout the reconstruction work the standard Manhattan Railway track construction was used. The ties are 6 by 8 in. in cross-section, full dimensions, and 8 ft. long. For the outside tracks, where a footwalk is required every third tie is 12 ft. long and carries the footwalk. The spacing of the ties is 18 in. center to center. The track rails weigh 90 lb. per yard, have a 5-in. base and are 5 in. high.

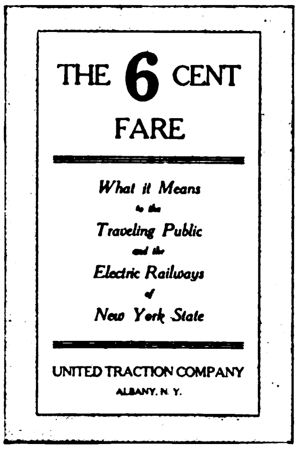
As an example of how the traffic conditions determined the conditions of the work, it may be mentioned that the station at 155th Street and Eighth Avenue serve the Polo Grounds, where the baseball league games are played. The work of reconstructing this station could not commence until the baseball season was over, and had to be completed before the next season started. Another example was the carrying out of the work in Ninth Avenue. There was formerly on the Ninth Avenue line a partial express service as far south as Fourteenth Street. In order to interfere as little as possible with this service, the company desired that the interruption of the express service due to the reconstruction of the stations at Sixty-sixth, Thirty-fourth and Fourteenth Streets and the grade-crossing elimination at Fifty-third Street, should be simultaneous and should not last more than fourteen days. Again when the three spans of the Harlem River Bridge were placed it was ordered that the work should be done in a night between Saturday and Sunday after midnight, at which time the traffic was lightest. As the work depended on the tide the placing had to wait until a Saturday night when the tide was favorable. In fact, throughout the construction the traffic conditions were the determining factors in the progress of the work.

CONTRACTS ON COST PLUS PERCENTAGE BASIS

To advertise for bids, either on a lump sum or unit-price basis, and then accept the lowest bidder would have been a gamble as far as the selection of the contractor was concerned, and the odds would have been in favor of inexperienced contractors. Even if experienced contractors were secured by accepting bids which were not the lowest, the company would not have been free to select when, where and how the work should be carried out to best suit traffic conditions on the existing railway. It was, therefore, finally decided that the only way to get the work done right was to choose contractors who were known by the company to possess the necessary experience to carry on the work, and to pay them the actual cost of the work, plus a fixed percentage of the same, to cover the use of their plant and their services. The soundness of the company's decision is shown by the fact that the work was completed in twenty-three months without undue delays to the train service, and practically without injuring a passenger, although more than 600,000,000 passengers were transported on 2,000,000 trains over the lines under construction. Credit for the wonderful co-operation which existed between the contractors and the railway company is given to the centralization of authority.

The total cost of the work done by the contractors was $10,273,637.

What the Six-Cent Fare Means



THE 6 CENT
FARE

What it Means
to the
Traveling Public
and the
Electric Railways
of
New York State

UNITED TRACTION COMPANY
ALBANY, N. Y.

THE 6-cent fare is a subject of vital interest to many electric railways in New York State and to every individual in the territories served. In order to give its public the opportunity for serious and just consideration of this matter, the United Traction Company is distributing to its patrons in Albany and Troy an interesting and instructive pamphlet. The twenty-eight pages of this booklet, the cover of which is shown herewith, are filled with extracts from commission decisions, newspaper editorials, comments of experts and the like to show how electric railways are confronted with an immediate need for increased revenues.

Coal Consumption on the B. R. T.

The January issue of the *B. R. T. Monthly* was a coal-saving number, with short and practical articles by officers of the company and by C. Loomis Allen, formerly director Electric Railway War Board. Howard Abel, comptroller, gave the following timely and impressive data on coal as an element of cost in local electric railway operation:

In November, 1913, the gross receipts from operation of the B. R. T. system were $1,950,374, and in November, 1917, $2,384,035, an increase of 22.23 per cent.

The coal consumed in the former period amounted to 38.119 tons, and in the latter period 48,286 tons, an increase of 26.67 per cent.

The coal cost in November, 1913, was, however, $82,408, and in November, 1917, $160,783, an increase of 95.10 per cent.

The quality of the coal in the two periods is reflected in the relative consumption. In November, 1913, it required 3.10 lb. of coal to produce 1 kw.-hr. of electricity, and in 1917 3.32 lb.

To heat street cars by electricity requires about 33 1/3 per cent of all the coal used, so that it can be assumed that the company spends more than $50,000 per month for heat.

Progress Toward Simpler Classification for Electric Railway Freight

The Author Explains Why the Recent Connecticut Public Utilities Commission Ruling Marks an Advance in the Direction of Simplicity

BY V. S. CURTIS
Secretary and General Traffic Agent The Connecticut Company, New Haven, Conn.

THE Connecticut Public Utilities Commission, in the recent ruling which became effective Jan. 1, 1918, established an important fundamental principle which will greatly simplify the conducting of trolley express and freight business in this State. This is the application of express tariff schedules rather than freight tariff schedules for this service. The decision was the outcome of a change in the schedules which was made by the Connecticut Company, effective on May 21, 1917, against which certain shippers protested. While the company considers the actual rates allowed by the commission to be too low, it is gratified by the ratification of the general theory for which it contended.

WHY REVISED TARIFF SCHEDULES WERE NECESSARY

Supplementing the descriptive article on the Connecticut Company's express department, which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 3, 1917, page 802, it seems desirable to point out some of the reasons why we found it necessary to abandon the use of the official freight classification with its maze of discounts from first-class rates, its *cellar* of commodity rates and its *sub-cellar* of "specifics." Let us first review the story of the genesis of this department.

The transportation of merchandise in less than carload lots on electric street railway cars in Connecticut was started at about the same time by Charles M. Cole, of Bridgeport, on the Connecticut Railway & Lighting Company's lines and by George Evans, of Hartford, on the Hartford Street Railway. Both were fairly successful, but their radius of action was too limited for the development of a great business. Both enterprises were absorbed into the Connecticut Company's express department when the consolidation of the principal traction lines in the State was accomplished.

A considerable carload business had been started previously on the Hartford lines in carrying crushed stone from quarries for road building, and sand, which is scarce in that region. This business is still growing, but as none of it requires station service the subject will not now be discussed.

As the Connecticut Company was owned by the New York, New Haven & Hartford Railroad after the consolidation by which it was formed, the steam road naturally selected men from its own freight department to operate the new electric freight service. These men were familiar with the official freight classification and naturally adopted it as their guide. They offered first, second, third and fourth-class rates, and even some commodity rates on less than carload lots, they cheerfully furnished station service and some wagon service, and they put all of the "classes" into the same car and gave them all identical service.

In conducting the electric freight business the company, regarding the handling of merchandise as a by-product of the passenger service, did not burden the express department with a strict allocation of its expenses. Favorable statements were accepted as a rule, and everyone came to believe after a while that the express service was extremely profitable. Attempts to analyze costs, particularly relative costs for the various classes, undertaken about a year ago, brought to mind Kipling's remark about the "conformable strata of absolutely impervious inaccuracies."

Analysis soon showed, however, that the handling of less than carload lots of freight through the stations was accompanied by such expense that it was doubtful if a dollar of revenue offset an equal amount of expense. Thus instead of the express department being the "fair-haired favorite" that it had been, it came under the suspicion of having "been in the jam closet." There was real reason for suspecting that the shipper of second, third and fourth-class freight had been getting a dividend in the shape of low rates at the expense of the 5-cent passenger fare.

The remedy proposed for the above condition was to abandon the use of the official freight classification and to substitute a classification based on the official express classification prescribed for the old-line express companies by the Interstate Commerce Commission.

THE CONNECTICUT COMPANY'S TENTATIVE, MAY 21, 1917, SCHEDULE

The first principle of the new classification, like that of the express classification, is that *"first-class rates are applicable to all property received for transportation by this company unless otherwise hereinafter provided."* Our "provisions" are all for higher than first-class rates if exceptions are noted. The selection of exceptions and the assignment of rates on these was a difficult operation. The official freight classification, with its 400 pages and supplement, took on the aspect and characteristics of Mark Twain's "silent assertion lie"—"the silent assertion that nothing is going on which fair and intelligent men are aware of, and are engaged by their duty to try to stop." Constant attrition, however, smoothed the way, and on May 21, 1917, the new classification was put into effect and the then existing first-class rates were made the standard.

A pamphlet containing the classification was prepared and distributed. The contents of this are not affected by the commission's action in fixing the first-class.

As soon as the new rates became effective appeal to the Public Utilities Commission was made by wholesale grocers of the State, led by a New Haven firm which had been the recipient of preferential service in the past. Hearings were held in New Haven and in Hartford and numerous data were submitted. As a result the commission decided that the new classification was justified and approved it, but suggested that the rate be made to conform to what had been the second-class rate. It fixed Jan. 1, 1918, as the date upon which the ruling should become effective. In making this conclusion consideration was given by the commission to all factors excepting to the important one of the *value of the service.*

The approval by the commission of the classification has been the source of great satisfaction to those who proposed it and who had diagnosed the previous trouble. One of the results of its operation is that we now have no difficulty in breaking in clerks to receive freight or to way-bill it, while the rest of the clerical work is much lightened and simplified, and its quality is improved. In connection with the putting of the new rates into operation a new receipt or domestic bill of lading, non-negotiable, was prepared. A feature of this is the limitation of value to $50 or to 50 cents per pound for a single shipment unless a greater value is declared and additional charges for values are paid.

A dictum of the Interstate Commerce Commission repeatedly found in its bulletins reads something like this: "We have consistently held that classification must be based upon a real distinction from a transportation standpoint. A classification cannot be regarded as scientific, or a difference in rates as well based, which is altogether founded upon a distinction that has no transportation significance. Such a differentiation would lead to an almost endless multiplication of rates, which would find no excuse save the use which might be made of the articles transported." (Stowe-Fuller Co. vs. Pennsylvania Co., 12 I. C. C. 215).

It is true that this dictum has usually been cited in an order reducing some rate, but as a ladder would lose half its value if it were good only to climb down on, so this statement should have equal force in connection with a rate increase. At any rate, somebody ought to be able to climb up on such a ladder.

Manufacturer Takes Share of Railway Load Peak

The Westinghouse Electric & Manufacturing Company has been co-operating with the Pittsburgh Railways in the supplying of power during the rush hours on lines furnishing railway service to the manufacturing company's plants. A rotary converter installed at East Pittsburgh is used to furnish power at 500, 550, 600 or 650 volts according to line conditions and the power needs of the railway. Between 600 and 700 kw. is supplied for an hour or more in the morning, from 6.30 to 7.30 o'clock, and from about 4.45 to 7 p. m. With both companies the main consideration in making the arrangement was the improved facility for getting the employees to and from their work promptly.

Zone System Impracticable in Boston

President Brush Elaborates Testimony Given Before Public Service Commission at Hartford Hearing

IN THE REPORT of the testimony of M. C. Brush, president Boston Elevated Railway, at the Hartford 6-cent fare hearing last month, published on page 229 of the issue of this paper for Feb. 2, Mr. Brush was quoted as saying that zone fare collection was impossible on an elevated line. In answer to an inquiry addressed to him by this paper asking if he was correctly quoted, Mr. Brush explains that his statement related to the Boston Elevated System. He then gives the following interesting facts in regard to the fare system in Boston:

"The situation with respect to the application of a zone system to the Boston Elevated Railway system is simply this:

"We are the only property, so far as I know, in the world that operates street cars underground, on the surface and overhead, and operates trains underground, on the surface and overhead, covering an area of 80 sq. miles, twelve cities and towns, with universal transfers between, all six kinds of surface transfer taking place in a very large number of cases in our so-called prepayment areas or within inclosed areas, making the use of paper unnecessary.

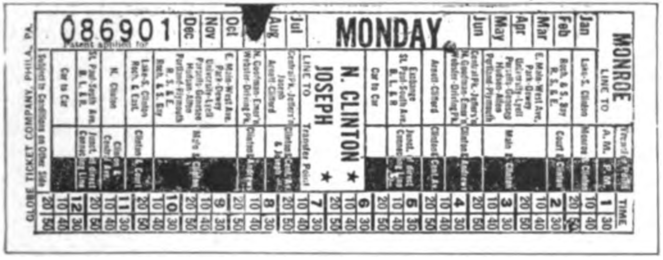
"In addition to all such prepayment area transfers, we receive in lieu of fare somewhat more than 85,000,000 paper transfers a year. The fact that a person can ride part of his journey on rapid transit and part on surface lines, and that there is but one fare on the entire system, would make it impossible for the company to establish a zone system which would be equitable both for rapid transit and surface lines. In other words, that zone system which would be proper and fair for rapid transit lines would be wrong for surface lines and vice versa.

"It is perfectly feasible to operate a rapid transit line on a zone principle because all that is necessary is to have passengers buy tickets at any station for any other particular station and upon reaching their destination surrender the proper ticket for that station, and failing to do that pay an additional fare. But where passengers can ride part of the way on rapid transit lines, then go into an inclosed area and get on a surface car and ride either the remainder of the journey or a portion of their journey and again get on a rapid transit line, I personally know of no way by which a zone system can be arranged which would be fair. This is entirely aside from the question as to the impracticability or impossibility of collecting fares under such circumstances.

"The only way I know that a zone system can be applied to the Boston system would be to have the termini of all rapid transit lines included in the central zone. But with a terminal, such as Forest Hills, lying approximately 5 miles from the center of the city, such a large central zone would be created by this plan that the amount of riding outside of this zone at an additional fare would be comparatively small. In consequence, the additional receipts gained by the zone system would not count greatly in the problem which the Boston Elevated Railway is facing to-day."

Color Scheme to Simplify Transfer Issuing

The New York State Railways, Rochester lines, are using a plan for issuing transfers, involving the use of five colors, which does not require the printing of the date on the transfers. On each transfer a day of the week is printed in red, so that for each day of the week there are transfers of five colors available. The transfers are ordered out one day in advance of use, the color being selected but not announced in advance by the traffic agent. This makes the misuse of transfers practically impossible, as it would not pay passengers to keep track of the colors in use on different days.

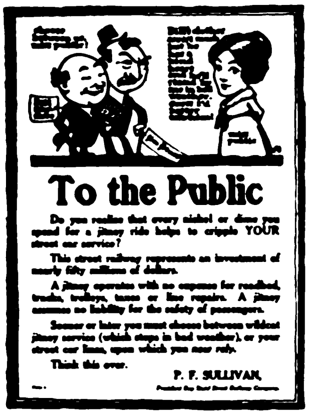

086901
MONDAY
N. CLINTON
JOSEPH
MONROE
GLOBE TICKET COMPANY, PHILA., PA.

TRANSFER USED ON ROCHESTER LINES OF NEW YORK STATE RAILWAYS

This scheme for transfer issuing is the invention of B. E. Wilson, general traffic and freight agent of the company. His experience indicates that the plan is economical of paper and printing, as there are but seven printing runs in the job, and books unused on a given day are not wasted but are available for later use. Mr. Wilson has applied for a patent on the transfer system.

"Jim Jitney" Is Turned Down

How "Miss Public" ought to refuse villainous "Jim Jitney" in favor of reliable "Bill Bay State" is shown in a car-window poster recently used by the Bay State Street Railway, Boston, Mass. This poster, which is 14 in. x 18 in. in size, is reproduced in the accompanying illustration. It emphasizes the fact that the public ought to support the electric railway, for it represents, as the jitney does not, an established investment, a desire to serve, an assumption of liability for the safety of passengers and a reliability of service. One instance may be cited to show the effect of the poster. A critic wrote to one of the newspapers in the company's territory saying that jitney competition should be allowed in order to force better railway service. To this the editors replied: "Cheer up! Remember how 'Bill Bay State' is going to stand by you in bad weather!" The editors added that the 6-cent fare might give revenue enough to allow the purchase of new equipment, but that obviously if the jitneys ate up the little revenue available it would not do any good on that score. Thus the message of the poster was sent on.



To the Public

Do you realize that every nickel or dime you spend for a jitney ride helps to cripple YOUR street car service?

This street railway represents an investment of nearly fifty millions of dollars.

A jitney operates with no expense for roadbed, tracks, trolleys, taxes or line repairs. A jitney assumes no liability for the safety of passengers.

Sooner or later you must choose between wildcat jitney service (which stops in bad weather), or your street car lines, upon which you now rely.

Think this over.

P. F. SULLIVAN,

BAY STATE PUBLICITY POSTER

Freight Handling Indorsed

Representatives of Chicago Industries Favor Electric Haulage—Drafts of Freight Ordinances Presented for Surface and Elevated Lines

INDORSEMENT of the proposed plan for permitting surface and elevated lines in Chicago to carry light freight and express matter was given by representatives of several industries at a meeting of the local transportation committee of the City Council on Feb. 8. At that meeting drafts of separate ordinances for the surface and elevated lines were presented. No action was taken on either proposition, owing to a lack of time to consider the exact wording of the ordinances.

The proposed franchises permit the companies to carry light freight, such as milk, food products, baggage, newspapers, mail and parcels post; and they authorize the companies to make physical connections and enter into contracts with other electric lines for handling such matter. The design of trucks and contour of wheels of the special cars used are to be approved by the city authorities. The city reserves the right to fix reasonable rates.

The ordinance for the Chicago Surface Lines differs slightly from that pertaining to the elevated roads. The former provides that all receipts from freight business are to be considered a part of the gross revenue of the company from which the city will get its usual percentage. The elevated franchise fixes an annual license fee of $50 on each car. Neither company is to receive any additional amount for the new grant in the event of city purchase according to values already fixed.

No objections were offered to the proposed plan, and all agreed that it would be of great help in relieving steam roads of a portion of short-haul freight. The opinion was expressed that with reasonable rates there would be a tendency to lower the prices of certain classes of merchandise in Chicago. The representative of a large banking company referred to the present necessity of hauling shipments to a point 7 miles from the downtown district in order to take advantage of the facilities offered by the Chicago, Aurora & Elgin line.

G. T. Seeley, for the Chicago Elevated Railways, said the Chicago lines could make connections that would put them in touch with about 500 miles of track in the surrounding country. C. E. Thompson of the Chicago, North Shore & Milwaukee Railroad told of the development of business from Milwaukee and said there was a continuous demand for service out of Chicago.

The committee agreed to get information as to the development of freight handling in Boston, Philadelphia, Cleveland and Detroit, so that Chicago might have the advantage of the best experience. Representatives of the Chicago lines explained that it would be necessary to get positive assurance as to the amount of business in sight before any large investment could be made in the necessary facilities.

HEARING ON IMPROVED SERVICE

The reopening of discussion for improved service in Chicago was marked by the appearance of President Busby of the Chicago surface lines, and representatives of the elevated lines, before the local transportation committee of the City Council on Feb. 11.

Mr. Busby confined his talk to the physical features of the report presented a year ago by the Traction and

Government Must Help Utilities

Needs of Public Service Corporations Set Forth in Hearing on War Finance Bill Held by Senate Committee on Finance

REPRESENTATIVES of the public utility companies of the United States have had two opportunities in Washington within the past week to present the problems of the utility companies to Government legislators and officials, and are much encouraged with the reception of their views. On Jan. 8 a presentation of these problems was made to the capital issues advisory committee of the Federal Reserve Board, with Governor Delano and Governor Hamlin present, and Allen B. Forbes, chairman, presiding, and on Feb. 12 representatives of the utility companies appeared before the Senate committee on finance to discuss the proposed war finance corporation bill.

The argument before the capital issues advisory committee was presented by P. H. Gadsden, president Charleston (S. C.) Consolidated Railway & Lighting Company, a member of the War Board of the American Electric Railway Association, at the request of John J. Stanley, president of the association. Mr. Forbes, the chairman of the advisory committee, had requested the heads of all the big utility organizations to be present, and, in addition to Mr. Gadsden, among those present were the following: John W. Lieb of the New York Edison Company, president of the National Electric Light Association; Alfred Forestall, president of the American Gas Institute; E. K. Hall, Electric Bond and Share Company, New York; H. H. Crowell, vice-president Michigan Railway, and representing the Hodenpyl-Hardy interests in Michigan; C. M. Clark of E. W. Clark Company, Philadelphia; and H. G. Bradlee of Stone & Webster, Boston.

At the hearing before the Senate finance committee statements were made by S. R. Bertron of Bertron, Griscom & Company, New York; H. H. Crowell and Mr. Gadsden. The argument, which was substantially the same at both hearings, was, in effect, as follows:

First: Public utility rates must be increased, as labor and materials are eating up equities in these properties. The fundamental remedy is to restore values by increase in rates.

Second: During the war the companies should be relieved of franchise requirements, such as paving streets and placing wires underground. Such work should be regarded as unnecessary capital investment at this time.

Third: The companies are being called upon to make large expenditures for extensions and betterments to meet the needs of government plants for power, transportation, and other parts of the war program. It is estimated that these expenditures for the year will be between $100,000,000 and $200,000,000, required for Government purposes. Some way must be provided for the Government to furnish this money.

Fourth: The public utilities, railway, gas and electric companies, have maturing obligations in 1918 of about $225,000,000. Under present conditions, where the Government has monopolized the whole money market, it is impossible to finance these maturities through the banks, and if the companies are to continue to perform their essential part in furnishing facilities for the speeding up of industry in this country, the Government must furnish the public utilities some relief in taking care of the maturing obligations.

It is understood that the Senate committee on finance was evidently seriously impressed by the situation which confronts the companies, as explained by the witnesses. Members of the committee frankly asked the gentlemen before them if it is not possible for Congress to grant some relief. It is felt that the committee practically unanimously felt the force of the rate question, as well as sympathized with the suggestion that the companies be relieved from non-essential expenditures; also there was apparently no question but that the committee realizes that much new capital will be required by the companies in order to meet the Government's war needs. The committee, by its questions, indicated an apparent unwillingness to grant such unlimited powers as those conferred in section D of the proposed war finance corporation bill. Mr. Gadsden took the position before the committee that public utility securities are a class which must be taken care of, and suggested to the committee that the words "Public Utilities" be inserted in this section of the bill, to leave no doubt that it was the intention to provide for them. A hearing at which representatives of the public utilities will be present will soon be held on this bill before the House committee on ways and means.

(*Concluded from page* 325)

Subway Commission. He said there would be time enough to talk about enabling legislation and rate of return after an agreement has been reached on a physical program which will meet with popular support. He referred to the commission report as being fundamentally sound, but said there were certain modifications which appeared to the companies as having merit from an operating point of view.

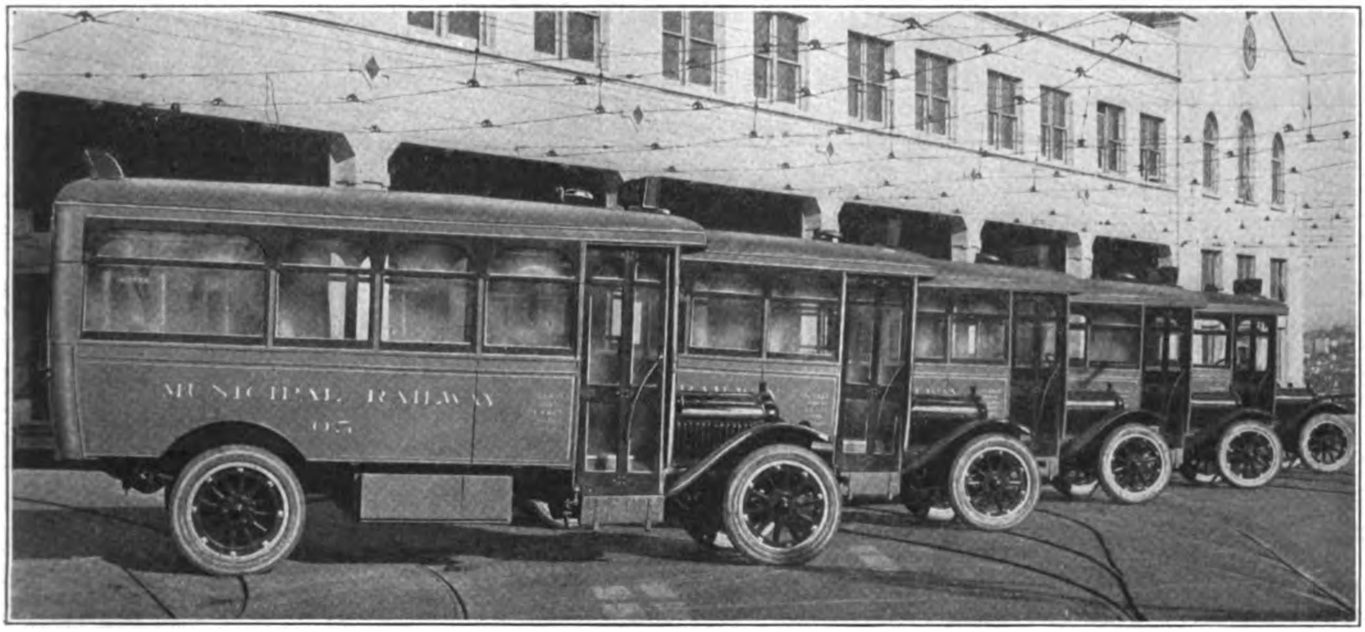
Mr. Busby said he did not believe in painting pictures as to what might be had in the distant future in the way of subway development, and he thought if the purpose could be served at an earlier date by an extension of elevated lines, this should be done. His statement was well received by certain of the aldermen, who had opposed the commission report for holding out no relief in the near future for their districts in outlying parts of the city.

Mr. Busby said that rapid transit development in Chicago had been at a standstill for many years. It is now only 14 per cent of the total mileage, whereas New York will soon have from 40 to 45 per cent rapid transit service. Chicago's development depends upon the extension of rapid transit service, and the only limitation to be kept in mind is that which would insure such a system to be self-supporting.

The Public Service Commission for the First District of New York has authorized the Public Service Commission Association to look after the commission's employees, now numbering 218, engaged in military or naval service. It is proposed to provide a Christmas box for each of the men, to furnish comfort kits and such other necessities as may be required, to aid the families of the men in such emergencies as may arise during their absence and to meet such other conditions as may arise from time to time. In order to carry on this work each employee will be assessed from 25 cents per month to $1.50 per month.

CONSTRUCTION, MAINTENANCE AND EQUIPMENT

ENGINEERS, MASTER MECHANICS AND OTHERS WHO HAVE DEVELOPED ECONOMICAL PRACTICES, OR WHO HAVE WORTH-WHILE IDEAS ARE INVITED TO TELL READERS OF THE JOURNAL ABOUT THEM IN THIS DEPARTMENT



FLEET OF AUTO BUSES IN FRONT OF SAN FRANCISCO MUNICIPAL CAR HOUSES

First Special Monthly Mechanical and Engineering Number Appears Next Week

THIS *will be the last issue for the present in which the short technical articles will be grouped in a separate "Construction, Maintenance and Equipment" department. These articles, which have proved so useful to the readers of the paper, will continue to be printed, but either segregated in the third issue of the paper for each month or scattered among the longer articles in the weekly issues.*

Appreciating an urgent demand for practical articles dealing more comprehensively with the elements of the mechanical and engineering aspects of electric railroading, the editors of this paper have arranged definitely to meet this demand. The co-operation of a group of qualified writers has been secured and a large section in the Feb. 23 issue will be devoted to the first group of special articles which they have prepared. In these articles the authors give facts and figures which will help the ambitious youngster to rise faster, and they will contain much by way of suggestion for more experienced men.

The editors desire to emphasize, however, that while the special writers will supply a considerable number of articles there will always be space available for worth-while contributions from the many occasional contributors who have done so much to help the JOURNAL *in serving its clientéle.*

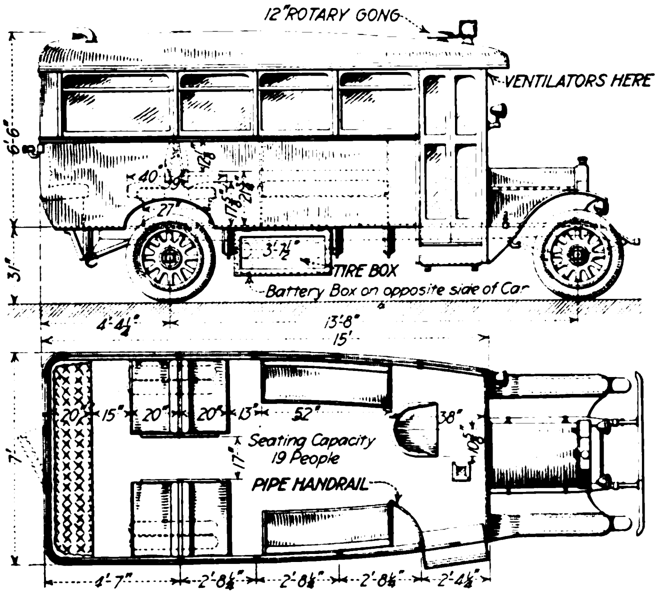
Municipal Auto Bus Traffic Feeders at San Francisco

BY N. A. ECKART
Railway Engineer Board of Public Works

THE Municipal Railway of San Francisco, on Jan. 15, 1918, put in service a bus system to serve as a feeder to its Geary Street car line and to render service to the residential section known as the Sunset District. Transfers are exchanged between the buses and the cars for the usual 5-cent fare. For the present the buses operate over two routes, 1 and 2 miles in length respectively, each crossing Golden Gate Park. On both lines the route is paved except for the half mile of oiled macadam across Golden Gate Park. Two buses maintain a ten-minute headway on the 2-mile line, and a single bus runs on a fifteen-minute schedule on the other. The average speed is 12 m.p.h. Thus the fleet of five buses which the city has purchased serves the two routes and allows two buses to remain in reserve.

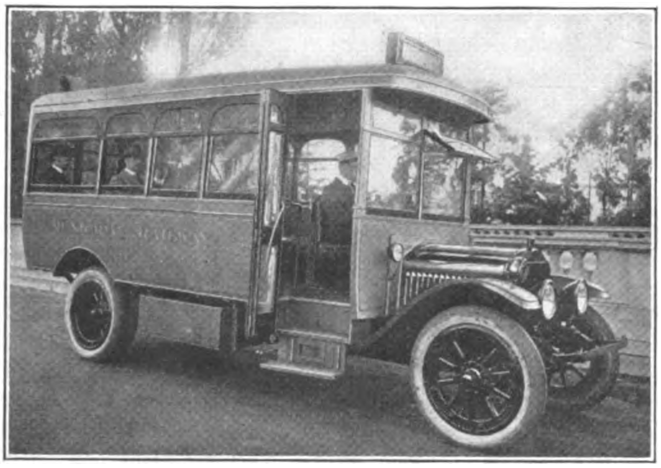
The buses, which are arranged to seat eighteen passengers, and will carry as many more standing, are of the prepayment type, designed for one-man operation. They are mounted on White 2-ton chassis, and are equipped with 37-in. x 5-in. pneumatic tires, single on the front wheels and double on the rear. They are 15 ft. long, 7 ft. wide, and have a wheelbase of 13 ft. 8 in. The weight, light, is 7830 lb. The buses are fully inclosed with drop sash and are finished inside and out in harmony with the standard practice of the municipal railway cars.

The plans and specifications under which the buses were purchased were prepared under the general direction of M. M. O'Shaughnessy, city engineer. These were so drawn that bids were received and the contract awarded to the lowest bidder on the basis of a bus which would show the lowest net operating cost over 125,000 miles of operation. The items considered were depreciation, as determined on probable turn-in allowance, fuel consumption to be determined on the basis of a 100-mile run over a prescribed route with 3.6 stops per mile, and all other elements affecting the operating cost. The contract price was $5,624 each, fully equipped.



GENERAL ARRANGEMENT OF MUNICIPAL RAILWAY AUTO BUSES

In the final acceptance test the performance was as follows on a run of 103.7 miles: Fuel consumption (Standard Oil distillate at 9 cents per gallon), 15 gal., or 6.9 miles per gallon (the bid guarantee was 6 miles per gallon); total elapsed time, including 361 full stops of ten seconds each, eight hours and twenty-five minutes, or an average speed of 12.33 m.p.h. against the specification requirements of 12 m.p.h.



AUTO BUS USED AS FEEDER ON SAN FRANCISCO MUNICIPAL RAILWAY

The conditions of the foregoing test were that the bus be loaded with 4000 lb. above the standard equipment, and that the speed could at no time exceed 20 m.p.h. The test course was so selected as to represent average San Francisco conditions and included grades up to 10 per cent. Under the same conditions of loading, the car ascended a 5 per cent grade on fourth gear, 10 per cent grade on second gear, 18.9 per cent grade on first gear and reverse, all as required in the specifications. The following gear ratios were used in the final test: first, 22.75; second, 14.62; third, 9.63; fourth, 6.83; reverse, 30.4.

Car Axles, Their Design, Manufacture and Service

PART III—MANUFACTURE AND CARE

By Norman Litchfield

AFTER the general study of the theory of axle design and its application to typical cases, it is fitting that some attention should be given to the manufacture and care of this important element of successful railway operation. The subject naturally divides itself into the materials from which axles are made and the treatment which they should receive when in operation.

AXLE MATERIAL

So much has been said of the value of this or that material, or of some particular method or process of manufacture that it seems well to review for a moment the elements which go to make up a desirable material.

The earliest axles were, of course, made of wrought iron, and in the days of good puddled iron and lightweight cars this material undoubtedly made a good axle. But the increase in weight of cars demanded a stiffer material, and steel came into general use. The open-hearth process is the one that has proved satisfactory both from the commercial standpoint and from that of the axle user.

Claims have been made of a difference in value between the acid and the basic open-hearth varieties but experience has shown that, with equally careful handling, either process can be made to yield a good product. In the details of manufacture the user must necessarily depend to a large extent on the experience, ability and honesty of the manufacturer. Attempts have been made from time to time to lay down specific rules affecting the inner workings of the manufacturer's process or organization, but these have not been proved necessary. There are, however, certain points which the user may reasonably request to have covered should he consider that his service is of a severity warranting the expenditure. A number of these points are touched upon here. While it is not claimed that all of them are necessary for every user, they are nevertheless of value and in some instances are warranted.

MOOTED POINTS IN AXLE STEEL MANUFACTURE

Taken in the order in which they occur in the process of manufacture, the first of the points on which argument between user and manufacturer is desirable is the amount of the ingot which is to be discarded and not used for making axles. There are various shapes and sizes of ingots and various methods of pouring, some from the top and some from the bottom. All of this has an effect on the amount desirable to be discarded. Probably as safe a way as any is to agree with the manufacturer as to what shall be the minimum amount of discard in any case, and to provide that the customer's inspector shall have the right to say whether or not this minimum shall be exceeded and to what extent. In some cases the minimum is made as high as 30 per cent. Demands of the inspector which the manufacturer considers unreasonable can be made a matter of individual settlement.

After discard comes the question of the processes of forging of which there are three in general use, namely, rolling, hammering and pressing. It is generally felt that rolling (except as a preliminary process) does not give a thorough working of the metal. With the other two processes the user should satisfy himself that the hammer or press equipment of the manufacturer is of such weight or power as will give thorough penetration. Good evidence of thorough working will be found in the ends of the axle, which if well worked will have more or less of an egg shape. On the other hand, if there has been only "skin forging" the ends will be concave.

With regard to the consumer's requirements as to the details of the chemical composition of the steel, different opinions have prevailed, but it seems fair that the manufacturer should make his own mixture in accordance with his best judgment as to what will give the character of steel which the purchaser desires. That is to say, if a carbon steel of certain physical qualities is desired the manufacturer should be permitted to state what proportions of carbon, manganese and silicon there shall be. On the other hand, the user has a right to ask for certain limits for impurities, such as phosphorus, and for the privilege of making check analyses of the full chemistry to see how uniformly the desired chemical composition is being maintained. If he considers it necessary he may also provide that drillings taken from the completed axle shall not exceed a given maximum of impurities, and also not exceed a given variation in carbon content between the center and the outside to provide against undue segregation. It must not be forgotten, however, that to some extent these are niceties which are not justified in every service, and necessarily increase the cost of the axles.

HEAT TREATMENT

Next in order comes the so-called "heat treatment," a much-abused word which has been used to cover a variety of heating processes after the final forging. This treatment, in the minds of some, has been thought in some mysterious way to provide an axle which is free from all troubles regardless of its design, chemistry and handling in the process of manufacture. When it is understood, however, that heat treatment is applied simply to obtain a more closely-grained structure, and in some cases to increase the tensile and ductile properties, it will be recognized that heat treatment merely adds one more step in the production of a high-quality axle. It in no way lessens the necessity for careful attention to the previous steps mentioned.

Until some ten years ago the usual method of handling high-class axles after forging was to bury them in hot ashes and allow them to cool slowly. This operation, when carefully performed, often produced very good axles. As demands of service became more exacting other methods were resorted to for producing a stronger and more uniform product. This led to the use of alloy steels and finally to "heat treated" or, more properly, quenched-and-tempered material, the quenching medium varying with the ideas and methods of the manufacturer.

While all the steps in the axle manufacture are important and require great care, that of heat treatment, affecting as it does the very molecular structure of the material itself, is most susceptible to improper handling. In consequence, attempts to get results by inexperienced operators have failed and have led in some quarters to condemnation of all heat treatment. But it is generally recognized that some form of heat treatment tends to produce a closer grained and more uniform material, some preferring simple annealing, and others quenching and tempering.

It is not the purpose of this paper to set forth any one set of physical qualities as being more desirable than another, and no opinion can therefore be expressed as to the relative merits of simple annealing, or quenching and tempering. Suffice it to say that it is generally agreed that after forging the axle should be reheated in a furnace under carefully regulated conditions to reduce any inherent strain and to refine the grain of the material.

The details of the type of furnace used, quenching medium, etc., while important, are nevertheless, as recently pointed out in an editorial in this paper, subservient to the honesty, integrity, ability and experience of the operators and to the care with which the results obtained are checked, either by the producer or the consumer.

TESTING AXLES FOR CONFORMITY WITH SPECIFICATIONS

The point last mentioned above brings us to the consideration of the number and character of the tests which should be made by the user to satisfy himself that the product is satisfactory. The M. C. B. committee of 1896, before referred to, reported as follows in regard to the specification it was presenting at that time: "For steel axles the specifications submitted will insure, within a reasonable probability, that the lot from which one is taken is fairly represented by the one axle tested." It will be noted that this specification merely required the drop-testing of one axle from each open-hearth melt, which might include 100 or more axles.

It need hardly be stated that the optimism of the committee has not been entirely justified by experience. More recent specifications, such as the standard specifications of the American Society for Testing Materials, require that each axle be made with a prolongation at one end and that one axle be selected for test from each annealing charge. This usually means that one of each twenty or thirty axles is tested for tensile properties and has check analyses made of chemical impurities. This, of course, represents a marked advance over the old M. C. B. method of merely drop-testing one axle from each open-hearth melt. But it is questionable whether even this represents all the care that should be taken for such an important part as a passenger-car axle used in severe service.

Experience shows that, even where the best of material has been used, occasional failures will occur. To eliminate these occasional failures, which while not representative of the rest of the axles may prove troublesome, it may be justified in some cases to subject each axle to test. While this, of course, adds to the initial cost of the axle, it is warranted by the character of the service. It may even pay to make the axles with a prolongation at each end, and to take tension and cross-bending pieces and drillings for analysis from both ends. Carbon determinations may also be taken at the center of the axle and at the periphery, and the carbon content may be required to vary not over a given per cent. Where desirable, occasional microphotographs may be taken to show the closeness of the granular structure. By so doing, the user has satisfied himself as nearly as may be that the axles are uniform in quality, and it cannot be too strongly emphasized that uniformity is the most necessary quality.

Axles made to the old M. C. B. specification, if uniformly of the same quality, would undoubtedly be satisfactory for many services. All of the improvements in manufacture have their best result in the production of a more uniform structure, and it would therefore seem that the user is justified in taking precautions to ascertain that this uniformity has been obtained.

A last and very important check on the soundness of the axles is the subjecting of each to a proof test by dropping thereon a weight from such a height as not to strain the steel above its elastic limit. This matter has received attention from the American Society for Testing Materials, the latest *Proceedings* making reference to the desirability of some such test and quoting two different standards. It is not as yet determined which of these is the more desirable. Experiments including some recently made indicate that neither of them is entirely proper. It is probable that this matter will receive further attention in the near future.

CARE OF THE AXLE IN SERVICE

The general procedure in purchasing axles is for the user to receive the axles from the manufacturers in the rough-turned state and to finish-turn them in the railway shops. In turning care should be exercised that the true radius of the fillets is maintained, as a sharp corner or tool mark made by a careless workman may defeat all the care used on the design and preparation of the axle.

Even with the best of care a poor axle may slip by, and it is therefore necessary to have some means of inspection of the axles in service to be sure that they have not cracked. Before considering inspection methods it may be well to review the nature of the common failures.

CHARACTER OF FAILURE

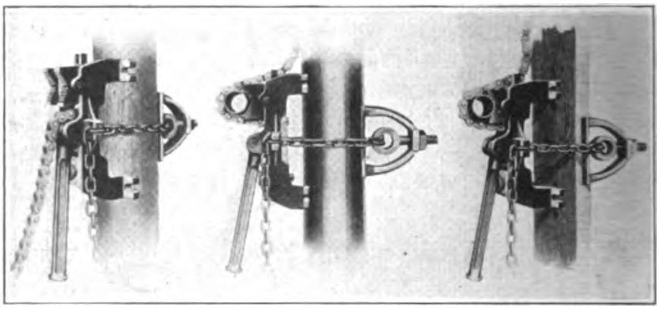
Where poor metal has been provided, or the design is abnormally weak, instances are found of a "clean break," but by far the most troublesome difficulty is the gradual or so-called "detail" fracture, which starts with a small very fine crack and gradually progresses through the axle. The appearance of the broken axle is in general of two different aspects, one wherein the failure runs around the periphery of the axle and gradually works around the center more or less concentrically, and the other wherein a succession of crescent-like sections are found, each enlarging as the center is approached. These failures are characteristic and when once recognized are always readily distinguishable from a clean break. These detail fractures when they have progressed but part way are very difficult to locate, the crack being so fine that it cannot be discerned even with a glass. A good method for periodical inspection for cracks is to immerse the axle (with the wheels mounted) in a tank of hot oil, and then to wipe the oil carefully off and cover the axle with whiting. The axle is then rested on a block at its center, with the wheels hanging free, and is struck several blows with a heavy sledge. Wherever there is a crack a fine thread of oil works up from the crack under the vibration set up by the sledge blows and is readily seen against the whiting. A careful record, signed personally by the inspector, should be kept of each inspection.

CONCLUSION

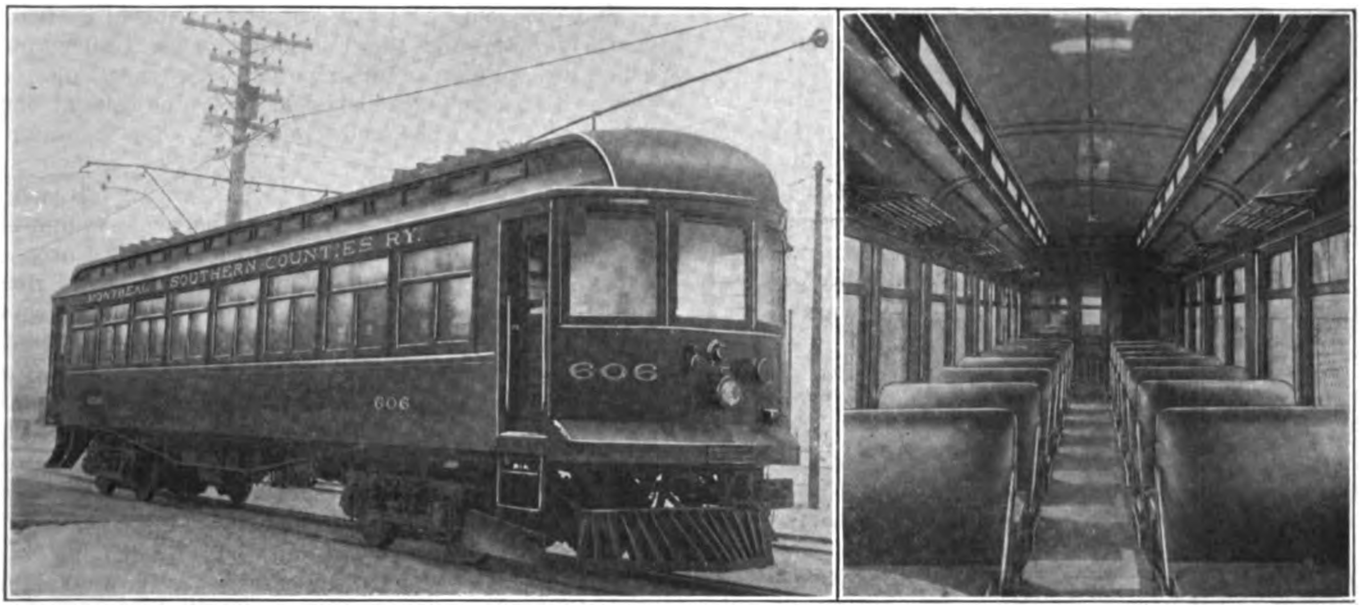
As has been before stated, the writer does not claim that all of the safeguards mentioned herein are necessary to be followed in all cases, but he has simply outlined them so that they may be readily available to axle users in general. To the discretion of the individual must be left the determination as to whether his service conditions demand the insurance provided by these means, or whether there are still further means that he can take to satisfy himself of the quality and condition of the axles.

New Portable Pipe Vise Which Employs Chaingrip Feature

THE "Chaingrip" pipe vise is a simple portable vise which can be quickly moved from one location to another and fastened to any horizontal or vertical support without the use of bolts. It locks pipe or conduit of any size within its limit by the slight push of a lever. The base support is in the form of an inverted V, and the vise is held in position by a heavy wrought-iron chain. This chain, passing around the supporting column, catches in a socket, the tension being adjusted by a nut on an eyebolt, as shown in the accompanying figure.


PORTABLE VISE ADAPTED FOR USE ON ANY SUPPORT

The locking motion of the pipe between the steel jaws and the close-link chain is accomplished by the movement of the handle toward the vise. Beneath the fulcrum point the handle has the shape of a cam, and operates against a movable horizontal bar to the end of which is riveted the steel gripping chain. The fulcrum point of the bar is supported by a threaded bolt, rotation of which raises or lowers the fulcrum point and provides an adjustment of pressure on the gripping chain. The "Chaingrip" pipe vise is manufactured by the Gerolo Manufacturing Company, Chicago, Ill.



NEW INTERURBAN CAR FOR MONTREAL & SOUTHERN COUNTIES RAILWAY

Light Interurban Car for Montreal & Southern Counties Railway

Cars Have Spring Buffers, Center Sills Continuous From Bumper to Bumper and All-Steel Underframes of Through Platform Type

By J. A. Wilson

Superintendent Car Department Ottawa (Canada) Car Manufacturing Company, Ltd.

THE Montreal & Southern Counties Railway, Montreal, Canada, has recently received from the Ottawa Car Manufacturing Company, Ltd., two of three motor cars for interurban service. As these cars operate over the Victoria Bridge they were built as light as possible consistent with strength, the weight completely equipped being 61,000 lb.

The car is built on a special lightweight all-steel underframe of through platform type, the side sills being of 5-in. Z-bar, weighing 11.6 lb. per foot, and the center sills of 10 in. channel weighing 20 lb. per foot, continuous from bumper to bumper. Knees and bumpers are of 6-in. channel with headstocks built up of plates and angles. The bolsters are built up of pressed steel sections, plates and steel castings, and the body is strengthened with both top and bottom truss rods. An anti-climber spring buffer, as described in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 10, 1917, page 867, is installed at each end of the car to take up slight collisions, being guided by channels supported by the center sills.

The body is of wood, well braced, finished on the inside in Mexican mahogany, the outside being painted in Pullman green, the lettering being in gold.

The bodies are mounted on Taylor trucks with Davis steel wheels, the motor equipment consisting of four Westinghouse-306 motors. The air brakes are of Westinghouse type AMM with supplementary reservoirs and governor synchronizing systems arranged for trolley circuits. Other features are the Westinghouse HL control and electropneumatic signal system, pneumatic sanders, luminous arc headlights, strong locomotive-type pilots, steel snow scrapers, Tomlinson automatic car and air couplers, etc.

Attention is directed also to the trap door hinged to the bottom of the vestibule door to cover the step well, and held up with a spring latch when the door is open. (See ELECTRIC RAILWAY JOURNAL, Nov. 17, 1917, page 910.) All vestibule doors are equipped with the Ottawa Car Manufacturing Company, Ltd., holdbacks. The seats are Montreal & Southern Counties' standard reversible type, upholstered in green Pegamoid and the headlining is of Agasote painted green.

Motor-Generator Set for Interurban Car Lighting

A NEW type of motor-generator set has been put on the market by the General Electric Company for the purpose of providing a system of car lighting which will be independent of trolley voltage. It consists of a motor which is driven from the trolley circuit and a compensating generator which produces about 32 volts at any speed at which the motor is likely to operate even under unusual conditions.

The principle upon which the generator operates is shown in the accompanying diagram. The generator armature is series wound, and the field contains twice as many poles as the number of poles for which the armature is wound. In the diagram but four poles are shown. The lighting circuit is taken from the brushes *A* and *C*, and in addition to these load brushes there is a third brush *B* placed 90 electrical degrees from the load brushes. From the diagram it is apparent that the electromotive force between *A* and *C* is the algebraic sum of two electromotive forces produced by the

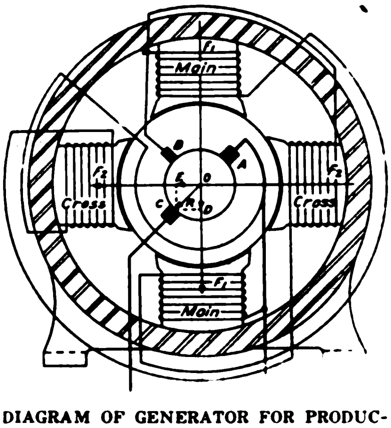


DIAGRAM OF GENERATOR FOR PRODUCING CONSTANT VOLTAGE WITH VARYING SPEEDS pairs of poles which are marked "main" and "cross" respectively. The way in which it is possible to have a practically constant electromotive force between *A* and *C* is explained as follows:

The field may be considered to consist of two independent magnetic circuits. One of these, F_1, is saturated, and the corresponding flux may be called the main flux of the machine. The second magnetic circuit, F_2, is not saturated and the corresponding flux may be called the cross flux. The main flux generates, between brushes *A* and *B*, an electromotive force which can appropriately be termed the main voltage of the machine, while the cross flux generates what may be termed the cross voltage. The excitation, which is taken from brushes *A* and *B*, consists of two branches, one exciting the main poles, the other the cross poles.

Since the main circuit is saturated the main flux remains constant, and the main voltage *AB* is proportional to the speed. Therefore, the excitation of both the main and the cross fields is proportional to the speed. As the cross circuit is not saturated the cross flux will increase in proportion to the speed, and hence the cross voltage *BC* must increase with the square of the speed. As the speed increases *AB* increases, but since *BC* increases faster the difference is constant. Test shows that it can be made constant over a wide speed range.

Of course, in a machine of this type it is necessary to provide for armature reaction. Since the line current is taken from the brushes *A* and *C*, there exists an armature reaction *OR* in the direction *AC*. This may be resolved into two components, *OD* in the direction of the main flux and *OE* in the direction of the cross flux. As the main magnetic circuit is saturated the additional excitation due to the armature reaction cannot add anything to the main flux. The component *OE* will, however, interfere with the cross flux and disturb the regulation of the machine if not counteracted. To overcome it, a series winding is added to the cross poles. This compensating winding provides for adjustment of the compensation, permitting the neutralization of the resistance drop.

That the compensation is effective is shown by tests made to determine the relation between trolley and generator voltages. One characteristic curve plotted between these voltages shows 30 generator volts at 350 line volts, 33¾ at 550, and 30¾ at 750. The maximum is 33¾ volts.

The low voltage of 32 was selected for the system in which the new motor-generator is employed to minimize weight and size of the machine, to produce the proper voltage for the operation of incandescent headlights and multiple operation of lamps, etc. It also furnishes current for the operation of control equipment if desired.

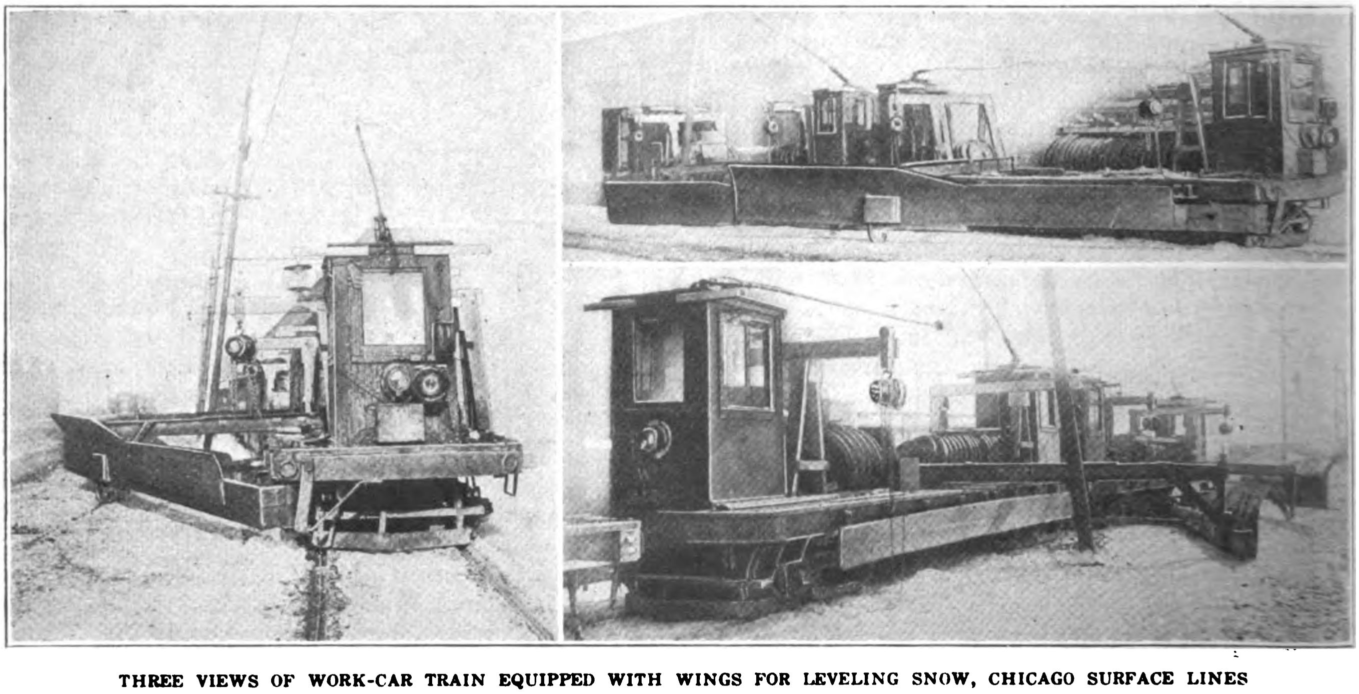
The estimated cost of operation of the lighting of a car equipped with a 250-watt headlight, and one circuit of seven 75-watt and three 25-watt lamps is $153.50 per year, assuming that the lamps burn 1707 hours. Energy is figured at 1¾ cents per kilowatt-hour and haulage at 5 cents per pound per year.

Further details of the lighting system employing this generator will be found in an article by W. J. Walker in the February, 1918, *General Electric Review*, and in an article to appear in an early issue of the *Proceedings* of the A. I. E. E. S. R. Bergman will explain more fully the principles involved in the generator design.

Work Cars Used as Snowplows

SUPPLEMENTING the article printed in last week's issue of the JOURNAL on the use of steel-shod wings on sprinklers and work cars the accompanying three illustrations are reproduced. These pictures have come to hand since last week's article was printed. They show the equipment described in the latter part of that article.

The apparatus illustrated consists of two work cars coupled permanently. Wings are provided on each, that on the front car being used to take off the upper layer of snow from high banks, the one on the rear being set closer to the rail. As was mentioned last week, two additional work cars are used in the rear to augment the propelling power.



THREE VIEWS OF WORK-CAR TRAIN EQUIPPED WITH WINGS FOR LEVELING SNOW, CHICAGO SURFACE LINES

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

St. Louis Strike Settled

United Railways Recognizes Union, but Matter of Wages Will Go to Arbitrators

The strike of the union employees of the United Railways, St. Louis, Mo., was settled on Feb. 7. The agreement was reached when Richard McCulloch, president and general manager, and some directors of the company and a committee of the men met with a special committee appointed by the Chamber of Commerce. This conference continued until after midnight. The agreement reached at that time was ratified by the union at a meeting on the morning of Feb. 8, and cars were again in operation for the evening rush hour on that day. The terms of the agreement are as follows:

1. Right of the men to unionize recognized by United Railways.
2. Men employed in future to be taken in on the preferential shop basis, which means that union men shall be given preference over non-union applicants for work.
3. All old employees of the company to be retained on the same basis they occupied before Jan. 1, whether members of the union or not. All conductors and motormen employed by the company since the start of the strike to be discharged immediately upon ratification of the agreement by the union as a body.
4. The question of wages, hours and other details to be settled at further meetings of committees from the board of directors of the company and the union, these conferences to be held within the next few days.

STRIKE DECLARATION

On the afternoon of Feb. 2 a committee of men left at the office of the company a series of demands including increases in wages which were to be accepted by midnight to avoid a general strike of motormen and conductors. At that time it was estimated that 200 employees and ex-employees of the railway had formed a local union with which the remaining 2500 motormen and conductors were not affiliated in any way. At midnight the union men stopped the cars and the tie-up Sunday morning was practically complete. On Monday, Feb. 4, the company operated sixty cars, on Feb. 5 ninety cars, on Feb. 6 100 cars, and on Feb. 7 about 150.

The strike was accompanied by very little lawlessness. A few cars were stoned on the first day and some glass broken and during the four days a great deal of annoyance was caused by short-circuiting the trolley wire and the rail with gas pipe. In only one case did the riot result in any injury. This happened to innocent bystanders, two of whom were wounded by stray bullets fired by the police.

On the second day of the strike, the company appealed to the Missouri Public Service Commission for an increase in revenue. The way in which the increase is to be accomplished is not indicated, but the most probable methods are as follows:

ALTERNATIVE REVENUE PROPOSALS

1. Increase to 6-cent fare. (This would increase the total revenues more than $2,000,000 a year.)
2. Permission to charge 1 cent for each transfer. (This would increase the total revenues about $1,250,000 a year.)
3. Adoption of a zone system.
4. Accomplishment of increase in earnings by a reduction in taxes. (Net income could hardly be increased more than $300,000 by this method.)

MEN WANT FORTY TO FORTY-FIVE CENTS

It has been estimated that the advance in wages demanded by the men will increase total wages $2,000,000 for the year, while the company's net income last year was only about $600,000, all of which was put into betterments. It is evident, therefore, that to increase wages materially there must be an increase in fare. The present scale of wages varies from 26 to 32 cents an hour according to length of service. The strikers demand a scale ranging from 40 to 45 cents.

Cars for Toronto Delayed

A hearing was held at Toronto, Ont., on Jan. 30 before the Ontario Railway and Municipal Board with respect to the failure of the Toronto Railway to comply with the order of the board requiring the company to put 100 new cars in service by Jan. 1, last. The company introduced as witnesses P. J. Honold, purchasing agent of the New York State Railways, and D. E. Blair, superintendent of rolling stock of the Montreal (Que.) Tramways Company.

Mr. Honold said that the manufacturers had pleaded inability to get steel, owing to the priority of war work, and had contended that they were handicapped by labor shortage. Mr. Blair stated that the Montreal Tramways had secured bodies and trucks for ninety-six cars, but had been unable to secure equipment. During the war deliveries had been slow and equipment ordered on Sept. 1, 1917, had not been delivered. Great difficulty had been experienced in getting motors.

It was planned to continue the inquiry into the car shortage on Feb. 11.

Causes of Labor Unrest

National Mediation Board Points Out Weaknesses in Present Industrial System and Suggests Relief

Greater co-operation between capital and labor is needed in this country in order to secure maximum efficiency. Such is the opinion of President Wilson's mediation commission which has just finished a survey of the labor unrest west of the Mississippi.

Among the causes of unrest the commission says the following stand out:

1. To speak broadly, American industry lacks a healthy basis of relationship between management and men. At bottom this is due to the insistence by employers upon individual dealings with their men. Direct dealings with employees' organizations is still the minority rule in the United States. In the majority of instances there is no joint dealing, and in too many instances employers are in active opposition to labor organizations.
2. Too many labor disturbances are due to the absence of disinterested processes to which resort may be had for peaceful settlement. Force becomes too ready an outlet.
3. There is a widespread lack of knowledge on the part of capital as to labor's feelings and needs and on the part of labor as to problems of management.
4. Wage increases are asked mostly in order to meet the increased cost of living. Such demands should be met in the light of their economic causes.

Too often, in the commission's opinion, is there a glaring inconsistency between American democratic purposes in the war abroad and the autocratic conduct of some of those guiding industry at home. To remove the causes of labor unrest the commission suggests in part the following:

"The elimination to the utmost practical extent of all profiteering during the period of the war is a prerequisite to the best morale in industry.

"Some form of collective relationship between management and men is indispensable. The recognition of this principle by the government should form an accepted part of the labor policy of the nation.

"There is needed the establishment of continuous administrative machinery for the orderly disposition of industrial issues and the avoidance of the waste of disturbances.

"When assured of sound labor conditions and effective means for the just redress of grievances that may arise. labor in its turn should surrender all practices which tend to restrict maximum efficiency."

New York Commissions Report to the State

Review of a Decade of Utility Regulation in the Reports Transmitted to the State Legislature

The Public Service Commission for the First District, embracing the city of New York, recently presented to the Legislature its eleventh annual report for the year ended Dec. 31, 1917.

On July 1, 1917, the commission completed its first decade, having been organized on July 1, 1907. In each year of the ten, the commission has carried on its functions of rapid transit and regulatory work.

The commission says that the past year has been one of the most notable in respect to the construction of commission laws, in that the course of judicial decision has finally clarified the commission's powers and has placed the commission in position to make reasonably effective its orders for the improvement of service and facilities.

$700,000,000 IN SECURITIES

In the last ten years the commission has passed upon the issuance of nearly $700,000,000 in securities of the various corporations.

The decade has also seen vast improvement in transit conditions. The passenger traffic upon street surface lines has increased more than 600,000,000 since 1907.

For several years the commission has given its attention to the construction of the new dual system of rapid transit, the world's largest engineering undertaking, which will cost in the neighborhood of $400,000,000, or more than the cost of construction of the Panama Canal. Its hundreds of miles of track on city and company-owned lines will effect approximately an increase of more than 100 per cent in the city's transit facilities as they existed in 1907.

At the end of the year there remained only five construction contracts to be awarded on the dual rapid transit system. Contracts already let amount to more than $200,000,000 upon lines to be owned by the city of New York.

The contracts awarded during the year were divided as follows:

Class	Number Awarded	Amount of Contract
Construction	1	$257,164
Steel	2	1,456,055
Station finish..........	8	2,237,112
Track installation.....	3	368,862
Track materials.......	8	302,297
Miscellaneous	19	376,833
Totals...............	41	$4,998,323

$100,000,000 FOR RECONSTRUCTION AND EQUIPMENT

Besides the contracts on city-owned lines awarded by the city, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation (Brooklyn Rapid Transit) had either completed or under construction at the end of the year improvements to their elevated railroads amounting to $52,000,000. The companies have also under way provision of equipment for all lines amounting to $56,000,000.

In addition to their payments for new equipment and construction costs of elevated third tracking reconstruction and other improvements, both companies have also contributed substantially to the cost of construction of city-owned lines — the Interborough Rapid Transit Company to the extent of $58,000,000, and the New York Municipal Railway Corporation to the extent of about $14,000,000.

The total expenditures of the commission for the calendar year amounted to $3,253,809, of which $3,001,420 was defrayed from the city treasury and $252,389 was paid by the State.

The commission then reviews the new rapid transit lines opened in 1917 and the ones likely to be opened in 1918.

REGULATION OF CORPORATIONS

At the close of the year 1917 there were 104 corporations under the jurisdiction of the commission, seventy-four being operating and thirty lessor companies. These companies had stocks and bonds outstanding amounting to $1,557,319,355 at the end of the year. Transportation companies had $1,121,296,001 of this total and the gas, electric and steam companies $436,023,354. The increase for the year was $124,398,223.

No stock issues were authorized by the commission in 1917, but bonds were authorized of a par value of $44,167,200. Action was either deferred upon or proposed issues were disapproved amounting to $2,632,572. There were also pending at the end of the year applications from other companies yet undecided for security issues amounting to $5,411,900. Since its establishment in 1907 the commission has allowed issuance of $696,134,677 in securities out of a total of $886,633,329 applied for.

WHAT THE UP-STATE BOARD SAID

The Public Service Commission for the Second District of New York, in its statement to the Legislature, reports that under present conditions, recognized as extraordinary and without precedent because of existing uncertainty as to the immediate and ultimate effect upon the commission of the control of railroad transportation by the government, and the not improbable extension of government control to other public utilities, at least indirectly, it has been considered advisable to eliminate general comment from the commission's report.

Due to the existence of war conditions the question of capitalization of public utility companies has assumed more importance than could heretofore be attached to it. Many of the public utility companies have been directly called upon by the federal government either to furnish energy in large amounts or to establish and maintain additional and enlarged facilities for transportation.

The expansion of facilities for the purpose of meeting these demands has necessitated the procuring of new and additional capital in amounts even beyond those which are ordinarily necessary to enable companies to keep abreast of the ever-increasing normal demand. It has been necessary for the public utility companies to find these additional amounts of capital at a time when the world war had caused financial conditions to have become unsettled, and at a time when the savings of the nation were being borrowed by the federal government on very favorable bases and in unprecedented amounts. That the public utility industry has been able to finance itself at all in the face of conditions such as have existed in the last three-quarters of the year is believed to be a remarkable achievement.

COMMISSION CO-OPERATION

In the present period of stress the commission is lending all possible encouragement to legitimate financial undertakings, and by advice, suggestion and constructive criticism, based upon its wide experience in such matters, is aiding all properly disposed enterprises to solve their financial problems to the end that their service to the public may be maintained and improved.

Stockholders Approve Lease

The stockholders of the Philadelphia (Pa.) Rapid Transit Company on Feb. 8 authorized the board of directors to accept the lease of the projected high-speed city lines. This leaves only the approval of the Public Service Commission to be obtained. The board of directors of the company will meet on Feb. 18 to ratify the lease. The city then will be notified and arrangements will be made to take the matter before the Public Service Commission. After it is submitted to the commission, thirty days will be allowed for protests and suggestions, and then the final hearings will be held.

In discussing the action of the stockholders, W. S. Twining, director of the Department of City Transit, said:

"The action of the stockholders is gratifying because it brings the city and the company into accord on the subject of an operating lease, and thus removes what since 1913 has been an obstacle to transit development in Philadelphia. Until Aug. 17 of last year, when the present lease was submitted to Councils, no progress toward the consummation of a contract had been made. Now that the stockholders have authorized the company to accept the lease, the board of directors probably will meet soon and sign it, after which it will be sent to the Mayor for his signature."

The underlying principles of the lease were discussed in an editorial in the ELECTRIC RAILWAY JOURNAL of Jan. 26, page 166.

May Electrify Belt Lines

Tremendous Traffic Demand at Buffalo Uncovers Heretofore Neglected Transportation Artery

The New York Central Railroad which owns and operates a six-track belt line service around the city of Buffalo, N. Y., has been asked by Mayor George S. Buck to electrify two of its tracks and operate cars or trains on frequent schedules. John C. Brackenridge, retained by the City Council to make a survey of traffic conditions on the lines of the International Railway, recommended this improvement as a solution to the transportation problem in Buffalo. It is pointed out that the population of the city has increased almost 100,000 within the last twelve months and that the city railway is unable adequately to handle the large number of extra passengers. The location of new industries in the northern section of the city, far from the homes of the working classes, has greatly increased the transportation problem.

Details of the plan suggested by Mr. Brackenridge propose a charge of 3 cents as fare over the belt line with an additional charge of 2 cents for a transfer to any local line of the International Railway. The New York Central Railroad already has stations at many points along the 15-mile belt line. This line makes a complete loop around the city intersecting the business and residential sections. It is not intersected by any other railroad and for a greater part of the distance the tracks are either elevated or below the streets. More than 60 per cent of the city's industries are located along the line. The belt line crosses all of the east and west-bound surface railway lines on the east side. Mr. Brackenridge is of the opinion that with the electrification of the belt line Buffalo would have a transportation system better than that of any other city of the same size in the world.

T. W. Evans, general superintendent of the New York Central for the western division, which includes Buffalo, is impressed with the possibilities of this new service. He has been in conference with Mr. Brackenridge and members of the Buffalo Street Railway Commission and the City Council. Unofficial reports to the City Council indicate the New York Central is now collecting $1,750 daily as fares on the belt line under the service as recently improved by the company.

Allowances Increased

Increasing Prices for Materials and Labor Jeopardize Fares Under the Tayler Grant at Cleveland

The street railway committee of the City Council at Cleveland, Ohio, on Feb. 8 approved the Cleveland Railway's request for an increase of 1½ cents per mile in the operating allowance, but cut the requested advance of 3 cents a mile for the maintenance allowance to 1 cent. This will make the allowances 16 and 6 cents respectively, instead of 14½ and 5 cents, as in the past. The company will also be permitted to charge off the deficit of $500,000 of last year at the rate of $30,000 a month. President J. J. Stanley fears that, with the continuance of high prices for all kinds of materials and increasing cost of labor, even this will not be sufficient to meet the expenses.

Fielder Sanders, street railway commissioner, says the prospects are rather gloomy for escaping the maximum rate of fare. This rate is 4 cents cash, seven tickets for a quarter and 1 cent for a transfer with no rebate. He said that 15 per cent of the total equipment was in the repair shop and delivery of new cars and materials seemed almost out of the question. Motormen, conductors and other employees of the company are clamoring for more wages. Their demands must be taken up in May.

PARING EXPENDITURES

No money is to be spent this year on new carhouses or extensions of the present houses, and the program for track repairs and replacements calls for just as little expense as possible consistent with safety and the upkeep of the property. No more cars will be purchased than are actually required by the traffic.

News Notes

New Commissioners Confirmed.—The Senate of New York has confirmed the nominations of Charles B. Hubbell, New York, and Frederick J. H. Kracke, Brooklyn, to be members of the Public Service Commission for the First District.

Fire in Toronto.—Fire destroyed the carhouse of the Metropolitan division of the Toronto & York Radial Railway on the west side of Yonge Street south of St. Clair Avenue, Toronto, Ont., on Feb. 5. Six interurban cars were completely burned.

Municipal Extension Opened.—The opening of the Seattle Municipal Railway extension into Ballard was celebrated on Jan. 27. C. B. Fitzgerald, president of the City Council; Mayor H. C. Gill and Superintendent of Streets Case were among the speakers at the ceremony attending the opening.

Strike Declared Off.—The strike of the trainmen of the Chattanooga Railway & Light Company, Chattanooga, Tenn., begun on Oct. 5, last, has been declared off by vote of the members of the local union there. At its inception the strike took on a serious aspect, but the company promptly replaced the men who went out and service was soon restored to normal. The declaring off of the strike at this time is merely a formality and leaves the present members of the union free agents to seek re-employment.

Minneapolis Union Heard. — Representatives of the union of the Twin City Rapid Transit Company, Minneapolis, Minn., gave their side of the recent strike there to the President's mediation commission at a conference on Feb. 4. Temporary adjustment of the difficulty was effected when the commission visited the Twin Cities.

Search for C. Loomis Allen.—During the past week the daily papers in Syracuse have published several articles in regard to the disappearance on Jan. 10 from Baltimore of C. Loomis Allen, director of the War Board of the American Electric Railway Association. It was reported at first that no clues could be found, but on Feb. 11 the daily papers carried a story that Mr. Allen had suddenly gone to Mexico without notifying his associates in Allen & Peck, Inc. On Feb. 1 his resignation as director of the War Board was presented to the board by J. N. Shannahan.

Programs of Meetings

Central Electric Railway Association

The annual meeting of the Central Electric Railway Association will be held in the Miami Hotel, Dayton, Ohio, on Feb. 28 and March 1. The executive committee will meet at 1.30 p. m. on Feb. 28, and the regular business session will be held at 2.30 p. m. The regular business session on March 1 will convene at 9 a. m. The program for the meeting has not yet been announced.

SINGERS WANTED FOR MEETING

J. F. Starkey, general passenger agent of the Lake Shore Electric Railway, Sandusky, Ohio, is anxious to get the names of anyone who can sing and will join a quartet, perhaps a double quartet, for singing patriotic songs at the coming meeting in Dayton. Those willing to volunteer should notify Mr. Starkey promptly and tell him what voice they sing. If possible a rehearsal will be arranged to take place in Dayton on Feb. 27.

Southwestern Electrical & Gas Association

The general convention committee has decided upon April 15 and 16 as the dates for the convention of the Southwestern Electrical & Gas Association at Galveston, Tex., the headquarters to be the Galvez Hotel. In order to be consistent in the matter of economy the committee has made this a two-day convention instead of a three-day convention as hitherto. There will be no general entertainment for those attending, it being the idea of the committee to economize expense and time and make the meeting strictly a business convention. The details of the program are now being arranged and will be announced later.

Financial and Corporate

Another Abandonment

Ware & Brookfield Street Railway Operating Eleven Miles in Massachusetts to Be Sold

The Ware & Brookfield Street Railway abandoned operation on Feb. 3. The property will be sold for its scrap value unless its future purchaser decides to continue operation. The road is about 11 miles long and has operated in the towns of West Brookfield, Ware, New Braintree and Hardwick, Mass., forming a connecting link in the route between Worcester and Springfield via Spencer and Ware. In April, 1917, the fare unit was increased from 5 to 7 cents. The first six months' operation under the higher fare resulted in about $2,500 increase in revenue, but the traffic decreased about 20 per cent. The total deficit on Dec. 31, 1917, was about $188,000.

IN RECEIVER'S HANDS IN 1905

The road was organized in 1900 as the Hampshire & Worcester Street Railway. It went into the hands of a receiver in 1905 and was sold under the decree of the court to the present owners. No dividends have ever been paid and the bond interest has not been met since the reorganization. The gross earnings in 1916 were $32,299 and operating expenses $44,847. Taxes were $440; interest on funded debt, $6,750; deficit for 1916, $19,739. In 1916 the road carried 566,773 revenue passengers. The principal items of operating expense were: Conducting transportation, $11,852; maintenance of way and structures, $9,699; maintenance of equipment, $7,620; power (purchased from Central Massachusetts Electric Company), $11,2[illegible]; general and miscellaneous, [illegible]. The outstanding bonds [illegible] par value.

[illegible], when it was seen [illegible] operation [illegible] no longer be indefinitely continued under the conditions then prevailing, J. Edward Brooks, president of the company, sent a letter to the selectmen of the various towns served and discussed the future of the property at various conferences. The Ware Board of Trade endeavored to raise local capital to save the property from abandonment, but was unsuccessful. The road was not hampered by jitney competition. Its chief difficulty was low density of traffic combined with high cost of labor and material. Five box cars are owned by the road and there were twenty-two employees on its payroll. President Brooks offered to sell the road to local capital for between $60,000 and $75,000, but nothing has come of this offer. The road has not as yet been placed in the hands of a receiver, but it is probable that one will be appointed within about two weeks. Practically no revenue has been derived for trolley express traffic. All the territory served is rural in character, although some industrial travel has been cared for between Ware and Gilbertville. These points, 4 miles apart, are connected by a branch of the Boston & Albany Railroad.

Annual Meeting in Cleveland

Increased Allowance Wanted for Maintenance and Operation—New Stock to Be Issued

At the annual meeting of the stockholders of the Cleveland (Ohio) Railway on Jan. 30, the following income statement for 1917 was presented:

Operating revenue	$10,176,125
Actual expenses	7,562,338
Net operating revenue	$2,613,787
Non-operating income	80,389
Gross, less expenses	$2,694,176
Taxes	643,108
Net income	$2,051,068
Interest	1,928,856
Surplus	$122,212
Obsolete property	524,000
Net deficit	$401,788

The company has asked for increases in allowances from 5 to 8 cents per car-mile for maintenance and from 14.5 cents to 16 cents per car-mile for operating in order to reduce the deficit more rapidly.

Expenditures for betterments during the year aggregated $1,219,715. The largest items were for laying 11½ miles of new track, building and equipping a new transformer station on Ashland Road and the purchase of seventy-six new trail cars and twenty-five motor cars. The company invested $500,000 in Liberty bonds.

With the population estimated as 800,000, the gross receipts per capita were $12.82. The number of passengers carried was 398,378,894, as compared with 375,382,748 the preceding year. Passengers paid $9,944,350, or an increase of $654,450 over 1916.

If approved by the Public Utilities Commission and the federal authorities, the company will offer stockholders of record of March 1, 1918, $2,700,000 of new stock at par. The right to subscribe will expire on March 15. Subscriptions are to be payable in installments on sixty days' notice.

Proceeds of the sale of stock are to be used to reduce the bonded and floating debt, to pay for extensions, betterments and permanent improvements and for any other purpose found necessary. Should the authorities disapprove of an issue of this size now, the amount will be reduced to the immediate requirements of the company. This is the first time stockholders have had an opportunity to enlarge their holdings since 1914.

Save the Road!

This Is the Plea of the Patrons' Committee to Prevent Abandonment of Taunton & Pawtucket Line

Residents along the line of the Taunton & Pawtucket Street Railway, Taunton, Mass., have not given up hope of saving the road from the scrap heap. The committee of patrons has been very busy soliciting subscriptions to stock in the new company which it is hoped will take over the property. A house-to-house canvass has been announced. Meanwhile the committee has outlined to patrons of the road through placards in the cars the situation with respect to the road and has stated how the committee hopes to accomplish its work. This statement by the committee follows:

FEB. 21 LAST DAY TO ACT

"This railway has been sold at auction for its debts. The sale is very likely to be confirmed in court on Feb. 24; if so, the road passes into the hands of purchasers who do not intend to operate it. They are, however, willing to sell. Therefore the property owners and others interested have until Feb. 21 to raise the money necessary to buy the railway property and keep the road running.

"The present assets of the Taunton & Pawtucket Street Railway, according to a very recent inventory approved by the State Public Service Commission, were more than $225,000. The sum necessary to be raised by the patrons of this road to secure a successful purchase is $75,000, because assurance is given the committee that if $75,000 is raised by the property owners, etc., the balance of $50,000 will surely be forthcoming.

"Do not depend upon the bill presented by Senator Silas D. Reed, for even if it should pass the Legislature—which is extremely doubtful—it will not be in time to save this road, as we have only until Feb. 21.

PUBLIC URGED TO TAKE STOCK

"The shares are $100 each and it is up to you to go the limit and take as many as you possibly can and then some. The stopping of this road will cause a vast reduction in the valuation of your property and a very great inconvenience to you and your tenants. We have talked and talked that we must keep the road running. Now let us do it by subscribing to our utmost limit to the fund for the purchasing of this property. The committee will call upon you for your subscription. The committee also has many others to call on, so please be prepared for their coming."

The fare unit on the line has recently been increased from 5 cents to 7 cents, making the through fare between Attleboro and Taunton 28 cents instead of 20 cents. In addition a charge of 2 cents is made for transfers. This change and previous steps affecting the road were referred to briefly in the ELECTRIC RAILWAY JOURNAL of Jan. 26, page 199.

$7,561,749 Is Dallas Value

This Sum Will Be Used as a Basis in Calculating Profits Under New Franchise

The valuation of the Dallas (Tex.) Railways, the lines consolidated under the Strickland-Hobson management, as fixed by the City Commission, is $7,561,749. This figure will be used as a basis in calculating profits under the service-at-cost franchise.

The basic valuation of the railway properties, as fixed by the terms of the franchise, was $4,100,000, with privilege of adding certain items in connection with the acquiring of the Oak Cliff lines and additions for betterments and improvements. An addition of $100,000 as working capital was authorized. Other additions included amount actually paid for construction of interurban terminal on or before Sept. 30, 1916, $1,301,516; value of property on Sept. 30, 1916, leased from the Northern Texas Traction Company (the Oak Cliff lines), $1,665,697, making a total valuation of $7,167,213. M. N. Baker, supervisor of public utilities, recommended that there be added to this the sum of $394,536, representing the cost of improvements and betterments since Sept. 30, 1915. The company requested that $442,186 be added on this account.

Chicago Elevated Gains

Increase in Revenues Gives Gain of $100,900 in Net Increase Despite Higher Expenses

The combined gross operating revenues of the elevated lines in Chicago for the year ended June 30, 1917, rose $854,905 or 10.1 per cent as compared to those of the preceding year. Such is the showing indicated by the latest annual report of the Chicago Elevated Railways Collateral Trust, which controls the South Side Elevated Railroad, the Northwestern Elevated Railroad and the Metropolitan West Side Elevated Railway.

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Gross operating revenue	$9,289,913	100.0	$8,435,008	100.0
Operating expenses:				
Way and structures	$212,692	2.3	$184,837	2.2
Equipment	523,156	5.6	459,679	5.4
Power	1,155,093	12.4	991,533	11.8
Conducting transportation	2,407,088	25.9	2,270,081	27.0
Traffic	27,677	0.3	20,610	0.2
General and miscellaneous	498,777	5.4	408,321	4.8
Total operating expenses	$4,824,486	51.9	$4,335,061	51.4
Net operating revenue	$4,465,427	48.1	$4,099,947	48.6
Taxes, city compensation and other items	863,334	9.3	722,115	8.6
Operating income	$3,602,093	38.8	$3,377,831	40.0
Non-operating income	*151,589	1.6	*135,694	1.6
Gross income	$3,753,682	40.4	$3,513,525	41.6
Deductions—interest and rents	*2,386,662	25.7	*2,247,407	26.7
Net income	$1,367,020	14.7	$1,266,118	14.9
Dividends	1,176,345	12.6	1,135,543	13.4
Surplus	$190,675	2.1	$130,576	1.5

*Intercompany rentals deducted.

The operating expenses of the combined lines, however, increased $489,425 or 11.3 per cent, so that the net operating revenue gained $365,480 or 8.9 per cent. Increases occurred in all the expense items. Furthermore, the taxes rose $141,219 or 19.5 per cent, and the income deductions $139,255 or 5.7 per cent, these increases overbalancing the gain in non-operating income. As a result the gain in net income amounted to $100,902 or 7.9 per cent.

The report of the Chicago Elevated Railways Collateral Trust, which is for the calendar year 1916, states that the trust received dividends of $1,218,991 on stocks owned and interest of $153,483, making a total income of $1,372,474. The interest charges totaled $1,186,815, the total disbursements amounting to $1,248,674. After providing for $198,648 of expenses incidental to the extension of secured gold notes, dated July 1, 1914, the trust had a surplus of $7,848 as of Dec. 1, 1916.

Expenses Outrun Revenues in Columbus

At the annual meeting of the stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, on Jan. 29, Samuel G. McMeen, president, reported that the gross revenue for the last year increased $486,786, or 13.76 per cent, but operating expenses and taxes increased $838,804. Because of the increase in the cost of coal, which amounted to $603,190, or 75.41 per cent of the increased operating expenses, the increase in the gross revenue was not sufficient to take care of the advanced prices in all classes of supplies and materials and the greater tax assessments, with the result that a material deficit was shown over the previous year. This explains the reason for passing the dividend on common stock on Feb. 1.

In an address before South Side citizens on Jan. 30, Harold W. Clapp, general superintendent of the company, declared that the rate of fare will have to be raised shortly. He said that Council will soon be asked to allow the company to sell fewer tickets for 25 cents than at present, eight tickets being the present rate. In his opinion the service-at-cost plan will be worked out after the war when conditions in the nation again have reached a normal state.

An Investor Speaks Up

Praise for Oregon Commission from Man Who Saw His Investment Shrinking With No Buyers

M. S. Kohler, Louisville, Ky., a stockholder in the Portland Railway, Light & Power Company, Portland, Ore., in a communication to the Public Service Commission of Oregon, blamed politics for past troubles of that company. After acknowledging receipt of the order of the commission in the recent 6-cent fare case, Mr. Kohler said in part:

"Personally, as a stockholder and as president of an investment company that has considerable holdings of Portland stock, I want to say it is gratifying to know that the increase in rates has been granted, and that right and justice to the stockholders were equally considered with that of the company's employees and the public.

OUT OF POLITICS

"The report shows that the commission has gone into the question very exhaustively and minutely, and I would infer that what the members do not know about electric railway management or overlooked in their investigation would hardly be worth while mentioning. The commission has well remarked: 'Some who do not realize the changed state of affairs are prone to use their newly acquired powers in belaboring their ancient enemy.' The company has suffered much from the Rushlights, the Dalys and even now a prominent commissioner of Portland is playing to the galleries in the same fashion. It took courage to do right, and the members of the commission deserve great credit that they dare to do their duty as they understood it, in spite of an opposition that is more interested in making political capital for themselves than to consider the interests of the whole city of Portland.

"It will take expert management, even with increased fares, to restore the credit of the railway; the stock has no market and is pressed for sale at nominal figures, without buyers. The water power possessed by the Portland company is a great asset, and were the company compelled to operate by steam alone, with the wages paid the men and the high cost of materials, the 6-cent fare would not by any means stem the tide of bankruptcy which has been staring it in the face."

The Portland decision was reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 26, page 184.

Municipal Railway Lost $135,497

According to figures of the Public Utilities Department of Seattle, the city's municipal electric railway lines, Divisions A and C, were operated between June 1, 1914, and Dec. 31, 1917, at a total loss of $135,497. This covers an interest charge of $1,593 a month on bonds issued for the construction and equipment of Division A. Beginning on Jan. 1 the interest charge was increased to $2,093. Mayor H. C. Gill expects that this deficit of more than $135,000 will be wiped out within three years through the operation of city cars to the north city limits of Ballard.

Notable Progress by Cities Service

Cities Service Company, New York, N. Y., and its subsidiaries report that earnings for the twelve months ended Nov. 30, 1917, exceeded the 1916 figures by more than $10,000,000. The company says:

"Due to the high operating costs, the net earnings of the public utility subsidiaries did not of course fairly reflect the unprecedented volume of business of the properties, but the oil interests developed to such magnitude as to result in record earnings. Total surplus and reserves of the company increased by $50 for each share of common stock outstanding in the hands of the public, and on Nov. 29 amounted to $22,597,906, or nearly $100 a common share. In the first eleven months of the year $12,509,436 of surplus earnings became available for reinvestment in the properties, and consequently to augment the values protecting the stocks. In the month of November these surplus earnings amounted to $1,247,682. From the beginning down to date the total is $27,056,138. The balance for the common stock was equivalent to 61 per cent, as compared with 37 per cent."

Tacoma Municipal Railway Results

The municipal tideflats railway in Tacoma, Wash., during the period from Nov. 12 to Dec. 31, 1917, showed gross earnings of $9,573. The expense of operation was $7,233. The net income was $2,340. These figures were supplied to the City Council recently by Controller Fred Shoemaker. The line is operated by the Tacoma Railway & Power Company for the city. Mr. Shoemaker stated that the figures for the first six weeks under the new contract dated Nov. 12, 1917, probably would not be fair indication of what the city will get out of the line in months to come, with improved methods of handling traffic, added equipment, etc. According to the controller the railway strike last summer was directly responsible for a deficit of $4,187 in the operation of the line under the old contract. This amount the city will have to pay the Tacoma Railway & Power Company by warrant on the general fund.

Financial News Notes

Receivership Application Denied.—At the office of the North American Company, New York, N. Y., it was stated on Feb. 9 that upon conclusion on Feb. 8 of arguments in the application filed on Jan. 7 by a stockholder of the United Railways, St. Louis, Mo., for the appointment of a receiver for that company, the application was promptly dismissed by Judge Dyer of the United States District Court on the ground that the allegations contained in the application did not justify a receivership and showed no cause of action.

Seeks to Take Over Light Company.—The Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., has filed a petition with the Indiana Public Service Commission, in which it asks authority to buy the common and preferred stock of the West Indiana Utilities Company, which operates the lighting plants at West Terre Haute and Brazil, Ind., for a total of $121,000 in cash. The Terre Haute, Indianapolis & Eastern Traction Company now sells energy to the West Indiana Utilities Company. The common stock of the latter company totals $50,000, and the preferred stock $150,000.

Abandonment of Line Approved.—The Helena Light & Railway Company, Helena, Mont., has been authorized by the Railroad and Public Service Commission to discontinue service on the Upper Broadwater Street railway from the trestle west to the Broadwater. The commission found the company was operating two almost parallel tracks between Broadwater hotel and trestle, known as the Upper and Lower Broadwater lines. The distance between the lines in the territory involved did not exceed at any point four or five blocks. It was estimated that to put the line in safe and proper condition for traffic at least $10,000 would have to be expended by the company.

Philadelphia Suburban Issue Offered.—Bioren & Company, Philadelphia, are offering first mortgage 5 per cent gold bonds of the Philadelphia & Garrettford Street Railway, Upper Darby, Pa., due on Aug. 1, 1955, of which there are $3,000,000 authorized, $1,910,000 outstanding and $1,090,000 reserved for future requirements. The company is operated by the Philadelphia & West Chester Traction Company as a part of its system, under an operating agreement by which the terminal property at Sixty-ninth Street is jointly used, the Philadelphia & West Chester Traction Company paying the Philadelphia & Garrettford Street Railway sums equal to the semi-annual interest payments on all of these bonds, taxes, expenses and maintenance.

Bonus to the City.—The Helena Light & Railway Company, Helena, Mont., recently tendered City Treasurer Martin Doty a check for $6,388 as bonus to the municipality on the company's gross earnings for 1917. Under a municipal ordinance adopted some time ago, the company is to pay 1¼ per cent on the gross earnings when its receipts show an increase of 20 per cent or more over those of the year 1900, 1½ per cent on the earnings if the gain be 40 per cent or more and 1¾ per cent on the earnings when the increase amounts to 60 per cent, and 2 per cent on the gross earnings in the event the gain totals 80 per cent. Earnings of the railway department for 1917 amounted to $92,981, an increase over 1900 of more than $46,059, or about 80 per cent. The amount due to the city of Helena as its share of this sum is $1,859.

A New Convertible Bond.—Henry L. Doherty & Company, New York, N. Y., and associated dealers are offering for subscription Toledo Traction, Light & Power Company second lien 7 per cent three-year gold bonds due on Jan. 1, 1921, issued in connection with the financing of certain maturing bonds of the company and the extensive additions being made to the subsidiaries of the company at Toledo. The bonds may be converted at any time from July 1, 1920, to Dec. 1, 1920, both inclusive, at the option of the holder, into $85 par value of preferred stock and $15 par value of common stock of Cities Service Company for each $100 principal amount of bonds. If the bonds are called for redemption before maturity the holders are entitled to the conversion privilege after notice. The bonds are secured, subject to the first lien bonds of the company, by the pledge of $16,829,000 face value of bonds and $20,563,400 par value of stocks, or a total of $37,392,400 of securities of operating companies in and about Toledo.

Electric Railway Monthly Earnings

ATLANTIC SHORE LINE RAILWAY, SANFORD, MAINE

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'17	$12,450	$23,250	†$10,800	$473	†$11,273
1 " "	'16	21,935	32,852	†10,917	668	†11,585

FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'17	$307,865	*$212,254	$95,611	$50,970	$44,641
1 " "	'16	230,174	*133,385	96,789	49,795	46,994
12 " "	'17	2,867,310	*2,010,464	856,846	594,454	262,392
12 " "	'16	2,502,142	*1,637,893	864,249	586,046	278,203

*Includes taxes. †Deficit. §Includes accruals under rapid transit contracts with city payable from future earnings.

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period		Revenue Operating	Expenses Operating	Income Operating	Charges Fixed	Income Net
1m., Dec.,	'17	$3,740,927	*$2,076,032	$1,664,895	$1,102,031	†§$768,433
1 " "	'16	3,634,246	*1,740,602	1,893,644	999,132	†§959,027
6 " "	'17	19,669,015	*11,094,712	8,574,303	6,482,085	†§3,554,231
6 " "	'16	19,023,024	*9,178,479	9,844,545	5,973,773	†§4,220,831

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'17	$574,790	$343,918	$230,872	$122,720	$108,152
1 " "	'16	480,765	273,062	207,703	99,171	108,532
12 " "	'17	6,389,608	3,992,670	2,396,938	981,861	1,415,077
12 " "	'16	5,170,441	2,662,837	2,507,604	887,661	1,619,943

Traffic and Transportation

Fare Raise by Maine Utility

New Zone Fare Tariff With Six-Cent Minimum Filed With Commission by Company at Portland

The Cumberland County Power & Light Company, Portland, Me., has filed with the Public Utilities Commission a revised schedule of rates of fare on the lines of the Portland Railroad operating in and about Portland.

In brief, the schedule provides a "copper zone" system, similar to that in use in Milwaukee, Wis., Worcester and Holyoke, Mass., Concord, Mass., New London, Conn., and other cities. A central zone, with a 6-cent basic fare, is proposed to cover practically all of the thickly settled portion of Portland proper and the greater part of South Portland. Outside the central zone are a number of other zones, each approximately 1 mile across. The zone rate is 2 cents. The longest route is the ride from Portland to Saco, with a total fare of 32 cents. The fare to Yarmouth will be 24 cents and to Old Orchard Beach, a popular shore resort, 28 cents. Only ten days ago the commission sanctioned the withdrawal, of "cut rate tickets" on the Westbrook Line.

The new rates will become effective on March 11 unless suspended by the commission.

The company has entered upon a campaign of publicity as to the new rates. Advertising space is being used in all the local papers, leaflets are being distributed in the cars, and placards are being placed in car windows. The company has also covered the ground fully in communications to the city governments and other civic bodies interested.

A statement in regard to the proposed increase was made by A. H. Ford, vice-president and general manager of the company, recently. Mr. Ford said in part:

FURTHER DELAY IMPOSSIBLE

"We have put off this step as long as possible. It costs us more to maintain the service to which the public is accustomed than the public pays us. That is all there is to it.

"We will not only put all the facts before the Public Utilities Commission; we shall, through the press and otherwise, put them before the public. We feel that enlightened public opinion should not only be informed but consulted, and we desire suggestions as to how to get the additional revenues that are indispensable for the continuance of good service. We have nothing to conceal.

"This problem is not peculiar to Portland. More than 150 companies have obtained increased fares or have taken the necessary legal steps to get them; but many have gone into receiver's hands. One such company is the Bay State Street Railway of Massachusetts, the second largest in mileage in America, despite the fact that its fares were increased only last summer. Several other New England companies have sold their lines for junk.

"If we were forced to reduce service, in order to cut expenses, the result would be:

"1. Cars could not move as frequently.

"2. Cars would be crowded.

"3. Cars could not be kept fresh and clean.

"4. The roadway and equipment could not be maintained.

"5. Rails could not be renewed.

"6. New sections would go undeveloped.

"The prosperity of the city and its railway go hand in hand. The whole matter is simply a business inquiry. The main interest of the public is that its service be kept up. Our business is not a private matter. We ask that the public's judgment be reserved until we have given them all the facts."

The date for the hearing on the application of the company has been set for Feb. 25.

Commission Replies to City

The Public Service Commission of the State of Oregon advised the city of Portland on Jan. 28 that if the City Council will present evidence showing that the commission's 6-cent fare order to the Portland Railway, Light & Power Company was erroneous or without justification, the commission will reopen the case, but it denies the resolution of the Council asking for a rescinding of the order on the ground that the commission had no jurisdiction to issue it. The commission asserts that it cannot consider the jurisdictional question involved, as the Attorney General, its legal adviser, had ruled that the commission had jurisdiction in the case. The commission makes it plain, however, that it will not reopen the case unless the application for rehearing is accompanied by evidence from the Council that the order was without justification.

The City Council has retained Judge Martin L. Pipes to assist City Attorney La Roche in contesting the 6-cent fare order. Complaint of the city against the company will be filed in the Circuit Court in the immediate future, and will involve the question of the right of the commission to alter the 5-cent fare provision, and also several other questions pertaining to jurisdiction in the case.

Commissioner Bigelow on Jan. 30 submitted to the Council an ordinance providing for the revocation of all the railway franchises of the company on the ground that in charging a 6-cent fare the company is not complying with the requirements of its franchise.

Connecticut Brief Filed

Counsel for Hartford Urges Zone System With Five-Cent Minimum Rather Than Flat Six-Cent Rate

The city of Hartford, Conn., has filed its brief with the Public Utilities Commission in connection with the case growing out of the petition of the city to the commission to require the company to return to a 5-cent fare in Hartford. The reply of the city was made through Corporation Counsel Francis W. Cole. The legal representative of the city disagrees with the representatives of the company that in so far as Hartford is concerned there is any advantage to that city under the scheme of organization of the company in considering all the lines that it operates as a unit. He expresses the belief that a Hartford company, with all its lines profitable, would have credit as good or better than the Connecticut Company and could purchase just as advantageously. He says that there seems to be no justification for Hartford bearing the burdens of lines in Waterbury, Bridgeport, Stamford or New Haven.

ZONE SYSTEM WITH FIVE-CENT CITY MINIMUM

Mr. Cole reviews the testimony as to the financial prospects of the company. In this connection he says that choice will soon have to be made between a zone system with a 5-cent minimum and a further increase to a flat 7 or 8-cent fare. If this is what the company is coming to, he thinks the company had better be compelled to do it with a 5-cent minimum fare in cities, which fare caters to the short and profitable rider, than to be forced to adopt the same plan with a 6-cent minimum fare, which is inconvenient for the public and kills a considerable percentage of the traffic.

Mr. Cole sums up the city's claims as follows:

1. That Hartford has a right to have its railway lines considered separate and apart from other properties of the Connecticut Company with a view to determining whether or not a rate of fare in the city of Hartford is reasonable.
2. That it is not deprived of the above right by the fact that the company's books and accounts have not been so kept as to make available figures on revenue received and cost of operation within the city.
3. That if the company needs additional revenue, it should be obtained by an equitable rearrangement of its fare zones.
4. That the 6-cent fare is unreasonable as a minimum fare as well as impractical and unjust to the short rider.
5. That as far as appears from the evidence, a 5-cent fare is a reasonable maximum fare within the limits of the city of Hartford.

In conclusion Mr. Cole says:

"Notwithstanding the difficulties which may stand in the way of evolving a just fare structure, it is the duty of public service officials to take hold of

Review of Salt Lake Fare Decision

Utah Commission Abolishes Four-Cent Tickets, But Refuses the Request for a Transfer Charge

By a unanimous vote the Public Utilities Commission of Utah, as noted previously in the ELECTRIC RAILWAY JOURNAL, decided recently to permit the Utah Light & Traction Company, Salt Lake City, to discontinue the sale of 4-cent tickets and to establish a straight 5-cent fare. The order went into effect on Jan. 1. The company was required to honor 4-cent tickets purchased before Jan. 1 through the month of January and to redeem such tickets for cash up to and including Feb. 28. In connection with the order to the company the commission reported its findings as follows:

1. Rates, fares and charges fixed by a franchise ordinance prior to the enactment of the law creating the commission may be changed by the commission, where authority to fix such rates was not expressly delegated to the municipality by the Legislature.
2. Present revenues of petitioner found to be insufficient.
3. Commutation books of fifty tickets for $2 abolished.
4. Permission to charge 1 cent for transfer denied.
5. Permission to establish additional 5-cent rate zone to Senterville and Sandy-Midvale lines denied, but a new division of zones prescribed so to afford a slight increase in revenue.
6. Free transfer privilege ordered at Midvale Junction to or from Sandy and Midvale.
7. Not more than one 5-cent fare may be charged for a ride wholly within Bountiful City and Murray City.
8. Physical valuation for rate-making purposes should be ascertained.

The company asked (1) for relief from the 4-cent ticket; (2) permission to charge 1 cent on transfers issued; (3) the right to add a 5-cent zone on two of its suburban lines on which the fare was 20 cents to the termini—proposing to make the fare to the termini 25 cents. A new tariff to this effect was filed with the commission on July 30, to become effective on Aug. 29. The tariff was postponed and a date for hearing set by the commission. The hearing, together with the argument, including several postponements, took up the time from Aug. 29 to Nov. 15, on which latter date the hearing was concluded by final argument on the part of petitioner and protestants.

The company asserted that in view of increasing cost of labor and equipment it was imperative that additional revenue should be obtained by means of increased fares.

The protestants contended that the conditions as set forth did not justify the application being granted and that the commission was without jurisdiction, in that existing franchise agreements could not be set aside.

On the matter of jurisdiction the commission said:

"There is no express authority in the constitution of the State or of the acts of the Legislature that would authorize the cities or towns in this case to fix rates that cannot be modified or changed by authority of the Legislature, and therefore the contention of protestants cannot be sustained. To take any other position would be to nullify important provisions of the act creating the commission and setting forth its duties and powers."

With respect to the valuation of the property of the company the commission said:

"A way must be found to insure investors with certainty the treatment their investment will receive if public service by private initiative is to be continued. A fair valuation of the property for rate-making purposes should, therefore, be ascertained. The commission recognizes that it is the proper body to ascertain this fair valuation of the physical property of the petitioner devoted to electric railway service, but to make such valuation would require considerable time and expense to the petitioner and to the commission, and, in the meantime, on the face of the showing made, it appears to us that the petitioner is entitled to some measure of relief if it is to maintain adequate service."

SOME RELIEF NECESSARY

In reviewing the probable effect of the change in rates on the earnings of the company the commission said:

"The petitioner has also compiled the hypothetical results of operation for one year, based on the application of the revised tariff proposed by it, applied to the operations of the first six months of 1917, which shows that if the commission granted all that was asked for by the petitioner, the net returns on a depreciated property valuation of $6,370,582 would be 5.4 per cent.

"It could not be expected that the petitioner at this critical time should obtain such relief as to make its investment whole. Part of the burden occasioned by the world war should properly be borne by the company.

"That relief is necessary appears to us to be evident, and it should be granted, in the absence of evidence to show that the company has been making such profits in the past as would carry its increased expenses over the present period, and until conditions have changed and become normal."

(*Concluded from page 339.*)

the various problems and solve them. Thus only can the burden of intolerable traffic conditions be removed from the shoulders of the workers in Hartford.

"Electric railway operation should be so conducted that it means fairness and service to the entire public, urban as well as suburban. If it were so conducted the result would be that the suburbanite would take upon himself the real cost of his own transportation and the car-riders living in each city would be relieved from the obligation of paying partly in cash and partly in poor service for the cost of carrying passengers to suburban towns or carrying them in other cities a considerable distance away, and with which there is in reality no community of interest so far as the carriage of passengers upon electric railways is concerned."

Skip-Stop Being Considered

Bulletin of Fuel Administration Describes Advantages — Conferences Held, But No Decision Reached

On Feb. 8 the United States Fuel Administration issued a bulletin that it has had under consideration for some time past, the question of putting into effect "skip-stop" schedules on urban and interurban electric railways. Conferences have been held with railway heads, officials of public utilities commissions and statistical experts and much information has been gathered. However, no decision has been reached and definite conclusions will be delayed until all the facts have been assembled and digested.

The Fuel Administration says that the proposition before it is substantially as follows:

"The regular passenger stopping places for electric railways shall be spaced so as not to exceed eight per mile in urban districts and six per mile in suburban districts. On interurban lines the regular passenger stopping places shall not exceed four per mile. Where safety stops are necessary they shall be combined, when practicable, with the passenger stops.

"Some of the points made in favor of the order are:

"Three times as much power is required to make an electric car stop and start as to run a block.

"There are approximately fifty million car stops made in the United States each day. The skip-stop schedule would eliminate one-third of these. The elimination of six billion stops a year, together with the regulation of car heating, will bring a fuel saving of not less than 1,500,000 tons of coal a year, which will meet the fuel needs of 300,000 average families.

"The reduction of car stops, it has been stated, will in a large measure serve to relieve the congestion of the overloaded street railway systems of the country and will enable better and quicker service to the individual. Under the present conditions of operation the number of stopping places for electric cars in urban districts is often fourteen or more per mile, and in suburban districts and on interurban lines is often correspondingly excessive when the character of the districts is considered.

"Students of street railway operation who favor the skip-stop order argue also that, by reason of the coal transportation shortage, there would be far less inconvenience to the public, and less interference with general business, through reducing the number of electric railway stopping places than through curtailing service.

"The use of a reduced number of stopping places for electric cars was introduced in Cleveland, after a favorable vote by the car traveling public, as a means of obtaining better service and not of saving fuel. The plan has been adopted with success in Detroit, Buffalo and other cities, according to figures submitted in semi-official reports and statements of car users."

Suggestions for Buffalo

Expert Favors Complete Rerouting—Says a Total of 770 Cars Is Needed

After an investigation covering a period of almost four weeks, John A. Brackenridge, New York, who has been retained by the City Council of Buffalo, N. Y., to make a survey of traffic on local lines of the International Railway, has reported that the company needs 770 cars to handle passengers during the peak-load hours. When it has received the last of the cars now being built for the company, the International Railway will have 834 cars or a surplus of sixty-four cars over its actual requirements. For some time past the company has had an average of 524 cars in daily service and 249 cars out of commission undergoing repairs. It is the opinion of Mr. Brackenridge that the company should never have more than 10 per cent of its equipment out of service.

The Municipal Traffic Commission has sent a recommendation to the City Council asking that action be started against the railway to abrogate its 999-year franchise. No action has been taken by the City Council on this matter, but the corporation counsel and the city law department have been instructed by Mayor George S. Buck to investigate the method of procedure and to prepare evidence for alleged violation of its franchise on the part of the railway.

E. J. Dickson, vice-president of the railway, has been furnishing Mayor Buck weekly with a statement of crippled cars undergoing repairs. This statement is in accord with the recommendation of Mr. Brackenridge. In commenting upon the large number of crippled cars, Mr. Dickson said that the increase in crippled cars was occasioned by the extreme cold weather and the very bad conditions that prevailed in the streets.

Complete rerouting is recommended by Mr. Brackenridge. To assist in this work a large map is being prepared by Mr. Brackenridge showing the direction of traffic and where traffic is the heaviest. The city has been divided into numbered zones each representing a section of the city one-half mile square. The population in each square is indicated. Veins of various colored ink show the direction of travel to and from the industrial sections and retail sections during all rush-hour periods.

San Francisco Trans-Bay Rate Case

Joint Plan of Operation Suggested by Opponents to Increase. After a Week's Discussion Case Continued for Further Study of Plan

The hearing of the trans-bay rate case of the Southern Pacific Company and San Francisco-Oakland Terminal Railways, the Key Route, before the Railroad Commission of California, was continued on Jan. 24. The application of these companies for increase in suburban fares was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 1, 1917, page 1011. The hearing beginning on Jan. 24 continued for one week, during which time many witnesses were called. C. W. Durbrow represented the Southern Pacific and W. E. Creed the San Francisco-Oakland Terminal Railway. The Oakland Chamber of Commerce, the Berkeley Chamber of Commerce, the city of Alameda and the city of Berkeley were represented.

J. J. Jessup, former city engineer of Berkeley, called attention to the surplus service rendered by the two companies in Berkeley. Some of the parallel lines are only 600 ft. apart. A. F. St. Sure, city attorney of Alameda, testified that the ordinances granted by that city in 1914 under which the suburban lines operate are for thirty-four and forty-five years' duration and call for a 5-cent fare in the city limits, a 10-cent fare between San Francisco and Alameda, and a commutation rate of $3 a month. A. Kibbe, valuation expert of the Key Route, testified that his company might be able to maintain a 10-cent fare on the profitable lines, but could not do it on a commutation rate. He stated further that while the company had been losing money on the operation of the Key System, some of the individual lines were profitable. The testimony of Robert Adams, assistant auditor of the Southern Pacific Company, showed that there had been an increase of $154,000 in the earnings of the Southern Pacific suburban system in Alameda County in 1917, as compared to the 1916 earnings. The electric service is charged with 25 per cent of the cost of maintaining the stations.

John S. Drum, a director of the San Francisco-Oakland Terminal Railways, presented a reorganization plan, based upon the valuation of $17,695,818 placed upon the system by the Railroad Commission. Under this valuation Mr. Drum would provide 70 per cent in 5½ per cent bonds at 90, and 25 per cent preferred stock at 80, and the balance in common stock in such amounts as the Railroad Commission may approve. Taking this as a basis he outlined the necessary earnings of the company as follows:

Operating expenses, including $178,066 depreciation on equipment	$3,771,075
Taxes	247,166
Depreciation reserve	382,775
Bond interest	756,995
Margin of safety for bonds	196,154
Dividends on stock	341,546
Gross earnings necessary	$5,695,711
Estimated gross revenue under present rates	4,754,928
Necessary increase	$940,783

The increase of $940,783 it is proposed to raise by the increase in the trans-bay rates which the company is now seeking.

COMPOSITE OPERATION SUGGESTED

A composite scheme of operation was suggested by B. D. Marx Green and outlined by Robert N. Prouty, former assistant professor of railroad engineering at the University of California, and now connected with the Berkeley city engineer's office. Mr. Prouty stated that a saving of $1,171,000 could be made by the two companies by combining transportation facilities, and to bear out this statement he drew attention to the following points: Three systems are now in operation, each connecting with ferry boats at separate terminals. Seven boats are operated on all-day service, one extra boat is used at the busiest period of the day, while four other boats are held in reserve. In addition, one boat goes to the Western Pacific terminal to meet main-line trains and three freight boats operate on the Oakland harbor route. The latter route, however, was not considered in the system outlined.

ONE FERRY SUFFICIENT

Mr. Prouty pointed out that one ferry line operating six boats to the Oakland mole could take care of the daily rush hour traffic. A saving in train operation, which would reduce the cost of power and maintenance, could be effected by eliminating the Alameda mole and terminal; Key Route mole and terminal; Key Route subway and power house; several lines of each company in districts where they parallel each other in Oakland and Berkeley, which are solely competitive; and a portion of the Southern Pacific lines leading from the Alameda mole to Alameda.

Mr. Prouty estimated that the trans-bay traffic of 1917 operated as a composite system such as the one outlined, would have netted a profit of $1,088,768, or 7.26 per cent on the investment of $15,000,000. His statements were based on the exhibits of operating costs of the two companies from which he made theoretical combination of the resources and facilities of both.

COMPANIES WANT DETAILED INFORMATION

The final hearing in this series of sessions on the case was held on Jan. 30, when counsel for the two companies demanded detailed information as to operating costs under the system outlined by Mr. Prouty. Just what information should be furnished and the length of time that should be allowed for its compilation will be determined upon by Richard Sachse, chief engineer of the Railroad Commission. It is believed that several months may be allowed for the preparation of these data. A date for continuation of the hearing is to be announced later.

Prospects of Quick Relief

First Section of Beeler Report on Washington Acceptable to Both Commission and Company

Announcement is made that the first section of John A. Beeler's report on the Washington traffic situation as abstracted in the ELECTRIC RAILWAY JOURNAL for Feb. 2, page 223, has been accepted in full by both the Public Utilities Commission of the District of Columbia and by the Capital Traction Company. The railway, in fact, agreed on Feb. 6 to put Mr. Beeler's recommendations into effect voluntarily without awaiting the formality of a hearing. This is doubtless a record in the acceptance and early enactment of recommendations for traffic relief.

The principal recommendations of Mr. Beeler were a 40 per cent cut in stopping places in the congested section, double-berthing, front-end fare collection, limitation of turn-backs at the New York Avenue crossover through routing of Chevy Chase cars; and certain changes dependent upon the municipality, such as one-way traffic, raised safety platforms, traffic policing and automobile parking.

The second section of Mr. Beeler's report, which deals exclusively with stops, is printed elsewhere in this issue.

Increase for Aurora Line

Company Allowed Two Cents a Mile but Must Retain School Tickets and Low Rates in Two Cities

The Public Utilities Commission of Illinois has granted to the Aurora, Elgin & Chicago Railroad, Aurora, Ill., permission to file a new fare schedule, establishing passenger fares based on 2 cents a mile, with a minimum charge of 5 cents, commutation ticket rates and the various items as set forth in the company's proposed tariff, except that the so-called school tickets shall not be limited to the use of school children, but may be used by all children up to eighteen years of age. The company is not permitted to cancel its six-for-a-quarter tickets in Aurora, and its six-for-a-quarter tickets in Elgin until further order of the commission.

NEW TARIFF FILED IN DECEMBER

The company filed with the commission on Dec. 1, a new tariff in which it proposed to advance its fares as reviewed in the ELECTRIC RAILWAY JOURNAL of Dec. 15, 1917, page 1096, and proposed also that the new rates become effective on Jan. 1. After two hearings in the case, the commission on Dec. 28 issued an order suspending the tariff until May 1, 1918. Further hearings were conducted in January, and on Jan. 21 the company made a motion, after a notice to all objectors, that the commission enter an order putting into immediate effect the rates as set forth in its tariff.

Figures submitted by the company setting forth operating results for the first ten months of the calendar year 1917, as compared with figures for similar periods in the three preceding years, showed that although operating revenues had increased, the advance had not kept pace with the increase in operating expenses. During the first ten months of last year the company expended $100,853 more for coal than in the same period in 1916. In the single item of brakeshoes it was shown that the increase in cost for 1917 over the preceding year was $567. It was stated that under the order of the federal government effective Nov. 1, 1917, the cost of coal will be further increased about $45,000 a year. The company must meet certain financial obligations falling due in the near future. It also expects to increase the wages of its employees.

The commission decided that the company's request should be granted in part, and that the changes be made effective from Feb. 1.

Removing Fare Opposition

Representative of Scranton Railway Urges Council Not to Oppose Fare Increase

C. L. S. Tingley, vice-president of the American Railways, Philadelphia, Pa., which controls the Scranton (Pa.) Railway, made an offer to the Council of Scranton on Feb. 1 that the local railway would agree to increase its annual appropriation to the city from $10,000 to $20,000 if the Council withdrew its objection to the proposed 6-cent fare schedule.

The Council promised to consider the matter and submit an answer to the company soon. Later, P. J. Shea and Lawrence Hart, representing the employees of the company, appeared before the Council to urge the withdrawal of the objection on the ground that 500 employees of the company are to receive a wage increase if the 6-cent fare is permitted.

TIME SIX-CENT FARE WILL CONTINUE

Mr. Tingley said that the matter of the length of time the 6-cent fare would continue in force was one for the Public Service Commission to decide. If in six months or a year or two years there was a return to normal conditions, then it would be for the Public Service Commission to order a reinstatement of the old 5-cent schedule. As long as conditions warranted the 6-cent fare, that schedule would operate. Mr. Tingley was of the opinion that the Public Service Commission would sanction any agreement of the character suggested between Council and the Scranton Railway.

The written offer from the company was to the effect that the company would increase its annual donation to the city to $17,500 and would also agree to sell seventeen tickets for $1. Mr. Tingley later said that the company would increase the payment to the city by $2,500 over the written offer, or to $20,000.

Another New York Increase

Six-Cent Fare Granted for New York Line of Waverly, Sayre & Athens Traction Company

The Public Service Commission for the Second District of New York on Feb. 1 granted authority to the Waverly, Sayre & Athens Traction Company to increase its rate of fare within the limits of the village of Waverly from 5 to 6 cents.

The Waverly, Sayre & Athens Traction Company operates in New York State only in Waverly. It has three lines covering almost 11 miles. One line operates in Sayre, Pa., another in Waverly through Sayre to Athens, Pa., and a third line from Waverly through South Waverly to Sayre. The determination of the case was complicated by these interstate operations. There was no opposition at the hearing.

It was asserted by the company that its New York State line does not yield a sufficient return. A surplus in operation was indicated by the company's accounts in each year except 1915. It was shown, however, that the president of the company owns all but six shares and that there are outstanding bonds of $460,000. Most of the bonds are owned by the president, who has each year surrendered and cancelled the interest coupons.

The commission, in conclusion, said:

"While the evidence relating to the New York State property and operations taken in connection with the general situation of the roads exhibits a state of affairs demanding that the relief asked for be granted, the company is advised that while the New York State operation is probably the least remunerative it is closely interlinked with the interstate operation. The company should consider carefully the wisdom and necessity of asking that its other patrons share the burden. In fact, some adjustment must be made, because passengers riding solely in New York cannot be charged 6 cents while passengers over the same line and transferring into Pennsylvania pay 5 cents."

Asks Ten-Cent City Fare

The locally published statement that the stockholders of the Titusville (Pa.) Traction Company have decided to abandon the road on May 1 is not quite accurate. According to an authoritative source, the board of directors passed a resolution to the effect that if the City Council of Titusville did not approve the company's application for an increase of fare from 6 cents to 10 cents, it might be compelled to cease operation.

The road is not a paying proposition and with the increase of overhead, wages, etc., the company, not securing a return on the investment, felt indisposed to continue to make up the annual deficit. It is believed, however, that the Titusville community and its Council will amend the ordinance so that the higher rate will prevail.

Rochester Will Appeal

Will Carry Up Fare Case Decided Against It by the State Supreme Court

Corporation Counsel Benjamin B. Cunningham of Rochester, N. Y., has announced that the city will appeal to the Court of Appeals from the decision of Supreme Court Justice Wesley O. Howard, Troy, who denied the city's application for a writ prohibiting the Public Service Commission from hearing the Rochester fare case.

The city contests the right of the commission to hear the case on the ground that the fare was fixed by law passed after the public service commission law and on the ground that the commission has no authority to invalidate the franchise contract between the city and the railway company which stipulates that a 5-cent fare shall be charged.

Emergency Rates in Sheboygan

Wisconsin Commission Authorizes Eastern Wisconsin Electric Company to Raise Rates

The Railroad Commission of Wisconsin under date of Jan. 29 rendered its decision in connection with the application of the Eastern Wisconsin Electric Company to increase its power and lighting rates, with the exception of the residence lighting rates, in the city of Sheboygan.

In its application the company requested permission to increase the rates 0.75 cent per kilowatt-hour, and to discontinue the sale of six tickets for 25 cents. In its decision the commission granted authority to increase the power rates and all lighting rates other than the residence lighting rates 0.25 cent per kilowatt-hour beginning Feb. 1 and continuing to Aug. 1 of this year, at which time the former rates again become effective, unless upon application the commission approves of a continuance of the rates granted under the present emergency order. The minimum lighting rate was reduced from $1 to 75 cents, and permission was granted to the company to discontinue the sale of six tickets for 25 cents for the period mentioned.

OTHER APPLICATIONS MADE

The company has also made application to the Railroad Commission for authority to increase its lighting and power rates at Fond du Lac 1½ cents per kilowatt-hour and to eliminate the sale of the six tickets for 25 cents at that point, and an application has been filed and hearings held in connection with the elimination of eight tickets for 25 cents on the Oshkosh property of the company. No decisions have as yet been rendered in connection with these last two applications made by the company.

The company operates 34 miles of railway and does a general lighting and power business.

Transportation News Notes

Against One-Man Cars.—The City Council of Dubuque, Iowa, at a recent special meeting, tabled the petition of the Dubuque Electric Company for permission to use one-man cars and amended the ordinance which prohibits the use of the cars in that city.

Company Publication at Joliet.—J. R. Blackhall, general manager of the Chicago & Joliet Electric Railway, Joliet, Ill., contemplates the publication of a weekly bulletin, which will have as its object the cultivation of better understanding between the company and its patrons.

Relief from Service Order Denied.—The Public Service Commission of West Virginia has refused to modify its order of Dec. 11, 1917, prescribing certain standards of service for the Wheeling Traction Company on its Moundsville-Wheeling line. The order as issued originally was made effective from Feb. 1. The company sought to obtain a stay of the order until March 15.

Fare Ordinances Presented. — Two ordinances have been presented to the City Council at Frankfort, Ky., one providing for an increase in fares on the city lines of the Kentucky Traction & Terminal Company from 5 to 6 cents and the other for increases on the interurban lines so far as the city is interested. They are to be supported by a detailed statement of cost of operations from the railway.

Pennsylvania Fare Hearings on Feb. 19.—The Public Service Commission of Pennsylvania has fixed Feb. 19, in Harrisburg, as the time and place for a hearing of complaints against electric railways that have asked permission to advance their fares from 5 to 6 cents in cases where such advances are alleged to be in violation of ordinances under which the companies hold their franchises. Among the cities said to be included in the protests filed with the commission are Pittsburgh, Scranton, Shamokin and Ashland.

Corporation Counsel to Act in Case of Fare Request.—The City Council of Seattle, Wash., has authorized Hugh M. Caldwell, Corporation Counsel, to take such action as he may regard as necessary to prevent the Public Service Commission from acting in the event the Puget Sound Traction, Light & Power Company petitions the commission for permission to increase railway rates. Mr. Caldwell advised the Council that in his opinion the commission has no right to invite or consider such an application.

Pro Bono Publico Fined.—A decision recently handed down by Circuit Judge Tucker, Portland, Ore., affirms the conviction in the Municipal Court of Albert Stevens, a jitney driver "employed" by the so-called "Pro Bono Publico" Club, and declares that the organization and operation of the "Club" for a short time last fall was nothing but a subterfuge employed by the local jitney men in an effort to evade the anti-jitney ordinance passed by the voters of Portland. Judge Tucker confirmed the $25 fine placed on Stevens by the Municipal Court.

One-Man Cars Again Demonstrate Their Worth.—According to reports, the one-man cars installed in Vancouver, Wash., by the North Coast Power Company are proving entirely successful. The three car lines include the Orchards-Sifton interurban line, extending 7 miles northeast from Vancouver; the Capitol Hill line, reaching the residence section of the western part of the city, and the line from the depot to the bridge. One-man operation was resorted to by the company as its last hope of being able to operate the railway lines at a profit.

Enforcement of Jitney Ordinance Postponed.—Enforcement of the recently enacted jitney ordinance in Dallas, Tex., was delayed till Feb. 1 by order of the City Commission. This action was taken on application of the Dallas Jitney Drivers' Association and others, who took the position that the new ordinance contained much of the restriction in the old ordinance now before the Texas Supreme Court on application for a writ of error from the Court of Civil Appeals at Dallas, and that the City Commission should await the decision of the higher court before enacting a new ordinance containing these provisions.

The Three "C's." — The Twin City Rapid Transit Company, Minneapolis, Minn., in a recent newspaper display advertisement 9 in. wide by 10 in. deep, told very effectively how much more it is costing at present to furnish electric railway service than it did before the war. Percentages of increases in costs were presented in a table containing eighteen typical items. The company said that the three big "C's" of the electric railway business are coal, copper and cars. As a specific instance of increased prices it was pointed out that the cost of a car, which is about equally divided between material and labor, had increased more than 60 per cent since 1914.

Wants Board to Require Adoption of Mr. Witt's Suggestions.—The City Commission of Trenton, N. J., has asked the Board of Public Utility Commissioners for an order to direct the Trenton & Mercer County Traction Corporation to make certain improvements recommended in the report of Peter Witt, by Sept. 20, 1918. The company, under the rules of the commission, has two weeks in which to file an answer, after which a date for a public hearing will be fixed. The recommendations of Mr. Witt included the suggestion that the company purchase fifty one-man cars. His findings were reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 19, page 138.

Personal Mention

T. J. Day has been appointed general freight agent of the Pacific Electric Railway, Los Angeles, Cal., succeeding to part of the duties performed previously by D. W. Pontius. Mr. Day has been in the service of the Pacific Electric Railway for ten years, and has had twenty-eight years of railroad experience, beginning with the Denver & Rio Grande Railroad. He was formerly assistant in charge of freight operation of the Pacific Electric Railway.

T. J. DAY

Harry M. Slater has been appointed chief transportation rate expert of the Public Utilities Commission of Illinois.

Murray Parsons has been appointed roadmaster of the Visalia Electric Railroad, Exeter, Cal., to succeed Samuel W. Card.

J. J. Mahoney has been elected first vice-president of the Fresno (Cal.) Interurban Railway to succeed Paul C. Fratessa.

James Favor has been appointed general manager of the Central Power & Light Company, Walnut Ridge, Ark., to succeed John F. Wilson.

W. R. Kennedy has been appointed purchasing agent of the Fort Smith Light & Traction Company, Fort Smith, Ark., to succeed W. J. Parker.

L. M. Stevenson has been appointed master mechanic of the Alaska Gastineau Mining Company, Thane, Alaska, to succeed William G. Carlberg.

H. A. Nevans has retired as auditor of the Aurora, Elgin & Chicago Railroad, Aurora, Ill., to accept a position with an insurance company in Chicago.

David Bruce has resigned as superintendent of the Lawrence division of the Bay State Street Railway, Boston, Mass. He has been succeeded by John H. Hayes.

Milton G. Potts, formerly treasurer and general manager of the Lykens Valley Traction Company, Williamstown, Pa., is dead. He was seventy-three years old.

A. Patterson has been appointed electrical engineer and engineer of overhead construction of the Southwestern Gas & Electric Company, Texarkana, Ark., to succeed George O. Bernard.

John H. Hayes, who has been superintendent of the Hyde Park division of the Bay State Street Railway, Boston, Mass., has been appointed superintendent of the Lawrence division of the company.

Henry F. Atherton, Albany, N. Y., has been appointed assistant general manager of the Hudson Valley Railway, with office at Glens Falls, N. Y. Mr. Atherton has been treasurer of the United Traction Company, Albany, and Hudson Valley Railway for the last five years and his new appointment is a well deserved and earned promotion. Mr. Atherton will be in charge of the company's passenger and freight schedules, thus relieving A. E. Reynolds, general manager, of the details of operation.

H. F. ATHERTON

George A. Fernald, Boston, Mass., has been elected president of the Nashua (N. H.) Street Railway, operated under lease by the Bay State Street Railway. Mr. Fernald succeeds John A. Fisher, resigned.

Ray W. Reynolds, general manager of the Mesaba Railway, Virginia, Minn., has been commissioned a captain in the army engineering corps and has been ordered to report at Fort Lee, Petersburg, Va. Mr. Reynolds was formerly superintendent of the Hartford & Springfield Street Railway, Warehouse Point, Conn., and was also connected with the Springfield (Mass.) Street Railway.

H. S. Newton, who has been general manager of the Ohio Valley Electric Railway, Huntington, W. Va., for several years, will on Feb. 15 become manager of railways for the Monongahela Valley Traction Company, Fairmont, W. Va.

John C. Stone, who has been assistant traffic manager of the Northern Electric Railway, Sacramento, Cal., for the last four years, has been appointed traffic manager of the Central California Traction Company, Stockton, Cal., effective March 1.

R. D. Voshall, superintendent of equipment of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has also been appointed master mechanic of the Birmingham-Tidewater Railway, which the Birmingham Railway, Light & Power Company controls, to succeed J. L. Mason.

E. W. Rice, Jr., president of the General Electric Company, and Gerard Swope, vice-president of the Western Electric Company, who have been visiting Japan, after extended tours in Eastern Asia, investigating industrial fields for electric plants, have been decorated by the Emperor of Japan.

G. B. Treat, assistant general manager and chief engineer of the Oklahoma Railway, Oklahoma City, Okla., has been appointed consulting engineer of the United States Fuel Administration for the State of Oklahoma. The appointment was made by P. A. Norris, Federal Fuel Administrator for Oklahoma.

O. A. Smith has been appointed general passenger agent of the Pacific Electric Railway, Los Angeles, Cal., succeeding to part of the duties performed previously by D. W. Pontius, now general manager of the San Diego & Arizona Railroad. Mr. Smith was formerly assistant to Mr. Pontius in the passenger department. He is thirty-two years old. He became connected with the Pacific Electric Railway nine years ago, going to that company from the Missouri, Kansas & Texas Railroad.

O. A. SMITH

Fred M. Smith, Dixon, Ill., who has for several years been in charge of the safety work of the Illinois Northern Utilities Company and has in this way been rather closely connected with the fureau of safety of the Middle West Utilities Company, Chicago, Ill., has become connected with the bureau as one of its representatives.

Eugene C. Clarke has received the title of superintendent of instruction and efficiency of the Tacoma Railway & Power Company and the Pacific Traction Company, Tacoma, Wash. In November last Mr. Clarke resigned as supervisor of instruction of the Brooklyn (N. Y.) Rapid Transit Company to direct the instruction of trainmen and to handle general efficiency work for the companies at Tacoma. A portrait and a biography of him were published in the ELECTRIC RAILWAY JOURNAL of Dec. 1, 1917.

N. W. Smith, general counsel of the Rhode Island Company, Providence, R. I., from about the time the New York, New Haven & Hartford Railroad took over the electric railways in Rhode Island until the Rhode Island Company was separated from the New Haven Railroad by the federal decree in the dissolution suit, has been made general attorney for the New Haven Railroad, with offices at New Haven, Conn. Mr. Smith was born at Providence on Nov. 18, 1873. He was graduated from Yale in 1896 and later from the New York Law School. In 1899 he became junior partner in the firm of Edwards & Angell, Providence, and in 1904 was appointed assistant attorney for the New Haven Railroad for Rhode Island.

I. L. Ward, formerly with the Southern Pacific Company in San Francisco, was recently appointed purchasing agent for the Pacific Electric Railway, Los Angeles, Cal. He succeeded F. W. Taylor, who left the Pacific Electric to become purchasing agent of the Southern Pacific's System in the territory from El Paso to Portland. Mr. Ward is thoroughly familiar with railroad purchasing. By taking over the Pacific Electric purchases Mr. Ward becomes practically the largest purchaser of materials in southern California. Mr. Ward was for nine years with the Chicago, Rock Island & Pacific Railway in the maintenance of way, mechanical and store departments. For the last eight years he has been with the Southern Pacific, serving first as chief clerk to the general storekeeper, as storekeeper, general stores, and chief clerk of the purchasing department.

I. L. WARD

James F. Hamilton, general manager of the New York State Railways, Rochester Lines, on Feb. 8 was made vice-president of the entire system of the New York State Railways, including the properties at Rochester, Syracuse and Utica. Mr. Hamilton will at once assume the entire management of the properties, with headquarters at Rochester, the several local managers reporting directly to him. Mr. Hamilton began his railroad career in 1897 as a conductor on the lines of the International Railway at Buffalo, and after various promotions with that company, he resigned in 1902 to accept a position as assistant superintendent of the Schenectady Railway and was promoted to the position of superintendent in 1909. Mr. Hamilton was appointed in 1911 general superintendent of the United Traction Company, Albany, and was retained by the Schenectady Railway in an advisory capacity. In 1912 he was promoted to the office of general manager in charge of both the Schenectady Railway and United Traction properties. He resigned from these positions to assume the duties of general manager of the New York State Railways, Rochester Lines.

J. F. HAMILTON

W. P. Power, who has been general manager of the light, heat and power interests of the Ohio Valley Electric Railway, Huntington, W. Va., has in addition been made general manager of railways of the company to succeed H. S. Newton, appointed to the Monongahela Valley Traction Company, Fairmont, W. Va.

Samuel Insull, Chicago, has resigned as president of the West Penn Railways and the West Penn Power Company, Pittsburgh, Pa., because of inability to devote the time necessary to the duties of that office with the companies. Mr. Insull has been re-elected a director. Mr. Insull became president of the companies several years ago.

A. E. Reynolds, who has been acting general manager of the United Traction Company, Albany, N. Y., has been made general manager of the company. Mr. Reynolds began his electric railway career in the city of Plattsburgh, N. Y., in 1896, with Sanderson & Porter, New York, the principal owners and operators of the Plattsburgh Traction Company. He continued with that company from the time of its purchase by the Delaware & Hudson Company in 1907 until June 1, 1909, when he was transferred to Glens Falls, N. Y., as general manager of the Hudson Valley Railway. Under Mr. Reynolds' management the physical condition of the Hudson Valley Railway was greatly improved and the property is at present considered one of the best interurban lines in the State of New York. On Oct. 1, 1917, upon the resignation of Charles F. Hewitt as general manager of the United Traction Company Mr. Reynolds was appointed acting general manager and continued as such until Feb. 1 when announcement was made of change in title to general manager. Mr. Reynolds remains as general manager of the Hudson Valley Railway, Albany. With these important systems Mr. Reynolds has under his operation the lines in Albany, N. Y., Cohoes, Waterford, Mechanicsville, Saratoga, Ballston, Glens Falls, Lake George and Warrensburg, a combined trackage of considerably more than 250 miles. Mr. Reynolds has won for himself a firm place in public opinion at Glens Falls as witnessed by the following comment from the *Post-Star:* "If Mr. Reynolds maintains the same interest in matters of public weal for Troy and Albany that he has always shown in Glens Falls, those cities will gain a prominent and energetic worker for all civic undertakings. If he continues the same co-operation with Troy and Albany newspapers that he has always shown in Glens Falls, the readers of those papers will gain a better knowledge of the railway and be brought to a better realization of the company's efforts to give good service." Mr. Reynolds will direct the operation of both companies from Albany.

A. E. REYNOLDS

C. E. Bennett will be assistant to Charles G. Adsit, consulting engineer of the Georgia Railway & Power Company, Atlanta, Ga., after Feb. 15. Mr. Bennett has been associated with Curtis A. Mees, consulting engineer, Charlotte, N. C., since last summer. In the summer of 1915 Mr. Bennett resigned as electrical engineer with the Northern Contracting Company and the Georgia Railway & Power Company to become associated with Hugh L. Thompson, consulting engineer, Waterbury, Conn. Prior to that time he was electrical engineer with L. B. Stillwell, New York City, and later with Charles O. Lenz, New York City. He was also connected with J. G. White & Company, New York City.

Obituary

George T. Bergen, who twenty years ago and for some years thereafter was general purchasing agent of the Chicago (Ill.) City Railway, is dead. Mr. Bergen attended many of the early conventions of the American Electric Railway Association. He retired from the electric railway field about ten years ago, but had recently been in steam railroad work.

John H. Ruhlman, Youngstown, Ohio, interested in the building of interurban railways, died on Jan. 31 of pneumonia. He was active in the building of the Youngstown & Southern Railway between Youngstown and Columbiana and for several years had been working for the construction of the Lake Erie & Youngstown Railroad, which was to connect Youngstown with Lake Erie at Conneaut.

James D. McDonel, secretary, treasurer and general manager of the Fostoria & Fremont Railway, Fostoria, Ohio, is dead. Mr. McDonel was a store owner in Fostoria and was also engaged in the real estate business in that city in association with his brother. He was injured more than seven years ago during the construction of the railway and is said never to have recovered fully from the hurt which he sustained at that time.

Frank Curtis, a pioneer in city railway operation in New York and formerly president of the Sixth Avenue Railway, now included in the system of the New York Railways, died on Feb. 4. Mr. Curtis was born in Sheffield, Mass., in 1839. At the age of twenty-five he identified himself with the Belt Line Railroad in New York and soon thereafter was elected president of the company. In 1884 he was made president of the Sixth Avenue Railway and finally negotiated the lease of its property to the Metropolitan Street Railway, the predecessor of the New York Railways. Besides his activities in railway enterprises, Mr. Curtis was prominently identified with various financial institutions in New York.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Empire Railroad, Sylacauga, Ala.**—Incorporated to construct a line from Sylacauga to Marble Valley, 15 miles. Officers: W. C. Lancaster, president; W. L. Legg, vice-president and W. J. Rowland, secretary.

Franchises

Kansas City, Mo.—The Board of Park Commissioners of Kansas City has granted permission to the Kansas City Railways to build a loop at the end of the Marlborough line at Seventy-ninth Street and the Paseo.

East Cleveland, Ohio.—Officials of East Cleveland are preparing a new franchise for the Cleveland Railway. The fare between Cleveland and East Cleveland will be 5 cents and within the boundaries of East Cleveland 3 cents.

Marion, Ohio.—The Columbus, Delaware & Marion Electric Company has asked the City Council for a twenty-five-year franchise for the operation of its street railway and light plant. It has been announced that $1,000,000 will be spent at Marion in power plant and track improvements.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—Application has been filed with the Railroad Commission of California by the Pacific Electric Railway for authority to abandon and remove its line serving the Arcadia race track.

Southern Traction Company of Illinois, East St. Louis, Ill.—Plans are being made by Senator A. E. L. Gardner of Clayton, Mo., to reorganize the defunct Southern Traction Company of Illinois, which at one time operated an electric interurban line from the present east approach of the Municipal Free Bridge to Belleville. The plan is to repair the road and operate it by electricity as a freight line. Coal is the principal article it is proposed to carry. Mr. Gardner will soon go to Washington to confer with Director General of Railroads McAdoo on the proposition. Mr. McAdoo will be asked to sanction the company's use of the Free Bridge so that coal hauled by the company may not be delayed on the east side of the river.

***Geneva Lake, Sycamore & Southern Railway, Sycamore, Ill.**—This company has been organized with a capital stock of $150,000 to construct an electric line from the southern shore of Lake Geneva, Wis., through McHenry, DeKalb, Kendall and LaSalle Counties, Ill. The head office will be at Sycamore, Ill.

***New Haven, Ind.**—Plans are being made by a large number of New Haven people for the construction of an electric line to connect New Haven and Fort Wayne. A number of residents have pledged to donate a right-of-way. It is reported that plans are under way to meet with the stockholders of the Fort Wayne & Northern Indiana Traction Company in regard to the new line, as it may be possible some plans may be made to interest this company.

Cheboygan Electric Light & Power Company, Cheboygan, Mich.—The project of building an electric line between Cheboygan and Petoskey through the northern resort section has been abandoned. The Cheboygan Electric Light & Power Company, which received a franchise from the city of Cheboygan, paid over to the city the sum of $5,000 for failure to construct the road, stating that present conditions do not warrant starting operations. [May 31, '13.]

***St. Louis, Mo.**—In a communication addressed to the Board of Aldermen, the Lindenwood Improvement Association asked that the city of St. Louis build and operate a municipal electric railway from the end of the Tower Grove line of the United Railways to Lindenwood.

Public Service Railway, Newark, N. J.—An extension from the Lackawanna Station to Port Newark terminal has been placed in operation by the Public Service Railway. The new line touches the Lackawanna station, Hudson & Manhattan tubes, Public Service terminal and the Ferry Street station of the Central Railroad.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—This company has complied with the order of the City Commission and has removed its feed wires along Calhoun Street and Pennington Avenue. The wires had never been used, the company at one time contemplating the extension of its lines on the two thoroughfares.

Brooklyn (N. Y.) Rapid Transit Company.—The work of third-tracking the Myrtle Avenue elevated railroad line between Myrtle Avenue and the Ridgewood depot, Borough of Queens, is rapidly nearing completion. The completion of this work will do much toward relieving the transit grievance of upper Ridgewood, for, with the express service once in operation between Ridgewood and the Williamsburg Bridge, considerable time will be saved over the present system. From Ridgewood to Chambers Street in twenty minutes will be possible under the new scheme, which will include express service on the third track between the Wyckoff Avenue and the Marcy Avenue stations, at the Williamsburg Bridge approach, continuing under local service across the bridge and thence through the tube to the Municipal Building.

New York (N. Y.) Railways.—Chairman Straus of the Public Service Commission for the First District of New York, has written to Mayor Hylan asking him to initiate proceedings for a relocation of the surface railroad tracks in Central Park West. Under the law the commission can only act in the matter on a complaint by the city authorities, and a complaint made by the last city administration failed because it was defective. One suggestion made was that the northbound track should be placed to the west of the present southbound track, thus leaving space on each side of the track for vehicles.

Pennsylvania Railroad, New York, N. Y.—It is reported that the application of the Pennsylvania Railroad and Lackawanna Railroad to serve the Niagara frontier from Buffalo by acquiring the property and right-of-way of the Frontier Electric Railway, is to be granted. The Pennsylvania and Lackawanna railroads, in return for getting permission to operate through this territory are to build an elevated line through the Tonawandas and the International Railway, whose new Falls line parallels the Frontier Electric Railway's right-of-way, is to extend its embankments as far as the north city line of North Tonawanda. The decision to permit the Pennsylvania and Lackawanna railroads to enter this territory will come shortly from the Public Service Commission for the Second District of New York to which application was made nearly two years ago for permission to operate the Frontier Electric Railway line.

***Rochester, N. Y.**—The city of Rochester is having preliminary plans prepared by F. L. Raschig, Cincinnati, Ohio, for the construction of an 8-mile electric railway through the old bed of the Erie Canal to cost about $3,000,000.

***Chillicothe, Ohio.**—Bids will be received at the office of the City Clerk of Chillicothe until Feb. 16 for the construction of an electric railway on Paint Street from Second Street to Riverside Street, on Water Street from North Walnut Street to the abandoned Ohio Canal, through City Park from Riverside Street to the right-of-way of the Baltimore & Ohio Railroad.

Windsor (Ont.) Street Railway.—The Ontario Railway Board has ordered the Windsor Street Railway to provide a two-way service on the West Side. It is estimated that the improvement will cost about $100,000.

Lewistown & Reedsville Electric Railway, Lewistown, Pa.—Notice has been filed with the Public Service Commission of Pennsylvania by the Lewistown & Reedsville Electric Railway of the issuance of bonds for $68,000 to provide for extensions and improvements.

Grand Trunk Railway, Montreal, Que.—It is reported that construction has been begun of an extension from the main line of the Grand Trunk Railway to the Military Hospital at Whitby, Ont. It is stated that this line will be electrified and will ultimately form a part of the electric lines to be built under the plans of the Hydro Electric Power Commission of Ontario.

Montreal (Que.) Tramways.—Under the terms of the new thirty-five year franchise, the Montreal Tramways is ordered to build double tracks on about 13 miles of new line. Work is to be begun in June and completed by November.

Dallas (Tex.) Railways.—Officials of Dallas are working out plans which will soon be placed before M. N. Baker, Supervisor of Public Utilities, and officials of the Dallas Railways for approval, looking to the removal of all street car tracks on Main Street from Preston to Lamar. It is the plan to improve Main Street and make a thoroughfare for automobiles and light vehicles. There are now double tracks on Commerce and Elm Streets, running parallel to Main Street and one block on either side, and it is claimed that the street cars that now use the tracks on Main Street could be re-routed so as to use these tracks. The Dallas Railways has already set aside a sum from the budget to be used in rebuilding the Main Street line and it is the plan of the City Commission to permit the company to use this money for other improvements.

Houston, Richmond & Western Traction Company, Houston, Tex.—A report from H. C. McMahon, secretary of the Houston, Richmond & Western Traction Company, states that construction of its proposed line will be begun in about sixty or ninety days. The line will consist of 196 miles of single track and will connect Houston, Richmond, Rosenberg, Garwood, Gonzales, New Berlin, San Antonio and other smaller towns. It is also proposed to extend East as far as Orange. The line will serve the exposition grounds at Houston and possibly one park near San Antonio. The power station will be located at Gonzales and the main repair shops at Houston. [June 16, '17.]

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A. L. Kempster, manager of the Puget Sound Traction, Light & Power Company, Seattle, states that within three weeks the West Street car approach to the high level bridge across the West Waterway near Spokane Street will be completed, and street cars will begin operation over the new structure. The new bridge will be provided with double trackage, and will replace the low level bridge nearby, which has occasioned much transportation delay because of the fact that a scow could not be taken up the Duwamish Waterway without the opening of the bridge.

Shops and Buildings

International Railway, Buffalo, N. Y.—Notice has been served upon the International Railway that it must stop work on the reconstruction of its Forest Avenue carhouse until the city determines whether or not the walls of the old structure encroach 7 ft. upon city property as disclosed by city maps. The company was also warned that it started to rebuild the burned structure without filing plans with the bureau of buildings and without obtaining the permit required by law. The company proposes to spend $30,000 for the reconstruction of the destroyed carhouse on the old site at Forest Avenue and Tremont Street.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has awarded to Walter Farrington, New York, the lowest bidder, at $217,655, the contract for the construction of station finish for four stations on the new rapid transit lines. These stations are at Whitehall Street, Manhattan, and at Clark Street, Court Street, and Borough Hall, Brooklyn. The station at the latter point adjoins the present Borough Hall station, and, like the Clark Street station, is on a line for operation by the Interborough Rapid Transit Company.

Power Houses and Substations

Pine Bluff (Ark.) Company.—This company is now installing a 2500-kw. General Electric, three-phase, 60-cycle, 2300-volt generating unit in its power station.

Pacific Gas & Electric Company, Sacramento, Cal.—This company plans to extend its transmission lines to Guinda, Rumsey and Brooks.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—Additional boilers are being installed by the Wilmington & Philadelphia Traction Company in its power house.

Albia Light & Power Company, Albia, Iowa.—Work has nearly been completed on the reconstruction of this company's power plant at Albia.

Hagerstown & Frederick Railway, Frederick, Md.—A 6250-kva. turbine is now being installed by the Hagerstown & Frederick Railway at its Security power plant.

Southern Canada Power Company, Montreal, Que.—The Southern Canada Power Company, of which the Sherbrooke Railway & Power Company is a subsidiary, contemplates the erection of about 100 miles of high tension transmission line and has asked for bids on poles, cross arms, insulators, cross arm braces, wire and other material for same.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Car Roofing Manufacturers Report Conditions Quiet

Prices Have Not Been Revised Recently—Shipments Out of Stock, But Deliveries Uncertain

With comparatively little new car construction going on, a majority of the builders having their plants largely devoted to government and war material work, the manufacturers of car roofing or headlining report business quiet. Such sales as have been made to electric railways is for maintenance or replacements. One manufacturer said that while no special changes had recently occurred in prices, the revision followed the metal markets to a very great extent. At any rate, quotations for car roofing material held good on an average of fifteen days for acceptance, but in some instances prices are subject to change without notice. As new rolling stock orders are concededly few and far between at present, trade is far from active, although the call for the material could be properly described as steady. Shipments are promptly made out of stock, and this company is prepared to handle any size order. Deliveries are dependent on the embargoes, which were seriously hampering all lines of business east of Pittsburgh.

A couple of other car roofing manufacturers expressed themselves along similar lines. There had been no change in price, in one instance, within two months. Prompt shipments could be made out of factory stock, but deliveries were subject to embargo restrictions. No business had been lost, however, as every concern in all lines was feeling the inconvenience of the present tangled transportation situation. Slight relief had been afforded during the past week. The railroads propose to try other methods of handling freights, it was observed, but it would doubtless be ten days or more, even with favorable weather, to clear up the congestion along the Atlantic seaboard. This manufacturer was handling government work, but it did not interfere with caring for the needs of the regular trade.

Still another manufacturer stated no change in his price quotations had been made in a year, nor was any contemplated. Shipments could be met promptly from warehouse stock, but the embargoes held up deliveries to the consignee, so that his company was obliged to name figures f.o.b. factory in self-defense, if for nothing else. It is the safest policy for the seller and equitable to the buyer, the company explained. No trouble was experienced in securing raw material.

Revised Rules for Obtaining Federal Priorities

War Industries Board Formulates New Regulations for Determining Precedence

The priorities division of the War Industries Board of the Council of National Defense has made public Priority Circular No. 3, defining the regulations which the priorities division now has in effect for determining precedence in orders and work and describing the methods of administering them. The regulations are subscribed to by the Secretary of War, the Secretary of the Navy, the chairman of the Shipping Board and president of the Emergency Fleet Corporation and the chairman of the Council of National Defense. The circular discloses a much wider field of operations than that defined in the first circular issued in September of last year. The priority regulations apply to all individuals, firms, associations and corporations engaged in the production of copper, iron and steel and in the manufacture of their products; of chemicals, cotton duck and woolen cloth, and all such raw materials and manufactured products as the committee may deem necessary from time to time.

Under the new regulations all orders and work are divided into four general classes instead of three as heretofore: Class AA, class A, class B, and class C, with such sub-divisions as class AA-1, class AA-2, etc., class A-1, class B-1, etc. Class AA comprises only emergency war work of a special or urgent nature.

The new regulations in no way change or modify any priority orders previously issued. The rule of procedure from now on is that orders and work in class AA shall take precedence of those in all other classes, orders and work in class A preceding those in class B and those in turn orders and work in class C, irrespective of the dates the orders were placed. The committee's work does not cover transportation, and it does not attempt to expedite transportation.

No industry, plant, material or commodity will be classified as such. Only specific orders for materials, commodities or work classified according to their importance in war preparation or in work necessary to the public interest or otherwise of exceptional importance.

Window Glass About to Advance

Production Has Been Decreased 75 Per Cent and Wages Increased 25 to 30 Per Cent

Evidently the price of car window glass is on the point of an advance. All window glass manufacturers, pending the placing of an important government order, withdrew their prices on Jan. 1. Since then no prices, according to one of the largest companies in the country, have been quoted either on car or any other kind of window glass, nor are orders accepted but conditionally. It is expected, however, that the waiting of the factories will soon be over, the official requisition allotted among the plants, and the quoting of prices resumed, but on a higher level. Supporting this report is 25 to 30 per cent increase in the wages of skilled glass workers as of the begining of the present "fire," namely Dec. 8, last. Owing to the fuel order production has been reduced 75 per cent. That some sizes of glass are already off the market is denied, but it seems true that stock in the hands of jobbers is meager.

Laconia Car Company Reorganized

New Officers Elected and a Different Product Decided Upon—Changes Announced

Following the readjustment of the affairs of the Laconia Car Company, Boston, Mass., it is reported that the company will give most of its attention to the building of freight rather than electric cars. This policy will be followed for an indefinte time. Early in December last the following reorganization committee was selected in the interests of the creditors: Clifton H. Dwinnell, chairman, vice-president First National Bank; Herbert K. Hallett, president Fourth Atlantic National Bank; John J. Martin, president Exchange Trust Company; W. J. Bryan, Hunter Illuminated Car Sign Company, and V. C. Bruce Wetmore, Wetmore-Savage Company, all of Boston. Arrangements were made with the creditors, and the committee announced the following policy:

1. To see that the company is operated as economically and efficiently as possible, only authorizing the payment of payrolls and other necessary expenses, and the purchase of such materials and supplies as are necessary to carry out present orders, or may be required for new business which may be taken at a profit.

2. To see that all creditors are treated alike, and that no preferences are accorded on the indebtedness which has accrued, except that all claims of less than $1,000 will be paid in full, and that money due from or advanced to the company shall have priority over the notes accepted by creditors.

3. To see that as soon as and as often as possible payments are made on account of the present indebtedness, the same percentage being paid to all.

Changes were made in the executive staff and management of the Laconia company, due to the resignation from the vice-presidency of C. S. Clark, as follows: J. E. Johnson, who, for years has been in charge of the company's Boston office, was appointed vice-president in charge of sales and purchases. C. A. Towle, formerly works manager, became vice-president and general manager, in charge of operation and management.

Sale of Overhead Material Restricted by Conditions

Price Changes Not Recent—Shipments and Deliveries Are Held Up by Freight Embargoes

With electric railways confining their purchases to immediate requirements, manufacturers, distributers and sales agents of overhead material and accessories do not say business is reflecting any marked degree of activity. More or less buying is mentioned, but apparently to replace either breakages or maintain the equipment at passable if not 100 per cent efficiency. With the placing of a recent order for new rolling stock and extension equipment through the Emergency Fleet Corporation that opened up a vista of promise, the hope was entertained that possibly similar requisitions may come along to supply deficiencies in traction roads furnishing transportation to other shipyards, or large manufacturing enterprises engaged in the production of war material. In this instance the wish was father to the thought which the overhead material man regarded as a part solution of the buyingless capacity of so many electric railway companies in all sections of the country.

Aside from this rather fanciful idea the sale of overhead material is curtailed by natural conditions. The demand for second-hand cars and adaptable equipment is still a factor in the market. Wire manufacturers and distributers, while having the full capacity of their plants engaged, declare the government is taking the greater portion of the output. Their sales of bare wire—waterproof, rubber covered and cable—to the electric roads is on a low level, and they figure only as maintenance and replacements. Prices are the same and deliveries have not improved.

A manufacturer of wire and cable connections informed the ELECTRIC RAILWAY JOURNAL that the demand for the past year was unusually heavy, a great part of which was for central station work, due to unusual expansion to meet extraordinary industrial needs. Three-quarters of the company's facilities were devoted to government requirements. No change had been made in the price in a year, so far as these particular products were affected. Shipments were met promptly; that, is, three or four weeks back, but deliveries was another question, in which the embargoes controlled.

Poles and line material had been subject to no late changes, respecting either price or deliveries. A distributer with many connections and a wide field of operations which handles quantities of wire related as an illustration of the obstacles encountered in making deliveries a late occurrence, where a Connecticut manufacturer had a shipment of 600 lbs. of wire going to a Pennsylvania customer. The railroad refused to accept but 500 lbs. and the shipper was compelled to cut the lot in two so the goods would comply with what seemed an arbitrary regulation and go forward.

Cross-arms and other line material also remained unchanged in price. Everything had been frozen up and it was difficult to get shipments of goods through. Line wiring devices were likewise in the same position. With the arrival of more favorable weather possibly conditions would greatly improve. A manufacturer of line splicers stated that, from his own experience and what he learned from others making these specialties, there was no great demand just at present. There were no price revisions, and deliveries depended materially upon the strictures of embargoes and who the buyer was.

Glass insulators are spoken of as in none too ample supply. Prices have been moving upward steadily from time to time, the last of 15 per cent jump being sent out about the first of the year. One of the manufacturers declined to be quoted on the situation. He admitted his works were in about the same place as other manufacturers so far as fuel and labor were considered, and he was simply awaiting developments. Line men's tools, or devices or kits are not selling any more freely than for some time past.

Date Your Catalogs

American Chamber of Commerce, Paris, France, desires to bring to the attention of American manufacturers who are sending copies of their catalogs to France the advisability of printing on such catalogs the date of their issuance. While catalogs sent to chambers of commerce and consulates are stamped with the date of their receipt and therefore an approximation of when they were issued is possible, if a business house or other recipient does not so stamp an incoming catalog there is a great chance of confusion of dates, with consequent misunderstandings between the foreign buyer and the American seller as to price, patterns, etc.

Well-Known Welding Concern in Merger

Large Metal and Chemical Interests Combine Business Under New Name

Announcement is made that the business of both the Goldschmidt Detinning Company and the Goldschmidt Thermit Company will hereafter be conducted by the "Metal & Thermit Corporation," with general offices at 120 Broadway, New York. These two concerns have been practically combined for the last two years and have occupied joint offices at the above address. The combination, which is controlled exclusively by Americans, has now been put in more permanent form as it is felt that this will tend towards greater efficiency and co-ordination of effort.

The detinning department of the Metal & Thermit Corporation will carry on one of the largest industries of its kind in the world, *i.e.*, the recovering of tin from tin scrap. Approximately 100,000 tons of tin scrap are treated yearly by this department and the recovery approximates the equivalent of 2000 gross tons of metallic tin. The output of this department consists of pig tin, tetrachloride of tin and detinned billets.

The Thermit department will continue the production and sale of Thermit welding materials and apparatus as well as the various carbon-free metals and alloys which are produced by the aluminothermic process. This process was introduced in the United States in 1902. Since then the business has grown very fast, particularly in recent years. In addition to its line of carbon-free metals and alloys, the company produces pure tungsten powder and is also selling agent for the output of a large plant in the Middle West producing 50 per cent electric furnace ferro-silicon.

The Thermit welding process is well known in the electric and steam railroad fields for welding heavy broken parts as well as for welding rail joints in paved streets. In fact, in the railway and steel industry alone more than 1,000,000 lb. of Thermit is used annually.

The Metal & Thermit Corporation operates four different plants, located respectively in Jersey City; Chrome, N. J.; Wyandotte, Mich., and East Chicago, Ind. The Chrome and East Chicago plants are devoted to the detinning industry; the Wyandotte plant to the production of liquid chlorine, and the Jersey City plant to the Thermit products, including welding materials, carbon-free metals and alloys and pure tungsten powder. The corporation operates branch offices and welding shops in Pittsburgh, Chicago, San Francisco and Toronto.

The following are the officers and directors: W. T. Graham, Edgar L. Marston, Daniel G. Reid, F. S. Wheeler, Hubert E. Rogers, F. H. Hirschland, E. L. Ballard, L. A. Welles, Chas. F. Dane, Philip Gensheimer and Fred W. Cohen.

Rolling Stock

Toronto & York Radial Railway, Toronto, Ont., Can., lost six interurban cars on Feb. 5 in a fire which destroyed the company's Metropolitan division carhouse.

International Railway, Buffalo, N. Y., had four cars destroyed by fire on Feb. 6. Three of the cars caught fire in the Cold Spring barns at Main Street and Michigan Avenue and were burned, with a loss estimated at $15,000, and the fourth car caught fire while being operated in Hertel Avenue and was destroyed with a loss estimated at $4,500. These four cars are in addition to the forty-eight cars recently lost in the destruction of the Forest Avenue carhouse.

Southern Public Utilities Company, Charlotte, N. C., it is reported, has purchased two second-hand cars from the Waycross Street & Suburban Railway, Waycross, Ga., which will be converted into the one-man type. The work is being done in the company's shops at North Anderson, S. C.

Illinois Traction System, Peoria, Ill., is reported to have ordered sixteen electric locomotives for handling freight trains exclusively. The engines are said to be of a new type, far heavier and more powerful than those now in use, which draw from twenty to thirty cars. Mention was made in the ELECTRIC RAILWAY JOURNAL of June 2, 1917, of the traction company ordering six locomotives. The company's freight traffic has been growing rapidly.

Trade Notes

Crocker-Wheeler Company, Ampere, N. J., announces that Ben D. Christian and D. B. Graze will hereafter represent it on the selling staff at Cleveland, Ohio, succeeding Howard Dingle and W. W. Clark.

Standard Electric & Elevator Company, Inc., Baltimore, Md., has been reorganized and is offering $100,000 of 7 per cent accumulative preference stock for public subscription. The money realized through this stock issue is to be applied to the development of the company's physical facilities necessary to present demands.

W. G. Arthur Reid has been appointed general manager of the Bryan-Marsh branch of the National Lamp Works of the General Electric Company, centering at Detroit, Mich. This will be a separate division.

Burton French, who has been associated with the Insull organizations in Chicago for the last eighteen years, has opened an office at 492 Continental and Commercial National Bank Building, as a consulting engineer, to engage in the preparation of appraisals, examinations, investigations and reports upon public utility properties for financing and operation.

New York Municipal Railway Corporation, Brooklyn, N. Y., has installed twenty Johnson fare boxes on its subway system, and ten more have been ordered from the National Railway Appliance Company, Eastern agents for the Johnson Fare Box Company, Chicago, Ill.

Boston Insulated Wire & Cable Company, Hamilton, Ont., has been chartered with a capital stock of $200,000 to manufacture cables, wire, etc. The incorporators are: Benjamin T. Burley of Worcester, Mass.; Harry B. Burley of Brookline, Mass.; Grant W. Arnold of Hamilton and others.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has just established permanent offices at 627 Plymouth Building, Minneapolis, Minn., to serve the north central States and Canadian trade. Richard K. Papin, formerly the St. Louis and Southwestern representative of the Davenport Locomotive Works, and for ten years manager of the Zelnicker company's equipment department, is in charge.

Esterline Company, Indianapolis, Ind., announces the appointment of the F. R. Jennings Company, 616 Ford Building, Detroit, Mich., as its sales representative for graphic instruments for Michigan. Mr. Jennings will handle that entire State for the Esterline Company, with the exception of the northern peninsula, which is taken care of by the Milwaukee office.

Electrical Engineers' Equipment Company, Chicago, Ill., announces the removal of its general offices and a portion of the manufacturing departments to 710-714 West Madison Street. This new location is directly opposite the company's present quarters at 711-715 West Meridian Street. The major portion of the factory proper, together with the shipping and stock departments, will remain at the latter address, which is connected to the Madison Street building by means of a runway.

New Advertising Literature

Automatic Ventilator Company, New York, N. Y.: Calendar with European war map to date, flags of the ally nations in correct colors and illustrations of the company's chief products.

Roller-Smith Company, New York, N. Y.: Bulletin No. 500 covering "Enclosed Type Plain No-Voltage Circuit Breakers," the particular application of which is therein described, with accompanying illustrations.

Browning Company, Cleveland, Ohio: Illustrated pamphlet—a fine example of typography—entitled "Browning Buckets"—the "buckets that bite." It is claimed there is no operating condition with which they are not thoroughly familiar.

Baldwin Locomotive Works, Philadelphia, Pa.: The company is distributing record No. 88, descriptive of their Santa Fe type locomotives. They have also prepared record No. 89, descriptive of the development of the eight-driving-wheel locomotive.

Ohio Brass Company, Mansfield, Ohio: Illustrated cardboard folder entitled "Basing Selections on Conditions," describing the company's line of Crouse-Hinds' Imperial headlights—Incandescent, luminous (electrode) arcs and carbon arcs—for which it is general sales agent.

National Lamp Works of General Electric Company: Bulletin entitled "Fundamentals of Illumination Design," which the engineering department of the company has presented, in simple and readable language, a discussion of the broad principles which underlie illuminating engineering practice.

RAILWAY MATERIALS

	Feb. 6	Feb. 30
Rubber-covered wire base, New York, cents per lb.	30-32	30
Wire, weatherproof (100 lb. lots) cents per lb., New York	28¼-34¼	28¼-34¼
Wire, weatherproof (100 lb. lots), cents per lb., Chicago	38.35	33½-38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.31	$1.31
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.32	$1.32
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	49	48½

NEW YORK METAL MARKET PRICES

	Feb. 6	Feb. 13
Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	27	27
Lead, cents per lb.	7	7
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7.87½	8
Tin, Straits, cents per lb.	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	34-36	34-36

OLD METAL PRICES—NEW YORK

	Feb. 6	Feb. 13
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	17½	17½
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	5½	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.42	$42.42
Old carwheels, Chicago, per gross ton	$30.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, February 23, 1918 *Number* 8

The Journal Again Broadens the Scope of Its Service

NEARLY eleven years ago, or on April 4, 1908, we issued our first "Maintenance Number." Since then a special number, devoted to the problems of the engineering department, especially of the shopmen, has been published early each year. Our coming Annual Maintenance Number will be issued on March 16 and will also be a "Fuel and Labor-Saving Number."

The wide popularity of these issues has suggested a still further broadening of the field of this paper. Briefly, the plan contemplates the inclusion in one issue during every month of special articles devoted to the fundamental problems of the electric railway engineer in addition to the concentration of short or "kink" articles in one issue. The number this week is the first of these special monthly issues. It is expected that those which follow this will appear on the third Saturday of each month.

It is the purpose in these numbers to take up broad engineering questions in all electric railway departments rather than detailed accounts of individual installations. For this reason the program should appeal particularly to the ambitious younger men in the industry who wish to obtain first-hand an understanding of the fundamental principles in electric railway engineering. At the same time, it is hoped that the articles will appeal strongly also to the older and more experienced men in the industry who will take this occasion to refresh their memories on basic principles.

The publication of the articles outlined will not interfere in any way with the service now being given by the ELECTRIC RAILWAY JOURNAL to its subscribers. The articles mentioned are an addition to, not a substitution for, any part of the present service. We shall continue to publish promptly and in the first available issue all of the technical and other news of the week relating to the electric railway industry. The only difference will be that the "Equipment and Maintenance Department" will be given up as a weekly department.

Two Kinds of Master Mechanics—And Others

THIS paper has consistently advocated a more general recognition of the importance of the work of the men who design or maintain the track, power plant, overhead and rolling stock. We have insisted from time to time that these men are not paid enough, which is still true. Reasonable salaries must be paid if the electric railways are to retain men of the type which the mechanical and engineering departments must have.

If a competent man was required five years ago to supervise a shop, a power plant or a track department, a more competent one is required to-day. Adequate recognition and compensation will help to retain good men and encourage them to develop themselves in their specialties.

But the management cannot do it all. The best service cannot be bought with money or even with recognition. There must be loyalty on the part of the employee—to himself, to the public, to his employer. This means that he must be keeping up with the times through study, through careful observation. He should thus not only be increasingly competent to do the work for which he is directly paid, but he should constantly be learning its relation to the whole organization. In the end the men who are not growing will eliminate themselves by the process of "natural selection."

Technical men—and others—divide themselves into two classes—those who work by rule-of-thumb and those who use their heads. It is high time that the latter class predominated. The hope of the industry for the future lies in the aggressive young men (and older ones if they are not becoming fossilized) who are using every means to make the most of themselves. Issues of the ELECTRIC RAILWAY JOURNAL like the present one are planned with these men in view.

Royaltyphobia or Aversion to All Payments for Inventions

THE symptom of Royaltyphobia in an electric railway man is a pronounced aversion to buying any article on which patent rights are enforceable. The victim strives desperately to find a "just as good," and as few mechanisms worth while are free to use, he falls back upon obsolete or discarded apparatus which can be made on a poundage basis. Curiously enough, the disease manifests itself only in connection with the victim's own business. He cheerfully pays the royalties that go into the cost of his Hanan shoes, his Stetson hat, his Rolls-Royce automobile, his Gillette razor, etc.; but he cannot see why Smithkin's beautifully balanced trolley wheels should cost more than the misshapen article that is making his trolley wire better known for pyrotechnic display than reliability of service.

Surely the inventor, like the laborer of old, is worthy of his hire. Royalty is simply reward for brains, skill and progressiveness. In the electric railway field the royalties charged are modest indeed when the cost of development, education and marketing an article is considered. We doubt if they usually exceed 5 per cent, and this charge, in comparison to the benefits conferred, is trifling in most cases. Yet regardless of this fact, so self-evident to those who know the manufacturer's sorrows and tribulations, there are still some operators so obsessed with the idea that inventors are little better than buccaneers that they might well adopt for their slogan: "Millions for the junk heap, but not one cent for brains."

It May Be a Patriotic Duty to Hold Conventions

WHEN the war broke out there was a general and commendable desire on the part of association managements temporarily to confine their activities to such as bore directly upon preparations for fighting. The result was a postponement of convention plans until the country had settled down to a steady and rapid pace in training its soldiers, sailors and airmen, and in producing and transporting the supplies needed by them. This time is now approaching.

It is generally conceded that the great world war is a war of engineering, especially of machinery and transportation. To make it most completely successful will require the perfect co-ordination of all contributing agencies. As utilities and manufacturers must somehow get together in their respective fields in order to discuss those questions which touch upon their relation to the war, it would seem to be the proper thing now gradually to resume the usual national and sectional gatherings. There should be no frivolity in connection with these; rather, a sober consideration of duty, of opportunity and of facility for the work in hand.

In holding its midwinter meeting in New York City last week the A. I. E. E. did that which was eminently fitting and patriotic. Much was made of the occasion for pressing home the lessons of the war preparations. There was nothing in the proceedings to offend the most sensitive patriotism. The same spirit evidently underlies the plans for the Central Electric Railway Association annual meeting to be held on Feb. 28 and March 1, the convention of the Southwestern Electrical and Gas Association, scheduled for April 15 and 16, and others which will be held soon. Such gatherings, with serious purpose and definite aim, cannot but contribute a share to the winning of the war.

Outside Traffic Expert Serves an Important Purpose

Traffic reports by outside experts have become quite the fashion during the last five years, but not all of them have produced an appreciable and early degree of relief. One of the chief reasons for this, perhaps, is the fact that the observers lacked operating experience. They were keen enough to see what was wrong, but not experienced enough to suggest practicable remedies. Sometimes, too, they fell into the error of assuming that all that was expected of them was an excoriation of the local railway from A to Z rather than constructive aid to the public.

Many reports by outside experts, however, have been really invaluable because they have directed attention to practical methods for ameliorating improper conditions. Sometimes such conditions have been due to the unprogressive policies of the railway; sometimes they have been due to financial limitations or to operating restrictions imposed by public representatives. In either case the report of the traffic expert has tended to create a better understanding of the existing conditions and to promote a desire for co-operation between city and company in improving them.

Thus to bring the two parties together is really the big function of the experienced traffic specialist. He sees the woods—the situation as a whole—because he has not been dwelling among the trees. He is free from the ingrained traffic habits so often acquired in the course of years by the local operator and the local public, and he is not blinded by prejudice or by a desire to cater to special interests. Therefore, if he takes up his work in a spirit of true inquiry and co-operation, he makes it easy for the municipality and the railway to do together what they had never been able to accomplish alone.

Preparing for Changed Conditions in Interurban Passenger Traffic

INTERURBAN passenger earnings, while never fulfilling the roseate hopes of the early promoters, were nevertheless fairly uniform and dependable until the advent of the popular-priced automobile a few years ago. On the heels of this disturber of the rail peace of mind came the war, which indirectly acted as a traffic stimulus and thus made up in part the losses incident to automobile competition. The freight congestion resulting from the early foreign war orders, while throwing some local freight to the interurbans, only slightly affected passenger traffic conditions. Our own entrance into the great maelstrom of Mars, however, has produced more marked changes. Gigantic war preparations and at the same time the shipment of vast quantities of supplies to our allies so congested the traffic on the steam railroads, hedged in as they were by peace-time regulations and by the conditions set by competition, that the governmental control recently established seemed the only way out of an otherwise inextricable tangle.

From the evidence in hand there seems little doubt but that with the steam railroads so controlled very little consideration, perhaps some direct discouragement even, will be given by them to passenger traffic. Already many passenger trains have been removed from service, schedules have been slowed down and many of the luxuries of travel discarded. These things, vitally affecting passenger traffic on the steam roads as they do, are bound to have some influence on interurban passenger traffic. Local interurban passenger traffic should increase because of the abandonment of competing trains on steam roads and the general depreciation in the quality of steam road service. Likewise and for the same reasons through traffic on interurbans should increase.

The war in general and the fuel situation in particular have aroused the country at large, as nothing else could have done, to the necessity of efficient use of our "steel roads." From the psychological point of view the recent order of the Fuel Administrator, drastic as it may have seemed to some of the industries affected, was a godsend to the railways in that it brought before the people in a startling way their dependence on our transportation systems. Certainly the war is putting away many of the old petty jealousies and bursting asunder the shackles of tradition which have so long hampered many of our railways in their efforts to meet satisfactorily the transportation needs of our communities.

In the governmental control order the interurbans were specifically excepted. Whether such control is desirable to the users and owners of interurbans is beside the point in the present discussion. What the interurbans must do is to keep their eyes open to opportunities for public service and increased earnings—for happily, in the long run, the two always go hand-in-hand. They, too, must seek to work their equipment to the limit of its safe capacity. As has previously been pointed out in these columns, the electric railway is particularly well adapted to the handling of a "gathering" and "distributing" type of traffic. Taking over local traffic, selling through tickets and checking through baggage over intersecting and even over paralleling steam roads, acting as nimble hands for the heavily loaded steam trunks, these are things that the interurbans can do and do well. The ideal from the standpoint of public service would be such co-operation as to make all of the railways, both steam and electric, one vast system, each member of the system doin the thing for which it is best fitted. By striving to attain this ideal the electric railways will be doing a patriotic service as well as increasing their earnings. Further, if for reasons of policy it would appear desirable at some time in the near future to place the electric railways under federal control also, much of the co-ordinating work would already have been accomplished and accomplished with a minimum of confusion to the users and of jeopardy to the owners.

Welfare Work Should Be Sympathetic, Not Paternalistic

EMPLOYERS interested in welfare work may find stimulus for thought in an article in the current Monthly Review of the United States Bureau of Labor Statistics. While only fifteen electric railways are included in the 274 establishments which furnished the information on which this study was based, the conclusions are applicable to all. The article deals with the means taken by many of the companies for the entertainment or the mental stimulus, through lectures and club work, of employees outside of the working hours. Figures are given as to the number of establishments having social gatherings, lectures, moving pictures, auditoriums, musical clubs and outings. Each of these features of welfare work is considered from the information given by the various companies.

Reference is made to the fact that some employers have encountered discouragement through the feeling of certain employees that time "after hours" is their own and must not be "interfered with" by any company plans for amusement. There is also danger, as pointed out, that it is easy in this line of work for employers to assume a paternalistic attitude. For this reason many employers have left the development of recreational features to the employees themselves, with the understanding that proper efforts along these lines will be assisted and encouraged by the company.

Experience is a good teacher in such matters, as in all others. Splendid results have been secured from welfare work on certain electric railway properties which we have in mind. The better side of employees has been developed in a manner which must be encouraging to the men in charge. Nearly always such work brings about a helpful *esprit de corps*. It is well, however, for the employer who would undertake such work to guard against a development of paternalism, which may arouse a feeling of resentment worse than the first state.

Don't Neglect the Refinements in Turn-Back Service

NO EASIER way to squander money can be imagined than the use of ill-considered schedules by a street railway company. A thoughtful analysis of this fact was presented by Mr. Layng in the Jan. 5 issue of this paper. To weigh only one of the points made by this expert, it is worth while to take up the question of turn-back service. Nearly every manager has had experience with critics who believe every car on a given route should operate to the most remote terminus. Perhaps there are just as many who insist that additional cars should be turned back at this or that point to accommodate unusual crowds. Between the two contentions there is a solution which may satisfy neither faction, but would give the fairest apportionment of service. It is in the settlement of this point that the best operating skill will show itself.

As Mr. Layng stated in his article, "It is just as wrong to run too much mileage as too little mileage; in one case the hardship suffered by the company is reflected in its finances; in the other, the hardship borne by the public is reflected both in decreased earnings and in the increased dissatisfaction." There are few lines on any system which call for 100 per cent through service. In fact, the longer a line is the more delays there are to be expected, thus affecting all intermediate points. On the other hand, not every heavy loading point is entitled to special turn-back service.

It is easy to exaggerate the importance of such requirements and thus deprive another district of its proper facilities. It must be remembered also that to switch back at a certain point entails discomfort and inconvenience to the passengers who must be unloaded, even though it accommodates a crowd waiting to travel in the opposite direction. This consideration shows the importance of correct destination signs on cars as well as the advisability of making known the existence of special service by advertising.

Efficient management calls for the placing of cars where and when they are most needed. There are various methods, of course, for determining such needs, and in the choice of the proper system good judgment will again assert itself. As Mr. Layng says, it is necessary to analyze the passenger loads on all cars at all hours of the day. This does not mean a mere reading of the register, which shows only the total passengers, or only the cash passengers, up to this or that point. Such figures would not show where the load had tapered off. There must be made an actual count or close estimate of passengers on the car at the various points designated. The selection of an "average" day from the two or three days' survey will give the best index as to conditions.

The points of maximum demand having once been determined, the service must be proportioned accordingly, and the usual appeals from disgruntled passengers must not cause the operating official to change his schedule unless a new check shows that conditions warrant such action. Economical requirements of the present day call for careful thought on such features of operation as are touched on in the article referred to. No wide-awake manager will "take things for granted" nor overlook any possible opportunity to conserve or add to the revenues of his company.

Considerations in the Choice of Car Equipment

Electric Car Equipment Has Grown More Specialized to Save Time, Secure More Revenue and Increase Safety—How a Traffic Survey to Determine Requirements Is Made

By C. W. Squier
Electrical Engineer

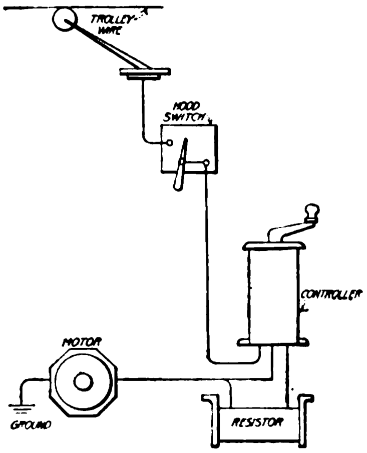
THE necessity of adequate means to meet present operating expenses which are mounting by leaps and bounds has made "efficiency" a watchword of all public utilities. The importance of what has appeared to the average official as dry technical calculations and uninteresting studies of operating requirements is so very great in the actual dollars and cents that can be saved and additional revenues that can be earned that the principles underlying them are now receiving increased attention.

In this and following articles on electric car equipment the writer does not claim to be developing any new principles. The material used and the facts brought out may be familiar to many railway engineers who are actively engaged in this work. Yet by a rearrangement and regrouping of the principles of operation and maintenance with a definite object in mind, it is hoped that certain of these fundamental requirements will be impressed more definitely in the minds of those most interested and prove an additional source of information and a benefit to the young men who are coming up in the electric railway field.

Comparison of First Car Equipments with Present

The equipment of the first electric cars was very simple, consisting only of a motor, controller, resistance and hood switch with the necessary wiring to connect the various parts. Contrast this with the equipment of the latest types of cars to-day. Motors have interpole and tap field windings and ventilated cores and windings for increasing their continuous capacity. Control equipments are arranged for multiple-unit operation with automatic and selective acceleration so that the acceleration of the car or train will remain constant regardless of the load. Current-limiting relays are provided which can be quickly adjusted to change the rate of acceleration to meet changes in service requirements. Electro-pneumatic brake equipments are used with quick recharge, graduated release and empty and load brake control so that the braking pressure will increase with the load, and thus maintain a constant rate of retardation. Automatic couplers are in use with main reservoir and train-line air connections made automatically and coupler slides with contacts for automatically making the electrical train-line connections between cars. Doors and steps are pneumatically operated and electrically controlled and their operation is interlocked with the signal system and main control connections so that the starting signal will not be given and the car cannot start until all doors are closed, and the doors cannot be opened till the car stops. Electric heaters are provided with thermostatic control, and coasting recorders or power recording meters are used to keep a check on the operation of the car.

From the foregoing comparison it is evident that an advance has been made toward automatic and power operation of all car parts; and there is no reason why a further elimination of manually operated devices should not be made. This permits the use of labor and cars that could not otherwise be employed in this capacity. Men can continue in the service longer, as age and physical weakness do not prove as great disadvantages as would otherwise be the case. The satisfactory use of women in car service as conductors in this time of great demand for labor has been made possible principally by power-operated and automatic devices and the consequent reduction of the labor necessary on the platform so that the conductor becomes little more than a car cashier.



SIMPLIFIED DIAGRAM OF CONNECTIONS IN EARLY CARS

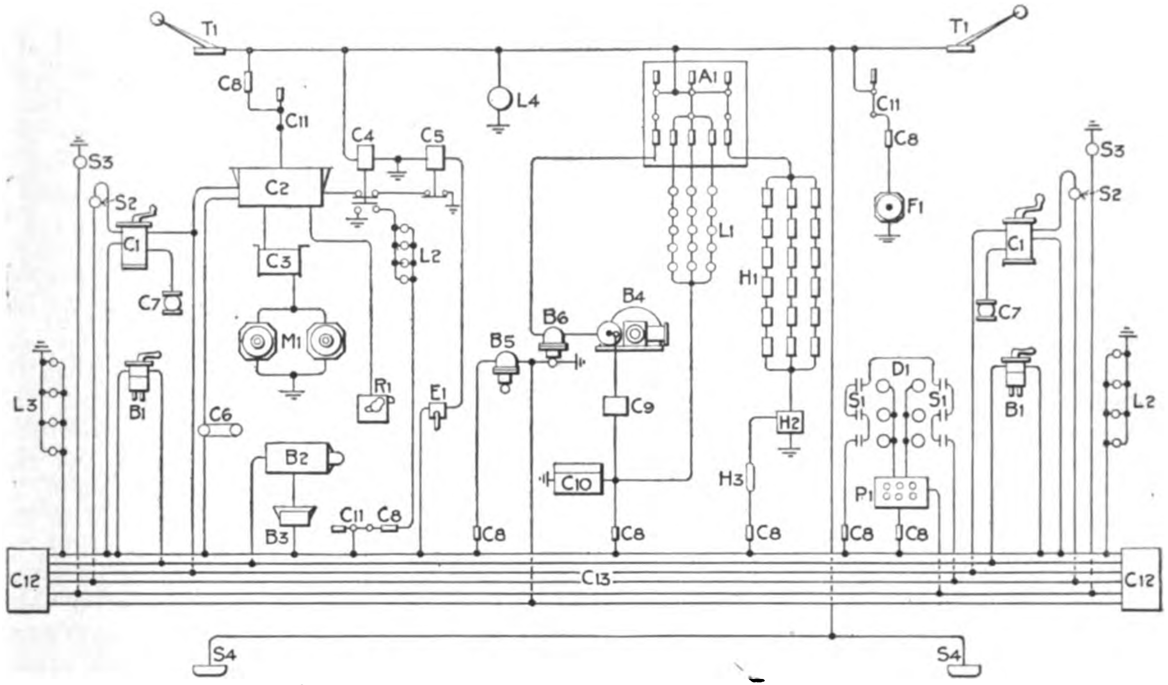
Another and greater advantage is the saving in time that can be effected by the use of power-operated devices. Other things being equal, anything that saves time is valuable to a railroad, since this is its chief purpose and service. Time saved by shortening the duration of stops is just as valuable as time saved during acceleration or retardation of the car. Napoleou regarded time as irreplaceable and of the greatest value. "Ask me," he said, "for anything but time." A saving in time increases the capacity or earning power of the road and also affords greater flexibility of operation and greater convenience to the traveling public.

The chief virtue and usefulness obtained from employing electricity as a motive power for railroads lies largely in its convenience and its economy in the use of power. The more use that is made of this power, the greater the economy that can be expected. Railway officials in general have been eager for improvements as necessity demanded them, and not a few have been willing to try out new devices in the hope of bettering conditions. The argument that a new device is not necessary because we have hitherto been able to do without it is seldom advanced. It is obvious that if such an argument had been universally followed we would still be digging roots with our finger nails for a living.

A discussion of electric car equipment may be for convenience separated into the following parts:

1. Determination of operating requirements.
2. Characteristics necessary to meet various classes of service.
3. Necessary details for proper installation.
4. Operation necessary for economy and safety, and
5. Inspection and maintenances practices.

The various parts comprising a complete car equipment may be logically divided into (a) those necessary for propulsion, (b) those used in braking, (c) auxiliary operating devices, and, (d) equipment for the safety, convenience and comfort of the traveling public.



LIST OF ELECTRICAL EQUIPMENT FOR LATEST TYPE CARS

A1—Switchboard.
B1—Brake valves.
B2—Universal valve.
B3—Empty and load brake attachment.
B4—Compressor.
B5—Master governor.
B6—Compressor switch.
C1—Master controllers.
C2—Unit switch group.
C3—Resistors.
C4—Line relay.
C5—Emergency relay.
C6—Selective accelerating device.
C7—Dead man's valves.
C8—Fuses.
C9—Battery charging switch.
C10—Storage battery.
C11—Knife switches.
C12—Electric couplers.
C13—Train line.
D1—Door operators.
E1—Emergency trip switch.
F1—Ventilating fan.
H1—Electric heaters.
H2—Heater switch.
H3—Thermostat.
L1—Main lights.
L2—Emergency lights.
L3—Head, tail and marker lights.
L4—Lighting arrester.
M1—Main motors.
P1—Push button box.
R1—Coasting recorder.
S1—Door signal contacts.
S2—Signal lights.
S3—Buzzer signals.
S4—Contact shoes.
T1—Trolleys.

SIMPLIFIED DIAGRAM OF MODERN CAR CONTROL EQUIPMENT

Let us consider first those parts used in the propulsion of the car. As the motors are the heart of this equipment they will be discussed first.

Choosing a Motor Car for a Particular Service

In order to choose a motor intelligently for any particular requirements, we must first know just what service it will be called upon to perform, and what future requirements may be expected within the life of the equipment. This, then, requires an accurate knowledge of the present operating conditions and an estimate of the changes that may result from increases in population and manufacturing industries necessitating a change in operating demands and lengths of lines. A large amount of this consists of data in connection with the character of the line and service which form a part of the records of most operating companies. Additional operating data of the latest requirements should be obtained by a traffic survey. Methods for conducting such a survey and for collecting the desired data have been very fully treated in the article by J. F. Layng in the ELECTRIC RAILWAY JOURNAL of Jan. 5, 1918, but the list of headings given below for data desired will be found helpful.

The larger operating companies have engineers who are in constant touch with operating conditions and who conduct tests at intervals so that the data enumerated above are readily available. Manufacturing companies are usually willing to assist in conducting such tests in order to find out just how their equipments

Character of Line

Length of run.
Length of single track.
Length of double track.
Number of turnouts.
Distances between turnouts.
Length and percentage of heavy grades.
Number and radii of curves.
Length of congested sections.
Special characteristics.

Character of Service

Number of stops.
Number of slow-downs.
Length of stops.
Maximum speed.
Time for run.
Layover time.
Headway by periods.
Cut-offs.
Turn-backs.
Single car or train operation.
Lengths of rush-hour service.
Car-miles per day.
Car-hours per day.

Operating Data

Line voltage by sections.
Duration of "power on" period
Duration of coasting.
Duration of braking
Rate of acceleration.
Rate of braking.
Number of passengers on and off at each stop.
Maximum number of passengers on car at one time.
Congestion at terminals and transfer points.
Delays.

Car Equipment Data

Type of car.
Special features of car.
Weight of car.
Number and type of motors.
Type of control.
Hand or air brakes.
Type of trucks.
Diameter of wheels.
Gear ratio.

Trouble and Defect Record

Number of run-ins.
Number of cars held from rush-hour service.

are operating and for the information that they thus obtain to help in their calculations and designs for new equipment. Also if there is a prospect of securing an order for new equipment they are anxious to check conditions to make certain that any equipment ordered will fulfill the requirements. In addition to these sources there are, of course, consulting engineering firms which make a business of conducting tests and advising regarding specifications for new equipment.

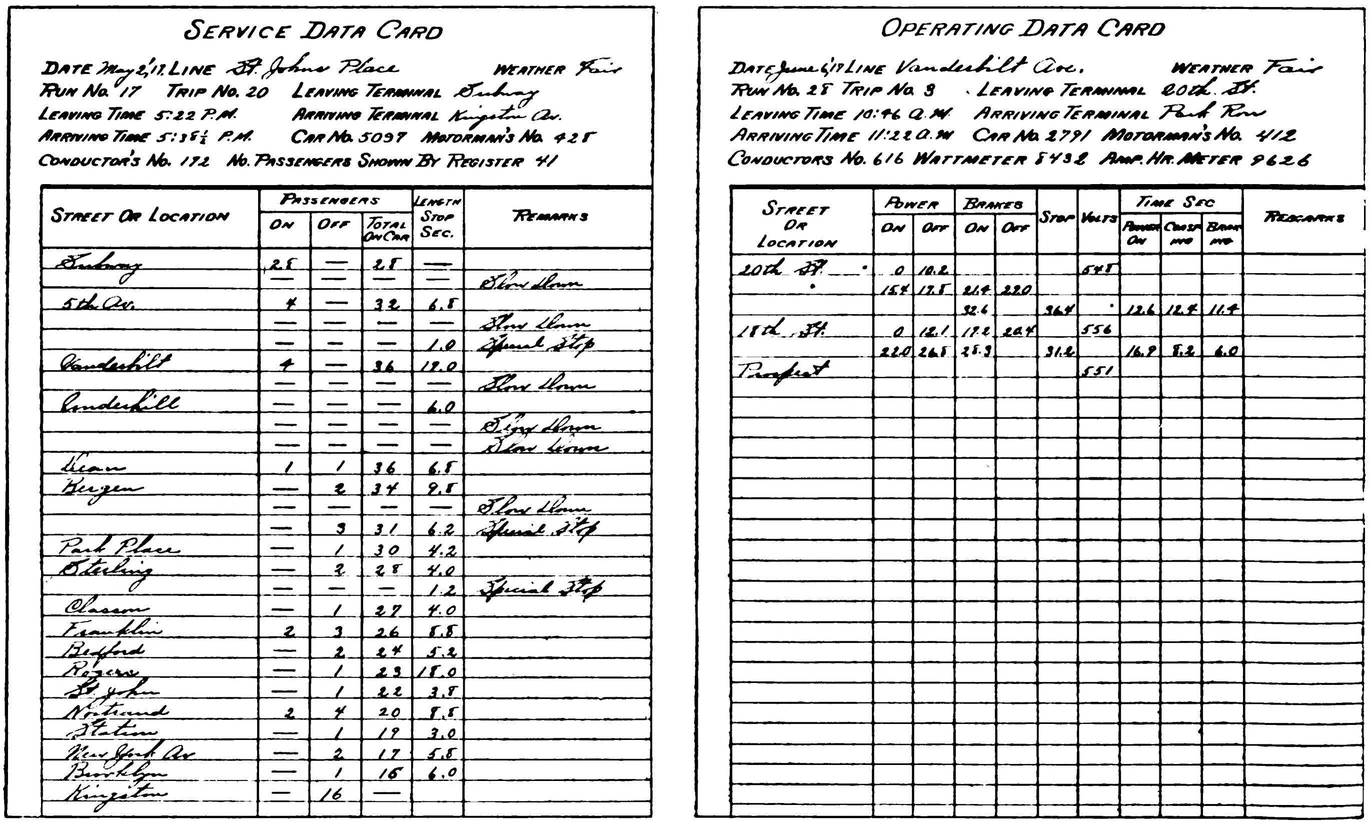
In making such a traffic survey it simplifies matters somewhat, and prevents duplicating information, if all data desired are taken at the same time, but this is not necessary if the tests extend over a considerable period. All the data on "character of service" for a specific line can be obtained and recorded by one man riding cars of that line. Three or four days' service should be sufficient in most cases. Another man can obtain all the operating data necessary.

The choice of size of motor depends upon efficient use of their qualities

The accompanying illustrations show two data cards that have been used by the writer on numerous traffic tests, and which satisfy all requirements. They have been kept as simple as possible in order to prevent confusion. The use of special men to obtain this information has been found more satisfactory than relying on conductors to fill out forms correctly. Another point the writer has endeavored to impress on those obtaining data is that if they miss a reading or neglect to record one they should not hesitate to make a note on the form to that effect and in no case enter figures that they have to estimate.

The man taking down the data as to character of service should be in a position where he can see and count readily all passengers boarding and alighting. This is done at each stop of the car. At the same time the length of stop is taken with a stop watch. Record is made of all slow-downs and their causes; also of any special stops or unusual occurrences that have a bearing on the service. At the beginning and end of the run he should fill in the following data as called for on the record card: Date, line, car number, run number, trip number, motorman's and conductor's numbers, leaving terminal, leaving time, arriving terminal, arriving time, weather and the number of passengers carried as shown by the fare register.

For obtaining operating data the car should have a voltmeter connected from the trolley pole to ground so that the line voltage can be read, and, if possible, a watt-hour meter and an ampere-hour meter. The man taking and recording the data takes a position where he can observe the operation of the car. With a split-second stop watch he takes the time during which power is on, and the time consumed in coasting and braking. This is most readily done by starting the watch as the motorman applies power. Then by the use of the split-second hand he records the time that power is cut off and braking began. By stopping the watch as the car stops he has the complete cycle. The motorman may apply and cut off power several times before he starts to brake or he may apply and release his brakes several times before he stops, but by recording the time that each different operation is begun the total time consumed in acceleration, coasting and braking can be readily computed. Voltage readings are taken at certain definite points along the run, and all high or low readings are recorded with their proper locations. Of course, a more extensive record can be


SERVICE DATA CARD

DATE May 2,'17. LINE St. Johns Place WEATHER Fair
RUN NO. 17 TRIP NO. 20 LEAVING TERMINAL Subway
LEAVING TIME 5:22 P.M. ARRIVING TERMINAL Kingston Av.
ARRIVING TIME 5:38½ P.M. CAR NO. 5097 MOTORMAN'S NO. 428
CONDUCTOR'S NO. 172 NO. PASSENGERS SHOWN BY REGISTER 41

STREET OR LOCATION	PASSENGERS ON	PASSENGERS OFF	PASSENGERS TOTAL ON CAR	LENGTH STOP SEC.	REMARKS
Subway	28	—	28	—	
	—	—	—	—	Slow down
5th Av.	4	—	32	6.8	
	—	—	—	—	Slow down
	—	—	—	1.0	Special Stop
Vanderbilt	4	—	36	19.0	
	—	—	—	—	Slow down
Underhill	—	—	—	6.0	
	—	—	—	—	Slow down
	—	—	—	—	Slow down
Dean	1	1	36	6.8	
Bergen	—	2	34	9.8	
	—	—	—	—	Slow down
	—	3	31	6.2	Special Stop
Park Place	—	1	30	4.2	
Sterling	—	2	28	4.0	
	—	—	—	1.2	Special Stop
Classon	—	1	27	4.0	
Franklin	2	3	26	8.8	
Bedford	—	2	24	5.2	
Rogers	—	1	23	18.0	
St. John	—	1	22	3.8	
Nostrand	2	4	20	8.8	
Station	—	1	19	3.0	
New York Av	—	2	17	5.8	
Brooklyn	—	1	16	6.0	
Kingston	—	16	—		

OPERATING DATA CARD

DATE June 6,'17 LINE Vanderbilt Ave. WEATHER Fair
RUN NO. 28 TRIP NO. 3 LEAVING TERMINAL 20th St.
LEAVING TIME 10:46 A.M. ARRIVING TERMINAL Park Row
ARRIVING TIME 11:22 A.M. CAR NO. 2791 MOTORMAN'S NO. 412
CONDUCTORS NO. 616 WATTMETER 8432 AMP. HR. METER 9626

STREET OR LOCATION	POWER ON	POWER OFF	BRAKES ON	BRAKES OFF	STOP	VOLTS	TIME SEC POWER ON	TIME SEC COASTING	TIME SEC BRAKING	REMARKS
20th St.	0	10.2				548				
	15.4	17.8	21.4	22.0						
			32.6		36.4		12.6	12.4	11.4	
18th St.	0	12.1	17.2	20.4		556				
	22.0	26.8	28.3		31.2		16.9	8.2	6.0	
Prospect						551				

FORMS USED IN MAKING TRAFFIC SURVEYS

What the Maintenance of Way Department Does

Good Maintenance of Way Is Necessary Not Only to Secure Maximum Life of Track and Structures, but Because the Upkeep Costs in Other Departments Depend Upon It

By R. C. Cram
Assistant Engineer Way and Structure Department
Brooklyn Rapid Transit System

THERE is no standard book on modern electric railway track construction and maintenance to which the young engineer or student can refer for information. There are handbooks which treat the subject in a rather formal way as a part of the general subject of electric railways, but none of them begins to tell the whole story. They lack the essential features of co-ordination and sufficient elaboration. Similarly, the steam railroad track maintenance field was not covered by a book devoted entirely to the subject until Willard's work on "Maintenance of Way and Structures" appeared in 1915.

The electric railway track, particularly that in streets, is intimately connected with the nature of rolling stock, vehicular traffic and street pavements. It is a fundamental part of the railway, and has a vital influence in the operating and maintenance cost of the road. The location of the tracks, largely in streets or highways, is responsible for the principal differences between electric railway track and steam railroad track, and contributes many details of construction and maintenance expenses which the steam road escapes.

The materials, appliances and methods used in electric railway track maintenance have entered upon a new phase, which began about 1908, principally as the result of extraordinary replacements required by much trackage reaching its wear limit. During the life of the electric railway the track has passed through a cycle which has attempted to follow the rapid changes in type and weight of rolling stock. It began with the light electrified horse car running on "tram" or stringer rails in cobble pavement. These were succeeded by the double-truck car whose weight steadily increased up to 35,000 or 40,000 lb., and the rails were changed to deep girder sections on ties in rough 8-in. granite or other block pavements. The recent tendency in rolling stock is in the nature of a return to the light-weight car, often of the single-truck type, and the track construction is returning to rails of less depth and sometimes of less weight. The pavement is tending toward the smooth types, such as asphalt and other bituminous pavements, 4-in. grouted granite, concrete and brick. Along with these changes in rolling stock and track, the character of vehicles using the streets has been changing. The narrow steel-tired wagon wheel of the horse-drawn vehicle is being supplanted by the rubber-tired motor vehicle, with a consequent lessening of the destructive action upon track pavements.

In company with these developments, much attention has been directed toward the materials of construction, and there has been a crystallizing force at work in the track-maintenance organizations so that they are rapidly approaching quite similar lines of endeavor.

It is believed that the work as now conducted will admit of description, and in this attempt to co-ordinate available data an effort will be made to set forth the best accepted practice now current in that important branch of electric railway engineering which has come to be known as maintenance of way and structures. Advantage will be taken of the privileges enjoyed in co-operation with other maintenance engineers through joint service for several terms as a member of the committee on way matters of the American Electric Railway Engineering Association. The Engineering Manual and Proceedings of that association will be drawn upon frequently, as it is responsible in a large measure for the standards now existing in electric railway engineering practice.

The similarity which modern interurban and high-speed tracks have to steam-road tracks makes the work of the American Railway Engineering Association particularly valuable to electric railway engineers, and the material from its proceedings as co-ordinated in Willard's work on "Maintenance of Way and Structures" will be used as occasion warrants. The valuable reports of the Board of Supervising Engineers, Chicago Traction, will also be consulted freely, since the reports cover many original investigations made in conjunction with the practical reconstruction of the entire surface railway system in Chicago, now about finished.

The work of others, and of periodicals, societies and associations, will also be credited where credit is due.

Maintenance of Electric Railway Track Is a Big Task

In round numbers there were 50,000 miles of single track operated by 1029 electric railway companies in the United States on June 30, 1917. This mileage is about 12 per cent of the steam-railroad mileage as of January, 1918, and is greater by about 9000 miles than the entire steam-road mileage of the Dominion of Canada in 1914. The electric railway trackage in operation would provide a double-track railroad around the earth at the equator. About 300,000 people were employed in operating and maintaining electric railways in the United States in 1917.

The upkeep of 50,000 miles of electric railway track, about 60 per cent of which is in densely populated areas within cities or towns (which means that this trackage

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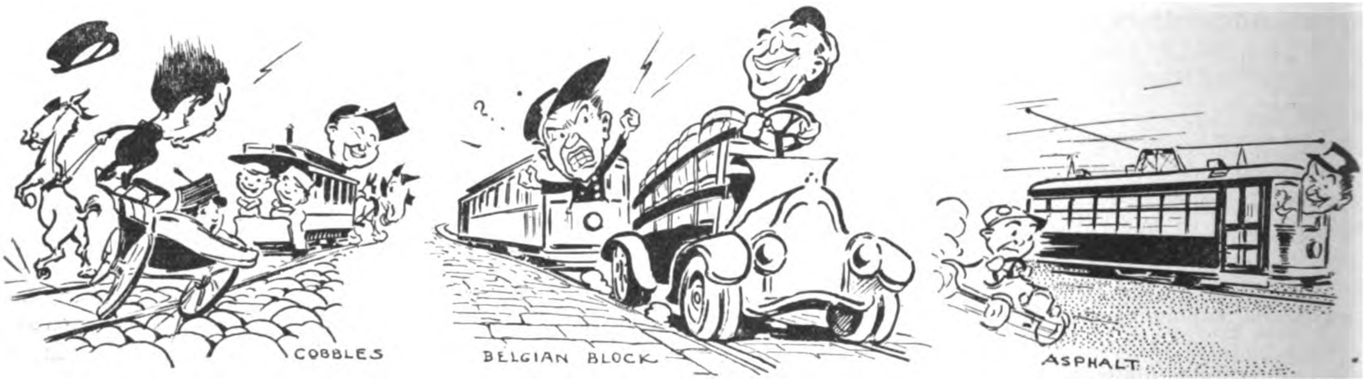
(*Concluded from page* 356)

obtained by the use of recording instruments. However, these suggestions presuppose that such instruments are not available, or that the time and expense of conducting a more elaborate test is not warranted. After the data cards for each trip are turned in they are summarized and the results thus secured are entered on the traffic data record as shown in an illustration on the preceding page.

is generally well paved) presents a problem worthy of the best engineering talent. The work involved is so full of detail as compared with steam-railroad maintenance work, that the force required by the electric railways could probably maintain more than twice as much mileage if employed in steam-road service. In common with the latter service, the work is termed "Maintenance of Way and Structures" or sometimes simply "Maintenance of Way." Its importance is indicated by the records, which show that about 16 per cent of the total operating expense is on maintenance of way and structures. The track is the basis part of an electric railway property, and because of its usual location in streets its maintenance must require a high order of skill, judgment and executive ability, and often considerable diplomacy, particularly in dealings with numerous civic authorities. Organization also plays a big part in the successful conduct of the work.

It should be remembered, as Willard has well said, that "two important facts should be understood, viz.: (1) The large proportion of the operating expense which is expended in track *and pavement* maintenance; (2) the relation existing between the kind, *location* and condition of the track and the economical operation and business of the road." (The italics are the writer's.)



PAVING HAS A VITAL RELATION TO TRANSPORTATION PROBLEMS

The track, pavement and roadbed represent the greater part of the investment in such roads, as a rule, yet the maintenance of this part of the property as a branch of engineering has not been recognized until recently as being of any particular degree of importance.

In line with steam road history, the work in the past was often in the hands of the practical man who had worked up from the ranks. In recent years, the necessity for the proper recognition of the importance of the work has been more and more apparent, so that to-day quite a number of roads have cadet engineers in training for the work, and we now generally have the engineer of maintenance of way replacing the old-time roadmaster or general foreman.

The tendency of electric railway managements to disregard the recommendations of the way department is perhaps not so pronounced as it is in steam-road practice. Nevertheless, when it seems necessary to reduce expenses the way department is generally the first one to receive the axe of retrenchment, and usually at a time when the performance of the work could be done most economically.

This is particularly true of the spring season, when much work should be completed before the heavy rush of midsummer business. The fact that cars must be operated and service maintained, with the necessary maintenance of equipment and operation of power plants, makes it plain as to why the way department must suffer first in consequence of any policy of economy. Such economies, however, are expensive in the end, as the usual result is a heavier proportionate expense later. Combined with this are increased expenses in maintenance of equipment, overhead line and transportation. These follow because track deteriorates rapidly if not well maintained, and rough track, bad joints and poor bonding soon cause excessive damage to equipment, extraordinary side wear on trolley wire, increased power consumption, and even the reduction of car speed in sufficient amount to require more cars to operate the line.

There is little doubt that the hitherto prevailing time for closing the financial year coming in June, as it has for a long period, has been responsible for the enforcement of retrenchment policies during the best part of the working season. However, the movement is gaining headway, and has been sanctioned by the various regulatory bodies which provides for an agreement between the financial year and the calendar year. The effect of this change will be appreciated by all having charge of maintenance-of-way matters.

It is believed that most managements now realize the importance of two basic principles: (1) The need for continued minor repairs and renewals to keep the track and pavement up to some fixed standard to offset normal wear and tear or depreciation; and (2) the need for a certain minimum amount of reconstruction or extraordinary maintenance to keep up a reasonable balance between traffic increases and increased loading or excessive wear on some portions of the system.

Improvements That Are Suggested by the Way Engineer

It is clearly the duty of the way engineer to point out to the management such improvements in tracks and structures as conditions may suggest, and from time to time to make requests for appropriations of funds to carry out the work desired. It is also his duty to make the best possible use of the moneys assigned for such improvements. He must, in addition, be prepared to furnish plans and estimates for the various improvements, additions and betterments which are

TABLE I—SUMMARY OF THE PRIMARY CONSTRUCTION COSTS FOR A PROPOSED ELECTRIC RAILWAY (FISCHER)*

Accounts	Cost per Mile of Track Minimum	Cost per Mile of Track Maximum
1—Engineering and superintendence	$1,000	$2,000
2—Right-of-way	2,000	4,000
3—Other land used in electric railway operations	100	500
4—Grading	2,500	6,000
5—Ballast	1,500	4,500
6—Ties	1,820	2,600
7—Rails, rail fastenings and joints	3,700	4,200
8—Special work	400	600
9—Underground construction	....	....
10—Paving	....	....
11—Track laying and surfacing	800	1,200
12—Roadway tools	50	50
13—Tunnels	....	....
14—Elevated structures and foundations	....	....
15—Bridges, trestles and culverts	2,000	4,000
16—Crossing, fences, cattle-guards and signs	500	1,000
17—Interlocking and other signal apparatus	....	2,500
18—Telegraph and telephone lines	100	500
19—Poles and fixtures	500	1,500
20—Underground conduits	....	....
21—Transmission system	500	1,200
22—Distribution system	1,500	5,000
23—Dams, canals and pipe lines	....	....
24—Power-plant buildings	600	1,200
25—Substation buildings	300	500
26—General office building	....	....
27—Shops and carhouses	400	600
28—Stations, waiting rooms and miscellaneous buildings	100	200
29—Docks and wharves	....	....
30—Power-plant equipment	2,000	4,500
31—Substation equipment	750	1,500
32—Shop equipment	150	300
33—Park and resort property	....	....
34—Cost of road purchased	....	....
35—Cars	800	2,600
36—Locomotives	....	....
37—Electric equipment of cars	600	1,600
38—Other rail equipment	200	500
39—Miscellaneous equipment	....	....
40—Law expenses	200	500
41—Interest	1,000	2,000
42—Injuries and damages	100	200
43—Taxes	50	100
44—Miscellaneous	500	1,000
Total	$26,720	$58,650

*See article by L. E. Fischer, on "Estimating Operating Expense and Cost of Construction," ELECTRIC RAILWAY JOURNAL, Sept. 6, 1913, page 387.

constantly being brought forward by the operating officials. These projects take the form of suggestions for double tracking, changes in special trackwork for rerouting of cars, construction of additional sidings and turnouts on single-track roads, and sometimes grade reductions and changes in alignment. The betterment and changes in bridges and other structures are also items which require a great deal of attention, with the view of securing all possible economies in maintenance charges. There are many municipal and state projects which require the engineer's most careful attention because of the necessity for co-operation with public authorities in connection with public improvements. It is not the purpose of these articles to discuss these improvements, except to point out occasionally how neglect of consideration of the maintenance point of view, when improvements and construction work are being planned, may ultimately provide excessive charges for maintenance.

Maintenance Never Stops

The construction of an electric railway is naturally of first importance, but once the road is finished its maintenance begins. The construction period is comparatively short, while the maintenance period never ceases unless the road is abandoned. Consequently the work of the maintenance-of-way department may be said to assume first importance so soon as the construction department ceases its activities. This is particularly true in electric railway work, because new construction is and has been almost at a standstill for the last five years at least, and what little construction work has been done has usually been carried out by the engineer of maintenance of way, acting through a specially assigned construction engineer. In times of stress, construction work can be stopped entirely for comparatively long periods, but a reasonable amount of maintenance must go on so long as the road is in operation.

In common with steam roads, the proportion of maintenance expense to total operating expense is high. This has been assigned to the fact that, like the early steam roads, the electric railways were originally built rapidly, and often in undeveloped territory. They were also built with the view to cheapness in first cost rather than to economy in future maintenance. Furthermore, quite a long period of time was required for inherent defects in early construction to develop, and much trackage was built with these inadequate early types as patterns before the defects of such types could be determined. There was also a long period of constant and rapid increase in car weights and traffic, which finally reached the point where the track construction was really not strong enough to sustain the loading. Under these conditions it is to be expected that the maintenance costs would mount to high figures.

No Common Standard of Track Classification

The steam roads have adopted classifications of track construction which correspond to certain predetermined amounts of traffic and varying numbers of main tracks, and their standards of track construction and maintenance are based upon the classifications adopted by the American Railway Engineering Association, which are as follows:

Class A Track.—All districts of a railway having more than one main track. Also all single-track districts where the traffic equals or exceeds a freight-car mileage of 150,000 per mile per year; or a passenger-car mileage of 10,000 per mile per year and a maximum passenger-train speed of 50 m.p.h.

Class B Track.—All single-track districts of a railway where the traffic is less than for Class A, and is equal to or exceeds a freight-car mileage of 50,000 per mile per year; or a passenger-car mileage of 5000 per mile per year and a maximum passenger-train speed of 40 m.p.h.

Class C Track.—All districts of a railway not meeting the traffic requirements of Classes A or B.

The modern interurban and high-speed electric railway construction, however, often meets and at times exceeds the requirements of Classes B and C in all respects except freight traffic, but there are no standard track classifications of this kind in the electric railway field. On the other hand, the electric railway is generally found to have only one fixed standard for its new construction or reconstruction in any one city or system covering a wide variation in traffic and disregarding the number of tracks. This applies to the interurban and other high-speed electric railways as well. It must not be understood that all the electric railway tracks on any one system or in any one city are alike. Far from it, because most properties of any considerable size are consolidations made up of different types of construction, which were perhaps selected by as many managements as there were companies. But it will be found that each system now has a fixed standard for city track and another for track on private way, and the attempt is being made to get the trackage rebuilt to only one or two general types for the system. This practice has both advantages and disadvantages, but the fundamental principles in back of it are sound, as they are based on many economies in materials and labor which accompany the use of only one or two standard types of construction.

What Does Electric Railway Track Cost?

Electric railway track construction costs are subject to many variable conditions which will increase or decrease the cost over a wide range. There are at least five distinct types of roads, which in turn call for as many distinct differences in cost. These types are: (1) Urban or city lines; (2) interurban or suburban lines; (3) high-speed lines operated by means of third-rail or high voltage d.c. and a.c. overhead trolley wires; (4) elevated railways, and, (5) subways. There is also a variation in strictly urban line costs, in New York and Washington, for instance, where the very expensive underground trolley system of operation is in use. Furthermore, the variation in character of country traversed and in cost of materials and labor in different parts of the country has considerable influence on costs.

Another factor which has a decided effect on the cost of urban or city lines is track pavement, which may vary as much as $10,000 per mile of track on lines similar in all other construction details, but situated in different cities, in one of which the paving requirements may call for a more expensive type of pavement than in the other.

In addition to these items, there are the variations in construction costs caused by the nature and extent of storage yards, terminal facilities at fair grounds, ferries, baseball parks and other places where large crowds of people congregate, and the important factor of special track work contributes cost variations which differ widely.

It is obvious that there can be no fixed rule governing the construction cost of electric railways, but it may be stated in a general way that, according to estimates by L. E. Fischer, the modern interurban road costs complete anywhere from $26,720 to $58,650 per mile of track (see Table I), and that the cost of right-of-way, tracks, bridges, signals and incidental structures, other than overhead work, will range from $16,140 to $32,710 per mile of track (see Tables I and II). These estimated figures were for 1913, and were based on an analysis of costs for ten interurban roads.

Tracks on lines located entirely in cities or towns, and requiring pavement, will range in cost from $20,000 to $45,000 per mile of track. The latter figure is taken from actual costs of a 6-mile extension built in 1917 in a large Eastern city, while the former covers a 2-mile construction job done in 1914 in an Ohio town.

The construction costs for tracks on high-speed lines, elevated roads and subways are usually equal to the costs for first-class steam road tracks.

There is a great deal of money spent on track maintenance for which there is no improvement in permanent value. Tracks on private way are continually resurfaced and re-aligned; rails and ties are renewed here and there and joints tightened up. In paved tracks, joint and rail repairs are more costly because of the incidental removal and restoration of the pavement. It is a well-known fact that pavement maintenance represents from 30 to 40 per cent of the total maintenance cost for tracks in paved streets. These details require careful consideration from an economic standpoint and it will often be found that large expenditures on radical improvements will result in great and continued economies in maintenance. There should be a constant effort to keep the condition of the track up to such a degree of efficiency that a proper relation between the track condition and car traffic will be maintained since the deterioration of the tracks, if allowed to go too far, will have a marked influence on costs of car operation and maintenance of equipment.

TABLE II—ESTIMATED TRACK AND ROADWAY COSTS OF A PROPOSED ELECTRIC INTERURBAN RAILWAY, BEING A SUMMARY OF CERTAIN ESSENTIAL ITEMS TAKEN FROM TABLE I WITH 5 PER CENT FOR ENGINEERING ADDED

	Cost per Mile of Track	
Accounts	Minimum	Maximum
1—Engineering and superintendence	$770	$1,560
2—Right of way	2,000	4,000
3—Other land used in electric railway operations	100	500
4—Grading	2,500	6,000
5—Ballast	1,500	4,500
6—Ties	1,820	2,600
7—Rails, rail fastenings and joints	3,700	4,200
8—Special work	400	600
9—Underground construction	....	....
10—Paving	....	....
11—Track laying and surfacing	800	1,200
12—Roadway tools	50	50
13—Tunnels	....	....
14—Elevated structures and foundations	....	....
15—Bridges, trestles and culverts	2,000	4,000
16—Crossings, fences, cattle guards and signs	500	1,000
17—Interlocking and other signal apparatus	....	2,500
	$16,140	$32,710

(Note: Track bonding is omitted because it is classified as a part of the distribution system.) From article by L. E. Fischer, ELECTRIC RAILWAY JOURNAL, Sept. 6, 1913.

The degree of track efficiency which is desirable is dependent to a large degree upon the general condition and age of all the trackage and the financial position of the road. It is obvious that a road of poor earning power can hardly afford the standard of maintenance expense which would obtain upon a road which has an ample income.

Track maintenance costs, like track construction costs, are subject to many factors which control the expenditures. As an indication of how the cost of maintenance may vary it may be stated that an examination[1] of the expense for maintenance of way and structures on ten interurban roads in 1913 indicated a range of from $800 to $1,000 per mile of track operated. This range compares closely with the costs covering the electric railways in the State of Connecticut in 1912, as found in the annual report of the Connecticut Public Utilities Commission. The cost of this item on urban roads will range from $1,000 to $2,000 per mile of track operated, being influenced greatly by the amount of reconstruction done in any one season, for the reason that the greater part of the cost of reconstruction work is really extraordinary maintenance and is charged to regular maintenance accounts. These figures are more interesting when it is stated that in 1913 it cost, on an average for all main tracks on steam roads, about $1,300 per year to maintain 1 mile.[2]

The maintenance expenditure for track and pavement on 100 miles of modern 7-in. girder rail track in Brooklyn, N. Y., having wood ties and grouted granite pavement on concrete and covering tracks from one to ten

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[1] L. E. Fischer, ELECTRIC RAILWAY JOURNAL Sept. 6, 1913.
[2] Willard: "Maintenance of Way and Structures."

Electric Railway Power Plant and Its Personnel

The Technically Trained Man Must Be Held in the Power Plant, and Particularly in the Boiler Room—He Can Be Held If the Management Realizes What Economies Can Be Carried Out by Men of Scientific Training

By Hartley LeH. Smith
Engineer of Tests
Brooklyn Rapid Transit System

THE power supply of an electric railway comes either from an electric power plant devoted exclusively to the individual railway's use or from a power plant carrying railway load as a part only of its total load, the remainder being lighting load and industrial power load for manufacturing purposes. While slightly more than one-half of the electric railways to-day get their power from plants devoted exclusively to their own use, and in fact owned and operated by them, the tendency is very rapidly growing to forgo exclusive power supply and purchase from a power company.

The forms in which electric power is generated for electric railway use are direct current at 550 to 650 volts, direct current at 1200 volts, direct current at 2400 volts, alternating current, three-phase at high voltage with substation transformation, and alternating current high voltage single-phase with distribution to the overhead contact system without transformation. The single-phase distribution just mentioned is in reality single phase distribution from three-phase generators in practically all cases to-day.

Generation of three-phase current in this country is at 25 cycles or at 60 cycles per second. Other frequencies are so rare as to be altogether negligible. This is by no means true in other countries. In England, for instance, there are four or five frequencies in common use.

Until very recently alternating current for railway use, whether transmitted to converter substations or distributed to high-voltage, single-phase trolleys, was invariably generated at 25 cycles. Lately, however, the 60-cycle, 550 to 650-volt railway converter has been developed and large amounts of power are now being generated at 60 cycles and transformed to direct current for railway motor use. It is indeed the 60-cycle railway converter operating at 550 to 650 volts which is making possible the movement away from exclusive railway power generation, and the substitution for it of power purchased from the general power company. The general power company generates at 60 cycles, since its load has been lighting and industrial power, and 60 cycles alone is a frequency suitable for lighting. Stations generating at 25 cycles are therefore either those devoted to electric railway load or they are stations situated in those very large cities where the congestion is so great as to make feasible the entire transformation to direct current form before distribution of light and power to consumer's circuits.

An Efficient Plant Is a Specialized Plant

So much for alternating-current generation and distribution. Of the forms of direct-current power, those at 550 to 650 volts, 1200 volts and 2400 volts, it may be said that they are generated in power plants devoted exclusively to railway use, the amounts of such power sold as a general supply for industrial purposes being so slight as to be quite negligible.

Classifications of course cannot be made too rigid. There are, for instance, very many electric power plants in this country with entirely distinct groups of generators devoted to the specific purposes for which they are exclusively fitted. Such plants constitute, so to speak, two or more generating stations under one roof; they are not typical of modern practice. They are examples neither of the specialization which spells economy, nor of the well nigh universal adaptability of the extremely modern stations which also spells economy.

Direct One-Man Management Is Rare

Of the organization of the personnel of electric power plants it may be said that there is very wide variation when considered in any detail; standardization of such organization even along very general lines has as yet by no means come. It is doubtful whether any distinction could be substantiated between the organization of personnel in railway power stations and that in others. One very broad and significant generalization can however be made; the division by a sharp line between electrical and steam (engine and boiler room) responsibility. The four walls of a power station but rarely house an official fully responsible for both classes of

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(*Concluded from page 360*)

years old with an average age of nearly four years, was found to be $460 per mile per year.[1]

It was also found that the expense for joint maintenance represented 52.1 per cent, pavement 34.8 per cent, and corrugation 12.8 per cent of the total maintenance expenditure. Incidentally it was noted that about 26 per cent of the pavement expense was for repairs to pavement following joint repairs, and also that 65 per cent of the total expense was confined to 11.4 per cent of the mileage, having been due mainly to a particular type of rail joint.

It will be apparent from the foregoing figures on maintenance costs that the engineer of maintenance of way needs to keep closely in touch with the expenditures of his department. Through careful analysis of expense and comparison with similar items on other roads as well as comparisons of different parts of his own road, he may search out the weak points and take steps to overcome them.

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[1] See ELECTRIC RAILWAY JOURNAL, March 17, 1917.

apparatus and service. Of course responsibility for these two cardinal services merge always somewhere in the company organization in one man. Very nearly always, however, he is a man stationed among the other company executives. In all but really large companies, where complexity and differentiation of organization naturally multiply, he is almost sure to bear other executive responsibility also. Very often he bears very many other responsibilities, as general manager. Very often, too, in companies somewhat larger he is electrical engineer and is in charge of electrical distribution and often indeed of rolling stock also, although this last is certainly less common than formerly. Really large companies organize quite differently, with much specialization as size increases.

As for companies of average size, and even much less than average size, so sharp a distinction runs between immediate first-hand charge of steam and electric operation and maintenance control there is no answer but one. Men considered capable of ambidextrously handling both are scarce. The thin ranks of such men are growing nevertheless visibly larger. Why so? Well, it is a fact that the boys from the technical schools of fifteen years ago are boys no longer now.

"Our job is to make this pile go farther"

An electric power station has its chief engineer; it has also its chief electrician. These are not responsible one to the other. That is the point I have been making; responsibility merges above. A consequence is that chief engineer and chief electrician have their own separate organizations. It is largely so that this dualistic responsibility perpetuates itself. Power stations are manned largely by men who grow up in power stations. A man grows up as a steam man or as an electrical man. After a while he gets to the top of the steam or of the electrical department. Do I know that the water tender in the boiler room reads in his technical paper the circuit connections of a three-phase generator? I do know it. I am not writing of the power station a bit in the future but of the present-day power station.

Organization Varies with Plant Characteristics

Of the detailed organization inside an electric power plant no standardized scheme can be drawn up. Certain very broad distinctions are however fairly clear. In all but very small plants there are electrical operators and electrical maintenance men. Rarely do electrical operators do repair work. On the steam side, however, a watch engineer and a monkey wrench are much together; likewise a boiler room engineer and a tube cleaner. In quite large power stations it is true there is apt to be considerable distinction between plant operation and maintenance with sometimes an assistant chief engineer responsible for maintenance under the chief engineer, while the watch engineers, operating men, remain responsible directly to the chief engineer.

A very important phase of the steam plant organization bears upon the relationship between engine or turbine-room force and the boiler-room force. At one end of the scale, that of the small plant, there is the engineer and the fireman or firemen, with nothing dubious as to who gives and who takes orders. But at the other end of the scale, the very large plant, the question of unity or cleavage of organization is sometimes decided one way, sometimes another. The question is whether the chief engineer deals directly with the boiler-room force or more or less through the ranking man or men of the engine room. Very rarely probably does the engine-room man find himself unconcerned with certain features of boiler-room operating practice, such as banking and starting up of boilers to suit the changing number of engine-room units in operation, the maintenance of uniform steam pressure, etc. Very often, however, no engine-room man is held in any way responsible for boiler repair work.

A vast deal is written nowadays about the superior significance of talent, real engineering talent, in the boiler room; that it is in the boiler room that plant economy is made or lost. We are told that in the boiler room is the opportunity for the big operating man; that there a man's work from hour to hour is worth amounts of money to his company so vast compared with his pay that his pay might be anything at all. We are told also that the increasing, very rapidly increasing, introduction of individual boiler units of very great size is rapidly putting this claim upon the basis of actual practice. We are told that the really technical man is demanded; that this company or that company is going after graduates of engineering schools of rank and that in the boiler room such young men will do the thing as it should be done. This sounds well. The scheme is grounded in very excellent logic; but does it really work? Would such men stay, and if they stayed would they do what is expected of them? In the first place there are a lot of things a technical man, a technical graduate, doesn't know. He knows boiler operation, or if he doesn't he learns it very quickly and well. But maintenance he doesn't understand because a whole lot of it consists of "tricks"; in other words, it is a trade. He can learn that, too, but life is short and the American technical graduate rises all too quickly to wait for that. Before you can very well get track of some of them you find that they are running power stations themselves. If that is so they must bluff it just a bit for a while, you say? Well, yes, but then we said above that they are Americans, did we not?

Technical Men the Hope of the Boiler Room

What then is the hope of the boiler room? I really think it awaits the day of the thoroughly technical chief engineer. That day hasn't come, but it is coming. If a man knows the field intimately at present he knows that the full advent of the day is distant even yet. And the reason for this is simple, it will not be here until the older men have left the field. Even that will not be enough; men must be graduated in larger numbers than at present, and a greater proportion of those graduated must continue working as engineers. The young fellows who are in power stations now in capacities more or less vague and nondescript, and there are many of these but many more are needed, must stay and grow up and find themselves eventually in charge by a sort of inevitable inheritance. Then, too, certain fast-vanishing prejudices which now exist must be banished forever.

And when the day comes when power plants, in practically all cases, are in charge of trained technical men, will economy have improved and if so how will it have been improved? After all, the technique of power station operation is not of great complexity. Compared with a scientist's field the day's work of a power plant engineer may be arduous, but it is not complex. Indeed, its very simplicity is a handicap, for it can hardly attract the ablest men. Scarcely any of the essentially technical features of power generation are entirely outside the knowledge of men operating power stations to-day. They have heard of them at least, although their grasp upon the underlying principles may not be of the firmest. The chief difference is that in that future day the men running power stations, technically trained men, will more truly believe in these principles. They will believe them to be more worth while; they will believe them to be more practical. Then, too, we must not forget that their task of execution will be easier. If the chief takes to knowledge and "drinks" it, what will the "boys" be doing?

Station Duties Differentiate into Boiler, Steam and Electrical

But to come back to the power station of the present. On systems of size there is almost sure to be, on the elctrical side, some sort of system operator or chief operator, distinguished from the chief electrician and his direct organization in that they deal with electrical operation inside the station while he deals with the relation of the station to its external load, so to speak.

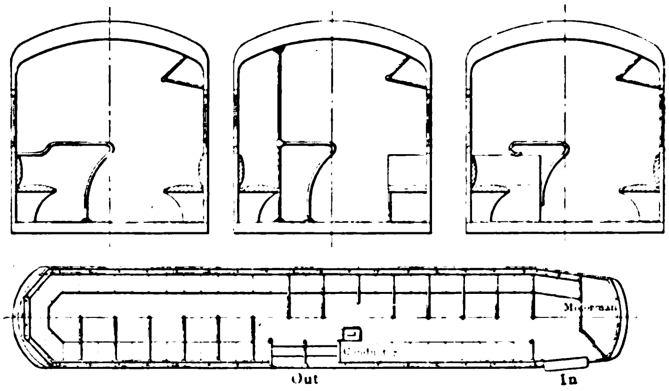
On the steam side under the watch engineers and possibly turbine engineers in large stations there are oilers for the main units and often engineers and oilers for the steam auxiliaries. The details of organization depend very largely upon the design of the turbine or engine room, that is, the proximity and accessibility of the auxiliaries from the engine or turbine floor. An important class of men, distinct in a large station, are those who take care of the maintenance of the auxiliaries of the main units. The need of such men is particularly urgent where very high vacuum is maintained in turbines provided with surface condensers and reciprocating dry-vacuum pumps.

In the boiler room the simple organization of a small station changes considerably to a complexity in stations of very large size. Beside firemen there are sometimes head firemen who see that instructions are observed and the general level of skill maintained. Often the water level is not controlled by the firemen but by water tenders. Over water tenders or head firemen, or both, there are sometimes boiler-room engineers, responsible as a general thing as operating men to the watch engineers of the turbine room or engine room. Of course, size of the plant is the chief factor. In many fairly large plants the chief engineer exercises directly many functions which in plants of very great size he exercises through subordinates.

To discuss organization broadly is to note that it deals in simple manner or complex, depending on size of plant, with the sorts of energy transformation and the apparatus by which the transformations are accomplished. In a steam-operated plant there is one beginning but there are two endings. The beginning is the coal handling. One ending is the removal of the ashes, the other is the delivery of the electric energy to the transmission lines. Many sorts and kinds of apparatus make up the total. To enumerate briefly the principal links we find coal hoists, coal crushers, coal storage plant, facilities for coal delivery to the boilers, coal feeding into the boilers, coal-combustion appliances and aids, the stacks, flues, economizers and other appliances for caring for the products of combustion, the ash-dumping and ash-removal facilities, boilers for steam generation, superheaters for the increase of efficiency, feed-water pumps and heaters, feed water purifiers, steam piping, main engines or turbines with their auxiliaries, condensers, condensing-water pumps, air pumps, oil pumps, electric generators, oil switches, switchboard control, electric measuring instruments, outgoing feeders. All of these present their problems for organization aside from their problems of operation.

Stanchions for Longitudinal Seat Cars

THE interest in the front-entrance, center-exit car renders timely a reference to patents granted to George C. Wing and Lewis P. Lipps, of Cleveland, Ohio, on a car interior arrangement designed to insure comfort and safety of passengers. In brief, the points covered are an arrangement of a passageway to one side of the center line of the car and stalls separated by stanchions or hand rails. Several possible forms of rail are shown in the accompanying diagrams.



ARRANGEMENT OF RAILINGS FOR SUBDIVIDING CAR INTERIOR INTO COMPARTMENTS

Although not primarily intended as a support for standing passengers, the rails would perform this function to a certain extent. They also would serve to insure equitable division of seating space among passengers and also of standing space. In addition they are designed to provide assistance to passengers when rising and sitting down.

Constructive Co-operation at East St. Louis

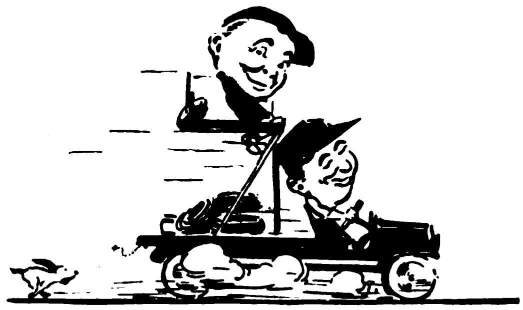
A committee of business men appointed by the East St. Louis (Ill.) Merchants' Association to confer with the officials of the East St. Louis & Suburban Railway has published a report of their conference in which they urge the people of the territory served by this company to co-operate with the officials in making the service satisfactory. They emphasized the importance of this in view of the fact that war conditions and greatly increased costs of production make operation of an electric railway a trying and a hazardous task. The report of the committee was published at length in East St. Louis papers and is a full and frank discussion of problems underlying the operation of the "East Side Electric Lines," as they are called.

The Forces Which Act Upon a Transmission Line

Data Are Given by Means of Which the Factor of Safety of a Pole Line Can Be Calculated The Transmission Line Is Shown to Be One Link in the Transportation Chain

By Charles R. Harte
Construction Engineer The Connecticut Company,
New Haven, Conn.

THE present-day tendency to broad publicity shows that at last electric railway operators are realizing the fact that they are merchants, their wares being transportation, and that if they are to be successful they must follow modern methods of salesmanship. Transportation, however, is only the last step; before the goods can be sold they must be produced. The complications of this process and the opportunities which it affords for losses or economies all along the line are hardly appreciated except by those most intimately connected with the details. An investigation of the process from the time when the raw material—the fuel—is delivered to the plant to the time when a ride is delivered to the customer, however, shows that it consists of a number of steps. The investigation will disclose also at least one, and in the majority of cases two, interruptions in the manufacturing procedure while the principal "material" of the ride is being shipped from one shop to the next.


Overhead linemen hastening to repair a link in the transportation chain

Let us start with the coal pile. The chemical energy locked up there must be transformed in the power station first to heat; then through the agency of steam and the turbines or engines to rotary motion; then in the alternators to electrical energy, and finally in the step-up transformers to an entirely different variety of current for "shipment" over the transmission line. At the substation the incoming energy is again changed to an entirely different form of alternating current; then by the rotaries or motor-generators to direct current, to be shipped over the distribution system to the car, wherein the motors convert it first into rotary motion and then, by the aid of wheels and track, into straight line car motion. The electric railway business involves, therefore, not only retailing the transportation, but producing it in three manufacturing plants and providing two transportation systems to carry the product of each to the next in order.

In the case of a small property, generation, transmission, conversion and distribution may all come under one department, but in larger systems each will have its own more or less complete organization. In a discussion in any detail each step will require individual treatment in many respects.

It is proposed in the series of articles on transmission and distribution lines, of which this is the first, to set out in some detail the purpose and requirements of the several elements, and to describe some of the materials and practices which have come under the writer's observation. It is hoped that their appearance "once in a while" will result in comment, criticism and additional information; that the sum total of the discussion will form a helpful contribution to the art by indicating what to do or, perhaps, that which the late Dr. Thomas Egleston of the Columbia School of Mines always said was equally important to know—what not to do.

In the transmission of power from the power station to the car it passes in general over the high-tension line, through the substation, over the low-tension feeders and finally through the overhead contact line or third-rail to the trolley wheel or shoe. In the present article we shall concentrate attention largely upon the transmission line, and particularly upon that important element, the pole.

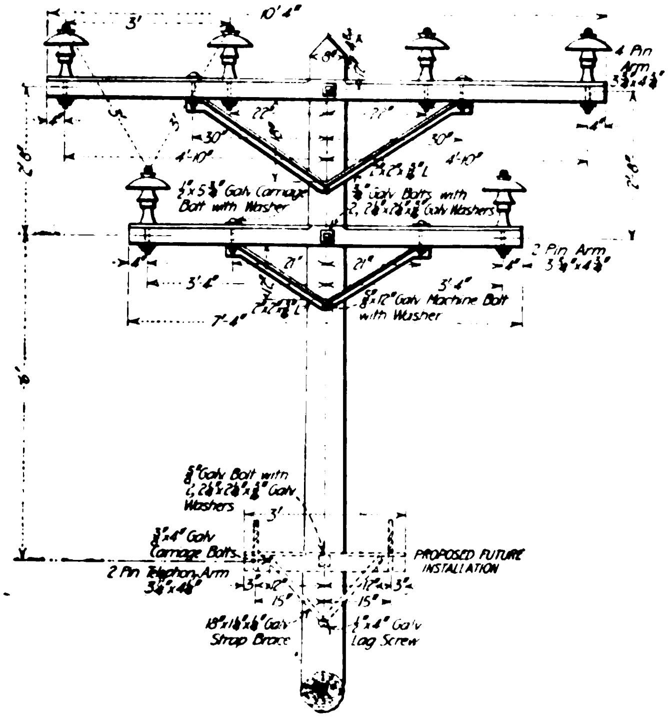
The transmission line is a transportation line pure and simple, with the one function of transmitting high-tension current from generating station to substation. Electrically this requires construction which will keep the current on the wire and lightning off it. Mechanically there must be strength to resist storm and decay or corrosion, and supports must be provided to keep the wires out of mischief to themselves or others. In theory apparently these are very simple matters; in practice they are often surprisingly complicated, particularly in the case of the long-distance high potential heavy-power lines. Such lines, however, are a whole subject in themselves, and indeed are more apt to be part of a big general-service power system than part of an electric railway.

The moderate-voltage transmission lines which make up the large majority of those actually a part of "trolley" systems have much in common with distribution lines, and to a considerable extent are combined with them. The greatest difference arises from the fact that while the transmission line serves merely as an industrial carrier between two fixed terminals the distribution line must deliver power to a rapidly moving car at any point along the line. In addition to carrying the current it must provide a satisfactory track for the collecting device. This fact gives the transmission line designer a considerable advantage, his mechanical problems differing only in degree from those which the older telegraph line practice had pretty well solved. Naturally the desire of not a few of those entering the new field to impress the stamp of their originality on the art led to some outrageous construction. The one thing that refused to lend itself to "freak" treatment was the form of support which probably for some time to come, as heretofore, will carry a good majority of the lines, namely, the wood pole.

The Pole Must Be Considered as a Beam

The line poles have three mechanical functions. They must support the dead weight of the line, withstand the tendency of the line and the wind to overturn them sideways, and hold the line sufficiently above the ground to provide adequate clearance.

In its direct effect the dead load is of comparatively little importance as regards the pole itself. Crossarms and other attachments, even though relatively numerous, do not weigh much. The pole top shown in the illustration, which is for two No. 00 copper circuits with 150 ft. normal span insulated for 45,000 volts but to operate at 33,000, has a dead load made up as follows:


10'4"
3'
4 Pin Arm 3¼"x4¼"
22"
30"
4'-10"
2'8"
½"x5½" Galv Carriage Bolt with Washer
⅝" Galv Bolts with 2, 2¼"x2¼"x⅛" Galv Washers
2 Pin Arm 3¼"x4¼"
21"
3'-4"
7'-4"
⅝"x12" Galv Machine Bolt with Washer
⅝" Galv Bolt with 2, 2¼"x2¼"x⅛" Galv Washers
3'
⅜"x4" Galv Carriage Bolts
2 Pin Telephone Arm 3¼"x4¼"
PROPOSED FUTURE INSTALLATION
12"
15"
18"x1¼"x⅛" Galv Strap Brace
½"x4" Galv Lag Screw

TYPICAL TRANSMISSION LINE POLE TOP

Six insulators, 11 lb. each	66 lb.
Six pins, 5 lb. each	30 lb.
Crossarms, 58.5 + 41.5 lb.	100 lb.
Braces, 14.5 + 11.5 lb.	26 lb.
Bolts, etc	10 lb.
Conductors, 6 x 150 ft., 0.403 lb. per ft.	363 lb.
Total	595 lb.

With the conditions specified in the National Electric Safety Code as "heavy loading," a dead load of 1230 lb. is produced. This provides for a coat of sleet ½ in. thick, making the diameter of each wire practically 1½ in. The specified wind pressure of 8 lb. per foot, which is also a considerable part of the heavy loading, is assumed to act horizontally, and so does not affect the vertical load. The sleet increases the loading by 535 lb., to which must be added probably 100 lb. due to the ice on the arms and the pole itself. This 1230 lb. is far below the capacity of any ordinary pole acting simply as a strut, but its effect on the arm is quite a different story.

Considering the pole as a beam, however, the effect of the loading in conjunction with wind, or in the unhappy case of unbalanced stresses due to some form of failure on either side, is a more serious matter. Before considering this, however, it is well to see what are the forces which must be overcome.

Estimating Maximum Stresses on Transmission Lines

The two forces which may tend to overturn a pole are those due to the wind and to the unbalanced pull of the conductors. The assigning of proper values to these forces in designing a line was the subject of bitter discussion until the appearance in 1911 of the "Specifications for Overhead Crossings of Electric Light and Power Lines." This work was prepared by a joint committee of the National Electric Light Association (at the instance of whose committee on overhead line construction, and particularly of Farley Osgood, chairman of the committee, the work was undertaken), the American Institute of Electrical Engineers, the American Electric Railway Association, the Association of Railway Telegraph Superintendents and the American Railway Engineering and Maintenance of Way Association (now the American Railway Engineering Association). The interests of the telephone companies, which have no corresponding national organization, were represented by F. L. Rhodes and H. S. Warren of the N. E. L. A. and A. I. E. E. respectively.

This committee selected the following as reasonable maximum pressures upon sleet-covered structures: 8 lb. per square foot of area of conductors with a coat of sleet increasing the diameter by 1 in. (½ in. of sleet) and 13 lb. per square foot "on the projected area of solid or closed structures and one-and one-half times the projected area of latticed structures." These pressures correspond to an "indicated" wind velocity of about 70 m.p.h., or an actual velocity of about 60 m.p.h., the difference being due to the fact that the usual cup anemometer gives readings higher than the actual velocities.

Velocities higher than those specified do occur, but almost never with sleet. In the case of large towers in exposed positions such higher velocities against the uncoated surfaces may require special consideration, but as a rule, on the rare occasions when such velocities occur the reduction in area by the loss of the sleet more than offsets the higher pressures.

A Few Pecularities of Sleet

The production of sleet on transmission lines requires a peculiar condition, namely, a temperature below freezing on the ground with one above freezing higher up so that the rain or wet snow does not freeze until it strikes the line. A very little temperature change fortunately stops the process, but altogether too frequently for the engineer's peace of mind the critical conditions endure long enough to do serious damage. The thickest sleet coat is much of the same class as the biggest trout caught; details are best remembered long afterwards. At the time of the occurrence the sentiment of all involved is apt to be that of a lineman whose failure to get some actual measurements in view of the previous specific requests for facts was mildly commented on by the writer. In this case the prompt "come-back" was "It bust the line; what the h— more do you want!"

Sleet ranges from a porous white and comparatively light form through all grades up to a beautifully clear ice. As a rule the white ice, some of which is almost as heavy as the clear ice, occurs with heavy winds. The clear ice is apt to form in quieter times, and to be followed promptly by clear cold weather with high wind. However, there seems to be no certainty in the matter and either form of sleet may do great damage.

The severe storms of 1909, one of which "assisted" in the inauguration of President Taft, were of the frozen-snow type. The storm of Dec. 13, 1915, was chiefly one of clear ice. The latter was notable in that, although it left the "overhead" practically uninjured it put the New York division of the New Haven Railroad out of business for several days by wrecking its communication lines. In these particular storms the damage was chiefly due to the weight of the accumulations. It occurred very largely on communication lines, the heavy leads of light wire afforded a particularly good opportunity for trouble.

How Geography Affects the Sleet Question

The evidence collected since the work of the joint committee was completed has shown the fairness and wisdom of its standard, and the ½-in. ice and 70 mile, zero-degree wind have been adopted by the federal Bureau of Standards in the new National Electrical Safety Code, the last word on the subject. In the code, however, the pressure against supports has been taken at 12 lb. instead of 13 lb. per square foot and lighter loading is prescribed for those sections of the country in which heavy sleet storms do not occur.

The district of heavy loading comprises all territory north of a line starting at the mouth of the Potomac River, passing east of Raleigh, N. C., along the line of the southern boundary of Tennessee to the Mississippi, in a southerly direction to Dallas, Texas, and thence northward in curve cutting off the northeast corner of New Mexico, through the northwest corner of Colorado to a point on the Canadian border about 100 miles east of the northwest corner of Montana.

The region of medium loading lies between this line and one which starts near Beaufort, N. C., runs south of Aiken, S. C., parallels the heavy-load region to a point near Waco, Texas, and thence sweeps west, passing into New Mexico at the Pecos River, through the south corner of Nevada and the valleys of the San Joaquin, Sacramento and Klamath Rivers to the Pacific. In the territory between this and the heavy loading area the maximum loading of the conductors is assumed to occur at a temperature of 15 deg. Fahr., and to be two-thirds of the value of the resultant of the wind and ice loads in the heavy loading district unless, as is the case with large conductors, this reduced value is less than one and one-fourth times the weight of the bare conductor. Under such circumstances one and one-fourth times the weight of the bare conductor is to be used, while for the supports the pressure is taken at 7 lb. per square foot. In the district lying south and west of this medium-loading area sleet is practically unknown, and for this section the maximum load is assumed to occur at 30 deg. Fahr., and to be four-ninths of the value of the resultant of the wind and ice loads in the heavy-loading district, but in no case less than one and one-fourth times the weight of the bare conductor. For the supports the pressure is taken at 4 lb. per square foot.

Some Examples and Applications

Let us now get down to the practical application of all of this. The several forces pushing on the pole tend to break it off at the ground line if it is well set. The fibers of the pole resist this tendency, and the problem is to pick a "winner" for the pole.

The force against the pole is practically as follows:

$$\text{Force}_1 = \frac{\text{butt diameter} + \text{top diameter}}{2} \times \text{length}$$

above ground × wind pressure per square foot. The pole dimensions are all in feet.

The effect of this force over the entire length is as if it was all applied at a point midway between top and ground. The force resulting from the wind against each ice covered conductor is:

$$\text{Force}_2 = \frac{\text{conductor diameter} + 1\text{ in}}{12} \times \tfrac{1}{2}\text{ length of}$$

each adjacent span × wind pressure per square foot. The conductor diameter is in inches and the span length is in feet.

In the case of the pole top previously considered the average pole is 35 ft. long, with 6 ft. in the ground; the top diameter is 8 in., and the ground-line diameter is 13 in. For the heavy loading region we have:

$$\text{Force}_1 = \frac{1.08 + 0.67}{2} \times 29 \times 12 = 304.5\text{ lb.}$$

$$\text{Bending moment at ground line} = 304.5 \times \frac{29}{2} =$$

4414 lb.-ft., due to the pole itself.

For each wire:

$$\text{Force}_2 = \frac{0.42 + 1.0}{12} \times \left(\frac{150}{2} + \frac{150}{2}\right) \times 8 = 142\text{ lb.}$$

For the upper set:

$$\text{Bending moment} = 4 \times 142 \times 29 = 16{,}472\text{ lb.-ft.}$$

For the lower set:

$$\text{Bending moment} = 2 \times 142 \times (29 - 2.67) = 7478\text{ lb.-ft.}$$

$$\text{The total bending moment} = 4414 + 16{,}472 + 7478 = 28{,}364\text{ lb.-ft.}$$

The moment of resistance of the pole in pound-feet is equal to 0.0002638 times the fiber stress in pounds per square inch times the cube of the circumference at the ground line in inches. If we make this equal to the pound-feet bending moment due to the wind we get the fiber stress as follows:

$$\text{Fiber stress} = \frac{0.0002638 \times 41 \times 41 \times 41}{28{,}364} =$$

1560 lb. per square inch.

As the breaking strength of chestnut, cypress, Southern pine and Western red cedar is 5000 lb. per square inch and of Northern white cedar 3600 lb. per square inch, sound poles of the first-named woods 41 in. in circumference at the butt would provide, under the conditions given, a factor of safety of 3.2. For Northern white cedar the safety factor would be 2.3. A factor of safety as low as that for Northern white cedar would

Railroad Electrification and Conservation of National Resources*

In the Author's Opinion Electrification Offers the Most Immediate and Practicable Means for Increasing Our Transportation Capacity—And "The Way to Electrify Is to Electrify"

By E. W. RICE, Jr.
President, The General Electric Company, Schenectady, N. Y.

WHILE electrical science and industry are fundamentally devoted to the products and conditions of peace electricity plays also an important part in the grim business of war. We are in the midst of an extraordinary coal famine, due to causes which it is perhaps undesirable for us to attempt to outline. However, the situation might have been much worse were it not for the contributions of the electrical engineer. Furthermore, our condition might have been much better if the contributions of the electrical industry had been more extensively utilized.

Suppose we assume that the present serious situation is due to a lack of production of coal. It is comforting to consider to what extent conditions surrounding such production have been improved and how the output of our coal mines has already been increased by the use of electrical devices in connection with coal mining. I think it is a fair assumption that the output of coal mines should have been increased at least 25 per cent on the average by the employment of such electrical devices. If this estimate were cut down to 10 per cent it would still leave a possible increase of something like 50,000,000 in the tonnage of coal produced during the last year.

If on the other hand our situation is not due to a shortage in the production of coal but rather to the failure of the distributive agencies of the country, which is more probable, this difficulty would have been largely removed if the railroads of the country had been operated by electricity instead of steam.

TRACK CAPACITY INCREASED BY ELECTRIFICATION

Where electricity has been substituted for steam in the operation of railroads, fully 50 per cent increase in available capacity of existing tracks and other facilities has been secured. This increased capacity has been due to a number of causes, but largely to the increased reliability and capacity of electric locomotives under all conditions of service. They thus permit a speeding up of train schedules by some 25 per cent under average conditions. Of course, under the paralyzing conditions which prevail in extremely cold weather, when the steam locomotives practically go out of business, the electric locomotives make an even better showing. It is well known that extreme cold (aside from the physical condition of the traffic rail) does not hinder the operation of the electric locomotive, but actually increases its hauling capacity. At a time when the steam locomotive is using up all of its energy by radiation from its boiler and engine into the atmosphere, leaving practically no useful power available to move the train, the electric locomotive is operating under its most efficient conditions, and may even haul a greater load than in warm weather. It may there-

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*Abstract of address delivered at the Midwinter Convention of the A. I. E. E., Feb. 15, 1918.

(*Concluded from page* 366)

make close attention to pole condition desirable and necessitate prompt renewals later on.

It is always desirable by calculation to test the probable strength of the poles used. For the average line "Class B" poles will almost always serve, but definite figures made at the time the line was built are often of great value in later discussions with regulative bodies.

Circumference of Pole at Ground Level in	Breaking Moment in Pound-feet for Fibre Stress in Pounds per Square Inch of	
Inches	5000	3600
30	35,620	25.650
31	39,300	28.300
32	43,220	31,120
33	47.400	34.130
34	51,840	37.320
35	56.560	40,720
36	61,540	44,310
37	66.820	48.110
38	72,380	52.110
39	78.240	56,330
40	84,440	60.800
41	90.900	65.450
42	97.720	70,360
43	104,860	75.500
44	112,360	80,900
45	120.200	86.540
46	128.400	92.450
47	136,940	98.600
48	145,880	105,030
49	155,200	111.740
50	164.880	118,710
51	174.960	125.970
52	185,460	133,530
53	196,360	141.380
54	207,700	149.540
55	219,450	158,000
56	231,640	166,780
57	244.270	175,870
58	257,350	185,290
59	270,890	195.040
60	284,900	205,130

The following table gives the maximum resisting moments of poles for fiber stresses of 5000 lb. and for 3600 lb. The former is a conservative *breaking* value for sound chestnut, cypress, Southern pine and Western red cedar, and the latter for Northern white cedar. The actual stresses should in no case exceed one-half of the values of the table.

It is the general practice to assume that any ordinary unbalanced pull in the direction of the line will not exceed that resulting from a cross-line wind against iced conductors. Pulls resulting from angles, long spans, and possible conductor failures are almost invariably met by special guys or braces. Occasionally, however, it becomes necessary to meet the stress with an unguyed pole, in which case a more careful analysis must be made. This will be considered later in connection with special structures. For the general line the assumption that the weakest point of the pole is at the ground line is sufficiently accurate.

fore be said that cold weather offers no terrors to an electrified road. On the contrary, cold weather is a stimulant to better performance instead of a cause of prostration and paralysis.

But this is not all. It is estimated that something like 150,000,000 tons of coal was consumed by the railroads in the year 1917. Now we know from the results obtained from operation of such railroads as are already electrified in this country that it would be possible to save at least two-thirds of this coal if electric locomotives were substituted for the present steam locomotives. On this basis there would be a saving of more than 100,000,000 tons of coal in one year. This is an amount three times as great as the total amount of coal exported from the United States during 1917.

The carrying capacity of our steam roads is also seriously restricted by the movement of coal required for hauling the trains themselves. It is estimated that fully 10 per cent of the total ton-mileage movement behind the engine drawbar is made up of company coal and coal cars, including in this connection the steam-engine tender and its contents. In other words, the useful or revenue carrying-capacity of our steam roads could be increased about 10 per cent with existing track facilities by eliminating the entire company coal movement.

It is not too much to say that if the roads of the country were now electrified no breakdown of our coal supply due to failure of distribution would now exist. What this would mean for the comfort of the people and the vigorous prosecution of the war can readily be imagined.—E. W. RICE, JR.

I have not mentioned the consumption of oil by the railroads. This we are told amounted in 1915 to something like 40,000,000 barrels, nearly 15 per cent of the total oil produced. This fuel is far too valuable to be used in a wasteful manner. It is important for many reasons that such a wonderful fuel as oil should be most economically used, if for no other reason than that it will be needed for the ships of our forthcoming merchant marine, for the tractors that till our fields and for the motor trucks that serve as feeders to our railways.

ELECTRIFICATION PERMITS THE USE OF WATER POWER

The possible use of water power should also be considered in this connection. It is estimated that there is not less than 25,000,000 hp. of water power available in the United States. If this were developed and could be used in driving our railroads, each horsepower so used would save at least 6 lb. of coal now burned under the boilers of our steam locomotives for each horsepower-hour developed. It is true that this water power is not uniformly distributed in the districts where the railroad requirements are greatest, but the possibilities indicated by the figures are so impressive as to justify careful examination as to the extent to which water power could be so employed and as to the amount of coal which could be saved by its use. There is no doubt that a very considerable portion of the coal now wastefully used by the railroads could be released, to the great and lasting advantage of the country.

The terrors of these "heatless days" will not have been without benefit if they direct the attention of the people and of our legislators to the frightful waste of two of our country's most valuable assets—our potential water power and our wonderful coal reserves. The first is being lost largely because most of it is allowed to run to waste—undeveloped, unused. The second asset is wasted for exactly the opposite reason. It is being used, but in an extravagant and inefficient manner.

While the amount of coal in this country is enormous, it is definitely limited; when once exhausted it is gone forever. It is really terrifying to realize that 25 per cent of the total amount of coal which we are digging from the earth each year is burned to operate our railroads under such inefficient conditions that an average of at least 6 lb. of coal is required per horsepower-hour of work performed.

The same amount of coal burned in a modern central power station would produce an equivalent of three times that amount of power in the motors of an electric locomotive, even including all the losses of generation and transmission from the source of power to the locomotive. Where water power may be utilized, as in our mountainous districts in the West, all of the coal used for steam locomotives can be saved. In the Middle and Eastern states, however, water powers are not sufficient and it will be necessary in a universal scheme of electrification for the locomotives to be operated from steam-turbine stations. However, as already stated, the operation of the electrified railroads from steam-turbine stations will result in the saving of two-thirds of the coal now employed for equivalent tonnage movement by steam locomotives.

It is therefore not too much to say that if the roads of the country were now electrified no breakdown of our coal supply due to failure of distribution would exist. What this would mean for the comfort of the people and the vigorous prosecution of the war can readily be imagined.

Of course, this picture which I have briefly and inadequately sketched of the great benefits which our country would have received if the roads had been electrified does not improve our present situation and it may be claimed that any discussion of such a subject at this time is of an academic nature. This is true, in a sense, but I think that we can properly consider it on account of the effect which it may have upon our future efforts. The picture is not merely an inventor's dream but is based upon the solid foundation of actual achievement.

We have had enough experience upon which to base a fairly accurate determination of the stupendous advantages and savings which will surely follow the general electrification of the railroads. In fact I think that we can demonstrate the fact that there is no other way known to us by which the railroad problem facing the country can be as quickly and as cheaply solved as by electrification. The solution of the railroad problem would also "kill two birds with one stone" by solving the fuel problem at the same time.

KEEPING PACE WITH THE COUNTRY'S DEVELOPMENT

If it is a fact, as has been stated, that the steam railroads of the country have failed to keep pace with the country's productive capacity, with the increase in output of manufacturing industries, and the extension of agriculture and other demands for transportation, then it is obvious that if the country is to go ahead the railroad transportation problem must be solved, and it must be solved at the earliest possible date. It becomes a matter of national importance that the best solution should be reached in the shortest possible time. That solution is best which will give the greatest amount of transportation over existing tracks in the most reliable manner and, if possible, at the lowest operating cost. As electrical engineers we are confident that we can make good our claim that the best solution is to be found in a general electrification of the railroads. That such a solution would be of great advantage to our profession and to our industry is important.

But this is not as important as the great advantage which it would be to our country, freeing it as it would from the present threatened paralysis of business, possibility of untold human suffering and incalculable financial loss. It should give us courage and optimism for the future of our profession to contemplate the service which we may render in this direction and which it seems to me is immediately at hand.

It should arouse in all of us, and particularly in the younger engineers, an enthusiastic confidence in the present and future stability and value of our profession and of the electrical industry. It should satisfy the young engineer that the opportunity for him to render important service is as real and great to-day as it has been in the past for those of us who have seen and participated in the marvelous growth of the industry up to the present time.

ELECTRIFICATION IS NO LONGER EXPERIMENTAL

We would not be justified in being so confident of the benefits of electrification of railroads if every element in the problem had not been solved in a thoroughly practical manner. The electric generating power stations, operated either by water or by steam turbines, have reached the highest degree of perfection, efficiency and reliability, while the transmission of electricity over long distances with reliability has become a commonplace. Electric locomotives, capable of hauling the heaviest trains at the highest speeds over the heaviest grades, have been built and have been found in practical operation to meet every requirement of an exacting service. There is, therefore, no element of uncertainty, nothing experimental or problematical, which should cause us to hesitate in pressing our claims upon the attention of the country. Electrification of railroads has progressed with relative slowness during these many years, waiting upon the development and perfection of all of the processes of generation and transmission and of the perfection of the electric locomotive itself. When all of these elements had been perfected, as they now have been for several years, the railroads found themselves without the necessary capital to make the investment.

I realize that the task of electrifying all of the steam railroads of the country is one of tremendous proportions. It would require under the best of conditions many years to complete and would demand the expenditure of billions of dollars. The country, however, has clearly outgrown its railway facilities and it would require, in any event, the expenditure of billions of dollars and many years of time to bring the transportation facilities up to the country's requirements.

ELECTRIFICATION NEED NOT BE UNIVERSAL

It is not necessary that electrification should be universal in order to obtain many of its benefits. It is probable that the most serious limitation of our transportation system, at least in so far as the supply of coal is concerned, is to be found in the mountainous districts and it is precisely in such situations that electrification has demonstrated its greatest value. Electrification of a railroad in a mountainous district will in the worst cases enable double the amount of traffic to be moved over existing tracks and grades.

If a general scheme of electrification were decided upon the natural procedure would, therefore, be to electrify those portions of the steam railroads which would yield the greatest results and give the greatest relief from existing congestion. Electrification of such sections of the steam railroads would have an immediate and beneficial effect upon the entire transportation system of the country.

It may be said that the present is not a propitious time in which to deflect any of the country's money into railroad electrification. In spite of the enormous advantages of which I have spoken, I should be inclined to agree with such a point of view if it were not for the recent unpleasant demonstration of the failure of our railroad transportation systems to meet the demands which have been placed upon them by the industries, aggravated it is true by the war conditions and also by the unkindness of the weather. After all, the question for the country to decide is whether we dare to limp along with the present conditions of restricted production, due to limited transportation, at a time when the world demands and expects from us the greatest possible increase in our efficiency and total production.

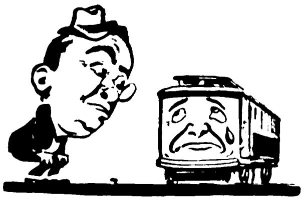
What assurance have we that the present conditions are temporary, and even if they improve as they surely shall with the coming of warm weather, what are we going to do next winter? Of course, even if we should start electrification at once we could not have all our railroads electrified by next winter, but we could have made a good start, and as Sherman said about the resumption of specie payments—"The way to resume is to resume," so we may say in this connection "The way to electrify is to electrify."

Classifying Passenger Cars for Given Conditions

A Different Car for Each Railway Unnecessary—Weight Provision Against Collisions Unimportant in Slow-Speed Service — Six Categories of Service Outlined

By Norman Litchfield

THE business of transporting passengers successfully requires the co-ordination of many mechanical units, the development of any one of which forms a subject whose history would be of interest to trace. No single one of these can be said to be more vital to the operation of the railroad than another, but from the rider's standpoint it is the car, together with the character and conduct of the employees on the car, that determines his estimate of the road and its management. The power house may contain the most marvellously efficient generating machinery, the track may be of most modern construction, the thousand and one other details may be covered flawlessly, but if the car does not provide the means for transporting him to his destination in safety, comfort and speed, whether he be bent on business or pleasure, the passenger rightly criticises the management and if possible withdraws his patronage. In fact, it may be said for the average rider that the car and its crew typify the railroad.


Existing cars should be analyzed for evidence of unnecessary weight

The Car Is a Tool for Producing Mileage

In view of the above conditions operating officials and car designers have joined hands to produce types which their combined judgment and experience have shown to be necessary to meet the rider's needs. Within the last few years the increasing use of steel has made it possible to fulfill requirements which otherwise would have been unattainable and has served as an impetus in the design of many interesting types of car developed to meet different conditions.

The railway operator may be considered as the manager of a factory whose output is transportation, and the cars as machine tools for the production of mileage. The more mileage the car produces, the higher the efficiency of the investment in track, power station, etc., and of the car itself and the employees on the car.

The efficiency of the car itself, or its ability to produce mileage consistently and without attendant losses from damage claims, etc., depends upon the arrangement and construction of the car and its running gear, and also upon its motive equipment, brakes, and other auxiliary apparatus. The studies covered by these articles will, however, deal only with the design and construction of the car itself.

It is evident that the broad field of electric passenger transportation cannot be covered by one type of car. It is difficult to draw absolutely certain lines of demarcation, defining groups in which different types of cars should be used, but it may be said that these fall roughly into six main divisions into one of which any given set of conditions may be placed. Probably no phrase has been more misused than that of "local conditions," for while it may be possible to use a car 6 in. longer and 2 in. wider than some one else can, it does not necessarily follow that it is wisest to do so.

The six groups referred to follow:

1. Car for towns and cities up to 100,000 population.
2. The large car for the heavy industrial lines of cities in excess of 100,000 population.
3. The two-car city train, where the extreme conditions of loading great factory crowds is met.
4. The subway-elevated car for multiple-unit train operation.
5. The car for light, frequent interurban service.
6. The car (motor and trailer) for long-distance high-speed interurban operation, large enough to include smoking, toilet, baggage and mail compartments.

It has been rightly said that any art goes through three broad stages, namely, invention, development and refinement. Electric railroading may be considered to have passed fairly well through the former two periods and to be, generally speaking, in the period of refinement. It is not that invention and development have ceased or will cease, but that they are no longer the outstanding feature of the art. The time was, and at a period not far distant, when the electric manufacturers designed an individual motor for every new set of conditions presented to them, even sometimes despite the wishes of the user. In fact, it is said of one official that he felt that the only safe specification for him to draw up was one reading, "I want a motor the exact duplicate of those now operating on the A. B. & C. Railway." But that time is passing. The tendency is toward a smaller number of types of motors, each of which will cover a number of conditions. So it is fair to say that very nearly any set of conditions may be said to be included in one of the six groups enumerated.

Different Conditions to Be Satisfied According to Service

We may then ask ourselves, what do we demand of each class of car? In general, it may be said that in city surface cars there are four prime essentials, namely, capacity, facility for passenger interchange, ease of fare collection and freedom from boarding and alighting accidents.

These features are equally desirable for the town or city of less than 100,000 population and for the larger city, the difference being of degree rather than of essentials. It is axiomatic that the number of cars a road must operate on any given line depends first upon the total number of passengers at the peak period and secondly on the interval that must be maintained in order not to lose patrons. The second item is often controlling in the small town throughout the entire day, just as it is in the large city during the non-rush hours. In other words, a service giving a succession of small cars at frequent intervals is obviously more popular than one with large cars for which the patron has to wait, even though in neither case are the cars crowded. It therefore follows that the small cities have been turning more and more to the smaller car. But with the increase in frequency of the service comes an increased platform charge and power consumption per passenger carried or nickel received, and when it is remembered that the platform charge under the best of circumstances amounts to a third or more of the total operating expenses, it is evident that this feature is of great importance.

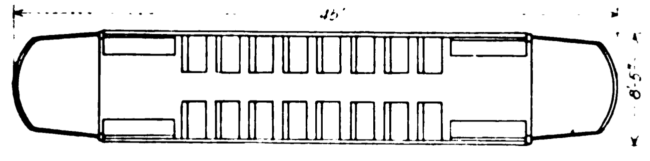


Fig. 1

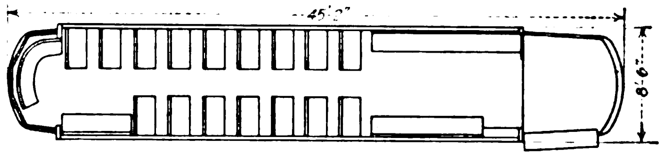


Fig. 2

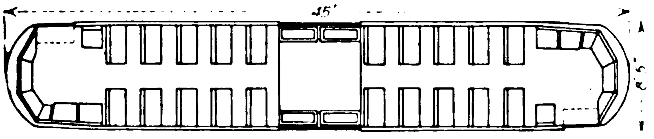


Fig. 3

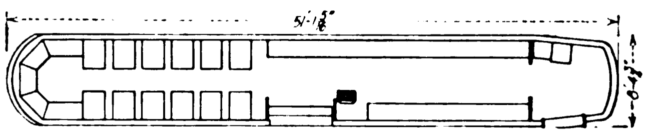


Fig. 4

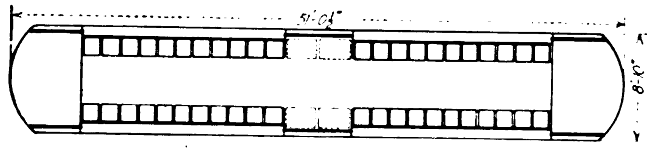


Fig. 5

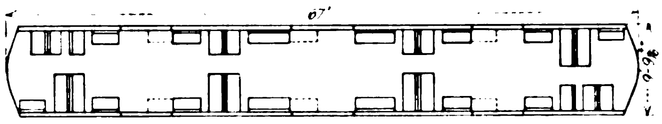


Fig. 6

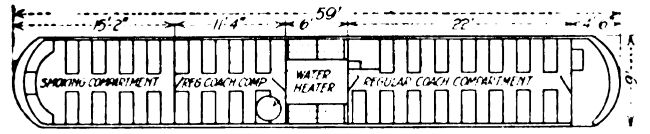


Fig. 7

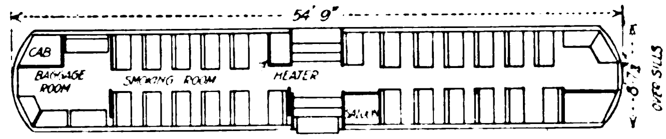


Fig. 8

FLOOR PLANS OF CARS FOR VARIOUS CLASSES OF SERVICE

For the above reasons the one-man or so-called safety car has been developed. This type has been described in recent issues of the JOURNAL. We have designated it for cities under 100,000 in population except on lines of unusually heavy travel. This at once provides the prepayment fare-collection features, reduced weight and platform charges and reasonable facility of passenger interchange for the conditions under which it is supposed to operate.

Where the Biggest Car Is Needed

For the larger cities, the congested conditions require the use during the rush hour of as many cars as can be accommodated on the tracks, each of as great capacity as can be operated safely under the conditions of track curvature. In this case, therefore, the platform charge cannot be reduced by the elimination of the conductor. In fact, special aids must be provided to reduce the duties of the crew to the minimum. It therefore follows that fare collection and the quick loading and unloading of passengers become of prime importance.

Since the earliest days of electric railways considerable attention has been paid to the platform arrangement with the idea of facilitating the handling of passengers. In 1901 a long platform car was operated in Detroit with a railing dividing it into two passageways, the idea being that some passengers would always insist on riding on the platforms, and that by requiring them to keep behind the railing a passage could be kept clear. This naturally required an exceedingly long platform, and as city cars are limited in length, it subtracted that much from the desirable seating space in the body of the car.

The problem of easy passenger interchange is closely bound up with that of fare collection, the solution of which was first successfully made by Duncan McDonald and W. G. Ross in the first Montreal pay-as-you-enter cars in 1906. In a description of these cars Mr. McDonald pointed out that up to that time there were four systems of fare collection in vogue, namely, the register, the portable fare box, the receipt system, in which each passenger was given a receipt (the receipts being checked occasionally by inspectors) and the prize system, in which prizes were drawn for by the holders of receipt coupons. He concludes that the task imposed upon the conductor under any of these systems is well-nigh impossible of fulfillment, and that the only ideal system is that in vogue on the elevated and subway systems wherein passengers have to pay before entering the car on which they desire to travel.

While there have been many variants on Mr. McDonald's car, the essential soundness of his views has been amply demonstrated, and the fundamentals are embodied in every surface car now being built. This keeps the conductor close to the point where passengers embark and leave the car and has gone far in the reduction of that exceedingly troublesome and wasteful feature of old-time surface car operation—the boarding and alighting accident.

More latterly has come the use of platform doors and folding steps controlled by either the conductor or the motorman, and interlocked with the motors and control so that the car cannot be started until the doors are closed, and in some cases also arranged so that the doors cannot be opened until the car has come to a dead stop. These features have to a large extent eliminated the boarding and alighting accident.

The final factor in facilitating passenger movement has been the elimination of steps by careful design, dropping the car floor to a minimum distance above the street level. All of these factors have brought the remarkable results of handling passengers at the rate of about one second each, reducing the lost fares to a fraction of 1 per cent, and the practical elimination of boarding and alighting accidents. There are to-day four distinct types of large city cars, as follows:

Stress diagrams meant little to the old-time car builder

Rear-entrance, front-exit, or ordinary pay-as-you-enter car, Fig. 1.

Front-entrance, front-exit, or near-side car, Fig. 2.

Center-entrance, center-exit, Fig. 3.

End-entrance, center-exit, or "pay-as-you-pass car," Fig. 4.

Each of these types has its advocates, and all possess certain distinctive features, but nevertheless have in common the fundamentals which have already been outlined.

We have already pointed out that in large cities it is necessary during the rush hours to run as many units as is physically possible, each of which must be of maximum capacity. A practical limit in the size of the car is finally reached at a length of from 45 ft. to 48 ft. When a larger unit is demanded for use under conditions such as the home-going of the employees of one of our large industrial plants, all at the same hour, it becomes necessary to employ the two-car train. This is sometimes composed of a motor car with a trailer, but this combination has a number of disadvantages; and the development of a light, inexpensive type of multiple-unit control and a semi-automatic air brake has made possible and economical the use of two motor cars. The latter arrangement is rapidly coming into favor. The remaining feature to be thoroughly developed is that of the automatic electric coupler, and it is reasonable to expect that this will be accomplished in the near future.

Door Location Vital in Subway Cars

In city cars operated in subways fare collection disappears, but passenger interchange increases in importance, and there is added the feature of protection against damage from collision. For the interchange of passengers it has been found desirable to make the proportion of doorways to passengers carried as large as possible and to minimize the distance of any passenger from a door. The size of car is largely controlled by existing conditions of track curvature, length of station platform, and by the determination of the most economical unit for combining with trains of different lengths at various hours of the day when the density of traffic varies. Two examples of this type are shown in Figs. 5 and 6.

In interurban cars the comfort of the passengers becomes a controlling factor, requiring the introduction of features not demanded or even desired by the public on the other class of car. (See Figs. 7 and 8.)

City Cars Need Not Be Weighted to Be Collision Proof

It may be noted that the feature of protection against collision begins to enter with the high-speed car. By this it is not meant that reasonable precautions against damage from collision should be overlooked in the city car but that city cars do not need to have weight put into them to make them, as it were, collision proof. The speed at which they operate is so low as to make them ordinarily controllable with the modern brakes. There is no need to prepare them for blows unattainable except at speeds they will never be called upon to reach. A close analogy may be found in the Ford automobile, which, admittedly not designed to withstand collision, wends its way through the most dense traffic in safety due to its ease of control. Mr. Ford himself has pointed this out in his recent criticism of certain steam car weights, that it was like using a 75-lb. basket to carry 25 lb. of groceries.

From 1250 Lb. to 500 Lb. per Seat

Considerable advance has been made in recent years along these lines, as may be evidenced by the instance of a city surface car built some years ago weighing approximately 50,000 lb. and seating forty passengers, making a dead weight of 1250 lb. per seated passenger; whereas cars now available for similar service weigh 35,000 lb. and seat fifty passengers, or 700 lb. per passenger. In fact, smaller cars are in use whose dead weight is not over 500 lb. per seated passenger. These reductions are due partly to the improvement in materials and design of motive apparatus forming a part of the car equipment; and partly to the use of steel in the car and truck construction disposed along scientific lines at the points were it is needed. The methods by which the proper proportioning of various parts may be arrived at will be reviewed in a future article.

Every former employee of the Toledo Railways & Light Company, Toledo, Ohio, who is now in military service, is to receive letters from the associates he has left behind him in Toledo. A schedule has been arranged whereby everyone now working for the company will write to each of the 170 former employees who are in camp. In this way it is believed that each soldier will in time get a letter from every one of his associates in Toledo. This scheme was suggested by Frank R. Coates, president of the company, who on his visit to the cantonments at Montgomery, Ala., and Chillicothe, Ohio, saw that nothing pleases the soldiers more than a letter from someone "back home."

Patriotism and Science at A. I. E. E. Mid-Winter Convention

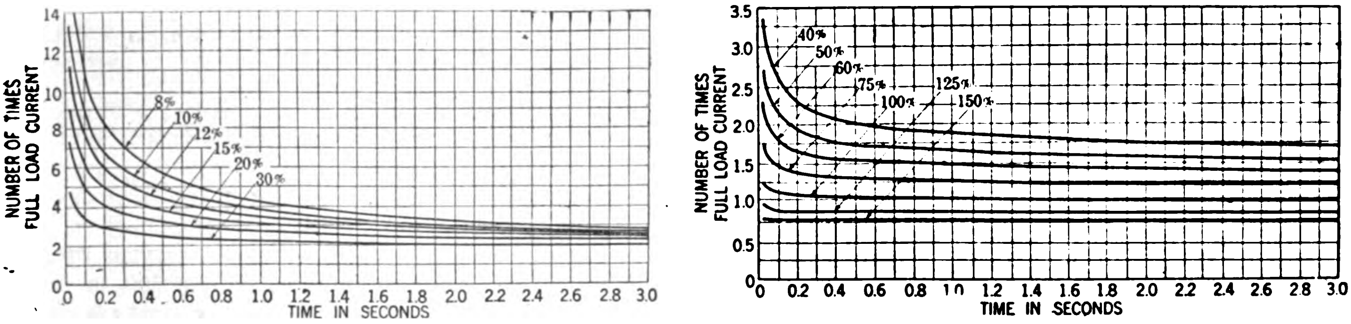
President E. W. Rice, Jr., in Two Notable Addresses Analyzed the War Situation and Showed How Electrification of Railroads Would Help

THE American Institute of Electrical Engineers held its sixth mid-winter convention in New York City on Feb. 15 and 16 with an attendance of about 400 at the meeting and 225 at an informal dinner on the evening of Feb. 15. In recognition of the state of war in which the country finds itself there were no entertainment features in the program, and the papers were short and scientific in character.

The opening remarks by President E. W. Rice, Jr., president General Electric Company, Schenectady, N. Y., dealt almost entirely with steam railroad electrification and what it could do in preventing a recurrence of the recent freight congestion. His remarks are given in extended abstract elsewhere in this issue.

President Rice was the only speaker after the informal dinner, and he took this occasion to correct the misapprehension on the part of those who feel that we could have done much better in our recent war preparations. After mentioning some of the events which superficially appear discouraging, he raised the question: "Is it true that we are making a failure of the job?" In answering this question he expressed among others the following convictions:

"It seems clear to me that we have not made a failure and that everything is moving along as well as we had a right to expect under all the circumstances. In spite of eminent authority, a million men cannot spring to arms overnight; nor can dreadnoughts, destroyers, submarines, anti-submarine devices, heavy ordnance, and all the great mechanism of war be produced in a day, in a month or even in a year, no matter how much we pray, 'cuss' or work. Our fundamental mistake was that we waited until war was thrust upon us before we started to get ready.



These curves, plotted between duration of short circuit and root-mean-square current in terms of full-load current, show the current which must be interrupted in a circuit of given total percentage reactance at any time after the short circuit has occurred. Initial load at 80 per cent power factor is assumed. Reactance is based on total kva. rating of synchronous machines.

CHARACTERISTIC CURVES FOR SHORT-CIRCUITS ON ENTIRE POWER SYSTEM

"This is a people's war, a war for democracy. This fact being recognized, we should not attempt to handle the job on the basis that it is to be run exclusively by the party in power. All of the people must be represented. It seems quite probable that the questioning attitude of the country to-day is due more than anything else to a growing fear that the full ability, wisdom and experience of the country are not being properly utilized. England has met the situation by a so-called 'coalition government'; why cannot we do something similar?

"After all, in my opinion the exact form of any organization is relatively unimportant. Its effectiveness in value is largely dependent upon the men who are on the job. Every organization must demonstrate what it can do to help the country in its hour of need. Every organization, whether of capital, labor, manufacture or business, and every individual, must be subjected to the test of whether each is doing the best and most effective work to win the war.

"The test of patriotism will be the willingness to work, each in his sphere, to the absolute limit. We need the maximum output of brains, labor and material. The country demands this, and the country will see that it is obtained. Any man or organization standing in the way of the purpose which this country has set for itself will eventually be crushed.

"It takes time for us to get over our ideas and practices based upon our competitive conditions and education. We are now to forget our competition and education and think of nothing but co-operation; in other words, of what is best to increase the country's production as a whole, for that is vital in winning the war.

"I believe that the problem facing us will be successfully solved in time, but we need more co-operation, more of the spirit of accommodation, all of our patience and wisdom, and, above all, a willingness to work to the limit. We must discipline ourselves until a shirker in any field of useful effort will be regarded with the same contempt as a shirker in the military service of the country, for there is no difference; or if there is any difference, a shirker behind the lines is worse than one in the trenches."

Of the nine papers presented at the technical sessions, most were of a theoretical character or were in fields remote from electric railway practice. That on "Rating and Selection of Oil Circuit Breakers," by E. M. Hewlett, J. M. Mahoney and G. A. Burnham, of the General Electric Company, Schenectady, N. Y., which was read at the Feb. 15 morning session, was a practical one and of electric railway interest.

The object of this paper, as stated by the authors, was threefold: (1) To discuss the interpretation of the A. I. E. E. rules covering the rating of oil circuit breakers, (2) to discuss the factors involved in the proper selection of oil circuit breakers, and (3) to suggest average system short-circuit characteristics useful for selecting oil circuit breakers for certain systems.

Annual Report of Association

Secretary-Treasurer Submits Report to Executive Committee—Comparison Is Published with Figures of Last Lear

USUALLY the report of the secretary and treasurer of the American Electric Railway Association is contained in the printed proceedings of the association. As the proceedings will not be issued this year, this paper is publishing the following abstract of the report submitted to the executive committee by Secretary-Treasurer Burritt. The period is for the year ended Oct. 31, 1917, and the publication is made with the permission of the association. The figures for 1916 are included for reference:

INCOME STATEMENT

Revenues

	Year Ended Oct. 31 1917	Year Ended Oct. 31 1916
1. Admission fees:		
Railway companies	$70	$240
Manufacturing companies	70	2,320
Total	$140	$2,560
2. Annual dues:		
Railway companies	$46,093	$46,148
Manufacturing companies	9,574	6,142
Individuals	3,307	3,979
Total	$58,975	$56,270
3. Miscellaneous income:		
Contribution from Hotel Men's Association	$32	$3,451
Interest on deposits	519	606
Sale of advance papers, year books and proceedings	377	509
Sale of Engineering Manuals and binders	199	285
Sale of "Cost of Urban Transportation Service"	195	614
Sale of Bibiliography on Valuation	20	151
Sale of other pamphlets	247	369
Sale of dinner tickets	5,230	......
Rent of convention exhibit space	......	19,968
Convention exhibit donation	......	375
Total	$6,823	$26,332

Revenues—(Continued)

	Year Ended Oct. 31 1917	Year Ended Oct. 31 1916
4. *Aera*:		
Advertising	$17,091	$19,098
Subscriptions:		
Railway companies	3,844	3,820
Manufacturing companies	1,405	855
Individuals	2,202	2,658
Company-section members	1,990	2,320
Non-member	128	167
Sale of extra copies	47	11
Sale of binders	17	6
Total	$26,725	$28,937
TOTAL REVENUES	$92,665	$114,100

Expenses

	1917	1916
American Association	$49,935	$74,917
Accountants' Association	1,336	1,153
Engineering Association	4,848	8,480
Claims Association	1,727	1,727
Transportation & Traffic Association	2,334	3,034
Aera	25,683	26,071
Total	$85,866	$115,385

EXPENSES BY ASSOCIATIONS

American Association

	Year Ended Oct. 31 1917	Year Ended Oct. 31 1916
Salaries of general office staff	$18,793	$16,049
Salary and expenses of Washington representative	2,046	416
Rent of office and storeroom	4,542	4,130
Stationery and printing	2,682	2,820
Postage	1,831	2,866
Repairs to furniture and equipment	13	51
Office supplies and expenses	1,168	1,224
Telephone, telegraph and messenger service	1,664	814
Express, freight and cartage	623	627
Exchange	109	103
Traveling expenses of secretary	803	207
Miscellaneous general expenses	1,347	1,169
Advance papers, annual reports and year book	1,526	2,211
Mid-year meeting	618	1,203
Mid-year dinner	5,865	.....
Annual dinner	......	506
Bureau Fare Research	......	870
Engineering Manual	1,659	814
Cost of transportation service	......	1,382
Bibliography on valuations	......	693
Accountant course	......	1,256
Miscellaneous pamphlets	368	18
Annual Convention expenses:		
1915 Convention	......	1,742
1916 Convention	253	5,497
1917 Conference	449	......
Installation of exhibit, 1916	......	18,203
Entertainment 1916 Convention	177	......
Committee expenses	3,389	10,033
Total	$49,935	$74,917

Accountants' Association

	1917	1916
Advance papers and annual report	$524	$787
Miscellaneous expenses of secretary	28	1
Committee expenses	783	365
Total	$1,336	$1,153

Engineering Association

	1917	1916
Advance papers and annual report	$1,645	$4,994
Committee expenses	3,193	3,486
Total	$4,848	$8,480

Claims Association

	1917	1916
Advance papers and annual report	$436	$681
Miscellaneous expenses of secretary	158	150
Hooper-Holmes Bureau	1,063	532
Committee expenses	69	362
Total	$1,727	$1,727

Transportation and Traffic Association

	1917	1916
Advance papers and annual report	$780	$1,409
Committee expenses	1,554	1,625
Total	$2,334	$3,034

"Aera"

	1917	1916
Salaries of *Aera* staff	$9,955	$8,244
Rent of office	678	398
Telephone, telegraph and messenger service	191	157
Postage and express	251	657
Traveling expenses of *Aera* staff	978	982
Miscellaneous expenses	31	289
Discount on *Aera* advertising	203	53
Cost of binders	123	......
Magazine expenses:		
Cost of printing	6,758	11,150
Cost of paper	4,344	2,012
Cost of cuts for text	597	951
Express, freight and cartage	536	470
Mailing charges	693	428
Envelopes for mailing	338	273
	$25,683	$26,071

(*Concluded from page* 373)

The opinions and data given were the result of an extensive study of circuit-breaker operation under practical conditions in various parts of the country. It was pointed out, however, that the securing of such data is very difficult owing to the fact that large power plants cannot be obtained for research purposes. Hence it is necessary to depend upon reports of accidental short circuits, and such reports are very considerably affected by the personal element.

However, it was possible to digest the results of observations, and to produce sets of curves between the duration of a short circuit in seconds and the magnitude of the short-circuit current (in terms of full-load current) for different percentages of total circuit reactance. Such curves were termed "system short-circuit characteristics."

The principal contribution of the paper to the knowledge of the subject consists in the furnishing of the characteristic curves, and in the solving of typical problems illustrating their use. The complete set of curves is reproduced on page 373.

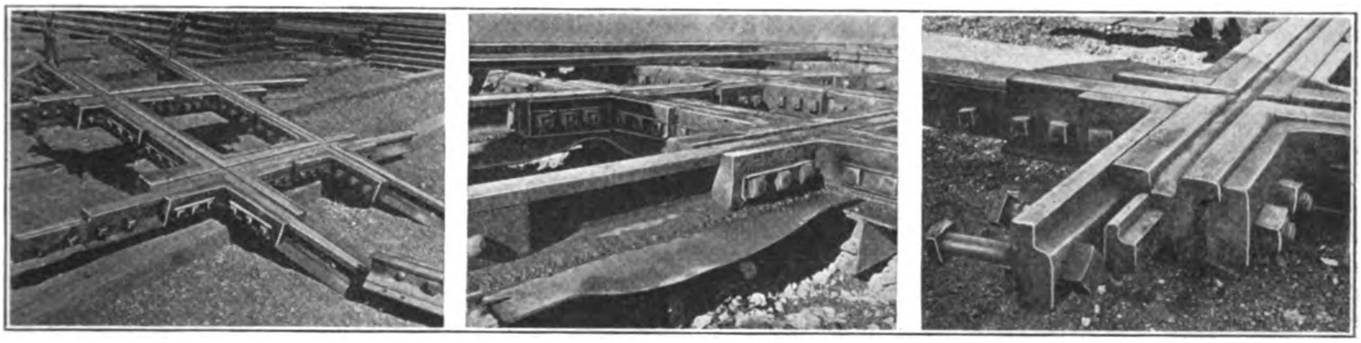
The subject of the rating of circuit breakers was very fully discussed and the consensus of opinion seemed to be that the data shown in the curves were conservative, and therefore safe. It was evident that even with the aid of these curves it will not be possible to select circuit breakers without the advice of manufacturers. The state of the art is not yet such to permit this degree of independence on the part of the customer.

Replacing Downtown Special Work

Procedure Followed in Denver to Meet Unfavorable Traffic and Weather Conditions and Complete Work in Shortest Possible Time

By W. L. WHITLOCK
Office Engineer Denver (Col.) Tramway

THE recent work of the Denver Tramway in replacing a grand crossing special work layout at Curtis and Fifteenth Streets, one of the most important corners of the city's business district, called into play the genius of the engineering department in order to cope with the difficulties of the work itself and special problems brought on by unfavorable weather conditions. The work had been delayed because of slow delivery on special work, so that plans laid for doing the work last spring could not be executed until this winter, with the consequent danger of freezing the concrete construction. The fact that the traffic at this intersection averages 176 cars per hour on one street and ten cars per hour on the other during eighteen hours of the day gave rise to a very carefully planned arrangement for handling each detail of the work so that it might be done as speedily as possible.



HEAVY BOLTED SQUARE CROSSING WITH MANGANESE SIDE BEARINGS—SPECIAL WORK WELDED TO STEEL FOUNDATION—END VIEW SHOWING MANGANESE RISER BETWEEN RAILS FOR FLANGE BEARING

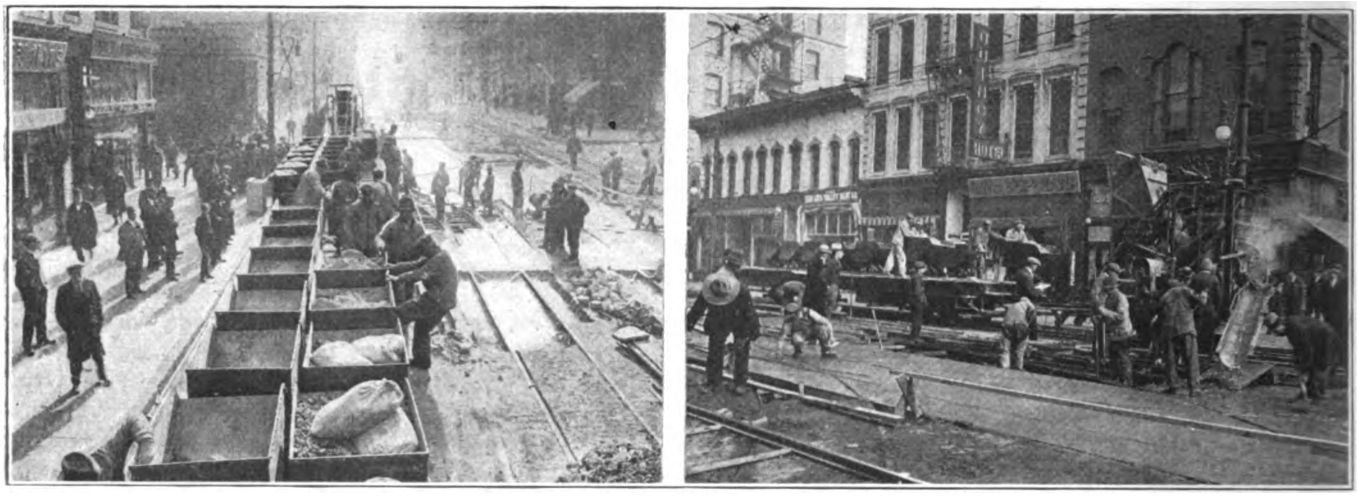
It was deemed impractical to attempt to replace the crossing under traffic on account of the frequent headway and the importance of allowing the concrete base for the special work to set thoroughly before placing it in use. For these reasons a special type of temporary track made up in sections was laid along each side of Fifteenth Street, so that this heavier traffic might be continued without rerouting. The cars on Curtis Street were rerouted to avoid this corner.

The old special work was a bolted construction consisting of 72-lb. rail laid on wood ties with approximately 2 ft. of pit run gravel ballast on top of the old cable concrete, which formed the sub-base, and with a top paving of basalt stone block. In the new layout a special bolted construction, using 100-lb. rail, was used. Second-hand 72-lb. rail was cut to length and used in place of wood ties. A few of these ties were drilled for rail clips to hold the track to gage during the preliminary work. The outstanding feature of the special work was the type of square crossing used. It was made up with 100-lb. rail and manganese flange-bearing risers, and exceptionally heavy knee irons bolted together by means of 1⅛-in, Myria heat-treated bolts which made a driving fit. Each one of these squares weighed 5000 lb. and was handled by a special crane car. They were laid on a crossing foundation of a special type built by the International Steel Tie Company, which was supported on crushed rock ballast with a 12-in. concrete slab above the ballast. The rails and the special work construction were electrically welded to the steel ties and to the steel crossing foundations. Continuous rail joints were employed. The entire special work layout was incased in a 1:2:3 mixture of concrete, and Master Builders' hardener was used for the wearing surface which formed the finished paving.

After the special work was assembled in place, surfaced and aligned, the concreting was completed within eight days, during three days of which no work could be done on account of a heavy snowstorm. In this work the tramway concreting train, which was described on page 628 of the ELECTRIC RAILWAY JOURNAL for Oct. 6, 1917, came in for very effective use by making it unnecessary to store materials along the street, and thereby also avoiding to a certain degree the unsightliness of such a large construction job. The total amount of concrete poured measured 96 cu. yd., and this was accomplished by means of the concreting train in a period of thirteen hours.

The first attempt to concrete the layout was defeated by a heavy snowstorm three hours after the work had begun and the job was promptly called off. The concrete already poured was finished and protected by canvas covering. Unusually cold weather accompanied the storm, and to prevent the concrete from freezing four ten-light clusters of 16-cp. lamps were placed underneath the canvas and energized from the trolley. These gave off sufficient heat to keep the concrete above the freezing temperature.

The weather moderated somewhat in two days and it was planned to complete the concrete work in one shift. To make this possible despite the cold weather a hot-



TRANSFERRING MATERIAL FROM CONCRETING TRAIN TO SERVICE CAR, AND MIXER IN OPERATION, DENVER TRAMWAY

water connection was made in an office 300 ft. from the job and a 1¼-in. iron pipe run to the street intersection with a hose from this point to the concrete mixer. No trouble was experienced in finishing up the concrete and although the temperature dropped to 32 deg. Fahr. the surface water on top of the concrete, where it stood because of the rough finishing did not freeze. Thermometer readings taken of the concrete showed it to be approximately 15 deg. warmer than the air. These were taken at 2 o'clock in the morning and the temperature rose with the coming of daylight. The run of concrete on this occasion began at 1 a. m. and was completed at 10 a. m., with thirty minutes out for breakfast. After the hardener used on the concrete surface had set, a coating of 1 in. of sand was covered over the concrete to protect it from frost. Wetting down was found necessary only once, three days after the concrete was poured.

TAKING CARE OF THE TRAFFIC OFFICER

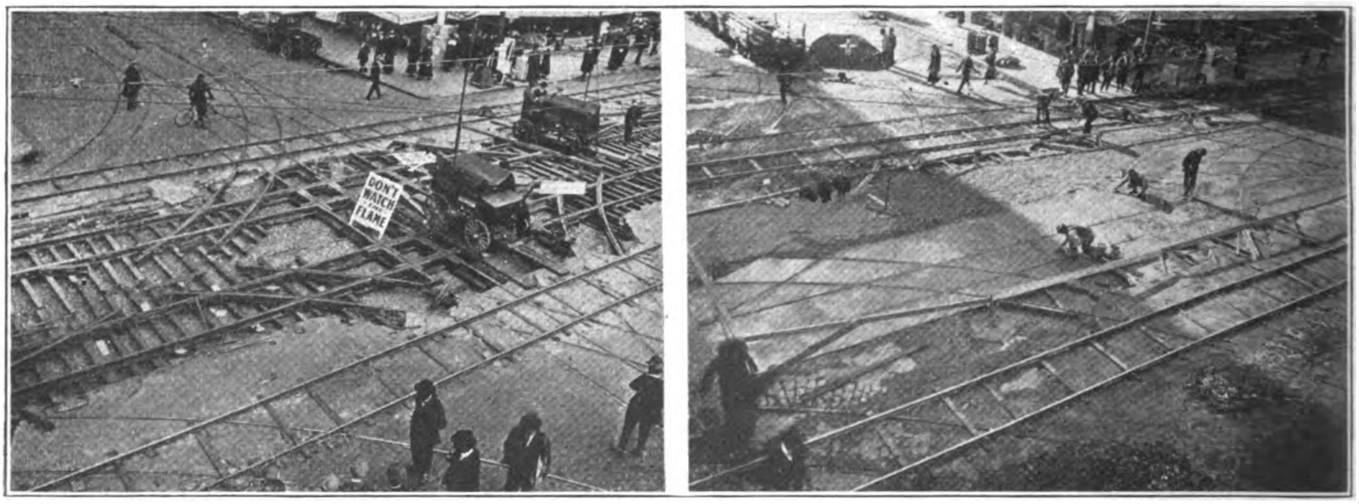
Previous to concreting, a conduit was run from a pole on the corner to the center of the intersection and an electric plug connection placed there for connecting a portable electric heater. An electric switch was installed on the pole and a heater furnished for the convenience and comfort of the traffic officer at the company's expense.

The publicity department of the tramway company created a great deal of interest in this construction work and succeeded in forestalling criticism because of the delays to traffic and the torn-up condition of the street, by running a series of advertisements in the daily papers at the time this construction work was going on. This publicity work was described in an article in the ELECTRIC RAILWAY JOURNAL for Dec. 22, 1917.

Good Results from Coke for Car Heating

The Public Utilities Company of Evansville, Ind., is well pleased with the results obtained in using coke instead of coal for car heating. It is said that the coke keeps the cars well heated, and the trainmen like it better than hard coal, owing to the fact that a coke fire is much easier to start and they get a quicker fire with better results.

During the winter of 1915-1916 the company used 149.94 tons of hard coal at a cost of $993.08. Last winter the same number of cars were heated with coke at a cost of $683.84 for 170.92 tons, although the winter was more severe and lasted longer in the spring. No figures are available to express the experience of the company in this regard during the present winter.

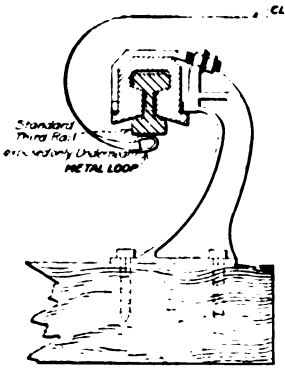


STEEL-RAIL TIES AND SQUARE CROSSINGS IN PLACE AND PAVEMENT AROUND SPECIAL WORK BEING HARD-SURFACED

Even Cloth Tapes Must Be Used with Care on Third-Rail Track

IT IS obvious that the use of metallic tapes along lines using third-rail is dangerous, due to the possibility of contact between the third-rail and the tape, thereby endangering life and possibily causing interruption to service.

Probably it is not as clearly realized that the ordinary cloth tape is nearly as dangerous as the metal. The cloth is not only strengthened by means of wire insertion which becomes exposed with wear, but there is also a metal loop at the end of the tape. Even the cloth forms a good conductor when wet.


CLOTH TAPE
Standard Third Rail
METAL LOOP

CONTACT BETWEEN CLOTH TAPE AND THIRD RAIL

The accompanying diagram shows how an accident actually occurred with a cloth tape. In winding up the tape it was jerked from the hands of the man holding the loop end. The free end curled up as it was jerked by the reel and the metal loop came in contact with the third-rail. The tape and the ground were slightly wet, and the result was a 550-volt shock.

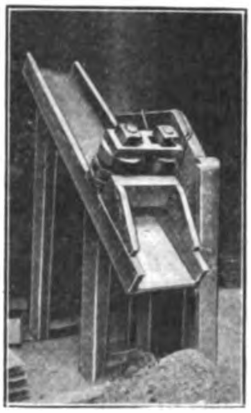
Steel Underframe for Montreal & Southern Counties Railway Interurban Cars

IN the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 16, 1918, page 331, J. A. Wilson, superintendent car department Ottawa Car Manufacturing Company, Ltd., described a new car which has been built for the Montreal & Southern Counties Railway. At the time the article was printed details of the underframe construction were not available, but through the courtesy of the author of the article it is now possible to show an outline of this construction, as is done in the accompanying drawing.

Sufficient detail is contained in the drawing to render unnecessary further explanation than that given in Mr. Wilson's article.

Magnetic Separator for Screws and Filings

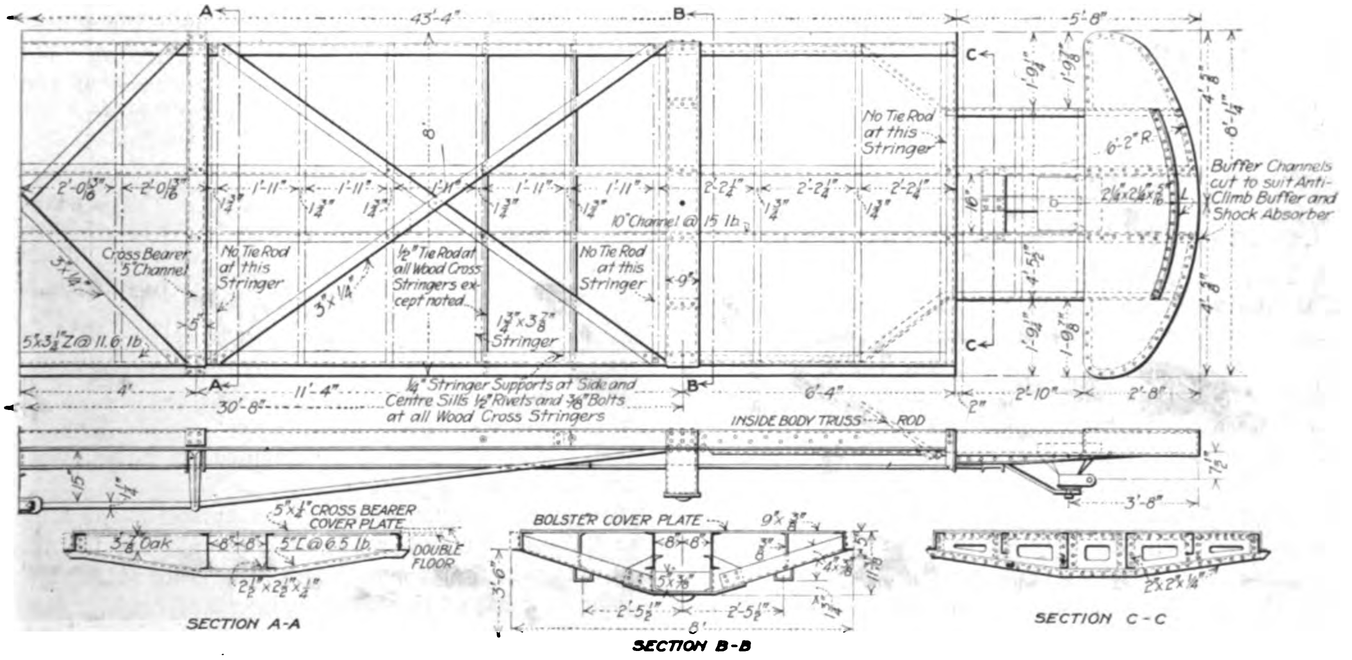
IN THE Wolf Street shops of the New York State Railways, Syracuse, N. Y., a home-made magnetic separator has been giving good service in connection with reclaiming filings and screws. The filings are much more salable when iron and steel are separated from brass, and iron screws can be separated from brass screws much more rapidly with this device than by hand.



HOME-MADE MAGNETIC SEPARATOR FOR FILINGS AND SCREWS

The separator consists of a zinc-lined wooden chute of the proportions shown in the halftone, mounted on the standard at an angle of about 45 deg. with the floor. Suspended over it are two contactor magnets placed so that the poles are about 2 in. from the floor of the chute. The operation of the device consists simply in shoveling the filings or screws into the top of the chute with the magnets energized, when all magnetic material will be held firmly to the poles. By rapping the chute lightly, any brass particles which may have a tendency to be blocked by the iron held fast by the magnet will be allowed to go on their way.

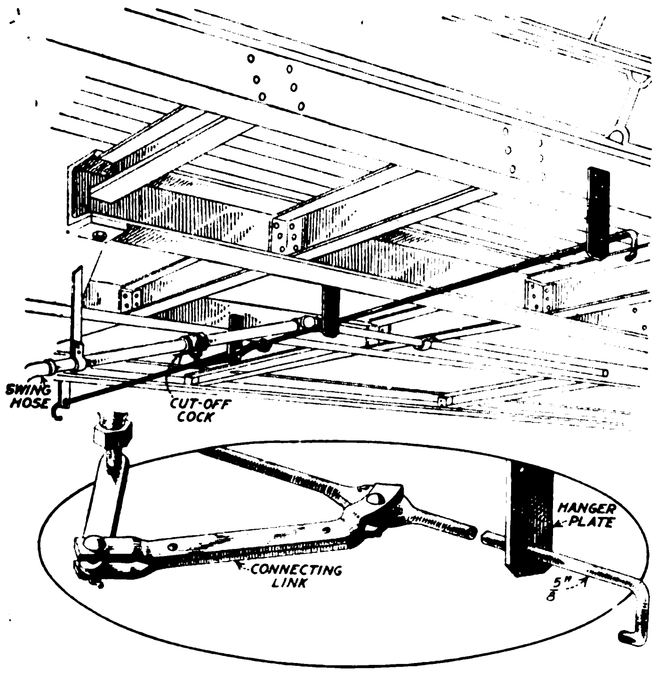
The device has been in use for some months, and has fully demonstrated its practicability. It was built under the direction of F. L. Hinman, master mechanic of the Syracuse lines of the company.


A
B
C
43'-4"
5'-8"
8'
2'-0 13/16"
1'-11"
2'-2 1/4"
1 3/4"
10" Channel @ 15 lb.
Cross Bearer 5" Channel
No Tie Rod at this Stringer
1/2" Tie Rod at all Wood Cross Stringers except noted
3" x 1/4"
1 3/4" x 3 7/8" Stringer
5" x 3 1/4" Z @ 11.6 lb.
9"
5"
16"
1'-9 1/4"
1'-9 7/8"
4'-5 1/2"
4'-8"
6'-1/4"
6'-2" R
2 1/4" x 2 1/4" x 5/16" L
Buffer Channels cut to suit Anti-Climb Buffer and Shock Absorber
4'
11'-4"
30'-8"
1/4" Stringer Supports at Side and Centre Sills 1/2" Rivets and 3/8" Bolts at all Wood Cross Stringers
6'-4"
2"
2'-10"
2'-8"
INSIDE BODY TRUSS ROD
15"
1 1/4"
7 1/2"
3'-8"
5" x 1/4" CROSS BEARER COVER PLATE
3 7/8" Oak
8"
5" [@ 6.5 lb.
DOUBLE FLOOR
2 1/2" x 2 1/2" x 1/4"
SECTION A-A
BOLSTER COVER PLATE
9" x 3/8"
5" x 3/8"
3'-6"
2'-5 1/2"
SECTION B-B
2" x 2" x 1/4"
SECTION C-C

DETAILS OF UNDERFRAME OF INTERURBAN CAR FOR MONTREAL & SOUTHERN COUNTIES RAILWAY, MONTREAL, QUEBEC, CANADA

Mechanism for Operating Air Cut-Off on Existing Equipment

THE Ohio Electric Railway, Springfield, has equipped several of its interurban cars in train service so that the cut-off cocks can be operated by pulling on a rod from either side of the car. This is both convenient and safe. The valve is placed at some distance in from the end of the car near the center where it will not interfere with the trucks, and to the cock handle is connected a link which is actuated by the cross-rod.



DETAILS OF REMOTE COCK CUT-OFF MECHANISM

The accompanying sketch shows the details needed. The operating rod used is ⅝ in. in diameter, flattened at one point and bored for attaching the connecting link, and has a length such that the rod handles when pulled over come to within a few inches of the side of the car. The rod is suspended from the car sills by three or four hanger plates as required, made of ⅜-in. x 2½-in. straps and fastened with screws or lags. No general dimensions of the apparatus can be given, because different types of cars would require different material. This device has been approved by the safety committee of the Ohio Electric Railway.

Concrete for Pavement Between Tracks

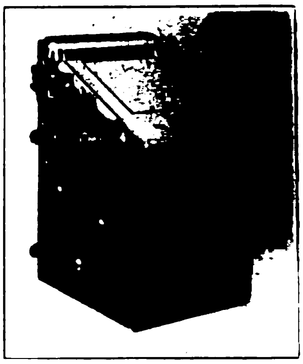
AFTER an exhaustive investigation for the best type of pavement to be placed between street car tracks, the San Diego Street Railway decided on plain concrete. The chief features of this pavement which led to the decision were that it did not require a large plant for the preparation of the material and that it could be laid by inexperienced labor, thus simplifying the work and making an economical pavement. Consideration was also given to the fact that as this type of pavement supports the head of the rail it tends to eliminate vibration and insures a more permanent pavement.

The pavement used is of 1:2:4 concrete with ¼-in. expansion joints placed 30 ft. apart. The tie spacing is 2-ft. centers, which allows 16 in. between ties, thus giving a block of concrete of 5 in. in the clear below the base of the rail for a length of 16 in. With this construction, should the ties fail through decay or other causes, there will still be a good support for the rail.

This type of pavement has proved so satisfactory to the railway and to the city in general that the company is completing 2.3 miles of it.

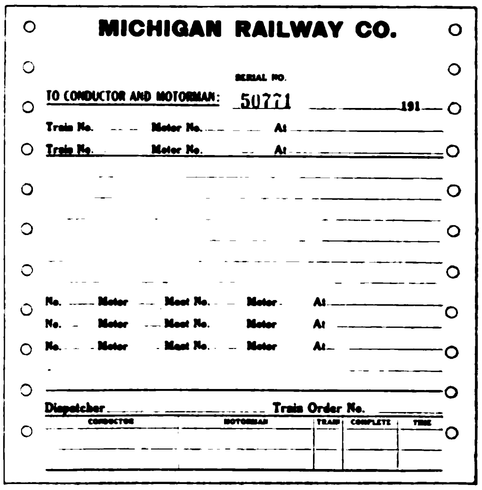
Improved Train Order Register for Interurban Roads

THE Standard Register Company, Dayton, Ohio, has on the market an autographic train-order register known as the "Kant-Slip" register, the operation of which is quite similar to that of other registers made by that company for purposes where accurate duplicates of records are desired. The distinguishing feature of this register, as expressed in its name, is a provision for very accurate alignment of all the copies made. This consists of holes, punched in the edge of the paper ticket, which are engaged by pins on the feed roller to prevent the tickets from slipping with respect to each other as they are issued.



TRAIN ORDER REGISTER DESIGNED FOR WALL MOUNTING

The register is made for wall mounting and is used either in telephone booths or in the car vestibules. It issues tickets 5¾ in. wide and 6½ in. long, which are brought out with one revolution of the feed wheel by turning the knob on the left. Three copies of all dispatches are made, two for the trainmen and one which is rolled up in the register as a permanent record. Each ticket has a serial number stamped on automatically when the ticket is printed.



MICHIGAN RAILWAY CO.

SERIAL NO.
TO CONDUCTOR AND MOTORMAN: 50771 ______ 191__
Train No. ____ Motor No. ____ At ______
Train No. ____ Motor No. ____ At ______

No. ____ Motor ____ Meet No. ____ Motor ____ At ______
No. ____ Motor ____ Meet No. ____ Motor ____ At ______
No. ____ Motor ____ Meet No. ____ Motor ____ At ______

Dispatcher ______ Train Order No. ______

CONDUCTOR	MOTORMAN	TRAIN	COMPLETE	TIME

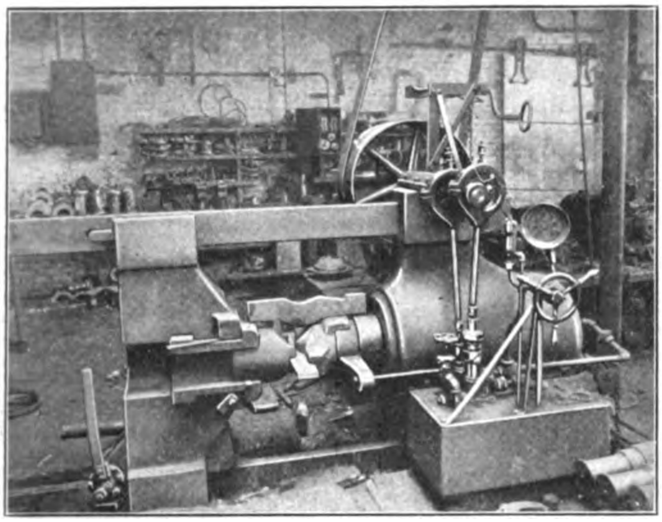
SAMPLE "KANT-SLIP" TICKET

Among the companies using the register is the Michigan Railway, which has a total of seventy-two installed. and it is said that the registers are giving satisfaction.

Many models of this improved style of register issueing different sizes of forms, for desk use in train dispatcher's office, are also manufactured by the above concern.

Brake Levers Made in Wheel Press

IN THE shops of the Washington Water Power Company, Spokane, Wash., brake levers are shaped in a wheel press which has been provided with cast-iron heads which act as dies. The brake levers are made of 1-in. x 4-in. old iron cut to correct length and heated to a cherry red heat in a forge before being pressed. The illustration shows the shaping operation and a lever after the shaping has been completed. This practice is not quite as good as the use of a forging machine, but where the latter is not available, the work is done much more quickly than by hand.



WHEEL PRESS USED FOR SHAPING BRAKE LEVERS

Inter-Departmental Co-operation

IN THE present struggle to get the maximum use of every piece of material and equipment and the most efficient management in every respect, co-operation between department heads is essential more than ever before. Frequent conferences at which all the department heads come together and discuss the numerous questions of more than intra-department interest which are constantly arising have proved very helpful.

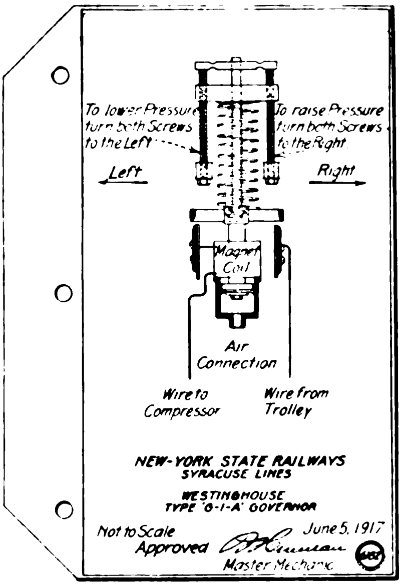
A number of companies have been following this practice more or less consistently, but perhaps nowhere has it been made a greater success than in Denver. Every Monday General Manager F. W. Hild of the Denver Tramway and all his department heads gather around a big table at the Denver Athletic Club for luncheon. As they eat Mr. Hild addresses the men in turn with the remark, "Well, Dave, what have you today?" or "Ed, your turn next; what have you to bring up?" etc. Very frequently the department heads bring up matters for the decision of the general manager which they were unable to bring to his attention during business hours. When a request of one department head, if granted, would be unfavorable to another department, a plan is found which is mutually satisfactory. In this way not only is friction forestalled but advantage is taken of the judgment of all the men on any matter. When all the men have responded the general manager usually has a few suggestions to make or some pertinent questions to ask particular department heads. The meeting is then open for general constructive criticism.

Mr. Hild and his associates are very enthusiastic over the value of these weekly semi-social conferences. They do not involve much expense and the amount of real work disposed of within the two hours fixed as the duration of the conferences is surprising. The result is a splendid good feeling and a company working as a company instead of as a group of departments.

Instruction of Carhouse Inspectors

REALIZING the need for a better opportunity to discuss equipment troubles with inspectors, Frank L. Hinman, master mechanic New York State Railways, Syracuse, N. Y., conducted a very promising experiment during the year just closed. In brief, this consisted simply of a regularly scheduled meeting of the inspectors with the master mechanic once each week.

A special classroom near Mr. Hinman's office was fitted up with blackboards, operating motor, air-brake and miscellaneous equipment, and facilities for handling and operating the apparatus before the group of men, or class if they could be called such. The men reported at the classroom every Friday morning for a period of two hours, for which they received regular pay. It happened fortunately that the men were obliged to come to the neighborhood of the shop to receive their pay at this time, hence were in a position to attend the class without delay. They were all on night duty and lost no working time during instructions.



SAMPLE LEAF FROM POCKET BOOK FURNISHED TO CARHOUSE INSPECTORS NEW YORK STATE RAILWAYS, SYRACUSE

Each man was furnished with a pocket book of blueprints, from which a sample is reproduced. These prints formed a partial basis for the instruction. A more important basis, however, was the actual trouble experienced by the men in their routine work. The details of this trouble were presented directly by the men and in addition queries which came in through question boxes placed in the several carhouses were also taken up and discussed. The instructor, Mr. Hinman himself for this first year, also laid out a simple but comprehensive general program to insure the covering of all essential parts of the car equipment.

The 1917 class comprised twelve men, who were all enthusiastic in regard to this practical kind of instruction. The draft early in the fall considerably interfered with the work toward the close, but not until enough had been done to prove the value of the plan. Mr. Hinman found the work very strenuous and hopes when it opens up again to be able to secure assistance. He finds that enthusiasm and conviction as to the importance of the work are essentials to its success.

Portable Electric Drill and Grinder

PORTABLE electric tools which save time and labor by replacing hand operation increase the output of a given working space. The drill illustrated in Fig. 1 is designed for this purpose. It is equipped with gears to give two speeds and these are changed by means of a knob on the bottom of the gear case. The gears themselves are made of chrome nickel steel and run in grease. Ball bearings are used throughout and a ½-in. Standard chuck and a sturdy electric switch are provided. The speed is 400 r.p.m. on low gear and 700 r.p.m. on high. Westinghouse motors are used in the drills.

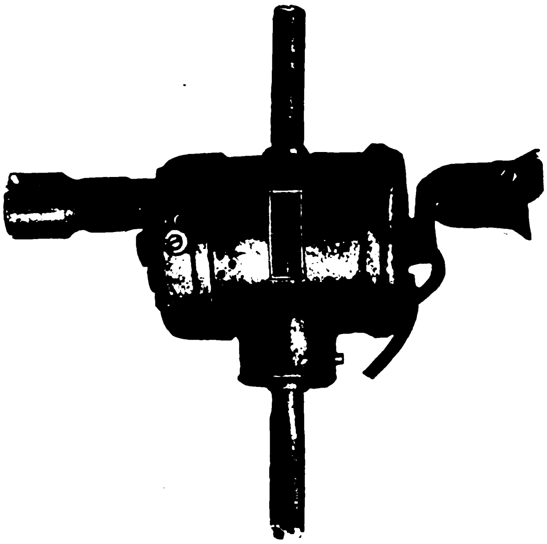


FIG. 1—PORTABLE ELECTRIC DRILL

The tool post grinder, illustrated in Fig. 2, is adapted for use on lathes. The angle plate can be clamped around the tool post and there is a vertical adjustment on the grinder. The grinder is equipped with a Westinghouse ¼-hp. motor running at 3400 r.p.m. and is provided with a 6-in. x ⅜-in. grinding wheel, an extension mandrel for internal grinding fitted with a 1½-in. x ⅜-in. wheel, a tooth rest for cutter grinding and an electric attachment plug with 7½ ft. of cord. These two portable electric tools are manufactured by Gilfillan Brothers Smelting & Refining Company, Los Angeles, Cal.

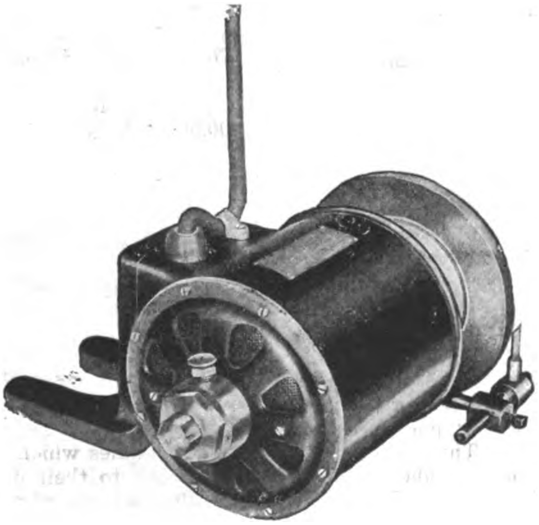


FIG. 2—TOOL POST GRINDER

LETTER TO THE EDITOR

Axle Failures Are Not All Due to Defects in Manufacture

CAPITAL TRACTION COMPANY,
WASHINGTON, D. C., Feb. 18, 1918.

To the Editor:

The articles by Norman Litchfield, appearing in the last three issues of the JOURNAL, on the subject of car axles, have been very interesting and instructive.

The question of satisfactory axles is so important that it will be unfortunate if these articles fail to bring out valuable discussion from men in charge of equipment on some of the large roads.

The design of axles, as Mr. Litchfield points out, is a most fundamental matter. Considerable work was done along this line by the equipment committee of the American Electric Railway Engineering Association in 1915 and 1916 in an effort to have certain sizes adopted as standard by the Association. It was very unfortunate that so little discussion was brought out at the convention.

While some of the heat-treated axles first put on the market were anything but satisfactory, the treated axle to-day is used very generally. However, to be satisfactory the heat-treated or quenched-and-tempered axle must have good material in it to start with, and the manufacturer must have the facilities properly to do the work. In addition there must be careful inspection to eliminate as far as possible defective material.

As Mr. Litchfield has said further: "The heat treatment merely adds one more step in the production of a high-quality axle." This means that the treating must be properly done, with careful inspection, for if steel is not properly treated it is worse after treatment than if treatment had not been attempted.

The proper method of testing axles has been the subject of much discussion and it is a matter that should be definitely settled. The inspection should be governed by the service in which the axle is to be used, and the program could very properly vary.

The manufacturer is not responsible for all the ills an axle may fall heir to; hence some of the inspection should be done in the railway shop. Furthermore, the importance of care of axles in service cannot be too strongly emphasized. Even after the axle has been received in good order from the manufacturer unless pains are taken in turning it, a well-made axle might become a potential source of danger. This fact cannot be impressed too strongly upon the mind of the lathe man.

Another point is to keep the motor wires away from the axle. I have seen axles that have failed due to spots burned from the motor leads.

Finally, periodical inspection of axles in service is essential. Such inspection should be made with scrupulous care as it is very difficult at times to locate defects that might easily result in ultimate failure of the axle.

R. H. DALGLEISH, Electrical Engineer.

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has completed the work of painting white bands around poles where cars will stop in the future.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Federal Strike Board Named

Secretary of Labor Wilson Announces the Appointment of Representatives of Capital and Labor

Announcement was made on Feb. 17 of the personnel of the joint conference of employers and union leaders, who will lay down a basis of relations between capital and labor during the war. The first session of the conference will be held in the office of Secretary of Labor Wilson on Feb. 25. The five members chosen to represent each side by the National Industrial Conference Board and the American Federation of Labor will choose two other representatives of the public, making twelve conferees to share in the deliberations, which will cover all phases of the situation.

Representatives of Employers

The representatives of the employers are:

Loyal A. Osborne, New York, vice-president of the Westinghouse Electric & Manufacturing Company and chairman of the executive committee of the National Industrial Conference Board.

Charles F. Brooker, Ansonia, Conn., president of the American Brass Company.

W. J. Vandervoort, East Moline, Ill., president of the Root & Vandervoort Engineering Company.

L. F. Loree, New York, president of the Delaware & Hudson Railroad.

C. Edwin Michael, Roanoke, Va., president of the Virginia Bridge & Iron Company.

Representatives of Workers

The representatives of the workers are:

Frank J. Hayes, president of the United Mine Workers of America, Indianapolis.

William L. Hutcheson, president of the United Brotherhood of Carpenters & Joiners of America, Indianapolis.

J. A. Franklin, president of the Brotherhood of Boilermakers & Iron Shipbuilders of America, Kansas City, Kan.

Victor Olander, representative of the International Seamen's Union of America, Chicago.

T. A. Rickert, president of the United Garment Workers of America, Chicago.

Questions to Be Considered

Among the questions to be considered by the conferees will be the basis for wage determination, strikes and lockouts, piecework prices and price-fixing, method of eliminating improper restrictions on output of war materials from whatever cause, discrimination against union and non-union men, admission of union agents to plants, method of promptly adjusting disputes at their source through boards containing equal representation of employers and employees, and right of workmen to organize.

Prevention of disturbances, rather than the cure of them, will be the central doctrine of the government's entire policy. Reorganization of the Labor Department will seek to eliminate duplication of effort and conflicting action by various departments in an effort to obviate friction. Where friction arises, the department's adjustment service will endeavor to remove the cause before interruption of production results.

Settlement Conferences Continue

St. Louis Board of Public Service Going Over Terms of Franchise Settlement One by One

The Board of Public Service at St. Louis, Mo., has held two sessions recently at which it discussed the proposed agreement for the settlement of the differences between the city and the United Railways. At the first session the sections ratified by the board were those extending the grant to April 12, 1948, and authorizing the United Railways to lease or purchase the lines of other companies at any time during the term of the proposed franchise; giving the company the privilege of using any present or better method of operating with electric power; authorizing a capitalization of $60,000,000; compelling the company to submit financial reports to the comptroller and creating the Board of Control.

At the second session the time was given over to an explanation by C. E. Smith, city engineer, of how he had set a valuation of $60,000,000 on the property of the company. Mr. Smith is reported to have said that the figure was fixed after city officials had heard that the company could be reorganized on a capitalization of $60,000,000. The company claimed a valuation of $77,000,000 and Mr. Smith's first estimates placed the valuation at $70,000,000. The company's total capitalization is about $104,000,000. Mr. Smith compared his valuation of the United Railways at $122,000 a mile with the Kansas City valuation of $112,000 a mile in 1914 and the Chicago valuation of $107,000 a mile in 1907, when the Kansas City and Chicago systems were in poor condition; with the Chicago valuation of $150,000 a mile to-day and with an average mile valuation for Chicago, Kansas City, Philadelphia, Milwaukee, Cincinnati, Los Angeles and Denver of $131,000.

Train Operation for Brooklyn

Commission and B. R. T. Compromise on Car Order Under Discussion Two Years

The Public Service Commission for the First District of New York and the Brooklyn Rapid Transit Company, after public hearings and court appeals, extending over a period of two years to determine whether the company should obey the commission's order to put 250 new surface cars in operation, announced a settlement of their differences on that subject on Feb. 15. The company has agreed to buy fifty trail cars of the "largest practical seating capacity" for use on Flatbush Avenue, Fulton Street and other lines of heavy traffic. The company has also agreed to buy 100 new steel cars for its dual subway lines, and to convert 100 of its center-entrance surface cars for multiple-unit operation, and fifty four-motor cars to serve as leaders for the trailers. Two-car trains are to be in operation in Brooklyn streets within a month.

The original order compelling the operation of 250 more cars said nothing about trail cars, and the dual subway contract required the company to furnish all cars necessary for operation.

A public hearing was set for Feb. 15 on the company's application for a rehearing on the 250-car order, but instead of Timothy S. Williams, president of the Brooklyn Rapid Transit Company, taking the stand as a witness, William L. Ransom, counsel to the commission, described the terms of the compromise. The pending proceeding was adjourned until October, the commission reserving all its rights.

About $500,000 will be spent for surface cars and $2,500,000 for other rolling stock.

Short Strike at Alton

The lines of the Alton, Granite & St. Louis Traction Company, Alton, Ill., controlled by the East St. Louis & Suburban Railway, were tied up for about twenty-four hours recently when the employees went on strike. The strike was called as a protest against changes in the schedules which the men thought would work to their disadvantage. After going out, the men added a demand for an increase in pay from 33 to 40 cents an hour. D. E. Parsons, general manager of the company, in announcing the settlement, said the company could not increase the men's pay, but that the old schedule would be kept in force pending an adjustment of the runs, which the company would try to make as satisfactory as possible to the men. The provisions of the settlement agreement were not made public.

Minneapolis Arbitration Award Announced

Summary Is Presented of Findings of President's Mediation Commission in Case Which Caused Sympathetic Strike

The President's mediation commission appointed to adjust labor troubles affecting the Twin City Rapid Transit Company, Minneapolis, Minn., handed down its findings on Feb. 15. The recommendations of the commission are as follows:

1. While competent former employees are available the company should not take men from the farms or war industries.
2. The company should not employ men now engaged in other industries while available and competent men just as skilled are idle.
3. The company should prefer for employment men skilled in the particular line of work over others who have had no training in such line.
4. The company, in returning to work the men who deemed themselves locked out by the company's order, should not discriminate against any of the men because of union affiliations.
5. All the men when put back to work should go back with their old standings.
6. The former employees should offer themselves for reinstatement as rapidly as vacancies occur.

THE COMMISSION'S STATEMENT

The commission states in its report:

"The President's Mediation Commission called the attention of the representatives of the company to the fact that their policy was opposed to the government's war needs that men employed in war industries and in the farming districts should not be removed to non-war industries and that the nation's man power must be used fully and economically by preferring for employment men with training and experience which makes them competent to fill vacancies.

"The company had been previously informed of the effect of local labor disturbances upon industries essential to the prosecution of the war, both in the vicinity and at a distance."

The trouble between the Twin City Rapid Transit Company and its men started in August and September, 1917, over the right of the men to organize. The company conceded this right but, the union men claim, discharged fifty-seven men for alleged activity in the union. The trouble spread until a sympathetic strike in the Twin Cities was called on Dec. 13. This strike lasted only three hours, being called off after information had been received from Washington that the Secretary of War had requested the president of the Mediation Commission then in Seattle to stop off in Minneapolis to investigate the situation there informally. The history of the controversy was followed briefly in the ELECTRIC RAILWAY JOURNAL at the time.

Foster Hannaford, general manager of the company, was quoted on Feb. 16 as saying:

"On receipt of the official copy of the report and recommendations of President Wilson's mediation commission this company will give the same most careful consideration, and in the meantime we will be glad to talk with any former employees who are still out of employment and who may come under the scope of the commission's recommendations as reported in the newspapers, and who may offer themselves for employment as vacancies occur. In the absence of President Lowry, who is out of the city, we can make no further statement at this time."

HOW THE REPORT IS REGARDED

The Minneapolis *Tribune* says the report is mainly noteworthy for what it does not contain. For instance, there is not a word on the subject of the right or propriety of the men wearing union or association buttons while on duty. According to the *Tribune*, the whole affair seems to be thrown back on the company, the union and the State for adjustment, the report being essentially a friendly call for harmony and for such employment of available labor as will serve best the interests of the community and the nation.

Praise for Mr. Newton

Constructive Efforts of Railway Manager at Huntington Gratefully Acknowledged by Local Paper

H. S. Newton has resigned as general manager of the Ohio Valley Electric Railway, Huntington, W. Va., to become manager of railways of the Monongahela Valley Traction Company, Fairmont, W. Va. Mr. Newton's four years at Huntington have been unusually successful from the standpoint of better public relations, and his record in this respect has resulted in very candid expressions of appreciation of his work by the newspapers. The Huntington *Herald* said:

ANTICIPATED PUBLIC DEMAND

"Mr. Newton has been general manager of the company for nearly four years, and it is the general public impression that he has performed the functions of his office capably and well. He is an apostle of the best creeds of modern corporations, and he would not tolerate any policy that did not give sufficient consideration to the demands of the public. That attitude won for him much favor with the patrons of the company. He soon became widely acquainted and attained an influential position in leading organizations of the city, such as the Chamber of Commerce and the Rotary Club, in both of which he is a director.

"In all possible ways he has been on the alert to anticipate and meet public demand, whether in the small items of local service, or in the broader matters of civic development. During his tenure of office the company successfully negotiated a new contract for extension of the lines to southwest Huntington along a line other than Washington Avenue, and for an extension of the company's lines to the Galliaville district. Mr. Newton has done much to bring about mutually satisfactory feeling as between the people of Huntington and the company. At the same time the interests of the company have been served in a season when public utilities, particularly electric railways, are having extremely hard sledding."

Elevated Plan for Cleveland

Prominent Business Man Has Advanced Ideas on Rapid Transit and on Fares

J. P. Brophy, vice-president and general manager of the Cleveland (Ohio) Automatic Machine Company, contributed to the magazine section of the Cleveland *Leader* of Feb. 3 an article on how an elevated system would solve the traffic problem in that city. Mr. Brophy said that there was no question that a subway to the city limits was in the distant future. On this account he suggested an elevated road and presented designs of his own for the structure.

He said that the road suggested by him would not cost more than 50 per cent as much as the type of elevated structure in use in other cities and he thought that the design which he advocated would prove more substantial and quieter in every respect. The article was illustrated with line cuts of the suggestions made by Mr. Brophy.

CHEAP FARES BEGET CHEAP SERVICE

Mr. Brophy does not think that all is well with the Cleveland railway situation. He said that the only good thing about the much-lauded 3-cent fare was a little advertising for the city. Three cents from passengers was not enough money to maintain good service. The fact was that the car rider in many instances now tolerated things that before the cheap fare would have been roundly condemned. He said, however, that the 3-cent fare seemed to have the people in its grip notwithstanding the fact that the difference in fare was insignificant compared with the loss of time to people, "waiting, swearing, praying and hoping" for a car to arrive to take them to their destination.

According to Mr. Brophy, service at 5 or 6 cents would be infinitely better for the morning and evening army of riders than an almost intolerable service at 4 cents. Mr. Brophy felt that if a vote were taken it would be found that most of the people favored real accommodations regardless of any slight increase in price. Under the Tayler franchise the service of the Cleveland Railway is under the control of the city through its street railway commissioner.

Favor Municipal Ownership

Senators Advocate Taking Over District Lines for Period of War at Least

Senator Jones of Washington, a member of the special committee which investigated the strike of the employees of the Washington Railway & Electric Company last spring, said on Feb. 8 he would frame a resolution calling upon the Public Utilities Commission to inform the Senate just what is being done, and what, in its opinion, should be done, to relieve the local surface railway situation in the District of Columbia. Senator Jones said that with the report of John A. Beeler to the commission as a basis upon which to work Congress will be able to go ahead with any legislation that may be necessary. He is quoted as follows:

"The railway companies must act to better conditions or the government must act. The companies must provide more cars, or more tracks, or the government must take them over, perhaps only temporarily, just as it has taken over the railroads of the country. The government could take the electric railway lines of the District just as it has the railroads, and guarantee to the owners a fair return for the use of their properties during the period of government control."

Senator Jones pointed out that the problem of municipal ownership of the lines could be settled later. He said that the main thing now was to obtain relief.

Senator Norris of Nebraska vigorously advocated that the government take over the local lines. He is reported to have said:

"It may be necessary to operate a number of large motor buses as auxiliaries to the electric railway lines while you are building more car tracks and buying more cars. Some steps should be taken without delay to relieve the congestion of travel. Plans are being made to handle the housing problem for the thousands of newcomers to Washington, and it is high time that radical steps be taken to make it possible for these people and residents of the District to obtain transportation from their homes to their offices."

Increase for Interurban Men

The Ohio Electric Railway, Cincinnati, Ohio, has issued notice of an increase in wages to motormen and conductors on its interurban cars amounting to 4 cents an hour a man. The increase is made in the form of a war bonus, and it is understood will be continued as long as the conditions justify. The wage scale which has been in effect is as follows:

First year, 26 cents an hour; second year, 27 cents; third year, 28 cents; fourth year, 29 cents; fifth year, 30 cents; sixth year, 31 cents; seventh year, 32 cents; eighth year and after, 33 cents.

The new rate will be as follows:

First year, 30 cents an hour; second year, 31 cents; third year, 32 cents; fourth year, 33 cents; fifth year, 34 cents; sixth year, 35 cents; seventh year, 36 cents; eighth year and after, 37 cents.

It is not contemplated at the present time to make any changes in wages of motormen and conductors employed on the various city lines of the company as they received an increase in wages last fall.

Beyond the Tunnel

San Francisco Is Considering the Advisability of Taking Over Private Lines West of Twin Peaks

On Feb. 8 a meeting was held in the office of Mayor Rolph of San Francisco, Cal., of all the city officials interested in the transportation problem west of the Twin Peaks tunnel. At present cars of the Municipal Railway run through the Twin Peaks tunnel to Sloate Boulevard. Beyond this point buses have been provided as a temporary expedient. The Municipal Railway stops short of the most thickly populated area. The United Railroads has lines beyond the tunnel, but is handicapped by lack of direct connection downtown. As a result of the meeting it is expected that the United Railroads will be asked to set a price on its lines beyond the tunnel. In commenting on the result of the meeting Mayor Rolph is reported to have said:

"We decided to approach the United Railroads with a view to having a price set on the part of its system beyond the tunnel. That this was the wisest move just now was the opinion of everybody at the meeting. Engineer O'Shaughnessy for the city was instructed to meet with representatives of the United Railroads and try to work out a method of arriving at a physical valuation of the property involved. To do this would be to apply the principle of the McNab plan, which was the purchase of the entire system. We need only a part of the system. A few months ago the United Railroads indicated a willingness to sell to the city. Whether it still is of the same mind we will now ascertain."

Public Utilities at U. of C.

The University of California is giving an extension course on the subject of public utilities, under the direction of Paul Sinsheimer, formerly stock and bond expert of the California Railroad Commission. The speakers who are to discuss various phases of the public utility problems include George Weeks, president of the National City Company; John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company; Paul Sinsheimer, vice-president of the Union Trust Company; State Railroad Commissioners Thelan, Edgerton, Gordon, Devlin and Loveland, and the following members of the commission staff: Richard Sachs, chief engineer; L. R. Reynolds, chief auditor; Fred O'Brien, recorder, and Douglas Brookman, attorney.

News Notes

Time Extended for Rhode Island Report.—A resolution was introduced in the Legislature of Rhode Island recently, granting an extension of time from Feb. 15 until March 8 to the special commission which was appointed a year ago to investigate the Rhode Island Company.

Increase in Wages for Interurban Men.—Trainmen in the employ of the Galveston-Houston Interurban Railway, Galveston, Tex., have received an increase in wages of 2 cents an hour. The schedule provides a scale ranging from 32 cents an hour for men in their first year's service to 36 cents an hour for men in their fifth year's service.

Hudson Tubes Under Government.—Much ado was made in the newspapers in New York over the discovery on Feb. 20 that the Hudson & Manhattan Railroad, operating tunnels under the Hudson River between New York and New Jersey, had been taken over by the government at the first of the year, under President Wilson's railroad proclamation. The *Times* said that "no official announcement of the move had been made."

Guarantees Minimum Wage.—The United Railroads, San Francisco, Cal., has posted in its carhouses a notice stating that hereafter the company will guarantee extra platform men an average monthly wage of $75, the adjustment to be made once every three months. The new wage is for extra men who report regularly and accept such runs as are offered them. Platform men on regular runs are not affected by this order.

Increase in Wages in Dallas.—The Texas Electric Railway, Dallas, Tex., has increased the wages of its trainmen. Under the new schedule, interurban trainmen will receive a minimum wage of 27 cents an hour and a maximum of 38 cents an hour, graduated according to length of service. The trainmen on the local lines in Sherman, Denison, Waco and Corsicana will receive a minimum of 22 cents an hour with a maximum of 26 cents an hour.

Car Service Through Twin Peaks Tunnel.—Regular service was established on Feb. 3 by the Municipal Railway through Twin Peaks Tunnel in San Francisco, Cal. The first car left the city hall with Mayor Rolph acting as motorman and T. A. Reardon, president of the Board of Public Works, as conductor. Ceremonies were held when the car reached the west portal. Traffic for several days following Feb. 3 was heavier than is expected to obtain under normal conditions.

Franchise Agreement Approved.—The Legislature of the Province of

Quebec has sanctioned the agreement between the city and the Montreal Tramways as prepared by the Tramways Commission. As suggested in the agreement the Lieutenant Governor in Council will name a special tramways commission of three members to supervise and see that the conditions of contract are carried out as agreed. The terms of the franchise were reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 9, page 288.

Freight Handling Discussed in Chicago.—Freight handling on the surface and elevated lines in Chicago was again considered on Feb. 12 at a meeting of the local transportation committee of the City Council. The preceding session was noted in the Feb. 16 issue of this paper. The truck gardeners showed a special interest in the proposed plan for getting their produce to the central market. The committee referred the whole subject again to the railways to secure their views on the location of terminals, the hours for handling freight and the classes of merchandise to be provided for in an ordinance.

Increase in Wages in Wheeling.—The Wheeling (W. Va.) Traction Company on Jan. 1 increased the pay of its trainmen to the following rates: First year, 32 cents; second year, 33 cents; third year, 33½ cents; fourth year, 34 cents; fifth year, 35 cents; sixth year, 36 cents; seventh year and over, 37 cents. The old rates were: First year, 26 cents; second year, 28 cents; third year, 30 cents; fourth year, 31 cents; fifth year, 32 cents; sixth year, 33 cents; seventh year and over, 34 cents. The new rates are to be effective until the expiration of the present working agreement on April 30, 1918.

Will Discontinue Park.—Owing to war conditions and the high cost of operation, due to increased values of both material and labor, it has been deemed advisable by the West Virginia Traction & Electric Company, Wheeling, W. Va., owners of Wheeling Park, and Messrs. Griffiths and Crane, the lessees and operators, to discontinue the operation of the park. Wheeling Park has been in operation for more than forty years and this will be the first season it will not be used. It was originally the estate of the late Thomas Hornbrook, who later sold it to the railway.

Bill to Take Over Lines to Shipyards.—A bill providing for the taking over of street and interurban railways serving shipyards or plants engaged, or that may hereafter be engaged, in the construction of ships or equipment for such plants, has been favorably reported to the Senate by the committee of commerce. The measure was introduced by Senator Duncan U. Fletcher, Florida, chairman of the Senate commerce committee. The text of the bill is being sent out by the American Electric Railway Association War Board, which adds the comment that there seems to be strong probability that the bill will be enacted into law.

Jersey Commission to Be Increased.—Both the New Jersey House and the Senate have passed the bill to increase the membership of the Board of Public Utility Commissioners of that State from three members to five. When the bill was urged for passage in the House it was pointed out that the commission was deluged with work. There were 441 formal hearings before the board in one year recently. Last year the members were called upon to pass on bond applications for issues representing more than $200,000,000. In its last annual report the board recommended the passage of a law empowering it to refer some of the cases to examiners to take evidence and report to the main commission.

Urges Franchise Settlement.—An appeal was made recently by Daniel Carmichiel, chairman of the central franchise committee of the Joint Improvement Associations of Minneapolis, Minn., for an early franchise settlement by the city with the Minneapolis Street Railway on a fair and equitable basis to prevent "a period of warfare between the public and the company." Mr. Carmichiel said: "During the fight figures and terms are proposed by both sides which are merely intended to fool, browbeat, scare or confuse the other party, and usually both sides to the conflict fight through to the point of exhaustion. Meanwhile service becomes demoralized, the equipment is allowed to deteriorate, necessary extensions and additions to equipment and service are refused, and in the end the public as usual pays the price of all the delay."

Short Strike in Kansas.—The trainmen of the Joplin & Pittsburg Railway, Pittsburg, Kan., suspended work at midnight on Feb. 13. They took this action following a lengthy conference with the officials of the company and of the State and federal government, at which efforts failed which had been made toward an adjustment of the differences between the men and the company. J. J. Barrett, federal commissioner of conciliation, attended all meetings between the men and the company, as did P. J. McBride, State labor commissioner of Kansas. The men returned to work, however, after a few hours on the suggestion of Mr. Barrett. The men contended that they were quietly leaving their work and that they would not object to other men taking their places. They are said to have asked for an increase of 18 cents an hour.

Chicago Rapid Transit Ordinance Progressing.—Further discussion of the proposed ordinance for extension of rapid transit facilities in Chicago was carried on before the local transportation committee of the City Council on Feb. 13 and 16. There was considerable debate on the question of giving broad powers to a board of regulation and control. Several of the aldermen agreed with President Busby's suggestion that charges for paving and maintenance of paving, and reconstruction of tracks disturbed for sewer removal, should be eliminated. There has been considerable demand for the removal of the restriction in the present ordinance against the use of trailers on surface lines, and the new ordinance may leave this detail to the board of control. It is expected that when the committee meets again a new draft of an ordinance will be ready for consideration. Many chapters have already been agreed upon by both sides.

Programs of Meetings

Illinois Electric Railways Association

The annual meeting of the Illinois Electric Railways Association has been postponed to a date to be set later. The necessity for the railway members giving their undivided attention to their properties and the pressure of business of many supply men made it inadvisable to hold the meeting at this time. The present officers and members of committees will hold over until the postponed meeting is held.

New England Street Railway Club

The regular monthly meeting of the New England Street Railway Club will be held on Feb. 28 at the Hotel Brunswick, Boston, Mass., at 6 p. m. The subject, "Power Production in War Times," will be discussed by H. H. Stinson, manager of transportation of the New England Fuel & Transportation Company; George E. Wood, mechanical engineer of the Connecticut Company, and W. C. Slade, superintendent of power and lines of the Rhode Island Company.

Central Electric Railway Association

The program has been announced for the annual meeting of the Central Electric Railway Association at the Miami Hotel, Dayton, Ohio, on Feb. 28 and March 1. The session on Feb. 28 will convene at 3 p.m. C. N. Wilcoxon, president of the association, will deliver the annual address. The business session and the presentation of the reports of committees will follow. The other speaker at this session will be Charles A. Bookwalter, former mayor of the city of Indianapolis. His subject will be "The War."

The session on March 1 will convene at 9 a.m., with the consideration of business and the presentation of the reports of committees first to receive attention. There will follow an address by Charles R. Gillies, Dayton, on "War Savings," and a paper by A. C. Van Driesen, president of the Central Electric Railway Accountants' Association, on "The Work of the Accountants' Association." The annual report of the secretary and treasurer will then be presented and new officers will be elected and installed. Incidental patriotic songs will be sung during both sessions by a quartet composed of members of the association under the direction of J. F. Starkey, general passenger agent of the Lake Shore Electric Railway, Sandusky, Ohio.

Financial and Corporate

Pittsburgh Bondholders Act

Representative of First Mortgage Bond Holders Files Bill Against Philadelphia Company

A bill in equity, on behalf of Benjamin C. Allen, acting for himself and other holders of the first mortgage bonds of the Union Traction Company, Pittsburgh, Pa., was filed on Feb. 15 against the Philadelphia Company, the Pittsburgh Railways and the United Traction Company, Pittsburgh, in the District Court of the United States in the Western District of Pennsylvania. The plaintiff in the suit is a holder whose bonds have been deposited with the committee, of which Thomas G. Gates is chairman, and whose interests are friendly to them.

The bill, after reciting the manner in which the different railway properties in Pittsburgh came under the Philadelphia Company, sets forth in detail the manner in which the Philadelphia Company enjoyed the financial advantages which it derived therefrom and the credit which it thus acquired.

UNDERLYING PROPERTIES NEGLECTED

The bill avers that under the Philadelphia Company the underlying properties have been operated as one system, having a common treasury into which all receipts have gone and from which all payments have been made. The plaintiff states that while thus enjoying the advantages of ownership the Philadelphia Company has failed to keep the underlying properties in proper operating condition or to set aside any fund for replacement, but, on the contrary, has contracted an enormous floating debt, diverting a large amount of revenue to itself by its control in the matter of the purchase of power, etc.

WHAT THE COMMITTEE SAID

A statement by the committee, after reviewing the charges just mentioned, says in part:

"After having dealt with the property and franchises so as to destroy their value apart from the rest of the Philadelphia Company's system, the Philadelphia Company has now failed to provide funds for the payment of coupons, seeking to obtain the benefit of the condition which it brought about, without any liability on its part to the innocent investors whose money orginally built the roads.

"The plaintiff, therefore, demands that the Philadelphia Company shall be held by the court liable to pay the interest accrued and hereafter to accrue upon bonds issued by corporations whose property has thus been appropriated, and that the principal shall be decreed to be an obligation of the Philadelphia Company and be charged as a lien on all of its property until they are fully paid. The bill further asks the court to restrain the Philadelphia Company from permitting further defaults to occur on bonds secured by mortgages upon any of its electric railway properties which might threaten to dismember its system and unfit it for public service by impairing its value as a whole.

"The responsibility for the principal and interest on underlying bonds of the companies which go to make up the Pittsburgh Railway system is thus squarely placed at the door of the Philadelphia Company, and the court is asked to recognize and enforce the liability which the Philadelphia Company, by its recent defaults, has sought to avoid."

Reorganization Operative

The reorganization committee of the Petaluma & Santa Rosa Railway, Petaluma, Cal., has announced that the reorganization agreement of Oct. 25, 1917, has been declared operative and that the trustee for the second mortgage has been instructed to start foreclosure proceedings.

L. B. Mackey, of E. H. Rollins & Sons, Boston, Mass., secretary of the reorganization committee, has addressed a circular letter to the holders of the first and second mortgage bonds and to the stockholders of the company, advising them that all but $11,000 of the $655,000 first mortgage bonds and all of the $217,000 second mortgage bonds have been deposited in accordance with the reorganization agreement.

In March, 1917, Rollins & Sons addressed the holders of the first mortgage bonds of the railway, calling their attention to the fact that the sinking fund provisions of the trust deed were in default and recommending that the bonds be deposited with the Mercantile Trust Company, San Francisco, Cal., under a plan which looked to the cancellation of the $250,000 of second mortgage bonds on condition that the sinking fund payments on the first mortgage bonds be waived.

Lehigh Transit in 1917

Sixteen Per Cent Increase in Operating Revenue but Slight Decrease in Net Income

In view of the large increase in gross business, in both the railway and the power departments, which had to be cared for at the prevailing high costs of operation, the results of the Lehigh Valley Transit Company, Allentown, Pa., for the year ended Nov. 30, 1917, are said to have been satisfactory. The details of operation for the last two years are given in the accompanying statement.

The revenue from transportation in the last year increased $304,847, or 15.4 per cent. Power sales gained $97,411, or 19.7 per cent. The total operating revenue, therefore, increased $403,201, or 16.3 per cent.

GAINS OFFSET

These gains were slightly more than offset, however, by the increase of $416,806, or 29 per cent, in operating expenses. Furthermore, the taxes advanced $19,728, or 23.3 per cent. As a result of maintaining the property at the usual standard, notwithstanding the increase in cost of labor and materials, there was a slight decrease in net income of $14,939, or 3.1 per cent.

Beginning with 1911 there has been credited each year to maintenance, renewals and depreciation an amount equal to 22 per cent of the gross earnings of the railway lines. All items of maintenance and renewals are charged to this account. The balance is set up to accrued depreciation reserve, which showed as of Nov. 30, 1917, a credit of $312,279.

The freight and the express business of the company showed a decrease in surplus on account of the inability of the income to meet the rapid rise in operating costs. The surplus of the freight business decreased $3,206, or 17.5 per cent, and the surplus from the express business fell off $107, or 1 per cent. The five-year contract with the Adams Express Company, whereby it operated over the company's lines and used equipment furnished by the company, expired on Dec. 12, 1917. The contract was extended for ninety days in order to determine whether or not it would be to the best interest of the railway company to renew the agreement for a fixed period.

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Passenger revenue	$2,131,596	74.2	$1,852,505	74.9
Other transportation revenue	140,759	4.9	115,002	4.7
Revenue from other railway operations	602,718	20.9	504,363	20.4
Total operating revenue	$2,875,073	100.0	$2,471,871	100.0
Operating expenses (actual)	$1,709,326	59.4	$1,283,339	51.9
Provision for equalization and accrued depreciation	141,145	4.9	150,325	6.1
Total	$1,850,471	64.3	$1,433,665	58.0
Net operating revenue	$1,024,601	35.7	$1,038,206	42.0
Taxes	104,173	3.6	84,445	3.4
Operating income	$920,428	32.1	$953,761	38.6
Non-operating income	144,755	5.0	145,209	5.8
Gross income	$1,065,183	37.1	$1,098,970	44.4
Deductions from gross income	611,646	21.3	630,493	25.5
Net income	$453,537	15.8	$468,477	18.9

Reorganization Fails

Road Between Mexico and Santa Fe, Mo., Not Now in Operation, Likely to Be Junked

The directors of the Mexico Investment & Construction Company have rejected the proposal made to them on Jan. 26 for the reorganization of the company, which operated 16 miles of electric railway between Mexico and Santa Fe, Mo. It was planned to have new interests take stock in the company, and to elect a new personnel to include three of the former directors and then to make a new trial of operation of the road. The proposal was rejected by the present owners for the following reasons:

1. It takes care of only one-third of the debts now due to outside parties, payment of which is being urgently demanded.
2. It makes no provision for the $30,000 advanced by the stockholders for building the extension from Molino to Santa Fe.
3. It is unreasonable that the owners of an $80,000 investment should be called on to surrender control to unnamed parties who propose to furnish only $5,000 of the capital.

It has been decided that in case the railroad is dismantled and the material sold all cash donated for the extension of the line from Molino to Santa Fe, whether legally collectible or not, be repaid in full, or at least in the same proportion that the stockholders are repaid, out of the proceeds of such sale.

Last November it was noted in the ELECTRIC RAILWAY JOURNAL that W. W. Botts, secretary and treasurer of the company, had issued a statement in which he said that the stockholders were "forced to the conclusion that unless the road should be wanted as a part of a through line from Hannibal to Mexico, the enterprise is a failure and ought to be abandoned."

Financing Policy Outlined

Chairman of Capital Issues Committee Says Encouraging Support is Being Received Throughout Country

The chairman of the capital issues committee of the Federal Reserve System on Feb. 17 stated that the support received from all parts of the country was most encouraging. This committee was appointed to act upon voluntary application for permission to issue new or refunding securities.

In dealing with applications thus far submitted, the committee has adopted the policy that whenever the application involves the renewal of maturing obligations, such renewal should be favorably considered unless there are particular reasons to the contrary. A similar policy is being adopted in dealing with the funding of banking debt incurred prior to Feb. 1, 1918.

In dealing with bonds to be issued for the purpose of new road construction, the committee has been moved primarily by the consideration of whether or not these roads are of importance either from a military or economic point of view and whether or not results, through the new construction, may be expected to be obtained approximately within the present year.

In passing favorably upon certain projects involving the production of electric power, the committee was guided by the fact that the amount involved was small as compared with the funds already hazarded in such undertakings, and by the fact that the power to be produced was required primarily for purposes connected directly with the successful prosecution of the war.

The advisory committee of the capital issues committee has been in close touch with all local committees established by the twelve Federal Reserve Banks, and all personal presentations of applications are being made to them.

Receivership Denial

Summary of Defense of United Railways, St. Louis, Mo., to Recent Application

The application for the appointment of receivers for the United Railways, St. Louis, Mo., has been denied. Judge Dyer of the United States District Court concluded that the defense was correct in its contention that the allegations contained in the application did not justify a receivership and showed no cause for action. These facts were noted briefly in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 338. The answer, filed by attorneys for the United Railways and others interested, maintained that the facts as outlined in the bill of complaint did not constitute a valid cause for action and that the United States District Court seemed to be without jurisdiction. Another allegation was that the complainant did not state who were the directors of the defendant company, nor that he ever appealed to the directors to give him redress for his alleged wrongs. Seven grounds on which dismissal of action was asked were as follows:

1. The bill of complaint does not state facts sufficient to constitute cause of action.
2. The United States Court appears to lack jurisdiction.
3. The bill of complaint is multifarious, and violates the equity rules, in that it does not assert that all the defendants are equally liable.
4. The bill combines alleged causes of action in equity with alleged causes at law.
5. The bill does not show that the plaintiff has complied with the rules of equity, in that he has not exhausted his rights within the corporation to correct his alleged wrongs; the bill does not show who the company's directors are, or that the plaintiff ever applied to the directors for redress, or that such an appeal, if made, would have been without result.
6. Plaintiff's right of action appears to have lapsed, if any such right existed.
7. The causes of action are barred by the statute of limitations.

Financial News Notes

Authorized to Junk Part of Line.—The Public Service Commission of Indiana on Feb. 15 authorized the holders of the bonds covering that part of the Gary & Interurban Railroad connecting Gary and Valparaiso to dismantle the property and to dispose of it as junk.

Sale Set for March 14.—The property of the Selma Street & Suburban Railway, Selma, Ala., will be sold on March 14 under foreclosure to satisfy a mortgage for $125,000 said to have been executed to F. M. Abbott, J. Waters and D. L. Gerould, Warren, Pa.

Danbury & Bethel Street Railway. Danbury, Conn.—J. Moss Ives, receiver for the Danbury & Bethel Street Railway, has petitioned the Supreme Court for permission to borrow $75,000 on receiver's certificates to liquidate outstanding obligations and provide for improvements, including new cars.

Several New Directors Elected.—At a recent meeting of the Philadelphia & Western Railway, Upper Darby, Pa . W. Barklie Henry, Edward F. Beale and Charles H. Bean were elected directors to fill vacancies caused by the death of Edward B. Smith and the resignations of G. R. Sheldon and G. T. Hollister.

Reserve Board Asked About B. R. T. Notes.—The Brooklyn (N. Y) Rapid Transit Company has applied to the capital issues committee of the Federal Reserve Board with respect to the steps to be taken by it looking toward providing for its $57,735,000 of secured 5 per cent notes, which mature on July 1.

New Officers for Fort Smith. — New officers have been elected for the Fort Smith-Oklahoma Light & Traction Company as follows: R. E. Ballard, formerly auditor of the company, president and general manager, to succeed W. J. Parker; George Sengel, Jr., formerly treasurer of the company, secretary, to succeed J. F. MacGilvray, and R. D. Beard, treasurer.

New Officers for Selma. — New officers have been elected for the Selma Street & Suburban Railway, Selma, Ala., as follows: Robert Wetheril, president, to succeed Joseph S. Keen, Jr.; W. H. Roth, secretary, to succeed H. B. Hodge, who has been appointed treasurer to succeed George M. Bunting, and A. H. Knean, general manager, to succeed James H. Dawes. The proposed foreclosure sale of the property is noted elsewhere in this column.

Directors Absolved.—The Court of Appeals at Albany, N. Y., on Feb. 5 affirmed the decision of the Appellate Division dismissing the suit brought against August Belmont. The decision in effect holds that Mr. Belmont and others did not enter into a conspiracy with the original directors of the Interborough Rapid Transit Company to issue $1,250,000 of stock in order to divide the same among themselves.

Upset Price of $1,700,000 Fixed.—The court has fixed $1,700,000 as the upset price for the property of the Northern Electric Railway, Chico, Cal., at foreclosure sale. It is said that the question still remains of settling the matter of priority of certain bonds of the Chico Electric Company. A special master will be appointed by the court to conduct the sale as soon as the question of the rights of the holders of the securities of the Chico Electric Company has been passed upon.

Appeal of Abandonment Case Dismissed.—The Ohio Supreme Court has dismissed the case of the village of Bellbrook and citizens of Green County against the Dayton, Springfield & Xenia Railway. The case involved objections to the abandonment of the company's branch to Bellbrook, which the Public Utilities Commission approved some time ago. The ground for the dismissal was the fact that the objectors did not ask for a rehearing before the commission, as provided by law.

Preferred Stock Being Offered.—Thomas C. Perkins, Inc., Hartford, Conn., is offering at par, $100, with a bonus of 20 per cent in common stock, a new issue of $375,000 of 7 per cent cumulative preferred stock of the Southern New York Power & Railway Corporation, Cooperstown, N. Y., of which $500,000 is authorized and issued. The common stock authorized and issued is $774,900. The company has authorized an issue of $5,000,000 of bonds, of which $1,133,000 is outstanding at the present time.

Court to Confirm Dan Patch Sale.—It was announced that a court order would be issued on Feb. 23 by Judge Booth of the federal court confirming the sale of that portion of the line of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company extending from Auto Junction to the Luce line junction, to a committee representing the collateral note holders. The sale was made on Dec. 18 to C. T. Jaffray, A. B. Jackson and R. B. Marchant, the committee, at the upset price of $100,000, with the privilege of dismantling and selling the physical property and right-of-way.

1917 Seattle Municipal Loss.—The Seattle Municipal Street Railway was operated during the fiscal year 1917 at a net loss to the city of $34,958, according to the annual report of Superintendent of Public Utilities, A. L. Valentine. The report shows that the loss on Division A was $26,458 and on Division C $8,480. Passenger revenue on Division A amounted to $25,097, and the total revenue obtained from the line was $28,081. The operating expense for the year was $54,539, this including an item of $19,125 as interest on the funded debt. Revenue on Division C amounted to $24,521, and the operating expense totaled $33,001.

Tax Tender Rejected.—The finance committee of the City Council of Seattle, Wash., recently recommended the rejection of the offer of the Puget Sound Traction, Light & Power Company to pay about $74,000 of gross earnings tax for 1917 under the same conditions that a tender for 1916 was made one year ago. The offer to pay the amount was made by the company with the understanding that it would be returned in the event the company is successful in the litigation started to obtain relief from certain franchise obligations, including the payment of 2 per cent tax on gross earnings and the paving of rights-of-way.

Detroit Net Falls Off.—At the annual meeting of the Detroit (Mich.) United Railway the report for the year just ended was made public. The statement shows that gross earnings from operations for 1917 were $17,427,940, an increase of $1,391,270. The operating expenses, however, increased to $13,259,791 in 1917 by an amount of $2,043,988. Income from other sources increased from $351,335 in 1916 to $411,737 in 1917, making gross income $4,579,886, compared with $5,172,202 the preceding year. The net income was $2,175,531 in 1917 and $2,880,792 in 1916. R. W. Martin, of New York, was elected to the board of directors.

Little Rock Company Issues Notes.—The Interstate Trust & Banking Company, New Orleans, La., is offering at 97½ and interest to yield more than 7¼ per cent $600,000 of two-year 6 per cent gold notes of the Little Rock Railway & Electric Company, Little Rock, Ark., dated Jan. 1, 1918, due Jan. 1, 1920. The notes are a direct obligation of the company issued to provide for the payment of $400,000 of notes, which matured on Dec. 1, 1917, temporarily refinanced by banks, for extensions and equipment, and to provide for the contract with the government for light and power purposes at Camp Pike, about 10 miles from Little Rock.

Reprints of Bond and Tax Tables Ready.—First National Bank, Cleveland, Ohio, is distributing reprints of the tables on liberty bond and federal income tax data, prepared by C. H. Hubbell, formerly auditor of receipts, Illinois Traction System, and mentioned on page 256 of the issue of this paper for Feb. 2. Upon request, the bank will mail copies to any address without charge. The bank also announces that if and when new issues of Liberty bonds are offered, the tables and statements will be revised to cover such new issues and copies of the revised circular will be mailed to a list made up of the names of those persons who may have asked to be supplied with copies of the original circular.

San Francisco Municipal Earnings Summarized.—The total receipts of the Municipal Railway, San Francisco, Cal., for the period from Dec. 28, 1912, to Dec. 31, 1917, were $7,421,551. Of this total, the operating revenues were $7,397,643. These figures are from a statement just issued by the bookkeeping department of the Board of Public Works. The disbursements during the period above mentioned amounted to $5,567,354. After miscellaneous transfers of $599,367 and reserve fund transfers of $767,061 for depreciation and $25,396 for injury insurance, there remained a surplus of $462,371. Of this, $144,279 is said to be available for future use, the remainder being intended for the completion of certain new construction. The depreciation fund at the end of 1917 contained $547,643 of bonds and $274.581 of cash, and the injury insurance fund had $25,396 of cash.

Nashua Lease Rejected by Receiver.—John A. Fisher, president of the Nashua (N. H.) Street Railway, has been notified by Receiver Donham of the Bay State Street Railway that he will not adopt the lease of the Nashua Street Railway, but will turn the property back to its stockholders. In 1900 the Nashua Street Railway conveyed all its property to the Lowell & Suburban Street Railway under lease for ninety-nine years. The lessee agreed to pay as a rental all operating and general expenses, interest on debt and the present 3 per cent net semi-annual dividends. This lease has been owned by the Bay State Street Railway for some time, but on Jan. 1 that company defaulted in the payment of the dividend. In a statement to the stockholders, Mr. Fisher says that he has been informed by counsel that a receiver has the power to turn leased property back, but he is likewise informed that the company will have a claim for damages. He expects shortly to receive more definite information and will then call a special meeting of the stockholders for their consideration and action.

Electric Railway Monthly Earnings

**ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'18	$10,832	$12,994	†$2,162	$484	†$2,646
1 " "	'17	22,902	23,974	†1,072	668	†1,740

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*Includes taxes. **On May 1, 1917, the Atlantic Shore Railway was divided east and west of York Beach, Maine, the western end passing to the operating control of the Portsmouth, Dover & York Street Railway. Figures for the first four months of 1917 are for the entire system. Beginning with May 1, figures for the Atlantic Shore Railway, as at present constituted, are given. †Deficit.

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec.,	'17	$586,540	*$280,350	$306,190	$218,153	$88,037
1 " "	'16	550,125	*229,796	320,329	215,656	104,673
6 " "	'17	3,159,044	*1,541,200	1,617,844	1,307,077	310,767
6 " "	'16	2,947,133	*1,313,980	1,633,153	1,290,789	342,364

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period		Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan.,	'18	$2,468,899	$1,574,727	$894,172	$813,677	$80,495
1 " "	'17	2,427,787	1,385,416	1,042,371	813,804	228,567
7 " "	'18	17,499,357	10,391,914	7,107,443	5,681,042	1,426,401
7 " "	'17	16,284,933	9,089,236	7,195,697	5,701,037	1,494,660

Traffic and Transportation

Portland Case to Court

Council Appeals to Circuit Court for Relief from Six-Cent Order of Oregon Commission

The complaint of the City Council of Portland, Ore., against the recent 6-cent fare order of the Public Service Commission to the Portland Railway, Light & Power Company has been filed in the Circuit Court. The first point in the complaint is based on the technicality that the State was not a party to the order of the commission setting aside the 5-cent fare. The second point sets forth that the people of Portland in 1913 enacted the commission charter, in which are minute provisions pertaining to the regulation of public service companies, including machinery for fixing the fares, and that the public service commission act exempts from the jurisdiction of the public service commission laws and regulations enacted by the voters in communities under the initiative. The third contention is that the commission order violates the constitution of the State and of the United States by impairing the obligations of the franchise contract. The fourth point contends that there was no allegation in the complaint of the railway and nothing in the proceedings in the case to show that the city's regulation of rates has become unreasonable. The fifth contention is that the order of the Public Service Commission violates the home rule amendment of the State Constitution. The complaint asks that the Circuit Court vacate and set aside the order of the commission.

ANOTHER APPRAISAL PROPOSED

The City Council has passed an ordinance providing for an immediate and independent appraisal of the property of the company used in the railway service, to determine the amount the company has invested and the return derived under the 6-cent fare. The sum of $30,000 was appropriated to cover the cost of the appraisal. This will be the third appraisal of the company's properties. The first was made by engineers and accountants employed by the company. An appraisal by the State followed, in which the company's figures were cut down materially.

A signed statement has been issued by members of the committee representing the various civic organizations of the city protesting against the city's action in taking appeal from the ruling of the Public Service Commission. The members take the view that such an action will be futile. Instead of resorting to litigation, the committee proposes constructive relief.

Frank J. Miller, chairman of the Public Service Commission, in a recent statement, pointed out that the City Council should bear in mind that the Council has two remedies of its own for the solution of the 6-cent fare problem, viz., the enactment of an ordinance fixing the fare for Portland and municipal ownership. He states that the law provides that "no ordinance or other municipal regulation shall be reviewed by the commission under the provisions of this section, which was, prior to such review, enacted by the initiative or which was, prior to such review, referred to and approved by the people of said municipality, or while a referendum thereon is pending."

Chairman Miller expressed the opinion that under the provisions of this section the city of Portland can pass an ordinance fixing fares within the city limits, thus removing the matter from the jurisdiction of the commission.

Fare Request in Kansas City

Kansas City Railways Seeks Increase in Fares to Meet Extraordinary Conditions

The Kansas City (Mo.) Railways has filed a petition with the Public Service Commission of Missouri asking a readjustment of fares. The company is not making a specific request for a 6-cent fare, but is pointing out the necessity for a larger income in order to maintain service at the desired standard.

The company's petition is divided into four sections. In the first it recites its ownership of the properties. In the second it reviews how the new franchise under which the company operates is of mutual advantage to the public, the city and the company. In the third it refers to the starting of the war and then takes up the burdens which that conflict has inflicted upon the company.

INCREASED EXPENSE OF $1,300,000

In the third section the company says that for the year which will end on July 14, 1918, solely on account of extraordinary war conditions, there will be at present prices an additional expense to the company over the previous year of more than $1,300,000. Of this increase $400,000 will be accounted for in the advance in the price of coal. The company says that "at a fare limited to 5 cents it will be impossible so long as such extraordinary conditions obtain to give to the city and those interested the full advantages of the franchise provisions of an up-to-date electric railway in a rapidly growing community." It says that "the relief now sought is, therefore, temporary in nature, to continue only so long as the commission shall determine to be necessary to meet the present abnormal situation."

In the fourth section the company refers to the clauses of the franchise that expressly provide for preserving the rights of the State, and then makes its plea as follows:

"To the end, therefore, that neither the company nor the public may be crippled by the said unforeseen and extraordinary increase in expense, an appeal is hereby made to the commission to make a reasonable increase in fares upon such conditions as may be fair and just in view of the changed conditions aforesaid, retaining control and supervision of any additional revenue collected, to the end that it shall be applied solely to the payment of the increased expense hereinbefore mentioned, necessary to be paid to render first-class service."

City of Trenton Answered

Trenton Company Places Blame On the City for Any Deficiencies in Its Service

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has filed an answer with the Board of Public Utility Commissioners of New Jersey to the application of the City Commission of Trenton, asking that the company be required to improve its system by making certain of the changes suggested in the recent report of Peter Witt.

The company states that there is very little the matter with the rolling stock, trackage and service furnished. It makes another appeal for the abolition of the six-for-a-quarter tickets in the city of Trenton.

OPPOSED TO ONE-MAN CARS

The recommendation of Mr. Witt that the company purchase fifty one-man cars is declared by the company to be impractical. The company contends that the type of car recommended requires greater time to load and unload, and that its seating capacity is only 70 per cent of that of the double-truck cars now in use. The company denied that cars are not kept in good repair. In its plea for relief from the six-for-a-quarter tickets the company points out that a straight 5-cent fare is the rate obtained by electric railways elsewhere in the State.

The city is cited as being responsible for doubling the taxes of the company and for securing the indictment of the directors for maintaining poles and lines of wires necessary for the operation of its property under franchises granted by predecessors of the City Commission. Other acts of the city are reviewed to show how the company has been hampered in giving the service which it hoped to give at the time it leased the local system and began the work of rehabilitation and improvement. The company says that to make the improvements asked for in the petition of the City Commission would cost more than $800,000. It denies that the commission has power to direct the company to make the changes and improvements prayed for by the city.

Navy Yard Traffic Problem at League Island

Philadelphia Rapid Transit Company Beset by Conditions Beyond Its Power to Control

Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, assisted by Herbert G. Tulley, superintendent of transportation, and a corps of assistants, was at the terminus of the League Island Navy Yard, Philadelphia, on Feb. 12, at 6.15 p. m., when the greatest number of workmen leave the yard for their homes. Their purpose was to study at first hand the problem involved in transporting the 9000 workers. The cars arrive on two tracks, so that men taking one line all enter on one track and those going in another direction enter the cars on the other. On the evening of Feb. 12 the experiment was tried of having a conductor or extra fare collector at the rear door, which was opened as each car arrived, as well as the front doors, so that fares were collected at either end as the men entered. It is said that the double-end loading proved a success, and is to be permanently established during the rush hours.

Mr. Mitten stated very frankly to the newspapers that the problem involved is not entirely within the power of the company to correct. The company is handicapped greatly by delays to its cars caused by traffic on the streets and is also beset by the vicissitudes of securing delivery of materials from the manufacturers upon whom it depends for equipment and supplies. Mr. Mitten is reported to have said:

SOME OF THE COMPANY'S PROBLEMS

"The only help that the company can give is to see that the cars are operated upon a schedule that can be maintained. We do not object to criticism, but when every line in the country is affected by the bad weather, on top of our inability to get materials, so that we have 350 cars tied up in the carhouses, the company feels that it ought to have a chance. Mayor Smith has ordered that the police see that teamsters do not drag or delay cars, and I feel that the service this evening already shows the effect. When the weather was severe, teams could not turn out of the car tracks with ease, and this caused much trouble.

"We have had priority orders for equipment for months, but they do not help us to get materials. Ammunition is the priority order. We as a public service corporation are classed as 'B-3,' and there are classes ahead of us that claim priority orders. What I want the government to do, and will ask Admiral Peoples to get for us, is to order a plant making wheels, axles and other equipment for trolley cars, to fill our orders. Then we can put 350 cars back on the streets. They are now laid up for repairs.

"We got our wheels from the Midvale Steel Works, but the company dismantled its car-wheel plant and is making war materials. The Carnegie Steel Company has our order for axles and wheels. But we cannot get it filled without an order from the government. We have been buying axles at a St. Louis plant, when we found that they had them, and they forward a few at a time by express, so as to hurry them, but we could only get a few. If we can get the materials we will have the men to put them on the cars."

As noted recently in the ELECTRIC RAILWAY JOURNAL, arrangements have been perfected by which 100 large cars are under construction for the railway at the works of the J. G. Brill Company in Philadelphia. This has been done through the instrumentality of the United States government, as the cars are to be used for Hog Island service.

I. T. S. Ad Campaign

600-Mile City and Interurban System Tells the Public About Its Problems

The Illinois Traction System, Peoria, Ill., is running in the various daily papers of towns and cities served by the companies that it controls a series of advertisements headed, "Our Problems Are the People's Problems." The company is showing how the increased costs of production and operation in all lines of business weigh especially heavily upon the utilities, inasmuch as they cannot increase their revenue without sanction from the regulatory bodies appointed by the state officials elected by the public direct. Two recent examples of advertising by the company along the lines just mentioned are reproduced herewith. These advertisements were published in the name of the Peoria Railway Company. Since the advertising campaign was started the company has carried its case for some of the properties to the commission, with the results noted elsewhere on this page.

Our Problems Are The People's Problems

Introductory to a frank statement of fact from your street railway company

This company believes in the policy of informing the public of the facts and conditions concerning its operation

Recent events of world-wide importance with which all of us are familiar have produced an abnormal condition in every avenue of trade and endeavor.

This is especially noticeable in the public utility industry, where remedies for existing extraordinary conditions have not been readily available as in other lines of trade.

The situation confronting the public utility companies in Illinois, and particularly in this immediate territory warrants the necessity of our present concern.

The prosperity and well-being of a city depends upon the success of its individual enterprises.

We believe the people of this community are interested in the problems of public service and the endeavors of its public utilities to solve these problems to the best interests of all.

With the thought in mind that OUR PROBLEMS ARE THE PEOPLE'S PROBLEMS we will in succeeding issues of this newspaper point out the effect of present day conditions upon one of your important industries.

Peoria Railway Company

I. T. S. Fare Hearing

Report of Comptroller of Currency Quoted to Prove Need of Utilities for More Revenue

After an all-day session on Feb. 19 the hearing before the Public Service Commission of Illinois on the petition of the Illinois Traction Company, Peoria, for increased rates for city railway service as well as for electric lighting and gas service, was adjourned until March 5. Henry I. Green, attorney for the fourteen petitioning companies, presented exhibits consisting of financial statements taken from the monthly reports of the companies. He also reviewed increases in rates granted elsewhere with opinions of the various commissions.

The figures which were presented were compiled especially to avoid the necessity of an extensive investigation to determine the need for more revenue so that emergency relief could be obtained. The company said it faced ruin unless such relief were obtained. The annual report of the Comptroller of Currency, referred to in the ELECTRIC RAILWAY JOURNAL for Feb. 9, page 292, was cited to show that many utilities need immediate help. Evidence was introduced to show that materials used by utilities cost at present four times pre-war prices.

H. E. Chubbuck, vice-president executive of the company, testified to the effect of increased costs for supplies on operation and efficiency.

Our Problems Are

The People's Problems

The high cost of living is a serious matter for all of us

Time was when the "high cost of living" joke was a favorite theme for the cartoonist and professional jester. It seldom failed to produce a laugh from those of us who thought that somehow, sometime, things would change, the advancing cost of commodities would cease, the cost curve would start downward again and normal prices would be restored.

Then came the world war, with accompanying increase in demand for all commodities, congestion in all trade channels and resultant added increases in prices.

The high cost of living has ceased to be a joke. It is a serious matter. It is a serious matter for the housewife, for the merchant with whom she trades, for the wholesaler, the jobber, the manufacturer, and for everyone all along the line who has to do with making and distributing the things that enter into the daily life.

This era of high prices is a serious matter for your utility company. This is particularly true because to date there has not been afforded the advantage of protection from mounting costs that has been provided in other lines of business.

Today your street car company faces a problem more important than any it has ever had to contend with. This problem is not ours alone. It is likewise of vital importance to this community.

In succeeding articles we will show what the high cost of living is doing to this company.

Peoria Railway Company

Objectors urged against a blanket order and suggested that each company receive a separate hearing. Some, however, asked only that the present rates be resumed when conditions again became normal. To this the companies are willing to agree.

To avoid delay the commission will make a short investigation and if the proposed rates seem to be justified some measure of relief will probably be granted, such approval to be for a definite time and the commission to keep the case under its jurisdiction.

Appeal for More Revenue

Application Made to the Commission by the United Railways, St. Louis, for Fare Advance

The United Railways, St. Louis, Mo., has appealed to the Public Service Commission of Missouri for an increase in fares. Among the suggestions of the company are that it be permitted to curtail the present transfer privileges or charge for transfers. In a statement which he issued, Richard McCulloch, president and general manager of the company, reviewed the problems that confront the electric railways in war time and pointed out some of the measures of relief extended to companies elsewhere in the United States by the regulating bodies. In conclusion he said:

"At the present time a nickel will buy only one-fifth to one-half of what it would purchase in railway supplies two years ago. The history of the nickel car fare is virtually the same all over the country. The electric railways have constantly installed better cars, made faster and longer trips, and issued more and more transfers. In the old horse-car days companies made a profit on the 5-cent fare. At present not 10 per cent of the electric railways in the United States show a profit."

It is said that the commission will take no action in the matter until counsel for the company and the city authorities have agreed upon a date for a preliminary hearing on the application.

The city is expected to oppose the application of the company through City Counselor Daues.

More Service for Munition Workers

Co-operation of Federal Authorities With Electric Railways Reported in Several Cities

In at least four cities departments of the federal government have recently taken an active interest in the service of the local electric railways. This interest is based on the desire of the government to improve the service for workers in munition plants or other factories engaged on government work, and is in addition to one or two other instances reported earlier, as at the Fore River Ship Building plant with the Bay State Street Railway.

In Philadelphia arrangements have been perfected through the instrumentality of the United States government by which 100 large cars are under construction at the Philadelphia works of the Brill Company to be used by the Philadelphia Rapid Transit Company in its Hog Island service. This statement was made officially by President Mitten on Feb. 7. The details of the financing have not been made public. In the meantime, Rear Admiral Tappan, commandant of the Navy Yard, has asked the Mayor of the city to have the jitney ordinance rescinded so that jitney service may be restored along Broad Street to relieve the congestion at League Island.

Another city in which the government is interested through the needs of munition plant workers is Pittsburgh. According to the daily papers one or more conferences on the subject of more transportation in Pittsburgh have been held by federal officials, and Secretary of the Navy Daniels is reported to have declared to a committee representing the Pittsburgh Commercial Club at a meeting in Washington that if necessary the navy and war departments, acting jointly, would commandeer enough cars to give the service desired. Much of the complaint of inadequacy was made during the severe weather of the first week in February.

Another company with which the government is reported to have arranged for an increase in service is the Tri-City Railway & Light Company, Davenport, Ia., and East Moline, Ill., in connection particularly with concerns engaged on government contracts in the latter city. The additional service is said to have been arranged through the Housing Committee of the Ordnance Department.

In Buffalo a survey was recently made of the possibilities of additional service to some of the plants engaged in airplane construction. An account of this investigation, conducted by B. J. Arnold, was mentioned in the ELECTRIC RAILWAY JOURNAL for Feb. 2.

Agree on Beeler Stops

Washington Operation Shows 3 M.P.H. Improvement in Schedule Speed of Capital Traction Lines

Measures have already been taken at Washington to put into effect the recommendations in the second traffic report by John A. Beeler presented to the Public Utilities Commission on Feb. 7 and abstracted in the ELECTRIC RAILWAY JOURNAL for Feb. 16.

Raised platforms at stopping places of the Capital Traction Company's cars on New York Avenue near Fifteenth Street and on Pennsylvania Avenue near Fifteenth Street were in use successfully by Feb. 19, and it is expected that more will be installed soon along Pennsylvania Avenue between the Peace Monument and the Treasury. Service through the throat of the Capital Traction system already has improved since the first Beeler recommendations went into effect.

The Capital Traction Company is reported to have agreed to all of the skip-stops proposed in the second report, and the details were to be settled on Feb. 20 at a joint conference of the commission and the railway.

The change in operation at the throat was first tried out Sunday, Feb. 17, but the real test did not come until the following day. During non-rush hours cars moved over Fifteenth Street at 10 m.p.h., an improvement of about 3 m.p.h. During the rush-hour cars were loaded rapidly and sent away in pairs without the congestion that occurred when the cars stopped on Fifteenth Street just south of the Pennsylvania and New York Avenues junction.

Jurisdiction Argued

This Question Before Pennsylvania Commission in Cases Involving Six-Cent Fares

Representatives of municipalities and electric railways attended a hearing before the Public Service Commission of Pennsylvania at Harrisburg on Feb. 19 to hear arguments on the question of whether or not the commission has jurisdiction in connection with the applications of electric railways asking for 6-cent instead of 5-cent fares in cities and boroughs that granted franchise rights with the understanding that the fares were not to exceed 5 cents. While there were thirty-three complaints bearing on this question of municipal rights, the argument centered about the situation in Pittsburgh and adjoining boroughs.

CONTENDS BOARD IS WITHOUT JURISDICTION

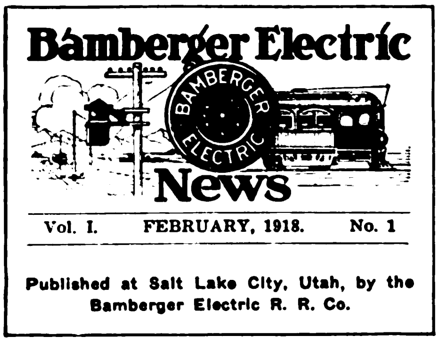
M. W. Acheson, Jr., Pittsburgh, who, with David L. Starr and Lee C. Beatty, solicitor of Allegheny County, represented the boroughs of Allegheny, was the principal speaker for them. He asserted that the commission had no jurisdiction, contending that the Constitution gave to municipalities the right to regulate rates of fares in granting franchises. He said that this right was vested neither in the Legislature nor the courts. Mr. Acheson said the Legislature, by the creation of a commission, could not abrogate that right and, if the right was conceded, the railways did not have authority to raise fares and violate the agreement they had made with a municipality. He argued that if such action was taken the violation of the municipal rights was a matter for the courts to decide.

CASE FOR THE COMPANIES

John C. Bane, representing the Pittsburgh Railways, spoke on the validity of the company's application for the right to increase fares in the Pittsburgh district to 6 cents. He argued two points in particular: Has the commission the right to approve the application and would the approval of the rates as asked be violation of the State Constitution? He said the contention of the complainants that the commission did not have the right to increase fares where municipal franchise agreements interpose was not founded in the law or Constitution and that such granting of a reasonable increase would not violate the Constitution. Asserting that the municipalities and companies have the right to make an agreement regarding rates, he said that conditions could so change that these rates would have to be changed to be reasonable and adequate. It was Mr. Bane's opinion that the commission had the right to fix reasonable and adequate rates, and that this meant not only that it could reduce rates, when they are found to be exorbitant, but that it could increase rates when it is found that rates in effect were so burdensome because of their lowness as to work a material hardship.

Another Company Publication

The Bamberger Electric Railroad, Salt Lake City, Utah, has established *Bamberger Electric News* to keep its patrons more closely in touch with the details of operation of the railroad, to call attention to changes of time-table, reduced rates and special service, and to help to spread the doctrine of safety. The company has asked the co-operation of its patrons and has requested them not to be too hasty in making complaints, though it says that constructive criticism is welcome at all times. The first issue of the new paper contains four pages. It is 3¼ in. wide by 9 in. high. The masthead, slightly reduced in size, is shown in the accompanying illustration.



Bamberger Electric News

Vol. I. FEBRUARY, 1918. No. 1

Published at Salt Lake City, Utah, by the Bamberger Electric R. R. Co.

MASTHEAD OF NEW PAPER

Transportation News Notes

Skip Stop Extended in Syracuse.—Skip-stop operation is now in effect on three full lines of the New York State Railways, Syracuse lines.

Passenger Advance Suspended.—The Public Utilities Commission of Illinois has suspended the proposed advance in passenger rates of the Joliet & Eastern Traction Company. The commission permits the company to file a schedule of fares predicated upon a 2-cent-a-mile basis.

Experimental Jitney Service by Railway.—The Portland Railway, Light & Power Company, Portland, Ore., has re-established its jitney service between Oswego and Oregon City, and will give it another month's trial. If the line does not pay expenses the service will be definitely suspended.

Three Ohio Roads Ask for Increased Rates.—The following roads have asked permission to increase their schedules to a basis of 2½ cents a mile: Dayton, Springfield & Xenia Southern; Mansfield Public Utilities & Service Company, and the Interurban Railway & Terminal Company, to apply on the Cincinnati & Lebanon division.

New Rates on Ohio Electric Become Operative.—The new rate schedule of the Ohio Electric Railway, Cincinnati, Ohio, formulated on a basis of 2½ cents per mile, went into effect on Feb. 1. Reductions in this rate were made by the Public Utilities Commission on a few short runs near Columbus, but through fares are all to be estimated on the new schedule.

2037 Women Employees in New York.—It was estimated on Feb. 15 that 984 women are working as guards and conductors on the transit lines in New York, 489 on the Brooklyn Rapid Transit cars, 470 on New York Railway lines, and twenty-five for the Hudson & Manhattan Railroad. Including five matrons, 1000 ticket agents and forty-eight car cleaners working for the Brooklyn Rapid Transit Company, New York traction lines employ 2037 women.

Rehearing Denied in Salt Lake Fare Case.—The Public Utility Commission of Utah has denied the petition of E. A. Walton for a rehearing in the case in which the commission recently authorized the Utah Light & Traction Company, Salt Lake City, Utah, to charge a straight 5-cent fare and make other charges in its tariffs. The finding and opinion of the commission in this case were reviewed in the ELECTRIC RAILWAY JOURNAL of Feb. 16, page 340.

New Auto Ordinance in Effect.—The jitney ordinance recently passed by the City Commission of Dallas, Tex., imposing restrictions on all automobiles, but aimed particularly at the jitneys, is now being rigidly enforced and as a result the number of jitneys in operation has been reduced by more than one-half. The jitney drivers have filed application for an injunction restraining the city in the enforcement of the ordinance, and the petition has been set for hearing.

New Rate for Ohio Line.—The Dayton, Covington & Piqua Traction Company, West Milton, Ohio, filed a new schedule of rates with the Public Utilities Commission of Ohio, calling for 2½ cents per mile, to take effect on Feb. 19. A hearing was set for Feb. 7. Thomas J. Brennan, general superintendent of the company, met with the commission. After going over the matter thoroughly as to operating expenses and the company's need of more revenue, the new schedule was allowed. It became effective on Feb. 19.

Interurban Seeks Fare Increase.—The Buffalo, Lockport & Rochester Railway, Rochester, N. Y., operating between Rochester and Buffalo and in the city of Rochester, has filed an application with the Public Service Commission for the Second District for permission to increase its rate of fare on commutation books from 1 to 1½ cents a mile on its interurban division, and from 5 to 6 cents within the city of Rochester. It is proposed to have the new schedules go into effect on March 1. No date for a hearing has been set by the commission.

Employment of Women a War Measure.—Richard McCulloch, president of the United Railways, St. Louis, Mo., issued a statement recently in which he declared it was not the intention of the company to replace men with women. Mr. McCulloch said the company had been employing every well-qualified man who applied, and had even advanced money for his pressing needs, allowing him to pay back in installments. He said no man had lost his place because of a woman and that none would, but that the employment of women was a war measure.

Fare Action Moving Slowly.—At Frankfort, Ky., the question of raising fares to 6 cents is proving an interesting problem. The Kentucky Traction & Terminal Company has asked the Council to amend its franchise so that a 6-cent fare may be charged. The Council has postponed taking action until the railway files a fuller report on the reason for taking such action. In the meantime the newspapers have been asking for expressions of opinions of the citizens relative to the increase. The Board of Commerce has been keeping out of the matter.

Joint Rates.—The Kansas City, Clay County & St. Joseph Railway (Missouri Short Line) and the Quincy, Omaha & Kansas City Railway (Steam) have adopted joint rates for the benefit of passengers who use both lines. The roads will place extra cars in service from Avondale, on the line of the Kansas City, Clay County & St. Joseph Railway, to Thirteenth and Walnut Streets, Kansas City, in order to relieve the congestion of passengers at the junction of the Kansas City, Clay County & St. Joseph Railway with the Quincy, Omaha & Kansas City Railroad.

Legislation to Help One-Man Cars.—On Feb. 4, 1917, the Board of Alderman of Salisbury, N. C., passed an ordinance requiring the North Carolina Public Service Company to require all colored passengers to leave the cars by the rear door. This ordinance was carried out until in the fall of 1917 the Public Service Company placed in operation its new light-weight safety cars. With this car it was impossible to live up to the ordinance as passed. As a consequence, representatives of the company, on Feb. 7, 1918, appeared before the board and asked that this ordinance be repealed. This was promptly done.

Women Meet the Test.—Col. Timothy S. Williams, president of the Brooklyn (N. Y.) Rapid Transit Company, in discussing the problems of the company in the current issue of the *B. R. T. Monthly*, had this to say about the employees: "Our men have met this test. They have stood at their duty manfully. They have shown the grit that makes heroes. And our new women! Those who in this great emergency have volunteered to do men's duty! What praise shall we not give to them? Subjecting themselves to a public curiosity from which the feminine nature instinctively shrinks, enduring taunts and insults from society's ruffians, these plucky women have rendered a great public service and are proving their ability to fill a man's job."

Personal Mention

J. W. Lowrie has been appointed traffic manager of the Bamberger Electric Railroad, Salt Lake City, Utah.

W. M. Mills has been appointed auditor of the Glendale & Montrose Railway, Glendale, Cal., to succeed W. S. Easton.

W. L. McKinley has been elected president of the Monterey & Pacific Grove Railway, Monterey, Cal., to succeed Charles N. Black.

J. P. McKinney has been appointed master mechanic of the Durango Railway & Realty Company, Durango, Col., to succeed Thomas D. Wheeler.

E. E. Pateman has resigned as claim agent of the United Traction Company, Albany, N. Y., to enter the military service as a major of infantry.

N. L. Chase has been appointed chief engineer of the power station of the Bridgeport Division of the Connecticut Company to succeed W. H. Goodrich.

Eric Swanson has been appointed chief engineer of the power station of the Danbury & Bethel Street Railway, Danbury, Conn., to succeed O. J. Richmond.

Norman Macbeth has been appointed secretary, treasurer and general manager of the Glendale & Montrose Railway, Glendale, Cal., to succeed W. J. Bohon.

H. W. Fuller, of H. M. Byllesby & Company, Chicago, Ill., has been appointed vice-president in charge of operations of the Northern States Power Company, with headquarters at Minneapolis.

S. G. Shaw has been made supervisor of safety of the Denver (Col.) Tramway to succeed W. C. Swisher, resigned. Mr. Shaw has been connected with the legal department of the company for several years.

Charles B. Hill, Buffalo, has been nominated by Governor Whitman for appointment to the Public Service Commission of the Second District of New York to succeed Chairman Seymour Van Santvoord, resigned.

C. B. Hudson, formerly superintendent of the power plant of the Ithaca (N. Y.) Traction Corporation, has become connected with the Strathmore Paper Company in charge of its power plant at Woronoco, Mass.

George Merriam, heretofore supervisor of service of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., has been appointed superintendent of the Waukegan North Chicago division of that road.

W. R. Lyon, secretary and auditor of the Los Angeles & San Diego Beach Railway, San Diego, Cal., has also been appointed vice-president, purchasing agent and chief engineer of the company to succeed W. J. Gough.

A. M. Linn, one of the officers of the American Water Works Company, the holding company controlling the West Penn Power Company, Pittsburgh, Pa., has been elected president of the latter companies to succeed Samuel Insull, Chicago, resigned.

W. J. Parker, formerly purchasing agent of the Fort Smith Light & Traction Company, Fort Smith, Ark., is now connected with the City National Bank, Fort Smith, as assistant cashier. Mr. Parker was in the employ of the local railway and light company for eighteen years.

Alfred C. Jordan, for two years commercial manager for the Cumberland County Power & Light Company, Portland, Me., has been appointed superintendent of its electric railway, succeeding G. Sabin Brush, resigned. Mr. Jordan was born in Casco, Maine, thirty-nine years ago. He attended the Deering schools and was graduated from Deering High. He then attended the University of Maine, from which he was graduated in 1904. Mr. Jordan then entered the service of the Westinghouse Company at Pittsburgh, Pa., with which company he remained seven years. He next became connected with the Elmira Water, Light & Railroad Company, Elmira, N. Y. Mr. Jordan entered the service of the Cumberland County Power & Light Company, Portland, in 1915, on the power end of the commercial department, and in March, 1917, took up the duties of commercial manager, succeeding George T. Fisher, resigned.

A. C. JORDAN

Harley L. Swift, assistant engineer of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been commissioned first lieutenant in the Sixteenth Regiment of Engineers (Railway) United States Army. Mr. Swift has been in France since August, constructing railroads, warehouses, hospitals, shops, etc.

A. Swartz, as assistant manager of the railway department of the Toledo Railways & Light Company, the Toledo, Ottawa Beach & Northern Railways & Light Company and the Maumee Valley Railways & Light Company, Toledo, Ohio, has been charged with direct supervision over operation, instruction and schedules. This will be in addition to Mr. Swartz's present work as vice-president of the Toledo & Western Railroad.

Harry L. Brown, formerly western editorial representative of the Electric Railway Journal, with headquarters at Chicago, who recently accepted a temporary appointment as radio engineer in the office of the Chief Signal Officer, United States Army, Radio Division, Washington, has been commissioned a first lieutenant in the aviation section of the Signal Reserve Corps and has been assigned to duty in the training section of the land division, office of the chief signal officer.

V. F. Fabian, for nearly three years superintendent of transportation of the Springfield (Mass.) Street Railway, has resigned. Mr. Fabian has been in the employ of the Springfield system for about eight years. He was superintendent of the Westfield division of the company from 1912 to 1915. Before that he was engaged in office, traffic and power plant work with the New England Investment & Security Company's interests and earlier was engaged in steam railroad service in the West. Mr. Fabian's resignation takes effect on March 1. He has not yet announced his future plans.

G. Sabin Brush, superintendent of the railway department of the Cumberland County Power & Light Company, Portland, Me., since 1915, has been appointed superintendent of transportation of the Springfield (Mass.) Street Railway, succeeding V. F. Fabian, resigned. Mr. Brush's previous experience, following an engineering course at the Massachusetts Institute of Technology, includes varied service in the transportation departments of the Middlesex & Boston Street Railway and the Boston Elevated Railway. At Portland he has had direct charge of the operation of about 107 miles of city and suburban trackage and also has been instrumental in the development of rebuilt and new rolling stock, installation of signals and other equipment which have put the service of the property on a very high plane. Mr. Brush has been actively identified with the Cumberland County company section of the American Electric Railway Association and is one of the best regarded of the younger operating executives in New England electric railway circles. A biographical sketch and a portrait of Mr. Brush were published in the Electric Railway Journal of Dec. 11, 1915, page 1193.

P. T. Philips, who has been superintendent of distribution of the Little Rock Railway & Electric Company, Little Rock, Ark., has been appointed general superintendent of both the electric and heat departments and will have full authority over power-house operation. This appointment is incidental to the merging of the heating business with the other departments in the course of which Commercial Manager Smith takes over the commercial affairs of the heating department, and W. J. Tharp, secretary and auditor, will handle the auditing and statistical records of the company.

W. C. Austin, auditor of the Eastern Pennsylvania Railways, Pottsville, Pa., has been elected assistant secretary and assistant treasurer of that company. In 1917 Mr. Austin was transferred from the staff of traveling auditors of the J. G. White Management Corporation, New York, N. Y., to the accounting department of the Eastern Pennsylvania Railways, which is being operated by the management corporation. For a number of years Mr. Austin was treasurer and auditor of the Otsego & Herkimer Railroad, now the Southern New York Power & Railway Corporation, Cooperstown, N. Y.

L. A. Pettit, Jr., who has been associated with the Albert Emanuel Company, Dayton, Ohio, for the last nine years as general manager of this property and also as an officer of the companies controlled by it, including the Kansas Electric Utilities Company, has severed active connection with the company to engage in the business of controlling and managing public utility properties. Mr. Pettit will remain a director in companies operated by the Albert Emanuel Company. Mr. Pettit also intends to engage in consulting engineering work on utility rates, developments, reports, etc.

William F. Bellmer, who was connected with the Eastern Wisconsin Railway & Light Company at Fond du Lac, Wis., and its successor, the Eastern Wisconsin Electric Company, for eighteen years, has become assistant general manager of the Evanston (Ill.) Railway. Mr. Bellmer was reared on a farm in the town of Friendship, Fond du Lac County, Wis. In June, 1900, he entered the employ of the Fond du Lac Street Railway & Light Company, a successor of the present company in that city, as a trainman, and served in that capacity and as lineman helper, repair man, dispatcher on interurban and city lines, and at the time of his resignation to go with the Evanston Railway he had charge of the roadway and track, the repair shops and the trainmen.

Arthur A. Ballantine of the law firm of Goodwin, Proctor & Ballantine, Boston, Mass., and for many years prominent in electric railway rate and arbitration cases in Massachusetts, has been nominated solicitor of internal revenue by President Wilson. Mr. Ballantine has been serving upon the legal advisory board of the Treasury Department and will continue this work. Mr. Ballantine is thirty-four years of age. He was educated at Harvard College and at the Harvard Law School. He has been closely identified with the movement for increased fares on the Middlesex & Boston Street Railway from the beginning of this work, and has represented electric railway interests in a number of wages arbitration proceedings. In his new service he will make his headquarters in Washington.

H. S. Newton, whose appointment as manager of railways of the Monongahela Valley Traction Company, Fairmont, W. Va., was noted briefly in the ELECTRIC RAILWAY JOURNAL for Feb. 16, has been general manager of the Ohio Valley Electric Railway, Huntington, W. Va., since March, 1915. Previous to that he was general manager of the Mesaba Railway, Virginia, Minn., and before that was general manager of the Hartford & Springfield Street Railway, Warehouse Point, Conn., for nine years. Mr. Newton was graduated from the Ohio State University as an electrical engineer. His first commercial work was with the General Electric Company in its Lynn shops. Later he was transferred to the Thomson-Houston Company at Cincinnati and supervised the installation of apparatus on properties throughout the Central West. Mr. Newton next became electrical engineer for the Wheeling (W. Va.) Railway. He left Wheeling to accept the position of electrical engineer for the Syracuse (N. Y.) Street Railway. He afterward assumed the same duties for the Syracuse Consolidated Street Railway, and finally was employed in the same capacity with the consolidated company, the Syracuse Rapid Transit Railway. He remained at Syracuse six years and combined for a part of the time the office of superintendent of transportation with his engineering duties. Mr. Newton was appointed general manager and chief engineer of the Syracuse, Lakeside & Baldwinsville Railroad when the road was projected, and remained with the company in the capacities named during its construction and for the first two years of its operation. Mr. Newton next became general manager of the Beaver Valley Traction Company, which consolidated four small roads near Pittsburgh. After leaving the Beaver Valley Traction Company Mr. Newton was placed in charge of the Hartford & Springfield Street Railway.

H. S. NEWTON

Obituary

W. F. Dillon, president of the Shreveport (La.) Traction Company, is dead. His body was recovered from Caddo Lake near Shreveport on Feb. 8. Mr. Dillon left Shreveport on Jan. 10 for a hunt on Caddo Lake. When he failed to return it was thought that he had been drowned in the lake and persistent search was finally rewarded by the finding of his body. The supposition is that Mr. Dillon was caught in a blizzard in a light boat and drowned when the boat was overturned.

Henry H. Hodell, president of the Cleveland Galvanizing Works Company and the Van Dorn & Dutton Company and a director of the Van Dorn Electric Tool Company and the Equity Savings & Loan Company, Cleveland, Ohio, is dead. Mr. Hodell was born sixty-eight years ago in Alsace-Lorraine, France. He became a pattern maker and in the early eighties went into the custom galvanizing business for himself. He was one of the pioneers in the weldless wire chain business, and helped to found the Van Dorn & Dutton Company and the Van Dorn Electric Tool Company, Cleveland, Ohio.

Porter Norton, a director of the International Railway, Buffalo, N. Y., and a member of the law firm of Norton, Penney, Nye & Brown, counsel for the company, died on Feb. 2. Mr. Norton was sixty-five years old. Soon after being admitted to the bar in 1875 he became associated with Henry W. Box, attorney for the Buffalo Street Railway. He married the daughter of the late S. V. R. Watson, founder of the horse railway in Buffalo, which has developed into the International Railway. Mr. Norton was also a director of the Crosstown Street Railway, now a part of the International Railway, and was a director of the Frontier Electric Railway, under construction, between Buffalo and Niagara Falls.

Augustine W. Wright died on Feb. 3 in Los Angeles, Cal., at the age of seventy-one. Mr. Wright was consulting engineer in connection with the building of the first city railroad in New York and in the early seventies he helped to design the cable railway established in Chicago by the late Charles T. Yerkes, and was chief engineer for this system for a number of years. In 1889 and 1890 he helped to build the first cable railway in Los Angeles. In his early twenties Mr. Wright had charge of much of the construction of the Union Pacific Railway across the plains of Kansas, Nebraska and Colorado. Later he was for five years chief engineer of the Northern Pacific Railway. Mr. Wright retired from active railroad work in 1890 and went to California. At the time of his death he was a member of the Los Angeles Board of Public Utilities.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporations

Alabama Interurban Corporation, Birmingham, Ala.—The Alabama Interurban Corporation, which was previously reported as having been incorporated, has been incorporated under the laws of Delaware to build its proposed line from Birmingham to the Warrior River. It is planned to construct only 17 miles of line, entrance to Birmingham to be over an existing road. Capital stock, $5,000,000, half common and half preferred. Incorporators: Thomas L. Cannon, president; Job Going, H. M. Cassman, Roy McCullough and O. P. Board, all of Birmingham, and James Tracy Hill, New York. [Dec. 8, '17.]

Lewisburg & Ronceverte Electric Railway, Lewisburg, W. Va.—Incorporated to operate the electric railway line between Lewisburg and Ronceverte. Capital stock, $50,000. Incorporators: J. J. Echols, J. W. Dwyer, J. B. Laing, H. B. Laing, H. B. Moore, E. L. Bell, H. F. Hunter, R. M. Bell and S. P. Preston, all of Lewisburg.

Franchises

Marion, Ohio.—The Columbus, Delaware & Marion Electric Company, the successor to the Columbus, Delaware & Marion Railway, has asked the City Council for a twenty-five year franchise in Marion.

Track and Roadway

Birmingham Railway, Light & Power Company, Birmingham, Ala.—A new line will be built by the Birmingham Railway, Light & Power Company linking the South Bessemer line at Vinesville with the Tidewater and South Ensley lines at Fairfield.

Little Rock Railway & Electric Company, Little Rock, Ark.—Work will be begun at once by the Little Rock Railway & Electric Company on the double-tracking of its Pulaski Heights line and the extension of the line to St. Mary's Convent. The company will also extend its East Ninth Street line from Ninth Street north on Thomas Street to Sixth Street, and thence east to the Weil packing plant.

***Okanagan Lake, B. C.**—It is reported that an electric railway will be built from Okanagan Lake to Oroville in connection with the development of the West Kootenay Power & Light Company in the Copper Mountain district.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway has acquired all rights-of-way and has asked the Railway Commission of California for permission to extend its line from Glendora to San Dimas, about 9 miles.

Municipal Railway, San Francisco, Cal.—Construction of outer tracks for the Municipal Railway on Market Street from Van Ness Avenue to Third Street will soon be under way. The contract was awarded on Feb. 6 to the Western Construction Company for $130,808, with a bonus of $7,000 for completion within 120 days. The contractors signed an agreement not to make a claim for breach of contract against the city within that period should the work be delayed by the non-arrival of special track work from Eastern mills. When this work is completed the Municipal Railway will have a line the entire length of Market Street extending from beyond the Twin Peaks Tunnel to the ferry.

City & Suburban Railway, Brunswick, Ga.—It is reported that the City & Suburban Railway will begin immediately the construction of an extension to several industrial plants.

Macon Railway & Light Company, Macon, Ga.—This company will extend the tracks of its Bellevue car line, now terminating at Broadway and Cherry Streets, to the terminal station as soon as the weather permits.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.—Street cars are now operating on the Tannery Spur, Waukegan, Ill. The cars are able to run from the corner of Washington and Genesee Streets to the hospital, thence north on North Avenue, thence east on Glen Flora Avenue to Sheridan Road. For the present the tracks will not be extended east of Sheridan Road, at least not until the work of opening up Glen Flora Avenue extension has been completed.

Evansville, Suburban & Newburgh Railway, Evansville, Ind.—Members of the United Mine Workers of America in southwestern Indiana coal fields have petitioned the Public Service Commission of Indiana to supply adequate service between Evansville and Boonville.

Hutchinson (Kan.) Interurban Railway.—This company reports that it will build ¾ mile of new track this year.

***Middlesboro, Ky.**—The business men and coal operators of Middlesboro have taken up plans for operating an electric railway, it being planned to extend the lines to the principal mines in order to carry the hundreds of workmen who are now employed in the mines, which are busy the year around. A mass meeting of business men and mine operators was held on Feb. 11, and the following committee was appointed to devise ways and means: J. M. Rogan, chairman; E. S. Helburn, William Walbrecht, E. G. Sheafer and others.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—Plans have been prepared by this company for an extension of its terminals on Pratt Street, Baltimore.

Boston, Mass.—The Boston Transit Commission has recommended in a letter to the Legislature that a downtown subway loop be constructed, with stations on its circumference, to relieve the present congestion of traffic. It advises this instead of a single terminus to the Boylston Street subway as contemplated by the act of 1911, or a double or forked terminal, as it recommended in its report in May, 1914. While it does not propose a route, it offers as an illustration the extension of the Boylston Street subway through Boylston and Essex Streets to the vicinity of the South Station, there passing under or over the Dorchester tunnel; under Federal Street to Post Office Square; under Water and School Streets to Tremont Street, and then under the present Tremont Street subway to Boylston Street.

Boston (Mass.) Elevated Railway.—Tracks for the extension of the Boston Elevated Railway from Summer Street Extension to the South Boston Fish Pier and the 200-ft. freight shed for use by electric freight and express cars of the Boston & Worcester Street Railway and the Bay State Street Railway, have been completed, and it was expected that cars would be operated on the new line by Feb. 16. The line was built by the state and will be leased to the Boston Elevated Railway for operation.

Butte (Mont.) Electric Railway.—Plans are being considered by the Butte Electric Railway for the construction of double-track on Main Street from Galena to Quartz Street and a single track east on Quartz Street to intersect with the present Centerville line.

Public Service Railway, Newark, N. J.—Operation has been suspended by the Public Service Railway on its line from the Lackawanna Station to Hamburg Place and Gotthardt Street owing to the lack of patronage.

Union Railway, New York, N. Y.—Application has been made to the Bronx Borough authorities and the Department of Parks of New York City by the Union Railway, controlled by the Third Avenue Railway, for permission to extend the track facilities at Van Cortlandt Park and 242d Street. Plans have been made, awaiting the sanction of the authorities, by which it is hoped to relieve the great congestion at the subway. The company has in view the lengthening of the siding at the Van Cortlandt terminus by means of a double cross-over to the Spuyten Duyvil Parkway as well as the erection of a shelter over the siding at the foot of the subway.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—It is reported that the construction of an extension on Atlantic Avenue and North Liberty Street, Newcastle, is being contemplated by the Mahoning & Shenango Railway & Light Company.

***Tulsa, Okla.**—It is reported that plans will be prepared this year by the Chamber of Commerce of Tulsa for the construction of a line from Tulsa northeastward to Oologah, about 25 miles. Clarence B. Douglas, secretary.

Chatham, Wallaceburg & Lake Erie Railway, Chatham, Ont.—It is reported that it is proposed to utilize hydroelectric power on the Chatham-Wallaceburg section of the Chatham, Wallaceburg & Lake Erie Railway. Owing to coal shortage the company has been unable to generate sufficient power at its own plant to keep the line going.

Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.—It is reported that the City Council of Windsor plans to construct a crosstown line on Erie Street, Windsor, and will rent it to the Windsor, Essex & Lake Shore Rapid Railway for operation.

Ottawa (Ont.) Electric Railway.—A special committee of the Ottawa City Council will take up with officers of the Ottawa Electric Railway the question of an extension of the company's line to Ottawa East.

Dallas (Tex.) Railway.—The first step toward the expenditure of $1.000,000 for improvements by the Dallas Railway began on Feb. 10 with the work of double-tracking the Columbia Avenue line from Collett to Beacon Street. Rails for this work arrived some time ago. Richard Meriwether, general superintendent, said the work would cost about $76,000. Other improvements outlined by the company in its statement recently approved by the supervisor of public utilities and by the City Commission will be carried out as rapidly as possible, Mr. Meriwether said. The company is also improving the Oak Cliff lines. New trolley wire is being strung the entire length of Jefferson Avenue at a cost of $13,000, and the tracks are being overhauled and new ballasting placed where needed. Other improvements in the traction lines to be carried out as soon as material arrives are the double-tracking of Colonial Avenue from Cooper Street, where the double track now stops, to the city limits, and building of the Second Avenue line from Parry Avenue to the city limits.

Eastern Texas Traction Company, Dallas, Tex.—Fire of undetermined origin destroyed 10,000 ties with an approximate value of $20,000, the property of the Eastern Texas Traction Company at Garland, Tex. The ties had been cut and were stacked over a space about the size of a city block for seasoning.

Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va.—J. N. Shannahan, general manager of the Newport News & Hampton Railway, Gas & Electric Company, is reported as having stated that its line will be extended north of the city to the point recently purchased as a site for $1,200,000 worth of homes for shipyard employees only on condition that the government provide the funds to finance the extension.

Seattle (Wash.) Municipal Railway.—The extension of the Seattle Municipal Railway into Ballard was opened on Jan. 27.

Tacoma (Wash.) Municipal Railway.—An ordinance has been introduced in the City Council authorizing $25,000 to be transferred to the light and water reserve fund to pay for the double-tracking of certain places on the municipal car line. C. D. Atkins, head of the public works department, asked that the plans for the improvement of the car lines be approved by the City Council before the final passage of the ordinance.

Monongahela Valley Traction Company, Fairmont, W. Va.—The board of directors of the Monongahela Valley Traction Company has approved the issue of $3 000,000 of one-year notes, the proceeds to be used for improvements, including a considerable amount of new construction work.

Shops and Buildings

Kansas City, Mo.—A certified check for $10 000 has been filed with Eugene E. Blake, city comptroller, by the Interurban Central Station Company as evidence of good faith that the new interurban station will be built. The company has until March 8 to file a bond of $50,000 to be approved by the city comptroller, when it can withdraw its check. The new station will be built on McGee Street, between Ninth and Tenth Streets.

Toronto & York Radial Railway, Toronto, Ont.—The Metropolitan division carhouse of the Toronto & York Radial Railway, together with six interurban cars, was destroyed by fire on Feb. 5.

Philadelphia, Pa.—Bids were opened on Feb. 14 by the Department of City Transit of Philadelphia for contract No. 541 covering plumbing installations in station buildings at Torresdale Avenue and Tioga Street and contract No. 542, covering electric installations in the same buildings. The low bidder for contract No. 541 was Walters, Purks & Mellon, Philadelphia, at $4.508, and for contract No. 542, Keller-Pike Company, Philadelphia, at $4,220.

Charleston-Dunbar Traction Company, Charleston, W. Va.—Plans are being made by the Charleston-Dunbar Traction Company to construct a terminal station on Kanawha Street, Charleston.

Power Houses and Substations

Tri-City Railway & Light Company, Davenport, Ia.—Announcement has been made by this company that a new feeder cable of 750 000 circ. mils capacity is being installed in Davenport to meet new requirements of the downtown circuit.

Ottumwa Railway & Light Company, Ottumwa, Ia.—A new 1250-kw. turbine has been completed and placed in operation by the Ottumwa Railway & Light Company. Included with this improvement is a new intake from the river, settling tanks, condensing equipment, boiler feed pumps, water softener and service pumps. The enlargement of the company's station capacity was necessary to supply energy for the increasing business of the company, including Fairfield and other communities in that vicinity.

Cincinnati (Ohio) Traction Company.—Walter A. Draper, vice-president of the Cincinnati Traction Company, has informed Mayor Galvin of Cincinnati that the extension of the North Norwood track to Kennedy Heights and Pleasant Ridge will necessitate the construction of an additional power house at a cost of $70,000 or $75,000. Residents of those places had sent a petition to the City Council asking for the extension. Street Railway Director W. C. Culkins will look into the matter further before a final decision is made.

Lake Shore Electric Railway, Cleveland, Ohio.—The power plant at Ballville recently taken over by the Lake Shore Electric Railway will be enlarged and improved.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Improvements, including the purchase of new cars and electric equipment to be used in its power plant, will be made by the Columbus Railway, Power & Light Company. The cost is estimated at about $175,000.

Harrisburg (Pa.) Railways.—Plans are being made by the Harrisburg Railways for the immediate installation of three large new transformers in its substation to provide for the utilization of power from its York Haven plant through the plant of the Harrisburg Light & Power Company. It is planned to use the current from the substation for the operation of the Second, Third and Fourth Street traction lines.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Plans have been completed by the Puget Sound Traction, Light & Power Company for the superstructure of its present coal-pulverizing plant, adjoining the power station on Western Avenue and Seneca Street, to cost about $75,000.

Monongahela Valley Traction Company, Fairmont, W. Va.—It is reported that the Monongahela Valley Traction Company has under construction a new power plant at Rivesville.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Considerations in Government Work

Localities in Which Orders Will Not Be Placed and Effect of Other Government Orders

In the matter of placing contracts for goods for government use, the General Engineering Depot, Washington, D. C., in asking for bids is requiring of bidders, "because of the known shortage of power in certain manufacturing districts and in order to conserve this power for the rapid completion of government contracts already under way," to state on demand the localities from which the materials entering into the manufactured articles are obtained. The purchasing officer in this way reserves the right in making awards to discriminate against those bidders who are dependent for their materials upon the manufacturers in congested districts.

In addition, in order that there may be no congestion in factories and that there may be more equitable distribution of goods, bidders are required to state in writing upon the request of the purchasing officer, after proposals are opened, the total money value of uncompleted orders placed with them by the United States and the allied governments. In addition, bidders must also state at that time the class and number of principal and subsidiary priority orders which may have been issued on their manufactured goods affecting directly or indirectly articles upon which they are bidding.

Larger Sales of Self-Truing Brakeshoes

Manufacturers at Present Suffering from Freight Embargo—Increased Sales Due to Enforced Economies

The sale of self-truing brakeshoes was greater in 1917 than ever before. Prices of metal used in the manufacture thereof kept increasing and some trouble was had in getting deliveries from the foundries, but on the whole it was possible to keep customers pretty well supplied. During the year prices were increased slightly. At present the manufacturers are suffering from the embargoes on freight.

The 1917 increased sales seems to be a direct result of the enforced economies which electric railways have had to practice. In many instances it is known that worn and discarded wheels have been salvaged from the scrap pile and pressed into service. Through the use of wheel-truing brakeshoes this can be done in many instances safely and economically. Then, too, these brakeshoes are used to advantage, when wheels are scarce, as they do the work while the car is in service, thus helping to reduce the non-earning period of a car to a minimum.

Brill Sales Rise 25 per Cent

War Conditions, However, Reduced Equipment Demand and Also Made Its Manufacture Difficult.

The sales value of the combined output of all the plants of the J. G. Brill Company, Philadelphia, Pa., amounted to $7,706,099 for the calendar year 1917 as compared to $6,180,895 in 1916 and $4,403,116 in 1915. The increase for the last year was $1,525,204 or almost 25 per cent, this comparing with a gain of $1,777,779 or 40 per cent in 1916. The record of sales since 1907 follows:

1907.....	$9.211.825	1913.....	$9.154.433
1908.....	3,845,173	1914.....	4.903,510
1909.....	4,261.204	1915.....	4,403,116
1910.....	5.960.778	1916.....	6.180.895
1911.....	5,870,907	1917.....	7,706.099
1912.....	7.842,090		

The combined result of operation in 1917 was a profit of $994,189, after deducting $494,227 for depreciation and the cost of all maintenance and repairs for the year. From this profit there was set aside as a reserve for all federal taxes the sum of $90,000, leaving a net profit of $904,189. After further reserving $100,000 for extraordinary depreciation of special machinery and equipment which may not be absorbed by future profits, and after paying dividends of $183,200, the total net surplus as of Dec. 31, 1917, amounted to $1,744,546.

At the beginning of the year, the report states, the management hoped for a continuation of the then existing demand for electric railway equipment. The war conditions of 1917, however, greatly reduced the demand for such equipment and also rendered the manufacture, except from materials on hand, extremely difficult. This was largely due to the inability to obtain raw materials or their transportation for other than government work.

The materials, raw and in process, showed the following totals at the close of recent years: 1914, $1,516,787; 1915, $1,739,319; 1916, $2,242,563; 1917, $4,234,705. The combined work on hand as of Feb. 6, 1918, amounted to an estimated total in excess of $20,000000 including the order for aeroplanes, in which the company is jointly interested with J. G. White & Company, Inc. These two companies organized the Springfield Aircraft Corporation for the manufacture of aeroplanes at the Wasson plant of the Brill company.

Railway Traffic Increased by Shipbuilding Activity

Sudden Demand for Rolling Stock and Slower Deliveries Feature Pacific Coast Trade Conditions

Shipbuilding activity, which has been a factor in transportation problems in all Pacific Coast cities; has increased suddenly and extensively in the northwest since the new year, and new traffic problems are being faced. Portland and Puget Sound have been affected by the increase of shipbuilding activity much more than other points along the coast, but in these cities the problem of handling large rush-hour crowds has become serious. In Tacoma, Seattle, Everett and Bellingham one-man cars have been put in service as rapidly as received in order that equipment of larger capacity could be released for handling shipbuilding crews. Moreover, cars that had been retired from active service have been brought out and repaired for the emergency demands and second-hand cars have been bought wherever this was feasible. Incidentally, the price of second-hand rolling stock has been very materially increased by this demand. The increased activity at the shipyards has come without warning, and there has been no opportunity for the company to secure new equipment under present delayed delivery conditions, even if financial conditions were such as to permit of such a solution.

It is notable that the increase to a 6-cent fare in Portland has caused no confusion or decrease in traffic. The Portland traction company has also pressed old rolling stock into service in order to accommodate the recent traffic increases. Not a little adverse comment has been occasioned by the failure to complete the four-mile stretch of track which would give the cantonment at American Lake electric railway service to Tacoma and Seattle. This cantonment, the largest yet built by the government, and which was planned for 48,000 troops, is still being served only by steam lines and automobile buses. The latter convey practically all of the local traffic and it is necessary to stand in line and sometimes wait long periods before securing accommodation, particularly since the ban on Seattle has been lifted so that large numbers of troops regularly visit that city.

A new angle of the situation on the coast is the question of securing federal aid in financing the need for additional rolling stock to take care of war industries. In the case of the steam roads the government has materially relieved conditions by loaning or interchanging equipment where necessary, and it is believed that even though this may not be feasible in just the same way in the case of electric railways, yet the local service which they are rendering is equally important in its way and must not be curtailed. It is suggested that if some plan can be worked out whereby the government will lend its support financially in the securing of such equipment as is urgently needed for emergency traffic requirements, not only would the railways be able to give service that would otherwise be impossible but priority orders could probably be secured to facilitate the prompt delivery of needed equipment.

Deliveries on electric railway supplies and equipment may be said to be worse than they have ever before been on the Pacific Coast. Not only is the delay in transit unusually long, but it is reported that since the government has taken over the direction of transcontinental lines it has been very difficult to secure information about freight shipments while in transit. No satisfactory explanation of why this condition should obtain has been given except that there is no longer the incentive to the accommodation of shippers which formerly existed.

Practically no important changes in prices have occurred in recent weeks, although there is a tendency to increase all along the line. The rolling stock of nearly all companies seems to be taxed to the limit. The limiting factor on the delivery of new cars at present is the delay in securing car bodies, about one year being the best that can be quoted. Motors and, in fact, all other items, are quoted for better delivery.

Deliveries on standardized items, so far as the factory is concerned, are fair; in fact, better than they were some months ago, but on equipment which is not standard the deliveries are probably worse than ever before.

Shop Equipment in Steady Demand

Various Electric, Pneumatic and Machine Tools Advanced in Price—Shipments and Deliveries Uncertain

Evidence is not lacking that electric railway companies are beginning to buy, not only additional rolling stock, but also accessories and supplies for various purposes. As yet transactions reported are not on a large scale, but purchases represent growing activity. Shop equipment is also coming in for attention, although manufacturers of lathes, borers, grinders, tools of all kinds, jacks and other minor articles, state that while business in their line is steady still it is not brisk. As in other departments of traction properties, the greater part of the buying is to replace outworn machinery or to maintain the efficiency of the shops at a fair working average. Extensions are not being indulged in at present, but reports would seem to indicate that when the financial standing of the companies will permit appropriations for this purpose the repair and construction section will be better and more liberally equipped.

PURCHASES COVER NEED FOR MAINTENANCE AND REPLACEMENTS

A manufacturer of electric and pneumatic tools of nearly every type installed in railway shops, which includes drills, grinders, etc., said that sales had been keeping up fairly well, but just now a falling off is noted. Railways were buying only what they were obliged to for maintenance and replacements, he observed. While his plant was working overtime it was filling government and shipyard orders, and traction road requirements were taken care of in the ordinary course of business. The speaker's company had a special department devoted entirely to supplying railway needs, and as soon as a revival of trade comes along it was in a position to meet any demand. Prices had been advanced with the increased cost of material, metals mainly. The last revision of from 3 to 5 per cent, averaging $5 on a tool, was made on Jan. 1. Shipments are back about two months. Some lines could be delivered out of stock, when embargoes were lifted and priority permits granted. Orders for air compressors were back a year in delivery. On small orders deliveries were made by express and even parcel post.

BRISK ACTIVITY IN MARKET FOR PORTABLE ELECTRIC TOOLS

On the other hand, another manufacturer declared the demand for portable electric tools is brisk, but the production was seriously handicapped by the Fuel Administrator's order. One concern, which ordinarily produces 5500 tools of both electric and pneumatic types a month, produced last month only about 3200 tools. This large reduction was caused not only by the fact that the production of this particular plant was affected but also by the further fact that it was impossible to secure the necessary castings, because of delays the foundries suffered in getting raw materials, held up by the fuel order. This concern is about 10,000 tools behind on its orders of all kinds.

In lathes and car-wheel borers for railway repair-shops a leading manufacturer said some sales were being made. An advance of 10 per cent was made on the entire line of lathes and machine tools of this producer the first of the year. Since the fall of 1916 prices had been revised on higher levels of from 75 to 100 per cent. While this company was back on orders of from six to nine months, and even on certain large types of machines a year and a half, deliveries were subject to existing transportation restrictions.

Jacks of various kinds are in brisk demand, and in standard sizes shipments can be made promptly from stock. Deliveries, of course, are uncertain, excepting when packages are sent by parcel post, which was frequently done. Prices have changed with the fluctuations in the metal market, but no further increase was anticipated.

On lanterns of the special type used by railways, a manufacturer said an advance of 25 per cent was made Jan. 1. Being a staple article the demand is steady. Shipments can be made in thirty days if conditions will allow. It is difficult to obtain glass, particularly red and green. Elsewhere it was learned that the demand for lanterns had been so active that jobbers have instructed their salesmen not to accept orders for several numbers. Deliveries from manufacturers are slow and very uncertain. Prices have advanced and are quoted as follows: tubular, $7.50 per dozen; large size, cold blast, $11.50 per dozen; tubular dash lantern, $10.25 per dozen.

There is also a heavy demand for files, with stocks fair and prices unchanged, with jobbers' discounts as follows: Nicholson files, 50-10-10½; New American, 60-7½; Disston, 50-10-5. Black Diamond, 50-10. Other shop tools and accessories, as to prices and deliveries, range along the lines of the standard equipment referred to above.

Another Advance in Price of Window Glass

Factory Production Curtailed a Third—Priority Order Necessary for Shipment

Milder weather has favored manufacturers of window glass in the matter of fuel supply, but the freight embargo prevents both shipping and receiving, excepting under certain conditions. On some schedules an advance of 20 to 25 per cent in price was foreshadowed; but an increase of 15 per cent on car window glass was positively announced as effective Feb. 7. This is now the ruling figure, with orders in no large numbers or great quantities. From the size of the engagements booked glass manufacturers figure that what is now being bought is for breakage principally or for the reshopping of old cars and changes incidental thereto.

With several important orders for new rolling stock, either placed or pending, it is likely the demand for this class and grade of window glass will be more brisk. The factories, which usually go in blast in September or October, this year deferred the "fire" practically to Dec. 8 and later, consequently the production will total only a third of 1917. Manufacturers are not disposed to pile up stock unless the prospective demand is better.

Shipments can be made from factory stock promptly, but it requires a priority order for transportation. This is the newest restriction, under control of the "Domestic Division, Freight Traffic Committee, North Atlantic Ports," lately established in New York as an appendage of the governmental railroad control.

Rolling Stock

Columbus Railway, Power & Light Company, Columbus, Ohio, is reported to be in the market for new cars.

Manila Electric Railroad & Light Corporation, Manila, P. I., will order fifteen new passenger cars at an early date.

Los Angeles (Cal.) Railway has received twenty-four new car motors from the General Electric Company, Schenectady, N. Y. They have been on order seven months.

Harrisburg (Pa.) Railways Company announces it has ordered five new steel cars from the J. G. Brill Company, Philadelphia, Pa., for its suburban lines. The cars will be delivered early in April.

Danbury & Bethel Street Railway, Danbury, Conn., through J. Moss Ives, permanent receiver, has petitioned the court at Bridgeport for permission to buy at least four new cars, the consent of the bondholders having previously been obtained.

Brooklyn (N. Y.) Rapid Transit Company assured the Public Service Commission, First District, last Friday that it will immediately spend more than $3,000,000 for new cars, of which 100 will be big steel cars for rapid transit lines and fifty will be surface car trailers of the largest practicable seating capacity. The company will also start in at once to convert 100 of its center-entrance surface cars for multiple-unit operation and fifty four-motor cars to serve as leaders for the trailers and the multiple-unit cars will be used in two-car train operation on congested surface lines. The commission has been urging the Brooklyn company to buy new rolling stock for a year or more. The original recommendation was for 250 cars and the foregoing is a compromise arrangement. While the matter was pending the Brooklyn company contested the commission's authority in many public hearings and in the federal and state courts, finally threatening to take its last defeat on appeal to the Supreme Court of the United States. With the above action all court and other proceedings have been voluntarily discontinued.

Trade Notes

Pittsburgh Wood Preserving Company, Pittsburgh, Pa., with the Ohio Wood Preserving Company, the Michigan Wood Preserving Company and the Acme Tie Company, have moved their general offices to the Century Building, Pittsburgh, Pa.

General Electric Company, Harrison, N. J., has commenced the erection of a large new plant on Cross Street for the manufacture of glass bulbs, and the work is progressing favorably. The company is also planning for the erection of an addition and alterations at its plant at 268 North Nineteenth Street, East Orange, and has taken out a building permit for this purpose.

Holden & White, Inc., Chicago, distributers of Miller trolley shoes and Wasson safety bases, have received orders from Col. Bion J. Arnold for complete equipment of the Elgin & Belvidere Electric Railway with Miller trolley shoes for use in connection with the Wasson safety base. An order has also been received from the Salt Lake, Garfield & Western Railway for twelve Wasson bases for use on new cars which are being built on this property.

Charles H. Keeling, after years of experience in the electrical field, has joined the selling forces of the Square D Company of Detroit, Mich., and will travel in the Canadian territory, with headquarters at Toronto. He was formerly connected with the Renfrew Electric Manufacturing Company, Ltd., Renfrew, Canada, being its first sales representative. In 1916 Mr. Keeling was appointed sales and advertising manager of that company.

Hickey & Schneider, Inc., New York, N. Y., manufacturer of transmission-line equipment, heretofore a partnership, is now to be continued as a corporation, capitalized at $100,000, according to a statement made by Mr. Schneider, president of the concern. P. Kovac, formerly with the New York Edison Company, is sales engineer in charge of the company's sales and service departments. P. S. Houton, an engineer of broad experience, is to handle the design work.

New Advertising Literature

Cutter Co., Philadelphia, Pa.: A calendar with various interesting information and data regarding this company's line of circuit breakers are included in this calendar.

Railway Improvement Company, New York, N. Y.: A valuable transportation booklet entitled "Traffic Surveys and How They Are Made." The booklet explains the methods which have been successfully pursued by the company in analyzing the car operating conditions on electric railways as a preliminary to the most valuable application of the Rico coasting recorder. The method presented is extremely simple and logical, and one that gives results advantageous in many other respects than those relating to the saving of power. Copies of this publication are available on request.

Terry Steam Turbine Company, Hartford Conn.: Interesting applications of steam turbines in naval public utlity and industrial service are illustrated in bulletin 242, just distributed by this company. In this twenty-eight-page publication the advantages of turbine drive for auxiliaries are featured, followed by a clear-cut description of the Terry wheel and principle of operation, with diagrammatic explanation of the action of steam, reasons for selecting this product and a condensed engineering discussion of eleven cardinal points in design. A full-page illustration of labeled turbine parts is included, and an interesting diagram is added showing the relative water rates with and without the use of partial nozzle control. The principal engineering features bearing upon turbine selection are set forth in simple terms easily understood by the industrial executive and sufficiently complete in detail to interest the technical reader. Shaft whipping, maintained alignment, handling fractional loads efficiently, low upkeep cost and reliability are a few of the points discussed. Applications of the vertical type of unit used for the past decade on United States destroyers, late advances in turbines giving various classes of pumping service handled by this equipment, are featured.

RAILWAY MATERIALS

	Feb. 13	Feb. 20
Rubber-covered wire base, New York, cents per lb.	30	27-34
Weatherproof wire (100 lb. lots), cents per lb, New York	28¼-34¼	28¼-34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33½-38.35	33½-38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.31	$1.33
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.32	$1.34
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	48½	47½

NEW YORK METAL MARKET PRICES

	Feb. 13	Feb. 20
Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	27	27
Lead, cents per lb.	7	7
Nickel, cents per lb.	50	50
Spelter, cents per lb.	8	8
Tin, Straits, cents per lb.	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	34-36	34-36

OLD METAL PRICES—NEW YORK

	Feb. 13	Feb. 20
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	17½	17½
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.42	$42.42
Old carwheels, Chicago, per gross ton	$30.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

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*Nominal.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, March 2, 1918 *Number* 9

Give the Motorman Every Possible Chance

AT FIRST SIGHT there may seem to be a lot of "frills" in the control system which has been provided for the new six-motor, two-car trains of the Montreal Tramways. Details of the control system are given in an article by Keith MacLeod, printed elsewhere in this issue of the JOURNAL. If, however, this or any other arrangement serves to give the motorman more perfect control of his car a slight complication of wiring should not be permitted to stand in the way of its adoption. The multiple-unit control system is a wonderful success in heavy train service; it will work just as well with light, short trains if the equipment is properly installed and maintained.

It being granted, for purpose of argument, that an operator can have practically anything he wants from the manufacturers in the way of control, provided he is willing to pay a reasonable price for it, it follows that he ought to have one perfectly suited to his needs.

We are all preaching to the platform man at either end of the car the doctrine of high schedule speed, the highest speed consistent with safety. The essential for this purpose, after ample but not excessive motor power has been provided, is perfect control. If an analogy is wanted, we might compare the motors to the brute force and muscles of the car, while the control, with the motorman's brain behind it, is its nervous system.

As in the animal perfect co-ordination of brawn and brain is essential to productiveness and safety, so it is in the car. Formerly when the main circuit was taken through the controller any increase in power capacity of the car or train meant that more platform space must be given up to control purposes. With master control no such limitation exists, and any degree in refinement of control becomes possible. Hence, when we provide the best available control we give the motorman an opportunity to get the highest possible output from his car.

Utilities Must Be Maintained

PRESIDENT WILSON has spoken once more, with his usual incomparable breadth of vision and clear-cut understanding of fundamentals.

It is the vital importance of utilities to-day to which he has now directed his attention. He realizes their value and their needs.

Here is what President Wilson says, in a letter on Feb. 19, to the Secretary of the Treasury:

"I fully share the views you express regarding the importance of the public service utilities as a part of our national equipment, especially in war time. It is essential that these utilities should be maintained at their maximum efficiency and that everything reasonably possible should be done with that end in view. I hope that state and local authorities, where they have not already done so, will, when the facts are properly laid before them, respond promptly to the necessities of the situation."

Federal Commission to Investigate Labor Question

THE threatened electric railway strike in Boston and others which have occurred during the past six months in other cities, emphasize the importance of the new federal National Industrial Commission which begins in Washington this week a study of "how to prevent strikes and assure a maximum production during the war of materials necessary to maintain the American armies in France." Presumably, the board will make an especial study of labor conditions on public utilities, because an interruption of railway or power service in an industrial community might easily cause more delay to munitions manufacture than a strike in a single munitions factory itself.

We are glad a national committee has been appointed to undertake this study, because the labor problem is undoubtedly a serious one on many electric railway properties. A large number of these companies, although their own finances have hardly warranted additional expenditure, have raised the wages of their men because of the increased cost of living. Nevertheless, it has been difficult in all cases to hold a full quota of men. This has been partly because there are many munition plants which can and do pay more wages than can a public utility. It is also partly due to the fact that this is a time when jobs are seeking men rather than men jobs.

We hope that the new federal board will blaze a new path in labor investigation and will determine some logical and permanent basis for wages paid by a public utility, so that necessary increases will be reflected in increased rates granted to the utility. The reason for such an arrangement exists in the public interest in continuous service. The public, in fact, is a third party to every public utility labor agreement, and has a right to demand from labor, as well as from capital, the maintenance of efficient, satisfactory and safe service. Conversely, labor and capital have each a right to demand from the public an adequate return for their services.

Public Improvements Should Be Deferred Wherever Possible

THIS is the season when the railways and municipalities are taking up their programs for the coming year's work. In ordinary times the railway would naturally consider in its program such items of public improvements in streets as new bridges and the like, which would in turn affect the railway tracks. Often railways have been forced to discard tracks and pavements which have several more years of useful life because of minor grade changes of streets to suit new types of pavements.

Managers and engineers can do a great work just now by getting in touch with civic officials and carefully considering this situation as applied to these times when every effort must be put forth to win the war. Men and materials are at a premium, and all unnecessary public improvements involving large expenditures by railways as well as municipalities must be eliminated. We have seen a number of instances during the year just past where pavements adjoining railway tracks have been completely renewed when a reasonably small expenditure for repairs would have put them in shape for at least two more years of service. The railways were compelled to co-operate in such wasteful practices to an extent which often prevented the making of improvements and repairs to tracks and pavements elsewhere far more urgently needed.

The municipal official must be shown that no business concern can now afford to make improvements or alterations requiring unwarranted use of men, materials and money which can by any possibility be avoided; that the public interests and the railway interests are one in the matter and that patriotism requires their close co-operation with one object in view, namely, Help Win the War.

Keeping Track of Electric Railway Information

EVERY man in a position of executive responsibility, no matter how light this responsibility may be, must be in a position to get together, on short notice if necessary, reliable data in the field of his specialty. His ability to do so will often insure success where otherwise failure would be certain, and a recognition of this fact serves to explain the great interest of heads of departments and others in schemes for filing and classifying references. Each man must work out his own filing or indexing system, or at least must adapt the plans of others to his own circumstances. Ready-made schemes, while attractive, are apt to be too general and elaborate for individual application, and, obviously, simplicity is the first requirement in any scheme if it is to become a lightener of labor rather than a continuing burden.

Among the most interesting plans which we have seen lately is that in operation in the office of Arthur Gaboury, superintendent Montreal Tramways. Mr. Gaboury has selected fifty representative electric railways for special study and has assigned a division in a filing cabinet for each. Here he files clippings, pamphlets, etc., relating to each selected road, as well as reports and comments made by officials of the tramways company based upon their own observation of the several properties. As an endeavor is made to have officials of the company become personally familiar with as many of these properties as possible the file has far more value than it would have otherwise. A simple card index supplements the data file, permitting a rapid and comprehensive topical study of the contents of the file. The important thing about Mr. Gaboury's plan is that it is not so comprehensive as to be unwieldy and at the same time the range of conditions covered is great enough to insure completeness. There are doubtless many other plans equally as effective and this one is chosen merely for illustration of a general principle. There is danger that the extent of the information on electric railway practice may seem so vast as to be bewildering, discouraging any attempt at systematic filing. However, any scheme faithfully carried out is better than none, and some scheme seems essential.

In the ELECTRIC RAILWAY JOURNAL editorial offices it has been found convenient to bind together extra copies of the indexes, permitting a rapid searching of the files. Some years ago a twenty-year index was compiled and published in book form, and this will be found useful for the early years. It will be a revelation to anyone who has never tried the JOURNAL indexes to do so and see the wealth of material published on practically every line of electric railway progress.

Fare Petitions Should Be Based on Facts, Not Feelings

COMMISSIONS are not going to grant higher fares purely out of sympathy for utility managers. Regulators act according to the dictates of their brains, not their hearts. Furthermore, their brains function along the line of judgment, not imagination.

These observations seem worth while at this time lest some electric railway operator should take too much for granted in trying to secure financial relief for his company. In their private capacity, public service commissioners undoubtedly realize the general plight of the electric railway industry, but in their official capacity they can act only upon the evidence. Hence, if a utility expects to receive proper consideration, it must "prove in" its case.

Any good executive requires a subordinate to justify in detail his requisitions for material and labor, especially if they pertain to something new or radically different. Skeleton figures and personal opinions without material justification are not sufficient. The subordinate must show not only that a definite need exists, but also that other methods immediately available will not meet the need, and that the proposed method will do so, as nearly as it is possible to prophesy performance upon the basis of sound engineering and accounting practice and good common sense.

Commissions have the right to expect the same justification of applications for higher fares. Company officials should show the same carefulness, thoroughness and promptness in presenting rate cases that they require of their subordinates in handling requisitions. Each case must stand on its own merits, and complete preparation is needed to make such merits apparent. Mere guesswork, the sympathy gag, going off half-cocked—such practices are worse than useless. Only one thing counts in rate cases—facts. And the proper procedure is evident—get the facts, and then present them.

Zone Fares Are Not a Primary Cause of Congestion

BEFORE entering into any discussion as to the relative money merits of a higher flat fare versus some kind of zone fare, electric railway men should determine whether there is any important connection between congestion in cities and use of zone fares.

A favorite bogey is the undoubted congestion in European cities. But is this really due to the zone fare? If it were, then the flat fare (2½ cents) of Berlin's street railways ought to result in a lower density of population than in Continental cities with the zone fare. This is not the case. Berlin is pre-eminently a city of big apartment houses. As a matter of fact, the high cost of land and the economy which it is necessary to practise in the use of building materials and fuel lead to close packing of large houses in even the smallest cities of western Europe. An American war correspondent wrote recently that in the reconstructed areas in France the farmers are more likely to live in a flat in the nearest village than to take up valuable land for a big, rambling house.

Still another cause for congestion in European cities is the historical fact that so many of them were once surrounded by walls and ditches for defense. The highly compact communities within these old limits have not broken up and spread in ratio with better transportation because comparatively little land is available, and the extent of the system of ground leasing instead of sale does not encourage a tenant to make improvements. Also, it is not uncommon for a forest reserve to hinder the natural growth of a city. From the foregoing it should be clear that the congestion of cities in western Europe, particularly, long antedates the zone fare or any other kind of fare. In short, the connection between congestion and zone fares is not particularly close.

To turn now to America, it is sometimes said that the flat or unit fare has been the prime cause that made it possible for many people to live in their own homes in the country instead of in unhealthful city tenements. Undoubtedly, this distribution of the population has been the greatest achievement of the American electric railway, but it has not been because of the flat fare, or certainly not primarily therefor. The main cause has been the existence of a good system of urban transit in a country where the restrictions of Europe on the use of land and material did not apply. The person who benefited most by these extensions of the service given for the 5-cent fare was the owner of suburban real estate. The car rider got more and better transit for the same nickel and the landlord got more income; while the railway acted as a philanthropist to both. The effect of these generous extensions on the flat-fare basis is too well known to-day to call for comment.

It is far from certain that a change to the zone fare will cause congestion. Chicago with a 5-cent fare has a higher density of population than Philadelphia with an 8-cent fare for a large proportion of riders.

People of foreign birth willingly pay an extra fare in order to live among colonies of their own people. Again, many thousands of Americans prefer a 25-mile suburban train ride and a zone fare to living in the city. Change from suburban to city life just now is due not to the question of fares, but to the shortage of domestic help.

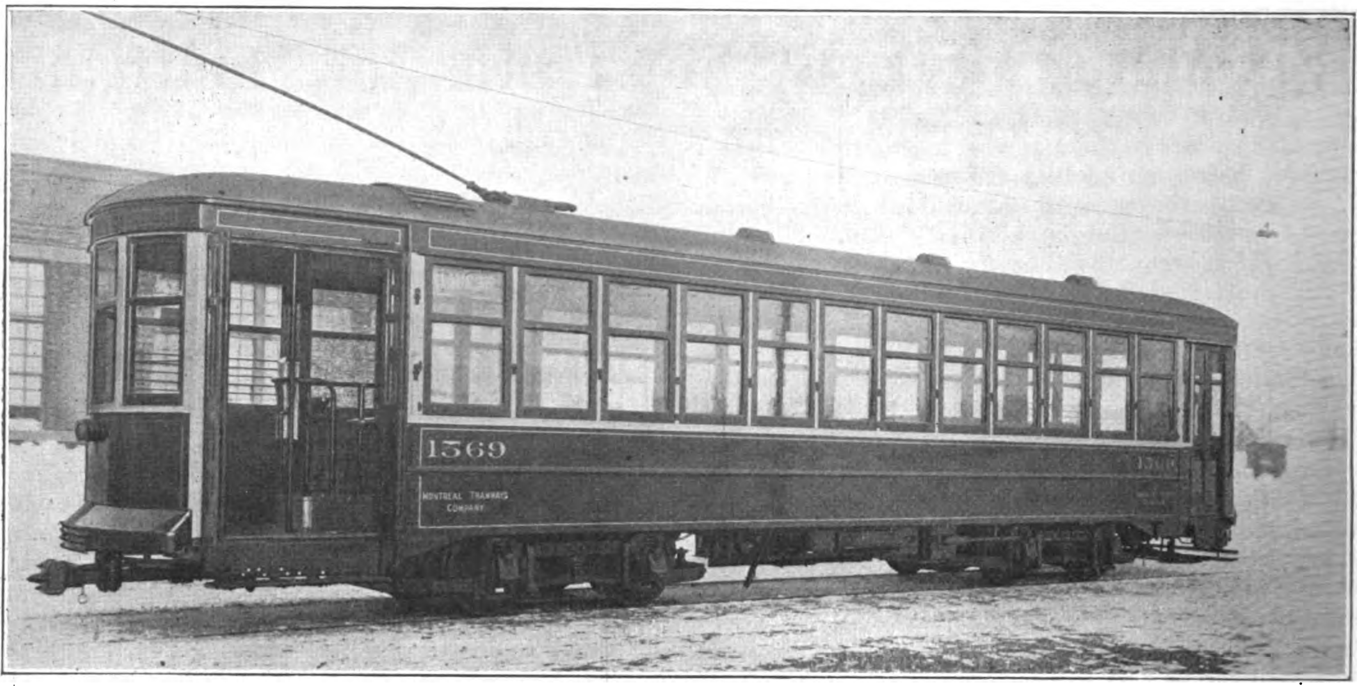
To conclude: The topography of a city, the relative location of industrial and home sections, the cost of land, building materials and fuel, and the habits of the people are much more important factors of the amount of riding which is done than the rate of fare. In the 70's and 80's, when the combined fares by different companies in the same city for a present 5-cent ride were 10, 15, or even 20 cents, American cities had a larger proportion of homes with gardens than now. If the people in those times when the nickel was real money refused to huddle in crowds, they will not be deterred in these days of 15-cent milk from paying a zone charge of 2 to 5 cents more if they prefer life in the suburbs.

Planning for the Future More Important Than Ever Before

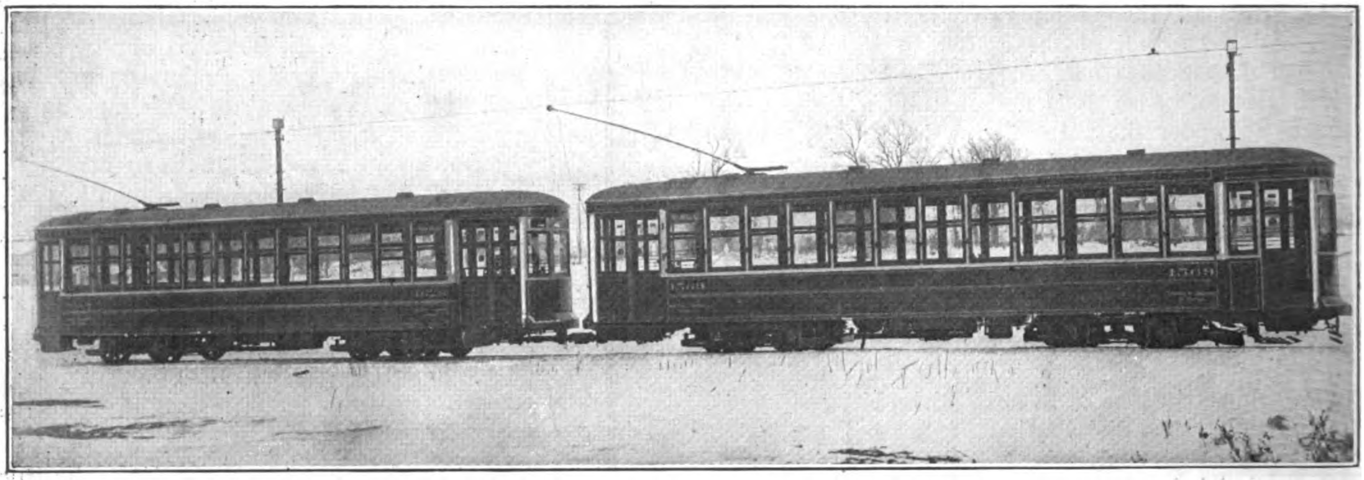
THE time was when railway department heads could foretell quite accurately the requirements of their departments along both labor and material lines for several years ahead. Plans for new equipment or extensions of service could be laid with some confidence that at the proper time the equipment or whatever was needed for the execution of the plans would be available. This situation has been completely changed by the demands which the war is making on our industries and labor market. We may be able to predetermine our equipment and material needs now for six months or a year hence, but that ability does not insure our getting either the equipment or the labor wherewith to install or operate it. We may have plenty of trainmen and a sufficiency of common labor to-day, but who can say what we shall have to-morrow? We may have ample fuel to-day and for a month, but to-day's situation is no guarantee as to the situation two months hence.

Railway officials are apt to be a conservative class of men. Men tied down as they are with the burden of routine work necessary for the safe operation of railways can scarcely be otherwise. But if our transportation systems are to continue to do an uninterrupted business, conservative action must at the very least be coupled with a radical use of the imagination. By this we mean that only by attempting to foresee and by planning to meet all possible future contingencies can railway service be kept at anyways near its present standard. This planning need not involve any considerable expense; in fact, it may need go no further than tentative plans laid out in the minds of the responsible officials. The average man reacts quickly and effectively in an emergency only if he has carefully rehearsed in his imagination the emergency and his plan of action relative to it. He then tends to do the right thing automatically. Even the layman understands that trainmen, central station attendants and others who are often required to face emergencies must receive special drill and training to fit them for the work.

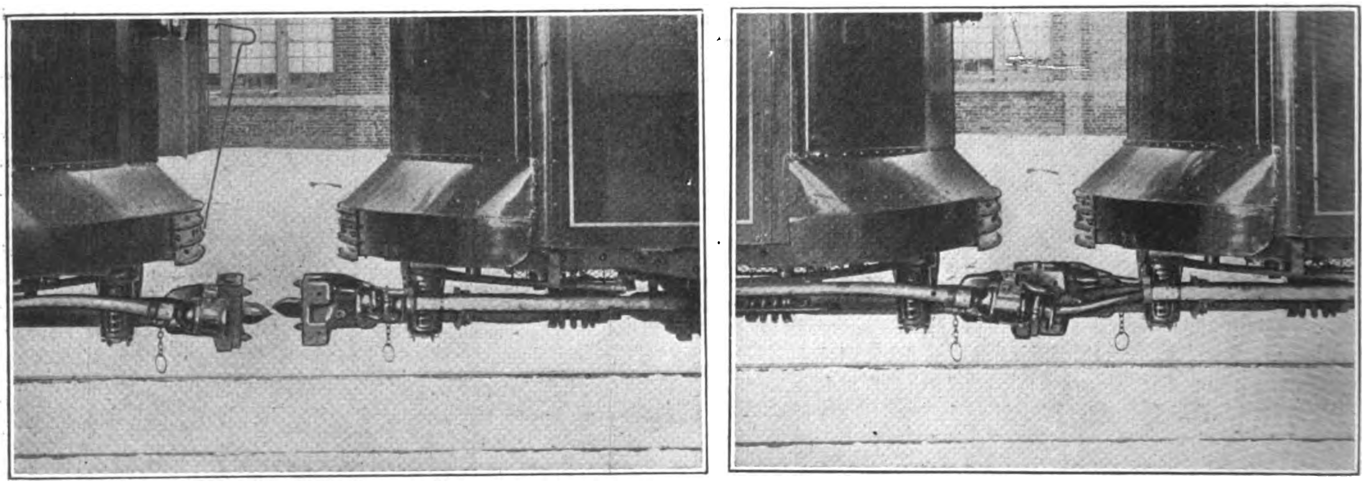
During the war our transportation systems will be compelled to face many new operating conditions and emergencies. While no doubt the higher officials of every railway in the country are striving to foresee future contingencies, we wonder if the rank and file of those holding the minor positions of authority are giving the matter the attention it should receive. They should begin to think about it if they have not already done so.


1369
MONTREAL TRAMWAYS COMPANY

MONTREAL TRAMWAYS MOTOR CAR, SHOWING CONDUCTOR'S STATION AND TRAPS IN CONTROLLER COVER FOR CUTTING OUT MOTORS



TWO-CAR, MULTIPLE-UNIT TRAIN



ARRANGEMENT OF CONTROL CABLE JUMPER WITH CARS UNCOUPLED AND COUPLED

New Montreal Cars Designed for Multiple-Unit Operation

Six-Motor Multiple-Unit Trains for Montreal

Two-Car Semi-Trail Operation on Grades Up to 13 per Cent—Multiple-Unit Control with Hand and Automatic Acceleration—Semi-Automatic Brake System — Emergency Opening Coupler — Air-Operated Doors with Safety Interlocking Control

BY KEITH MACLEOD
Engineer of Equipment Montreal (Que.) Tramways

THE operation of trailers on the fairly level east and west lines of the Montreal Tramways has proved so satisfactory that it has been decided to place fifty new two-car trains on the north and south lines. As these lines are quite hilly, the maximum grade being 13 per cent, it was necessary to increase the motive power, and a two-car multiple-unit train was decided on as the most efficient and flexible arrangement.

It is in the control mainly that these cars differ from the former cars* of the company. In general the new arrangement is a multiple-unit system with Westinghouse P-K-35-G controllers operated from storage batteries, each car having identical control with the exception of the rheostats. There are four Westinghouse 533-T-4 motors on the motor cars and two on the front trucks of the trailers. Although it is not intended to operate the trailers as independent units, it was desirable, since motors were needed on them anyway, to increase the operating flexibility by adding controls. There is no bus line, as it was feared that under Montreal winter conditions serious trouble would occur on a 500-volt jumper and that the current on grades would be too heavy for a single trolley. By having only battery voltage in the control cable, a very convenient arrangement of jumpers is possible.

The storage battery which operates the signal-light, buzzer and control systems is a standard 12-volt, 35-amp.-hr. automobile lighting battery, charged by a shunted portion of the compressor motor current. The shunt is adjustable, so as to allow the battery to be kept properly charged. The buzzers are connected so that any button will operate both buzzers, and the signal-light circuit is connected to the switches on each entrance door and on the emergency door at the rear of the trailer.

The control circuit is also grounded through the switches on the entrance and emergency doors, but provision is made for an independent ground on the control if for any reason the door circuit cannot be closed. When the door cutout switch is in use the signal-lamp circuit is open, which makes it necessary for the motorman to obtain a definite bell signal before proceeding. The signal lamp burns only on the car from which the train is being operated and the switch carries a target as a signal to the street inspectors.

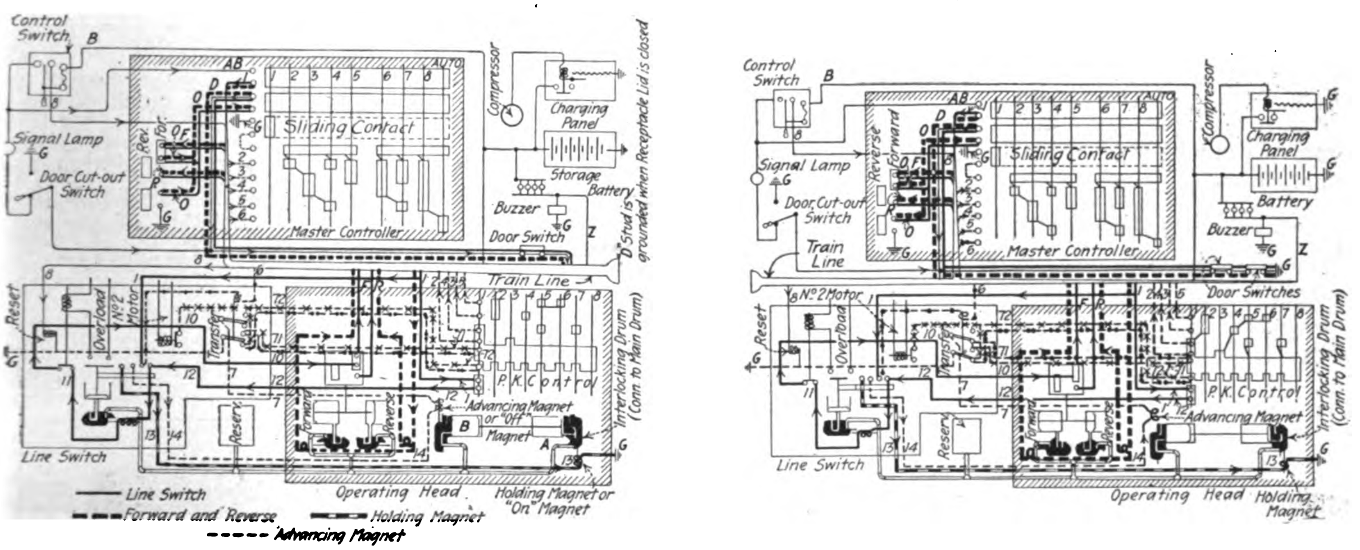

Control Switch
Signal Lamp
Door Cut-out Switch
Rev. Fer.
Sliding Contact
Master Controller
Compressor
Charging Panel
Storage Battery
Buzzer
Door Switch
D Stud is grounded when Receptacle Lid is closed
Train Line
Reset
Overload
No 2 Motor
Transfer
Line Switch
Reserve
Forward
Reverse
P.K. Control
Advancing Magnet
"Off" Magnet
Holding Magnet or "On" Magnet
Operating Head
Interlocking Drum (Conn. to Main Drum)
Line Switch
Forward and Reverse
Holding Magnet
Advancing Magnet
Door Switches
Battery
Holding Magnet

DIAGRAM OF ELECTRICAL CONNECTIONS ON FOUR-MOTOR CAR AND TWO-MOTOR CAR

For convenience in tracing the circuits they are indicated by different kinds of lines for the several controller positions, as listed below the left-hand diagram

The control is provided with the usual line switch, overload and reset relays. A distinctive feature, however, is the combination of both hand and automatic acceleration. The connections on the master controller and the interlock drum are such that in hand notching the main controller will always follow to whatever notch the master controller handle has reached. There is an inherent time lag in the engine which prevents too fast feeding of the main drum if the motorman opens the master controller too quickly. Eight notches on the master controller correspond to the eight notches on the standard K-35 controller and the ninth notch connects in the automatic current limit relay.

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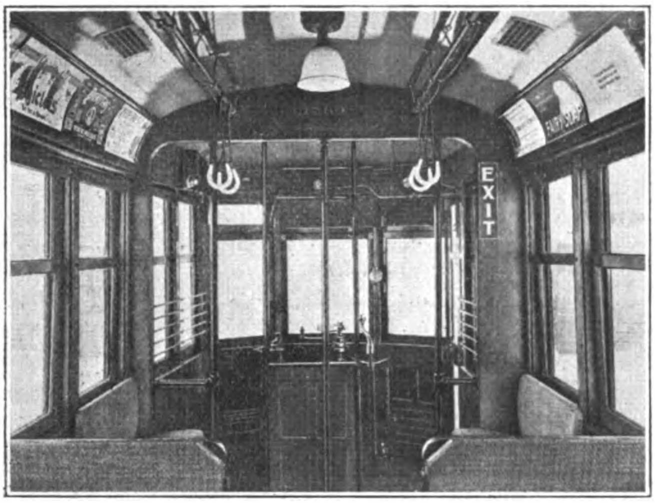
*For previous articles on Montreal cars, see the following issues of ELECTRIC RAILWAY JOURNAL: Dec. 2, 1916, page 1163; Oct. 3, 1914, page 614; Feb. 14, 1914, page 367; Oct. 25, 1913, page 939.

In combining the hand and automatic features, it was found necessary to incorporate what is termed a transfer relay, which separates the hand and automatic circuits without increasing the number of train-line wires. Without this relay there is a circulating circuit between the interlocks which, under certain conditions, will make unwarranted advances of the main drum.



FRONT VESTIBULE OF MONTREAL TRAMWAYS MOTOR CAR

CONTROL CIRCUITS

There are five distinct circuits in the control, namely, reset, forward and reversing, line switch, hand acceleration and automatic acceleration. The first three are easily followed from the diagram and it may be noted that the line switch will not close until the reversing engine has made the main controller correspond to the master controller. The method of accelerating consists of advancing and returning the main drum by differentials of air pressure and a double piston connected to the main drum through a rack and pinion. Whenever the line switch is in, air pressure is applied to piston *A* by means of the "On" magnet valve, and remains until the line switch releases. Whenever the "Off" magnet is energized, pressure on piston *B* reduces, and the main drum advances. Whenever the "Off" magnet is de-energized, pressure builds up in *B* and prevents further movement. The function of the accelerating circuits is therefore to provide means of properly energizing and de-energizing the "Off" magnet.

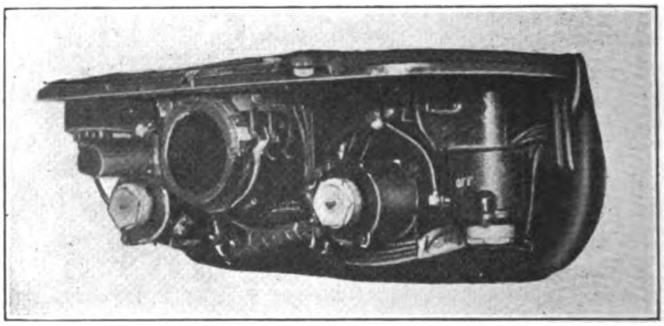
With hand acceleration the first notch merely closes the line switch, the main drum already being on the first notch. On the second notch of the master controller the "Off" magnet obtains its circuit from 1 on the line switch through 7 and 71 to the interlock drum, through 2 by the train line to finger 2 on the master controller and through the sliding contact to ground. The "Off" magnet being energized, the main drum commences to move, and as it moves, finger 2 on the interlock falls off, but 72 engages and carries the "Off" magnet circuit until it also falls off at position 2 of the main drum. Since no other fingers on the interlock and master controller now correspond, the "Off" magnet circuit is open, and the main drum ceases to move. Advancing the master controller to the third notch closes the "Off" magnet through finger 3 and so on through the range of hand notching.

Automatic acceleration is obtained by grounding No. 6 wire in the master controller, thereby lifting the transfer relay and connecting the "Off" magnet to the limit relay, the interlock being still used to insure that the main drum stops on definite notches. When the master controller handle is thrown off, the line switch circuit is open, the line switch releases, both "On" and "Off" magnets are de-energized, pressure builds up in *B* and decreases in *A* and the main drum moves back to the first notch.

An operating feature of interest in this combination hand and automatic acceleration is that if a motorman, using the automatic on a grade, finds the main controller has not reached full parallel, on account of the limit not dropping, he may move the master handle back two or three notches and work up by hand notching, the main controller being then forced to follow up.

The control wiring is installed in a combination of rigid and flexible conduit, straight lengths of pipe being used wherever possible, with flexible bends and turns. This proved to be much cheaper than either rigid or flexible work alone. Simple straight runs in rigid conduit are provided for the main cable, and a special design of junction box made for quick disconnecting is furnished for the motor leads.

The car bodies are of the same general design as those described in previous issues of the JOURNAL, the principal modifications being the addition of air engines, which are of National Pneumatic Company make, to operate the entrance doors and of a ventilating sash in the front vestibule to take care of mild days in the spring and fall when the storm sash is still on. Under certain weather conditions wet driving snow or sleet will freeze on a storm sash, while if there is only a single pane the heat of the car will melt the sleet and keep the motorman's vision clear. An arrangement of the front storm sash has therefore been made which will allow the permanent windows to be lowered independently.



PK CONTROLLER OPERATING HEAD

The conductor's station was made to conform with the design worked out in connection with the application of folding doors and steps to the older cars of the company,

Interurban Cars Slow Up City Service

Third Section of the Beeler Report on Washington, D. C., Recommends That the W., B. & A. Line Be Terminated in Suburbs Instead of in Congested District

THE third section of the report of John A. Beeler on transportation conditions in Washington, D. C., was issued on Feb. 14. This section deals with the problems occasioned by the operation of the heavy electric interurban cars of the Washington, Baltimore & Annapolis Electric Railroad over the conduit tracks of the Washington Railway & Electric Company's Columbia line into the very heart of the city. Mr. Beeler notes the increase of traffic congestion at the busiest two traffic centers of the city, Fourteenth and Fifteenth Streets and New York Avenue, and the delays caused to the city patrons of the Columbia line. In order to overcome the present serious difficulties, he recommends that the interurban cars be stopped at a point almost 3 miles out, until such time as terminal facilities not interfering with city traffic shall be built outside the congested district.

The Washington, Baltimore & Annapolis Electric Railroad operates a high-speed interurban line between Washington and Baltimore, a distance of 40 miles, with a 20-mile branch line from Annapolis Junction to Annapolis. Prior to 1910 the Washington terminus was at the White House Station, at Fifteenth and H Streets, N. E., 2.82 miles from the Treasury. In 1910 the interurban line was re-equipped and the construction of the conduit track of the Columbia line was strengthened in order that the cars could be routed through to the terminus at Fifteenth Street and New York Avenue opposite the Treasury.

According to Mr. Beeler, the point where the interurban cars stand at the city terminus of the line is precisely where the throat of the Capital Traction Company's system is the most contracted and the greatest congestion exists. The operation of the Baltimore cars over the Columbia line of the Washington Railway & Electric Company also causes congestion at the neck of this system, on Fourteenth Street between F and H Streets. Furthermore, the interurban road is the cause of innumerable delays and interruptions to service on the Columbia line.

The square on New York Avenue between Fourteenth and Fifteenth Streets contains four car tracks, two belonging to each of the principal companies in the city. The line of the Washington Railway & Electric Company terminates in two stub tracks, which do duty as a terminal for three important lines of the city system as well as the Baltimore cars.

The time-table of the Washington, Baltimore & Annapolis road calls for forty regular trains per day in each direction using the terminal at Fifteenth Street and New York Avenue. According to schedule the time allowed at this point is five minutes per car. Observations show that one or more of the interurban cars are standing at this congested point practically all through the day. Out of a total of twelve hours and twenty-four minutes during which observers watched the street, one or more interurban cars were standing there nine hours and thirty-four minutes, or 77 per cent of the time. The average time each car stood there was nineteen minutes and one second. Since the cars are taken to Fourteenth Street before loading is permitted, it is seen that this space in Washington's busiest center is used only as a storage track.

The action of the interurban road in allowing its cars to stand thus in the street, Mr. Beeler says, is in direct violation of a most commendable regulation of the police department. This regulation states: "A driver of a street car shall not allow it to stand upon a street for a longer period than five minutes unless the way is obstructed."

The loading of the interurban cars at Fourteenth Street is slow. As the car steps are high and narrow, the ingress of passengers is a laborious performance. This is especially true in this case, as the passengers are nearly all burdened with luggage. Observations show that the boarding time is three seconds or more per passenger. Frequently 100 or more passengers board a single car at this point, requiring from five to six minutes. Meanwhile the car is standing on the main line and blocking the track for the city cars.

INNUMERABLE DELAYS TO PATRONS OF COLUMBIA LINE

The situation is aggravated by the delays occasioned to the city cars on the Columbia line. The delay sheets kept by the Washington Railway & Electric Company show that during recent months the delays of the Washington, Baltimore & Annapolis cars within the District of Columbia were as follows: October, eighty-two delays totaling 677 minutes; November, 127 delays total-

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(*Concluded from page* 404)

as described in the Aug. 18, 1917, issue of the ELECTRIC RAILWAY JOURNAL, page 262, and an extra stanchion was placed in the front of the motor car.

Other features of the new cars are the lighting, which is furnished by five 93-watt, 120-volt lamps with reflectors and Electric Service Supplies Company compensating fixtures which shunt in an equivalent resistance when the lamp burns out, the thermostat controlled heaters and the Brill 76 E trucks with 30-in. wheels, bolster guides and a graduated spring system.

The brakes on the cars are the semi-automatic system with straight air for service and automatic for emergency application. Safety stops on the cylinder levers are arranged to insure braking on one truck in case of failure on the other. An American slack adjuster is provided which, with one take-up on the dead lever of each truck, takes care of all shoe wear. Conductor's valves are installed on both cars and an attachment on the coupler is provided which opens the emergency line when the drawbar swing becomes abnormal, as for instance if the strain splits a switch.

ing 1092 minutes; December, eighty delays totaling 752 minutes.

During this period an average of three and one-tenth delays was recorded for each day. The average duration of the delays amounted to twenty-seven and one-half minutes daily. When it is considered that the scheduled headway of the city cars on the Columbia line is twelve cars per hour during the midday period, and forty-eight cars per hour during the morning rush, the seriousness of these ten, twenty and thirty-minute delays becomes apparent. A ten-minute delay during the period of maximum travel holds up eight cars of the city lines, thereby delaying perhaps 800 people.

These delays of interurban cars practically all occur on the conduit tracks within the city proper. In Mr. Beeler's opinion, they are due to four principal reasons, namely: (1) Complicated and heavy equipment; (2) Lack of thorough inspection and systematic repairs to rolling stock; (3) Shortage of competent and experienced motormen; (4) Faulty condition of tracks and defective conductor rail.

The interurban cars are 50 to 57 ft. long and weigh from 78,500 to 79,800 lb. empty. To Mr. Beeler's mind it is not surprising that this equipment with its numerous 600-1200-volt trolley-conduit complications is subject to frequent breakdowns under the present shortage of skilled operators and mechanics. Furthermore, these heavy cars, in operating to Fifteenth Street and New York Avenue, are doing so under conditions with which this equipment should not be expected to cope. There are no less than thirty compulsory stops on the short round trip between the White House Station and the Treasury, an average of five and one-third stops per mile. For a thorough interurban car weighing between 45 and 50 tons loaded, this is bad. In addition to these compulsory stops other stops are made for passengers.

INTERURBAN CARS SHOULD STOP FARTHER OUT

Mr. Beeler recommends that the interurban cars of the Washington, Baltimore & Annapolis Electric Railroad be denied the use of the conduit tracks west of the White House Station at Fifteenth and H Streets, N. E., until such time as the following necessary improvements, all of which are essential to the proper operation of these interurban cars, are made:

1. Terminal facilities that will permit the interurban cars to load and unload on separate and independent tracks shall be provided so as not to interfere with the free passage of a city car. Such a terminal should preferably be on a loop over which city cars will not operate.
2. The terminal should be located east of Fourteenth Street, N. W., so that the Baltimore cars will in no wise interfere with the congested traffic on Fourteenth and Fifteenth Streets. This is for the benefit of the patrons of the two city traction systems and also of vehicular and pedestrian travel.
3. Thorough inspection and adequate maintenance of equipment of the interurban cars must be provided to insure against the breakdowns and delays that are now of such frequent occurrence and so annoying to the citizens of Washington dependent upon the Columbia line for transportation to and from their work.
4. A sufficient number of competent and experienced motormen must be secured and carefully instructed in the proper handling of these heavy and complicated cars over the conduit tracks.

As the result of the elimination of the interurban cars from the heart of the city, the track will not be occupied by half-filled interurban cars during the height of the rush period, and the space thus made available can be used to advantage by the city cars and their passengers. The effect of this change on the Washington Railway & Electric Company will be that more local cars can be put through on the Columbia line and an improved and more regular service maintained. This company must provide sufficient additional equipment to care properly for the interurban passengers between the White House Station and the Treasury.

Passengers of the Washington, Baltimore & Annapolis road will be slightly inconvenienced, because they will have to change cars at the White House Station. In Mr. Beeler's opinion, however, this requirement, under the circumstances, is not unreasonable. Most of the passengers come by trolley or other vehicle to the present terminal at the Treasury. In short, this requirement is no more than that imposed upon the passenger who arrives at the Union steam railroad station. In fact, the use of the White House Station will have its advantages for patrons, as it would be much easier for them to board the high cars from flush platforms, which can readily be provided at this station.

At first thought, Mr. Beeler states, it might be presumed that the exclusion of the interurban cars would have a damaging effect on the Washington, Baltimore & Annapolis road, but this road is now handicapped by a lack of facilities to handle the traffic being forced on it by the Camp Meade cantonment and Annapolis activities. Sufficient cars and men are not available to care for the present business. By terminating its cars at the White House Station, from two to five cars and crews will be released for an increase in the service on the remainder of the system. Little or no expense need be incurred by the company to take care of the new arrangement, as it already maintains a waiting room at the White House Station. To terminate all the interurban cars there will be simply to revert to conditions that existed eight years ago.

35,000-Kw. Turbine Wrecked in Boston Station

About 4.55 p. m. on Thursday, Feb. 14, the 35,000-kw. horizontal, single-cylinder steam turbine in the O Street station of the Boston Elevated Railway exploded, so completely wrecking the machine that it will be sold for junk as it stands, it is reported. Fortunately no one was killed or injured. The trouble developed in the low-pressure stages—the seventeenth, it is believed. All diaphragms and wheels, together with the blades from this stage on to the twentieth, were fractured and broken in many pieces and released with such force as to smash away the whole top half of the low-pressure end of the casing.

The initial cause of the accident is thought, at this writing, to have been excessive steam pressure between the diaphragm and the seventeenth wheel, concaving the diaphragm, causing it to foul the wheel, closing up the buckets and thus increasing the steam pressure at this point until the next diaphragm was similarly affected, when the whole low-pressure end let go.

The accident occurred at a time when 27,500 kw. carried by engines in another station of the railway company dropped their load. It is assumed that the wrecked turbine tried to take all of this load, opening its secondary valve to get all the pressure available.

New Power Source for Columbus (Ohio) Railways

Station Has Large Units for Size of Community Served and Is Located Without Regard for Load Center—Most of Electrical Equipment Out of Doors—No Reciprocating Units Installed

THE Columbus Railway, Power & Light Company, Columbus, Ohio, has completed for operation the first part of its new Walnut power station, located on the east bank of Walnut Creek, about 10 miles southeast of the center of the city. This company operates the city railway system in Columbus, supplies light and power to the city and surrounding villages within a radius of 15 miles, and supplies power to some extent to the interurbans entering the city. It also furnishes considerable energy at the present time to Camp Sherman and the national army camp at Chillicothe, and also to the cities of Chillicothe and Circleville, about 50 miles south of Columbus.

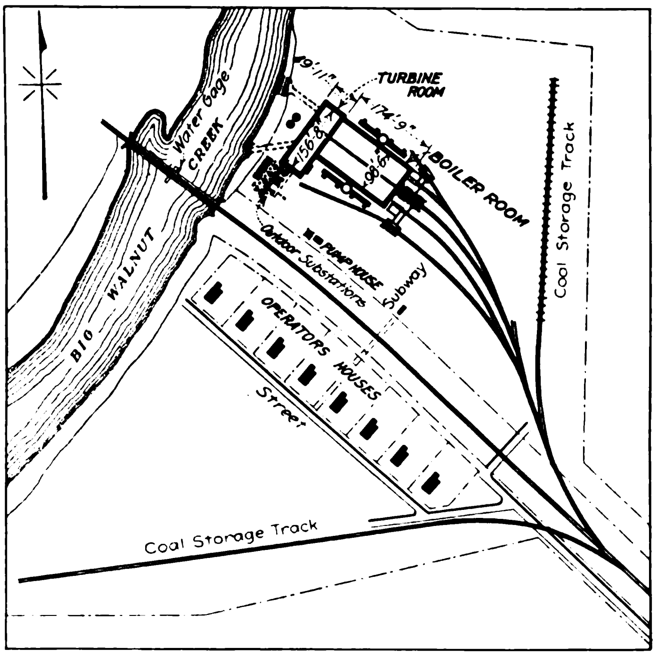


FIG. 1—PROPERTY MAP OF COLUMBUS RAILWAY, POWER & LIGHT COMPANY'S WALNUT STEAM STATION

The company has several old power stations, some of which are becoming inoperative, and all of which are located within the city limits. The new steam station became necessary owing to the large increase in the industrial load, and to the necessity of securing more economical operation. Due to the lack of suitable water for condenser purposes and of space for coal storage, a site outside of the city was selected, determined by the natural resources rather than the density of population.

Walnut Creek has a water shed above the plant site of approximately 500 square miles, and a natural pool at the station varying in depth at low water from 15 to 20 ft. The Hocking Valley Railroad runs approximately through the middle of the 25-acre property on which, in addition to the plant, will be built operators' houses and a large coal storage system. When coal is obtainable three or four months' supply will be carried in storage.

The generating equipment now in operation consists of one 18,750-kva., General Electric, 60-cycle turbo-alternator. The plans include a second turbine unit of 12,500-kva. capacity. Eight Babcock & Wilcox 440-hp. boilers are now installed, and eight more will be added later. The future equipment is under order and is expected to be ready for installation the early part of this year. Energy is generated at 13,200 volts and is transmitted over three 39,400-volt transmission lines, and one 13,200-volt circuit, which feeds an industrial section at the extreme south end of the city.

The plant is laid out with the intention of having all equipment that requires attention on the main floor level. This applies to the switchboard, turbines, motors for driving circulating water pumps and hot-well pumps, controllers for all forced-draft, induced-draft and stoker drives, battery-charging sets, etc., giving little occasion for operators to leave the main floor for any length of time.

A noteworthy feature of the plant is that no reciprocating apparatus is used. The only steam auxiliaries are one steam turbine-driven feed pump and two steam-driven dry vacuum pumps. All other auxiliary equip-

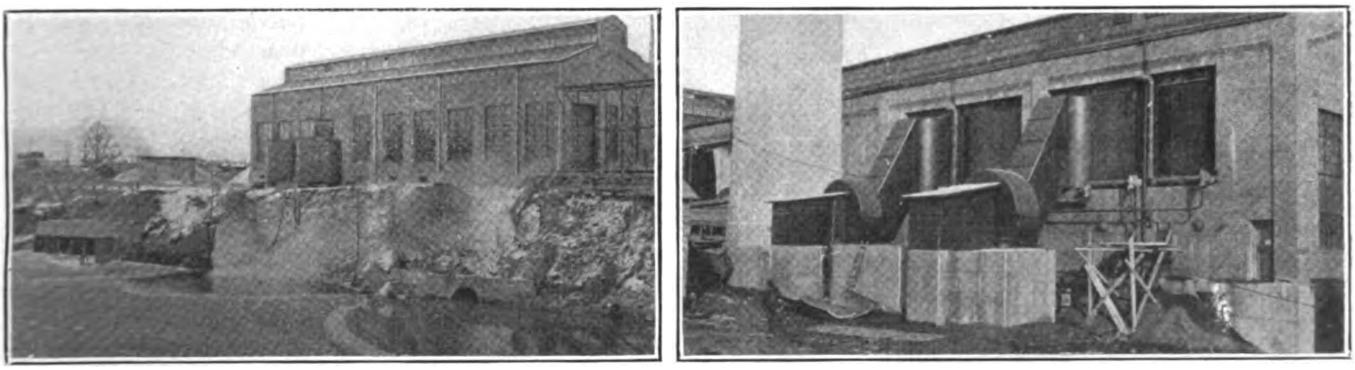


FIG. 2—GENERATING END OF PLANT SHOWING INTAKE AND DISCHARGE TUNNELS AND FEED-WATER PURIFYING PLANT —INDUCED-DRAFT FANS AND WALL OPENINGS FOR ECONOMIZERS

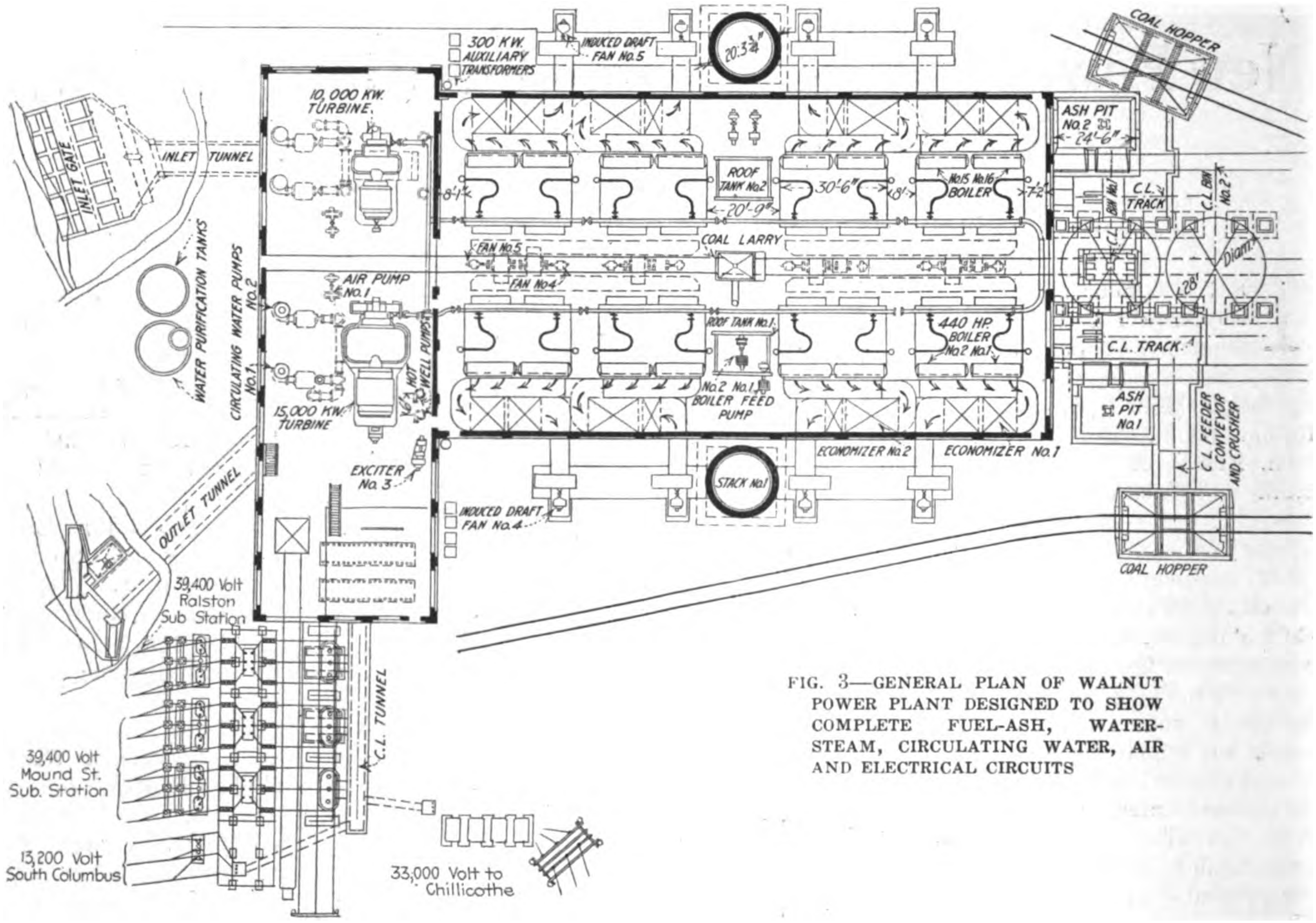

300 KW.
AUXILIARY
TRANSFORMERS
INDUCED DRAFT FAN No. 5
20'-3¾"
10,000 KW. TURBINE
INLET GATE
INLET TUNNEL
WATER PURIFICATION TANKS
CIRCULATING WATER PUMPS No. 2
No. 1
AIR PUMP No. 1
HOT WELL PUMPS
15,000 KW. TURBINE
EXCITER No. 3
OUTLET TUNNEL
INDUCED DRAFT FAN No. 4
8'-1"
FAN No. 5
FAN No. 4
ROOF TANK No. 2
20'-9"
30'-6"
8'
No. 15 No. 16 BOILER
7'-2"
COAL LARRY
ROOF TANK No. 1
No. 2 No. 1 BOILER FEED PUMP
440 HP. BOILER No. 2 No. 1
ECONOMIZER No. 2
ECONOMIZER No. 1
STACK No. 1
COAL HOPPER
ASH PIT No. 2
24'-6"
C.L. BIN No. 1
C.L. TRACK
C.L. BIN No. 2
Diam.
28'
C.L. TRACK
ASH PIT No. 1
C.L. FEEDER CONVEYOR AND CRUSHER
COAL HOPPER
39,400 Volt Ralston Sub Station
39,400 Volt Mound St. Sub. Station
13,200 Volt South Columbus
C.L. TUNNEL
33,000 Volt to Chillicothe

FIG. 3—GENERAL PLAN OF WALNUT POWER PLANT DESIGNED TO SHOW COMPLETE FUEL-ASH, WATER-STEAM, CIRCULATING WATER, AIR AND ELECTRICAL CIRCUITS

ment is driven by induction motors, most of which are provided with variable-speed control. Every motor or turbine, including the generating unit, has a flexible coupling.

Very little space within the station is used for electrical equipment, all transformers, high-voltage bus structures, main-line switches and lightning arresters being located out of doors. Any of this equipment, however, can be cut out of service for inspection and repairs, thus securing all the advantages of the outdoor type of electrical equipment with minimum disadvantage. The control is compact, and only the 13,200-volt switches are within the station.

In providing spare equipment the effort has been to make each unit complete so that it can be regularly operated. For instance, duplicate circulating-water pumps and condensate pumps are provided, the spare unit in either case being available for immediate service. The large alternator is provided with a direct-connected exciter, and a geared turbo-exciter set is installed for spare service.

The boiler plant, as previously stated, will ultimately contain sixteen boilers, each having a heating surface of 4440 sq. ft. These are designed for 250 lb. pressure, and are provided with Diamond mechanical soot blowers, Copes feed-water regulators and balanced-draft regulators. Bailey furnace meters are also used to record steam flow, air flow through boilers, temperature of exhaust gases and draft under stokers. The single-loop superheaters will produce about 150 deg. of superheat under average conditions.

The boilers are set two in a battery and the gases from each battery pass through 5/16-in. steel-plate flues, covered with ½ in. of asbestos, to one Green fuel economizer of 6300 sq. ft. heating surface. The gases from each economizer are in turn conveyed from the economizer through uncovered steel breechings to one 60,000-cu.-ft.-per-minute Green induced-daft fan. The fans discharge downward into a concrete flue, located below grade, which connects with the base of a tapered concrete chimney of 150 ft. height and 14.5 ft. inside diameter at the top. Two such chimneys will be provided, each to accommodate four fans and eight boilers.

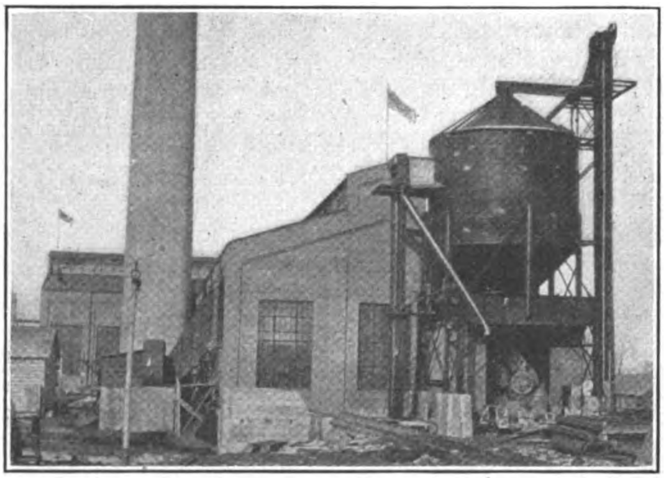


FIG. 4—STEAM END OF PLANT SHOWING COAL AND ASH-HANDLING EQUIPMENT

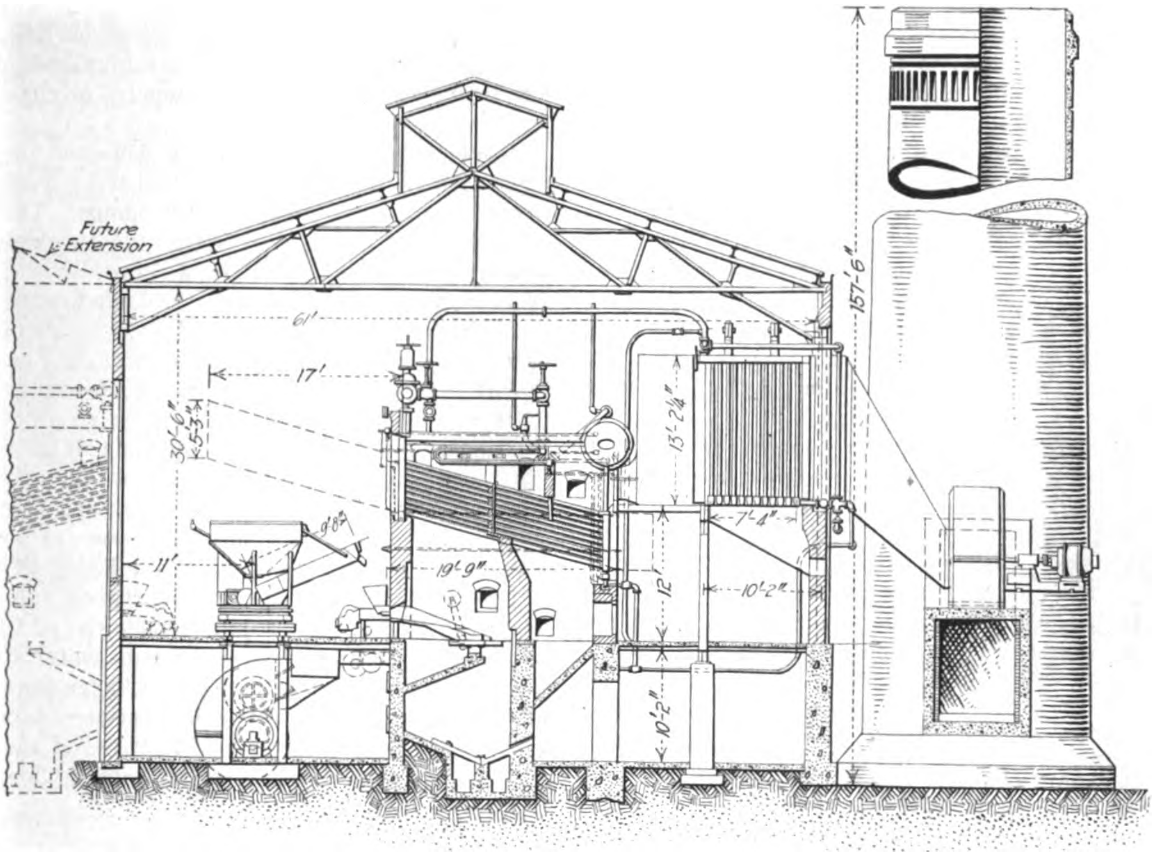


FIG. 5—CROSS-SECTION OF BOILER ROOM SHOWING ARRANGEMENT OF EQUIPMENT AND SCHEME FOR EXTENSION

The turbines are guaranteed for a water rate, under best conditions, of 11.35 lb. per kilowatt-hour on the 18,750-kva. unit, and 11½ lb. on the future 12,500-kva. unit. The steam equipment is arranged in units of two boilers and one economizer, the economizer having approximately 71 per cent as much heating surface as the two boilers. Each boiler is provided with one eight-retort Sanford Riley underfeed stoker. This gives a unit which is capable of turning out a maximum of 340 per cent of its nominal rating, according to guarantees by the stoker company. The battery of boilers therefore has a maximum capacity of 3000 hp., so that the station can generate approximately 7 kw. per rated boiler horsepower.

It should be noted that no by-passes are provided for the economizer, as it is expected to operate each unit of boilers with draft fans continuously. When it is necessary to make extensive repairs an entire unit will be shut down. Either one of the boilers may be shut down for cleaning without disturbing the operation of the other. The economizers are provided with the usual scraper mechanism, one 5-hp. motor driving the scrapers on two economizers. The controllers for the motors driving the draft fans are located near the boilers and are under the control of the boiler-room operators. The balanced-draft equipment provides for close regulation of the induced draft, and the large steps in the adjustment of this draft are obtained by the variable-speed motors, which are hand controlled. The forced draft is also hand regulated by varying the speed of the motors and by the movement of the dampers in the air ducts.

The steam from the boilers is carried through 6-in. steam lines to a main 12-in. steam header for each row of eight boilers. The two headers are connected at each end so as to form a complete ring. In the same way the feed water will be supplied to the boilers from a 6-in. feed-water header for each row of boilers, and the feed-water headers will be connected to form a complete loop.

The economizers are operated in parallel, feeding di-

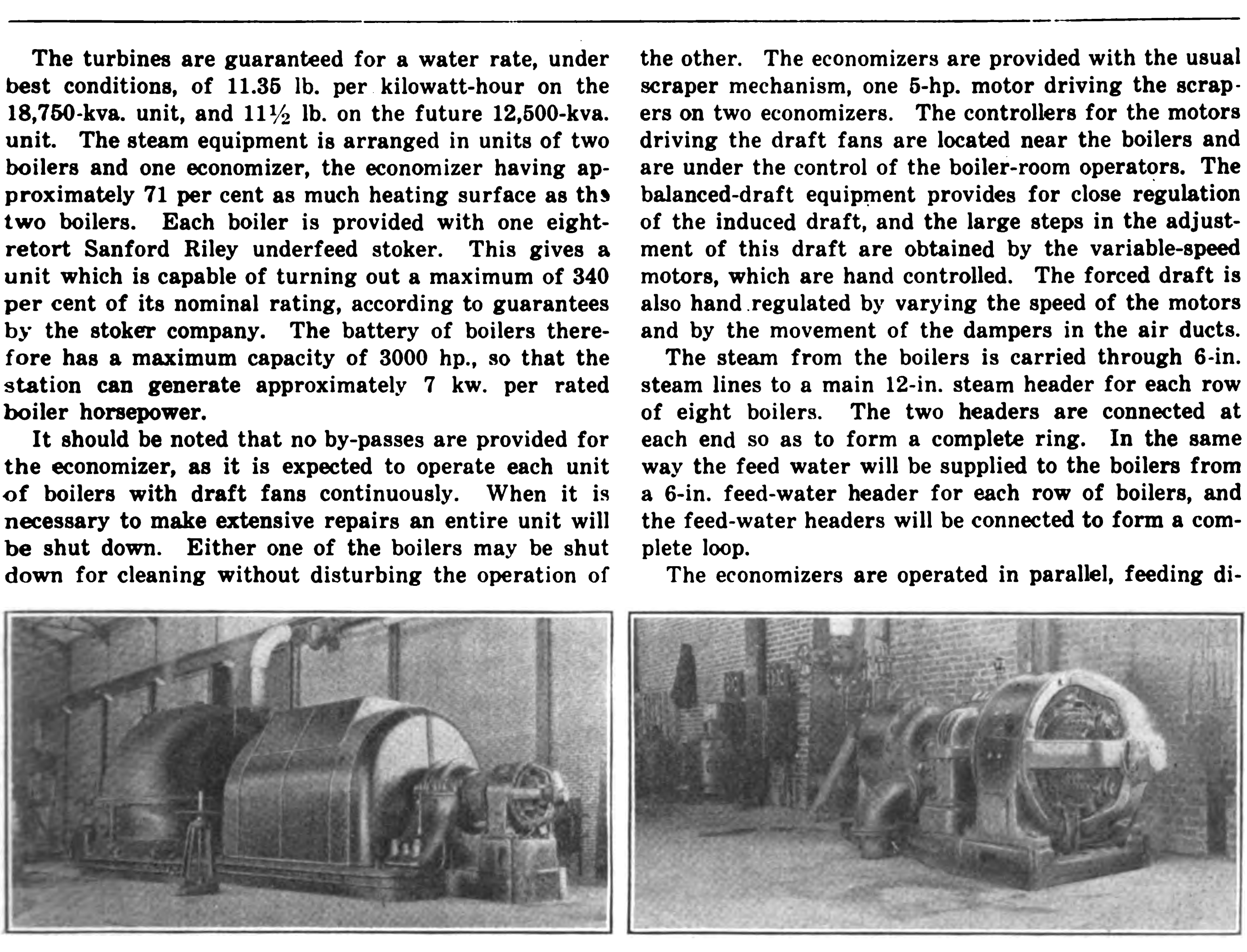


FIG. 6—18,750-KVA. TURBINE SET WITH DIRECT CONNECTED EXCITER—100-KW. TURBO EXCITER SET

rectly into the feed-water header, and to avoid unequal feeding Monel metal orifices are provided in the header between the connections to the economizers. It is expected to obtain fine adjustment of the feed to the economizers by regulating the opening of the valves in the connections between the economizers and the header, determining the adjustment of these valves by the temperature of the feed water leaving the economizers as shown by Bristol recording thermometers. These are supplied for the gases leaving the economizers, for the water entering and leaving the economizers, and for that entering the feed-water heater.

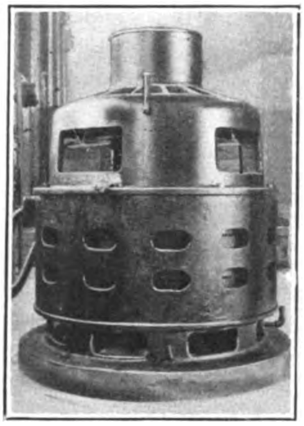


FIG. 7 — 120-HP. VERTICAL VARIABLE-SPEED MOTOR FOR DRIVING CIRCULATING WATER PUMP

The economizer arrangement is such that the access tubes and blow-off are on the outside of the building. Asbestos sectional covers are used over the outside of the economizers, and the opposite brick wall of the building is omitted. This arrangement provides for easy inspection and repairs and saves floor space. All steam piping is provided with steel flanges and Vanstone joints, and welded nozzles are used wherever possible to eliminate joints and to make piping contact.

Coal passes from two track hoppers by means of a flight conveyor through a crusher and thence by bucket elevators to the top of two 400-ton coal bunkers located just outside the boiler room at the end of the station. The coal from the bunkers is carried into the boiler room by means of a 4½-ton traveling larry on a standard-gage track laid flush with the boiler-room floor. The larry is electrically operated, has a revolving bin which works like a turret, and is provided with a screw conveyor which supplies the boilers on either side of the firing aisle. It is operated by one man, is simple in construction and all wearing parts are easily accessible for repairs. Track scales are provided under one of the coal bunkers so that all coal can be weighed as it is taken into the station. This will permit the keeping of an accurate record of coal used by any boiler or for the entire station during any desired period.

To provide against shortage of coal, through lack of cars or irregularity of shipments, an elevated storage track is provided, which is 480 ft. long and elevated approximately 15 ft. above the ground level. The track is carried on reinforced concrete piers, 14 ft. between centers, and is supported between piers by I-beams, with steel cross members on 5-ft. centers to prevent spreading. The coal will be distributed over the ground and reloaded into cars as needed by means of a 15-ton Brownhoist steam-driven locomotive crane equipped with a 2-yd. grab bucket.

The ash pits are formed by the concrete foundations of the boilers. Two drag-chain conveyors pass under each row of eight boilers conveying the ashes out to the end of the station and discharging them into a clinker crusher, which in turn discharges into the boot of a bucket elevator. This elevator can discharge into a concrete ash pit, a railroad car or a wagon. The ashes can be disposed of for a long time in grading around the property. Although each conveyor has sufficient capacity for carrying out the ash, duplicate conveyors are furnished so as to permit repairs or changes without inconvenience to operation.

The circulating water for the Alberger surface condenser under the turbine is supplied by duplicate vertical variable-speed motor-driven pumps. These pumps receive water from a gravity tunnel, which extends under the entire length of the turbine room. The water from the condenser discharges into another gravity tunnel, which also extends under the turbine room and carries the water out into the river at a point about 160 ft. below the intake. Each condenser is provided with duplicate motor-driven single-stage centrifugal condensate pumps. The concrete tunnels under the turbine room eliminate the usual large amount of piping required for circulating water and also conveniently supply the water with a minimum waste of power. The water in the tunnel will have a velocity of 2 ft. per second with the two turbines carrying full load and about 3.1 ft. per second with 40,000 kw. of turbine capacity in operation. The discharge water lines from the condensers are sealed in the discharge tunnel so that advantage is taken of the syphon action obtained.

The intake end of the tunnel is enlarged and provided with a large area of racks for the water to flow through. The velocity through these racks will be ½ ft. per second for the first two units and 0.8 ft. per second for 40,000-kw. of turbines in operation. There are also provided six large removable wire baskets of 1-in. mesh, designed to catch leaves, twigs, etc., that may come downstream during high water. Each basket is in a separate compartment provided with a gate for shutting off the flow of water when the basket is raised for cleaning. A traveling hoist is provided for operating the gates and baskets. Any material that passes through the baskets and racks can be removed before reaching the condenser by means of Elliott twin strainers having ⅜-in. holes and located between the circulating water pumps and the condensers. The circulating water pumps are placed on top of the intake tunnel so that a minimum suction lift of 11 ft. is secured.

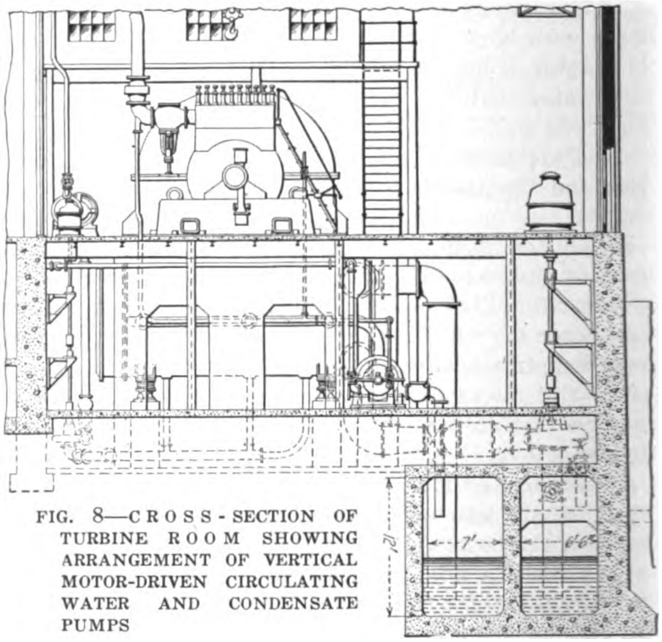


FIG. 8—CROSS-SECTION OF TURBINE ROOM SHOWING ARRANGEMENT OF VERTICAL MOTOR-DRIVEN CIRCULATING WATER AND CONDENSATE PUMPS

The condenser of the unit now installed is bolted direct to the exhaust flange of the turbine without any expansion joint. Car springs are placed below the condenser and so compressed as to balance the weight of the empty condenser. These springs will allow the condenser to expand when heated, and the turbine is capable of taking the additional weight of the water which may be in the condenser during regular operation.

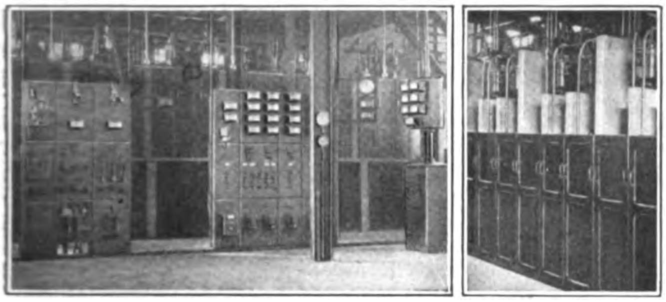


FIG. 9—SWITCHBOARD PANELS AND BUS STRUCTURE—DETAIL VIEW OF 13,200-VOLT SWITCH CELL

The condensate from the condenser is forced by the centrifugal pumps to the top of the boiler room, where it flows through water meters into an open storage tank. This tank is divided into two compartments, one with a capacity of 6000 gal. for condensate and the other with a capacity of 3000 gal. for make-up water. The water from the tank flows through a Hoppes open feed-water heater having 1300 sq. ft. of heating surface. The feed-water heater is divided into two parts; the condensate passing over one-third of the heating surface and the make-up water over the remaining two-thirds.

From the heater the water passes through a battery of four 400-gal. per minute four-stage Cameron centrifugal boiler feed pumps. Three of these pumps are motor driven and one is steam driven. The pumps discharge into headers supplying the economizers, which carry full boiler pressure plus the additional pressure required for forcing the water through the economizer to the boilers.

To supply the make-up water for the boilers, that is, water in addition to that secured from the surface condensers, a lime and soda ash feed-water purifying plant is installed. This plant consists essentially of two 20,000-gal. wood stave tanks with stirring mechanism, and an elevated dosing tank. The river water is of fairly good quality except during high water when it may be quite riley. A battery of four 200-gal. per minute motor-driven centrifugal pumps is located in the basement of the turbine room for furnishing water to the feed-water purification plant and for cooling bearings and transformers.

MUCH OF THE ELECTRICAL EQUIPMENT PLACED OUT OF DOORS

In general the electrical system is that which is considered modern practice for the potentials at which it operates. The alternator is connected to a 13,200-volt bus through a General Electric, type H3 oil switch. A transfer bus is provided so that any 13,200-volt switch with its instrument transformers can be cut out when necessary without interrupting service. All feeders and other circuits have oil switches of the same type and all of them are remote-controlled from the switchboard. The turbine controls are also located on the switchboard.

Energy is transformed from the generated voltage of 13,200 to 39,400 volts by means of 15,000-kva., three-phase, 60-cycle, water-cooled, outdoor type transformers, two units of which will be installed this year and a third at a later date. All of the 39,400-volt switches, lightning arresters and connections are located outside of the station. Electrical energy for Columbus will be received at 39,400 volts at one point for the present, and at a second and a third point later on, and will be distributed in the city between substations at 13,200 volts. The primary voltage for all other light and power customers is 4150 on a four-wire distribution system. The tie lines between the principal substations of the city operate at 13,200 volts and consist of triple-conductor lead-incased cables laid in vitrified clay duct subways.

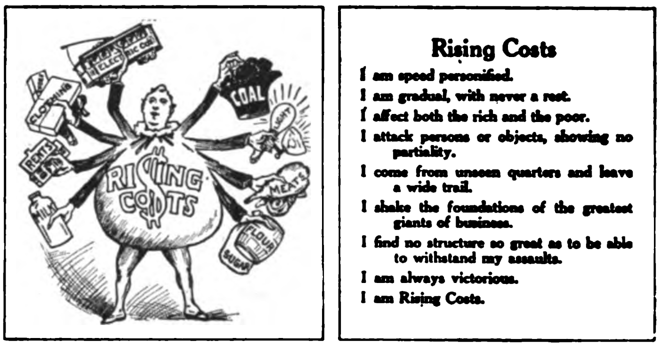
The Walnut station was designed and constructed by the E. W. Clark Management Corporation, through whose courtesy the foregoing illustrations and data were obtained.

Who Put the Nick in the Nickel?

A CURRENT bulletin issued by E. J. Cooney, executive assistant Rhode Island Company, Providence, R. I., in the interest of a 6-cent fare contains a presentation of the "rising costs" question that will undoubtedly be of interest to other railway men. The material is shown by the accompanying illustrations and the following paragraphs:

"For some years past electric railways have been suffering under burdens placed upon them by various municipalities in the form of taxes, etc., until investors have looked upon them as questionable security.

"But the situation became really serious in 1914 when war broke out in Europe, shocking the whole world. As the months passed all lines of business became affected by a sturdy youth named 'Rising Costs.' As he grew he stretched out his tentacles and pulled in one commodity after another, until he reached the public service utilities.



Rising Costs

I am speed personified.
I am gradual, with never a rest.
I affect both the rich and the poor.
I attack persons or objects, showing no partiality.
I come from unseen quarters and leave a wide trail.
I shake the foundations of the greatest giants of business.
I find no structure so great as to be able to withstand my assaults.
I am always victorious.
I am Rising Costs.

TWO PAGES OF "RISING COST" BULLETIN ISSUED BY RHODE ISLAND COMPANY

"Nothing was too big for him to tackle as he went onward, and the electric railways began to feel the effects of his attacks. The nickel that for so many years gave them profits on their huge investment began to weaken, until 'Rising Costs' cut a nick in the nickel that greatly reduced its value"

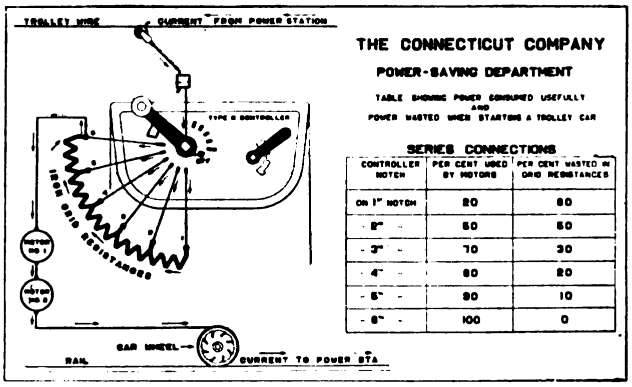
Connecticut Company's Power-Saving Campaign

Systematic Educational Work Has Reduced Energy Consumption Per Car-Mile by 11 Per Cent in Five Months—Best Records on Each Line Are Recognized by Substantial Prizes

By WILLIAM ARTHUR
Electric Railway Engineer, New Haven, Conn.

SEVERAL months ago the officials of the Connecticut Company, as part of a general move toward greater economy, decided to see what could be done further to reduce power and maintenance bills, particularly those caused by faulty operation on the part of motormen and conductors. It was realized that the power wasted in car operation was considerable, and an effort was made to determine just how considerable the waste was. It was also realized that the problem of getting men to change the ingrained habits of years was no easy matter, and that the task must be done thoroughly or not at all.

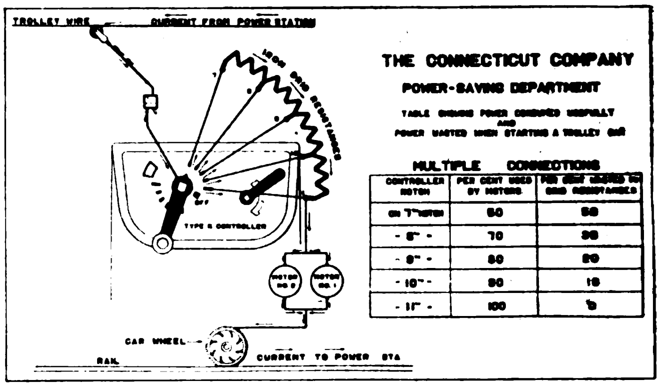
It was decided to create a power-saving department in the company, putting an engineer in charge, and to have him work out his problem in conjunction with the company officials. The writer was retained in an advisory capacity in connection with this work of organization.



THE CONNECTICUT COMPANY
POWER-SAVING DEPARTMENT
TABLE SHOWING POWER CONSUMED USEFULLY AND POWER WASTED WHEN STARTING A TROLLEY CAR

SERIES CONNECTIONS

CONTROLLER NOTCH	PER CENT USED BY MOTORS	PER CENT WASTED IN GRID RESISTANCES
ON 1ST NOTCH	20	80
- 2D -	50	50
- 3D -	70	30
- 4TH -	80	20
- 5TH -	90	10
- 6TH -	100	0



THE CONNECTICUT COMPANY
POWER-SAVING DEPARTMENT
TABLE SHOWING POWER CONSUMED USEFULLY AND POWER WASTED WHEN STARTING A TROLLEY CAR

MULTIPLE CONNECTIONS

CONTROLLER NOTCH	PER CENT USED BY MOTORS	PER CENT WASTED IN GRID RESISTANCES
ON 7TH NOTCH	50	50
- 8TH -	70	30
- 9TH -	80	20
- 10TH -	90	10
- 11TH -	100	0

INSTRUCTION CHARTS DESIGNED TO IMPRESS ON MOTORMEN THE MAGNITUDE OF RHEOSTATIC LOSSES
FIG. 1—SERIES POSITIONS OF CONTROLLER; FIG. 2—PARALLEL POSITIONS

REVIEW OF CONDITIONS EXISTING BEFORE THE CAMPAIGN STARTED

The Connecticut Company employs about 2500 platform men and operates approximately 1100 passenger cars. Its lines cover most of the State of Connecticut, connecting New Haven, Hartford, Bridgeport and Waterbury, together with about seventy smaller towns and villages. For company purposes, this territory is subdivided into nine operating divisions. Each division, therefore, operates some city and some interurban services.

The platform men employed by this company compare favorably with men of similar class in other sections of the country. All motormen had received preliminary training at the time of employment. In a general way, also, their work had been checked up from time to time by the chief motorman of each division, or in the case of the four larger divisions, by the chief motorman and his assistant. Men were expected to know the company rules, observe safety precautions at all times, avoid abuse of equipment, and operate as economically as possible.

This was good so far as it went, but in the matter of power saving the instructions were not specific enough. Too much reliance was placed upon individual judgment as to the proper methods to be employed in this direction. The chief motorman on one of the big divisions is usually a very busy individual, upon whom devolves the duty of breaking in new men, including the teaching of all rules relating to signals, emergency work, etc. He usually has little time to study the fundamental technical principles of power saving, much less to impart these principles to the men under his charge. As a result many of the most elementary principles and conceptions are either not understood at all, or at most they are understood very imperfectly by the men on the cars. In this particular the conditions existing on the Connecticut Company property prior to the power-saving campaign were probably fairly representative of the conditions existing on similar properties throughout the country. This point is enlarged upon because the success achieved in any power-saving campaign will depend largely upon the clearness with which those organizing it visualize the state of mind of the men whose habits it is desired to correct. Consider only a few of the ideas which are current among motormen throughout the country.

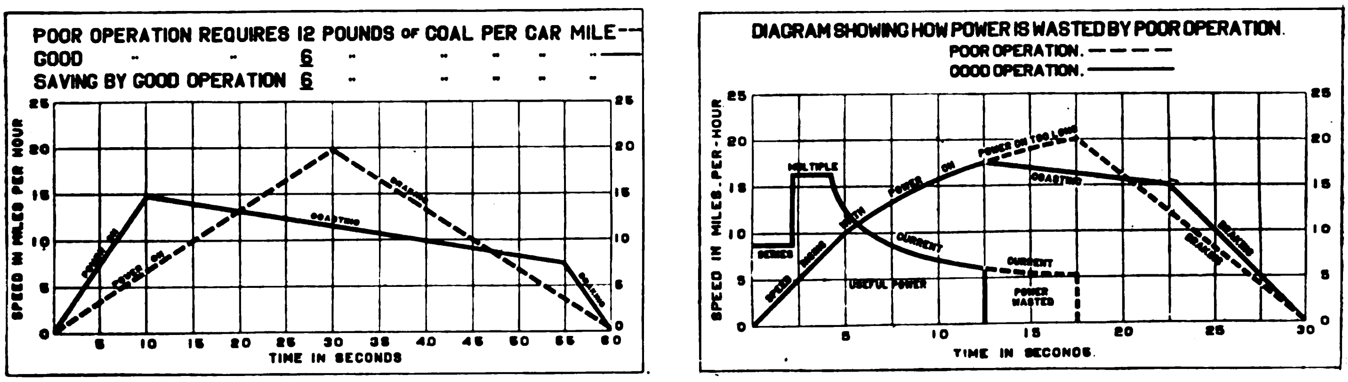
1. Practically all believe that the controller turns on the power "gradually," much in the same way that a faucet turns on water. This to anyone without special training is a very natural thought, but is a fundamental misconception which of itself is productive of a frightful amount of waste. This point will be further dealt with.

2. Some motormen are taught that in notching up a

controller, the full car speed possible on any notch must be reached before passing to another notch.

3. Many believe that in starting the car fewer motors are in operation when the controller is in series than when it is in multiple.

4. Others are convinced that when motors are connected in series those nearest the controller, and which therefore "receive the power first," do most of the work—and so on.



DIAGRAMS USED IN VISUALIZING CAR OPERATION LOSSES IN POUNDS OF COAL—FIG. 3—TO SHOW EXTREME CONDITIONS; FIG. 4—TO SHOW USUAL CONDITIONS

This list of popular misconceptions could be much extended, but the instances given are typical of the kind which are common, and which, to some extent, must be removed before real progress in power saving can be made on any property.

The essential thing is to change the habits of the motormen operating the cars, if a power-saving campaign is to be effective. But habits cannot be changed until wrong ideas have been supplanted by correct ones. Once the men are in a frame of mind where they are willing to save power (and this condition of mind can be created) they must then be shown how. *A power-saving campaign is therefore primarily an educational matter.*

A Word About Checking Devices

Next to education a checking device is most essential; in fact, the two features are complementary. There must be provided some means of recording and comparing the men's individual efficiency from day to day, otherwise no permanent benefit will follow from the educational effort. Men forget rules or become careless or indifferent, or they operate carefully only while watched, or while under the surveillance of the chief motorman or other official. Some constant stimulus to good work must be provided, otherwise their interest lags. The only means so far devised for creating and keeping up this interest is to put on the car some instrument which will permit comparison to be made between the individual performances of groups of men doing similar work, *i. e.*, of men working on the same route or under the same general conditions. By this means a competitive spirit is created, and by simple follow-up methods can be maintained.

The three essentials, therefore, for a successful power-saving campaign are: (1) Education of motormen. (2) Use of a checking device. (3) An effective follow-up system.

All three features were employed in the campaign herein described. The cars were equipped with "power-saving recorders"; an educational campaign was started, and means for following up the motormen's daily records were devised. Particulars of these three features will now be dealt with.

The educational work comprised four distinct features: (1) Special instruction of the chief motormen; (2) the issuance to all motormen and conductors of a small educational folder, containing power-saving rules; (3) personal instruction of motormen on the cars by the chief motorman or his assistant; (4) illustrated talks to groups of motormen at meetings specially held for this purpose.

As a part of the instruction of the chief motormen, meetings were held weekly, at which men from all divisions were in attendance. At these meetings the fundamental principles of power saving were carefully explained and discussed. Many deep-rooted ideas held by these men, however, could not be removed by mere discussion. It was necessary to show them, on a car, that large savings can actually be made by slight changes in methods of operation of controller and brakes.

Tests were therefore made on specially equipped cars, and the different ways in which power could be wasted and saved were shown in such manner as left no room for dispute or personal opinion. These tests were carried out by the chief motormen themselves, under the supervision of the writer, and were of the greatest assistance in imparting to these men a spirit of enthusiasm and confidence.

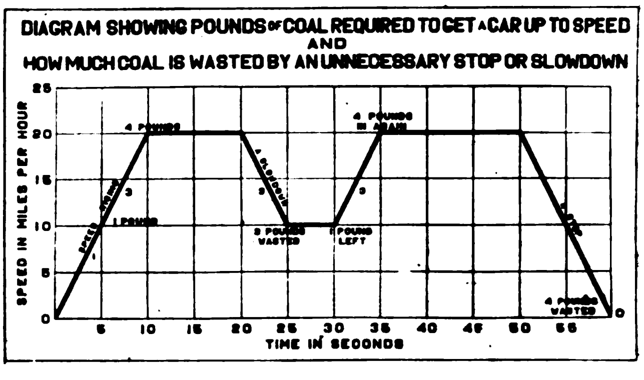


FIG. 5—DIAGRAM TO DISCOURAGE THE MAKING OF UNNECESSARY STOPS AND SLOWDOWNS

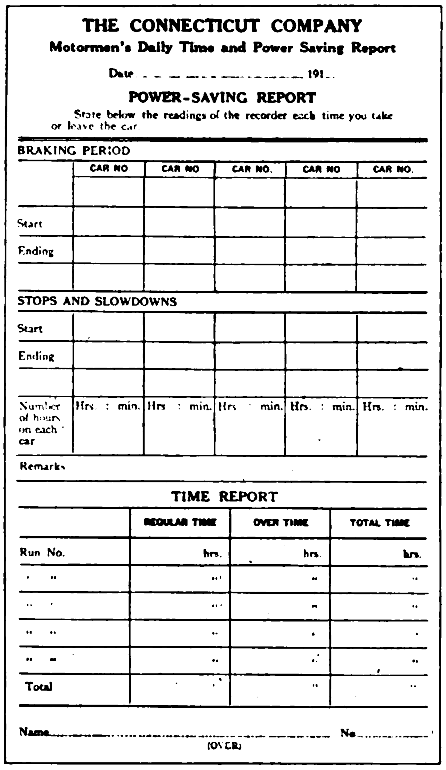
As illustrating one of these tests, a car was operated in city service on a definite schedule making six complete trips in the way in which it would be handled by an average motorman. No attempt was made to exaggerate conditions or produce a result such as would be obtained by a very poor motorman. For instance, the controller was notched up without noticeable dawdling on the resistance notches, a certain amount of coasting was done and the brakes were applied and released in the ordinary manner. The power consumption was metered by the chief motormen themselves on every trip. Six runs were then made over the same route, making the same number of stops and running on the same schedule, but with the car handled in the new way in which the men had been instructed, and again the power consumption was metered.

Upon comparing the results, to the intense surprise of the men, they found an average difference of 25.7 per cent in energy consumption. In another test they found an average difference of 32.5 per cent. No further argument was necessary.

FOLLOWING UP THE INITIAL EFFORTS

The introductory portion of the educational folder containing power-saving rules is reproduced herewith. This illustrates the general style, and also tells something of the method of awarding prizes for meritorious work which was adopted. Several prizes are awarded quarterly on each division and range from $5 to $2 each. At this point it is not necessary herein to enlarge upon these rules, as they are given in the writer's article in the issue of this journal for Sept. 2, 1916.

On the four large divisions, New Haven, Bridgeport, Waterbury and Hartford, the assistant chief motorman assumed the chief part of the burden of instructing the motormen in the finer points of power saving. On the smaller divisions this duty was carried out by the chief motormen themselves. These men were required to ride with each motorman in turn, and impart to him in a practical way the proper methods of handling his controller and brakes, giving in simple terms the reason in each case.



THE CONNECTICUT COMPANY

Motormen's Daily Time and Power Saving Report

Date .... 191..

POWER-SAVING REPORT

State below the readings of the recorder each time you take or leave the car.

BRAKING PERIOD

	CAR NO	CAR NO	CAR NO.	CAR NO	CAR NO.
Start					
Ending					

STOPS AND SLOWDOWNS

Start					
Ending					
Number of hours on each car	Hrs. : min.	Hrs : min.	Hrs : min.	Hrs. : min.	Hrs. : min.

Remarks

TIME REPORT

	REGULAR TIME	OVER TIME	TOTAL TIME
Run No.	hrs.	hrs.	hrs.
" "	"	"	"
" "	"	"	"
" "	"	"	"
" "	"	"	"
Total	"	"	"

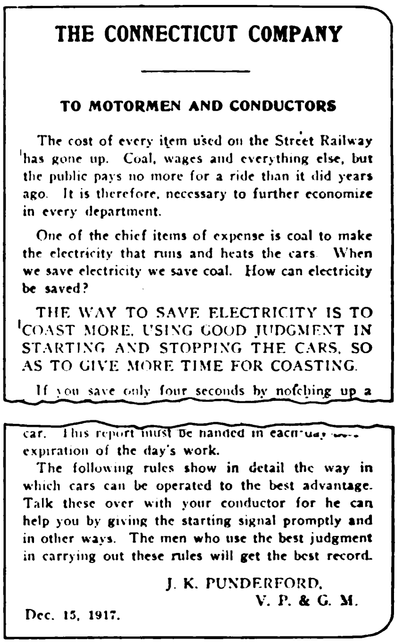
Name .... No ....

(OVER)

FIG. 6—COMBINED TIME AND POWER-SAVING DAILY REPORT FORM

The educational campaign was further rounded out by a series of informal meetings at which from thirty to 300 motormen and conductors at a time were instructed. By the use of large charts, some of which are herewith reproduced, the differences between careless habits and good habits were shown, the effect upon the coal pile being explained in each case. These talks were entirely non-technical. For instance, no reference was made to "kw.-hr.," the unit of "pounds of coal per car-mile" being used instead. The abstract conception of "kw.-hr." is absent from the minds of most motormen, but they readily grasp the idea of "pounds of coal per car-mile." Questions were encouraged, and many interesting discussions took place, in which the motormen joined. The local manager, the superintendent, and other officials, would often be present and take part in these discussions.

Motormen evince the liveliest interest when new ideas are presented to them in a simple manner. For instance, the idea that a controller does not throw on power gradually, but draws from the trolley wire substantially the same amount on each series notch, is a brand new idea to most of them. The charts shown in Figs. 1 and 2 are used to illustrate this point and to show the large percentage of waste that takes place on certain of the controller notches. It is a startling thought to most motormen that on the first notch four-fifths of the power is wasted in the resistance and only one-fifth used by the motors in starting the car. Emphasis is, of course, laid upon the need for more coasting, and usually brings forth from the men the questions: "How can I coast more and not lose time?" The many ways in which this can be done are then explained, and the fact is emphasized that some of these ways require the conductor's help, whereas others do not. It is shown that the whole secret of obtaining a good coasting record is in learning to save a few seconds here and there, and then using these seconds for more coasting. The following suggestions are typical:



THE CONNECTICUT COMPANY

TO MOTORMEN AND CONDUCTORS

The cost of every item used on the Street Railway has gone up. Coal, wages and everything else, but the public pays no more for a ride than it did years ago. It is therefore, necessary to further economize in every department.

One of the chief items of expense is coal to make the electricity that runs and heats the cars. When we save electricity we save coal. How can electricity be saved?

THE WAY TO SAVE ELECTRICITY IS TO COAST MORE, USING GOOD JUDGMENT IN STARTING AND STOPPING THE CARS, SO AS TO GIVE MORE TIME FOR COASTING.

If you save only four seconds by notching up a

car. This report must be handed in each day ... expiration of the day's work.

The following rules show in detail the way in which cars can be operated to the best advantage. Talk these over with your conductor for he can help you by giving the starting signal promptly and in other ways. The men who use the best judgment in carrying out these rules will get the best record.

J. K. PUNDERFORD,
V. P. & G. M.

Dec. 15, 1917.

FIG. 7—CLIPPINGS FROM FIRST AND THIRD PAGES OF INSTRUCTION BOOK ON POWER SAVING

HOW TIME CAN BE SAVED

1. By being alert in responding to the bell.
2. By notching up more quickly.
3. By braking at a higher rate.
4. By helping the passengers in and out and so saving a second or two at the stop.
5. By not arriving at the end of the line ahead of time in order to get a longer lay-over.
6. By starting on time.
7. By stopping at the right place so that the passengers won't delay the car by having to walk some distance to the doors.
8. By the conductor calling out the streets in a clear voice so as to permit quicker unloading.

Methods for notching up the controller are dealt with in considerable detail. The rules given regarding this may be summarized as follows:

1. Run with resistances in circuit as little time as possible. This means notching up at as fast a rate as a proper regard for safety, for the comfort of the passengers and the care of the equipment will permit.

2. In starting a car move quickly over the resistance notches to the first running point, wait there for a short time, then move quickly until the full multiple or last notch is reached. This waiting until moving into multiple has three good effects. First—It enables a motorman to move more quickly over the multiple resistance notches, and so saves power. Second—It reduces the strain on the controller. Finally—It reduces the draft of power and strain on the transmission lines and power station.

3. Don't, however, notch up so fast as to spin the wheels and pull out the circuit breaker, as this will waste power just as much as the old way. Use good judgment in this as in everything else. When the rails are slippery, adjust operation accordingly.

Proper methods of applying the brakes were then explained and for convenience the rules regarding this are summarized as follows:

1. Apply the brakes at as low a car speed, and at as high a rate as is possible, having regard to safety, to the comfort of the passengers and to the care of the equipment. Slow down the car without jerks; avoid "fanning the air" and whenever possible make one application do the work. Release the brakes a little just before the final stop. This will avoid a jerk, and will reduce trouble from flat wheels.

2. Making a quick stop saves power just as making a quick start does, but in a different way. A slow stop loses time in one block, and so leaves less time for coasting in the next, or in a later block. "Fanning the air" aggravates this, and in addition wastes still more power by requiring the more frequent pumping up of the air reservoir. Fast braking doesn't mean stopping the car so fast as to lock the wheels. Good judgment will tell what is right in this as in everything else. Adjust the braking rate to suit the rail conditions from day to day.

One of the first serious sources of waste in car operation consists in running too close to the car ahead, and so being forced to make unnecessary stops and slowdowns. In this connection it is pointed out that it takes about as much power to start a car once as will keep it running for a quarter of a mile on level track; so that unnecessary stops are very wasteful. Motormen are required to note that the word "unnecessary" is used. All proper brake applications as dictated by safety and the needs of the public should, of course, be made. Only the "unnecessary" ones should be eliminated.

Some unnecessary brake applications were then indicated as follows:

1. Those caused by running too close to the car ahead, when the second car might just as well be a short distance behind.

2. Those caused by approaching cross streets, curves, etc., at too high speeds.

3. Those caused by not keeping a good lookout for teams and other obstructions ahead.

Correct operation in each of the above three particulars not alone saves power but obviously increases safety of operation. This point is emphasized. The effect of unnecessary brake applications upon brakeshoes, wheels and rails is then gone into, and the connections between these and power saving pointed out.

MAKING THE POSSIBLE SAVINGS DEFINITE

In discussing the chart shown in Fig. 3 it is pointed out that the difference between good operation and careless operation can be as high as 6 lb. of coal per mile. This at 100 miles a day can make a difference of more than 100 tons of coal per year. Six pounds of coal per mile does not look very much to a motorman, but when translated into "100 tons of coal per year" it acquires a new meaning. This is the difference between the best and the worst men. The average amount to be saved, of course, is less than this.

Conductors are encouraged to attend these meetings for the reason that motormen's efforts at power saving can be very much influenced by the way in which the conductor performs his portion of the duties. The best results come only from good team work on the part of both men. As a guide to conductors, the following suggestions were made:

1. As soon as the car starts, call out in a clear voice the name of the next street or stopping point, so that as early as possible passengers may signify their desire to stop.

2. Give the stop signal early. The bell in time will often prevent the motorman from throwing power on unnecessarily and so avoid waste of power.

3. Make the stop as short as possible, having regard to the safety and convenience of the public. All time saved at stops can be used by the motorman for extra coasting and so will help in saving power.

4. Avoid excessive use of heating current. It takes about one-third as much power to heat a car on a winter's day as to run it. An overheated car is more disagreeable to the public and more unhealthful than one which is too cold. Avoid waste in this as in everything else.

THE FOLLOW-UP SYSTEM AND ITS RESULTS

Motormen are supplied with a combined time and power-saving daily report form which is reproduced herewith. The time-slip portion of this is similar to that used prior to the power-saving campaign. The other portion has been added and provides space for the motorman to write down the power-saving recorder figures each time he joins and leaves the car. These reports are handed in each day and are then allowed to accumulate for two weeks. They are then classified into routes, so that all men whose records are in any way comparable may be grouped together. The records for each route are then totalized and the average efficiency figures found for all men operating cars on this route.

Each man's record is compared with this average, thereby making it possible to classify the men in the order of their merit. Rating lists, showing each man's standing, are posted twice a month, and by this means a spirit of competition is created and kept alive. Men showing constantly at the bottom of the list receive special attention from the instructors.

The results of the power-saving campaign have been gratifying. The division first equipped with power-saving recorders (New Haven) has shown a consistent and constantly increasing reduction in kilowatt-hours per car-mile month by month, totaling at the end of five months nearly 11 per cent. It is expected still further to reduce the power consumption and gradually to achieve the same, or better, results on other divisions, some of which are but now being equipped with recorders.

What has been achieved is not the result of any one man's individual effort. It has resulted from the loyal co-operation of many local managers, superintendents, chief motormen and others. Similar results can be obtained wherever the same team-work is possible.

The cost of the uniform worn by the women conductors on the New York Railways is $5.75, made up as follows: Coat, $2.75; bloomers, including puttees, $1.75; cap, $1.25. The uniform is made of khaki material. A photograph and a description of it were published in the issue of this paper for Dec. 15, 1917.

Women Successful as Conductors*

Have Been Quick to Learn—Average of Character and Intelligence Is High Among Those Who Apply—Public and Male Employees Have Accepted Plan Kindly

By COL. T. S. WILLIAMS

President Brooklyn Rapid Transit Company

OF COURSE the employment of women for what are generally called "men's jobs" is by no means new, although it has been accentuated by the conditions which war has produced. While in some states of society women have been expected to carry the burden of most of the hard physical work, the higher standards of civilization, recognizing the importance of conserving both the physical and moral influences of women on the human race, have regarded with disfavor any employment of women which subjects them to occupation not mainly domestic or intellectual.

Notwithstanding this tendency, the census of 1910 showed that in this country more than 23 per cent of females of ten years or over were engaged in gainful occupations. Out of 8,075,000 such females only 2,530,000 were engaged in domestic and personal service, 733,000 in professional service, and 593,000 in clerical service. There were 1,807,000 engaged in agriculture, and nearly 2,400,000 in manufacture, transportation, trade and mining.

It therefore looks as if our previous occupational standard for women was being radically modified—whether for the better or worse being a question as to which there may be radical differences of opinion. The present increasing interest in this question arises out of the recent and very sudden increase in the employment of women occasioned by the conditions of war. Especially in England and France, but all over Europe, and to a considerable extent in this country, women are taking the places of men in lines of work which have been generally regarded as distinctly mannish. England has a million women engaged in munitions work alone. They are doing agricultural work to a larger extent than ever, are running automobiles, and are engaged in the operation of railroads and other transportation properties.

With the railroads in this country the employment of women, except for duties more or less clerical which they have long been performing, was at its inception a matter of necessity and not of choice. For the kinds of railroad work to which women now for the first time have been assigned, I assume all railroad companies would have continued the use of men had it been possible to obtain men with satisfactory qualifications. That was essentially our condition on the lines of the Brooklyn Rapid Transit Company, and it is with respect to our experience that I speak more particularly.

We were the first transportation company in the country to employ women as guards on subway trains. Fortunately for the trial of such an experiment, the duties of this occupation are not onerous. Train doors are opened and closed automatically by pushing a button, and about all the woman guard has to do is to be careful in properly closing the doors, in giving the necessary train signals and in calling out the names of stations. In addition she must, of course, have a cool head, a knowledge of what to do in emergencies, and must show courtesy to passengers. We found that in nearly all these qualifications women were the equal of men, and in some surpassed men—especially the type of men now seeking these positions.

WOMEN MAKE GOOD IN RAILWAY WORK

This initial experiment was so successful that we extended it to the position of conductors on surface cars, and to the position of porters at stations and of car cleaners. Of course, women have been successfully employed by the company as ticket agents for a great many years.

After three months' experience we are prepared to say that these women employees have absolutely made good. We have now 525 women thus employed. Of this number 300 are subway guards and 175 are surface railroad conductors. The consensus of opinion of our operating officers is that they are quicker in "breaking in" than the average man; that they are not so anxious for days off; that they attend to their duties more faithfully and have fewer accidents; that they are anxious to learn and to hold their positions; that in collecting fares and passing signals they are on an equality with the best male conductors; that they are more conscientious in registering fares, and that the rank and file of male employees are doing their best to help the women in making a success as train employees.

REQUIREMENTS FOR POSITIONS

Female applicants for the positions must be over twenty-one years of age and preferably between twenty-four and thirty-five; must be in good physical condition, weighing not more than 150 lb.; not under 5 ft. 5 in. in height; have good eyesight and color sense, and they must present satisfactory references. The applicants are mostly women who have heretofore worked in factories, as domestic servants, as nurses, hotel employees, cashiers and school teachers. Many are wives, daughters or sisters of Brooklyn Rapid Transit men who have gone into military service, and some are widows of our former male employees. There are instances of man and wife on the cars respectively as motorman and conductor, of brother and sister, and of father and daughter.

The average of character and intelligence is high among the women already employed, and as the novelty has worn off and the public has become more accustomed to seeing women on the cars, women of more education

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*This article appeared in the *New York Evening Post* for Feb. 26 as one of a series dealing with the new industrial opportunities for women in America, brought about by the change in labor conditions resulting from the war.

are applying. The publicity which the employment of women has received has seemed to bring out applicants of a higher rather than a lower type.

Women employees are paid at exactly the same rates as the men—all of our rates being on a seniority basis. On the surface lines they start at 27 cents an hour, are raised to 30 cents an hour in the second year, with increasingly larger rates to a maximum of 35 cents an hour. As subway guard, where the work is easier, they start in at 24 cents an hour, with an increase each year to a maximum of 30 cents an hour. These wages attract the women because they are higher than they have been accustomed to receive in other occupations, and are higher, I believe, than the average amount paid women in occupations not requiring special training and experience.

Of course, the employment of women has necessitated special accommodations for their comfort at the car depots. Here they have their own rest rooms and lockers, and as the number increases special women inspectors will be employed to look out for their welfare. The women are not allowed to use the men's clubrooms, or to mingle with them in any social way during working hours.

The privileges of our group insurance plan are open to them on the same terms as to men employees of the company, and equally with the men they are entitled to free medical service.

INNOVATION SUCCESSFULLY MADE

So far as the public is concerned, it seems to have taken to this innovation kindly. It required considerable courage for the first women employees on the cars to "break the ice" and subject themselves to the curiosity of passengers. As the number of women conductors and guards increases, however, and their presence has become an old story, this cause of embarrassment is disappearing. With the exception of occasional taunts and jibes from ill-mannered men, and some ill-tempered criticism from hypercritical women, the attitude of the public towards the women employees may be said to be considerate and helpful.

It is noticeable also that their presence is having a good effect upon the male employees. The latter now appreciate the necessities which have compelled the employment of women in these occupations, and their masculine chivalry is constantly apparent. The occasional intoxicated male passenger seems to have no terror for the women conductors and guards, as they usually quiet his offensiveness by a word and a smile, and if these do not succeed there is always the motorman, to say nothing of sober male passengers, who are willing and eager to proffer their services.

Of course, there are interesting human phases of this new industrial experiment. One woman conductor fell in love with her motorman, stayed away for one day to be married and returned the next day with the announcement that both she and her husband would remain in service. One old-time motorman threw up his job because his wife would not allow him to work with a woman conductor. One woman employee fell a victim to pleurisy, and another had to give up her job because she fell off the rear platform of a car.

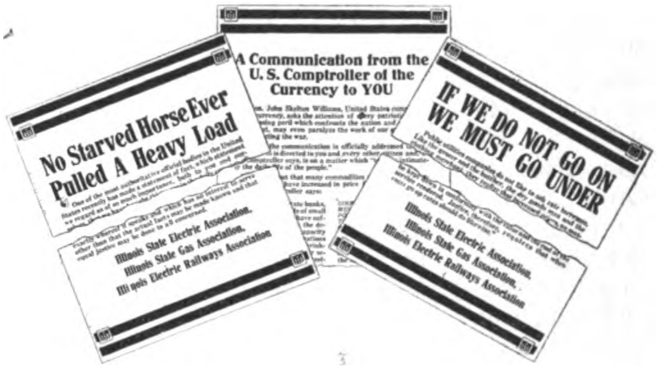
There have been few dismissals for inefficiency or dishonesty.

Illinois Associations Appeal to Public

State Bodies Are Speaking to the People Through Newspaper Advertisements Showing the Need for Higher Rates

THE accompanying reproduction shows the kind of material being used by the Illinois Electric Railways Association, the Illinois State Electric Association and the Illinois State Gas Association in their united appeal to the public for due consideration of the need for increased rates. The three advertisements shown in the illustration below have been sent out for publication in the various newspapers in the State.

This campaign was decided upon in order to bring directly before the people of Illinois the problems which confront utility managers in these "high cost" times, and to cause the thinking public to realize that the vastly increased costs have affected utilities as well as other enterprises. The associations hope to point out that public utilities and railroads are perhaps the lone exceptions whose price to the public is fixed by ordinance or statute, thereby making them unable to increase their revenues to offset the increased costs of operation.



No Starved Horse Ever Pulled A Heavy Load

Illinois State Electric Association
Illinois State Gas Association
Illinois Electric Railways Association

A Communication from the U. S. Comptroller of the Currency to YOU

IF WE DO NOT GO ON WE MUST GO UNDER

Illinois State Electric Association
Illinois State Gas Association
Illinois Electric Railways Association

THREE ADVERTISEMENTS, REPRODUCED IN PART, SHOWING THE STYLE OF PUBLICITY EMPLOYED BY ILLINOIS PUBLIC SERVICE ASSOCIATIONS

It is also hoped to have the public appreciate the necessity for the continued operation of public utilities on account of their intimate relation with the prosecution of the war. It is felt that if the gas and electric companies and electric railways are handicapped to such an extent that they are unable to keep their properties up to a high state of efficiency, the entire industrial world will suffer.

The following quotation from the annual report of the Comptroller of Currency, John Skelton Williams, which was noted in the ELECTRIC RAILWAY JOURNAL of Feb. 9 and is reproduced in part in one of the advertisements, is regarded as being particularly timely:

"The work of war has thrown upon many of these corporations strains which they are unable to endure without prompt help. The cost of their labor and of all materials for operation, betterment and upkeep has increased heavily and suddenly. . . . The continued and increasing efficiency of these corporations is important for the successful conduct of the war. . . . The first and most direct relief to the public utilities can be given by the state public utilities commissions and municipal and local authorities with the broad-minded co-operation of the people."

Annual Meeting of C. E. R. A. Takes Patriotic Form

About 200 Delegates Attend—President Wilcoxon and Ex-Mayor Bookwalter of Indianapolis Speak on First Day—Work of Accountants' Association Reviewed on Friday—Special Quartet Leads Singing

THE annual meeting of the Central Electric Railway Association was held this week at the Miami Hotel, Dayton, on Feb. 28 and March 1. The first session was set for 3 o'clock on Thursday afternoon to allow delegations from neighboring cities to leave in the morning and reach Dayton the same day. The largest special party came from Indianapolis. About 200 in all were present.

C. N. Wilcoxon, president Chicago, Lake Shore & South Bend Railway and president of the association, called the meeting to order at 3 o'clock and presented his annual address, which advocated publicity as of help in securing relief to electric railways. The address was received with applause.

An attractive feature of this and the other sessions was the singing of national anthems. The singing was led by a quartet under the direction of J. F. Starkey, general passenger agent Lake Shore Electric Railway, but the audience joined in the singing.

After the presentation of the address by the president, Charles A. Bookwalter, former Mayor of the city of Indianapolis, addressed the delegates. Speaking as one who had had much to do in his official capacity with the relations between the public and the electric railways, he noted several successive changes in the attitude of the public toward electric roads. Originally when the interurban railways sought to enter terminal cities over the streets, there was a howl of disapproval. Then, as it was found that the interurban brought new business and prosperity to the cities this attitude changed to a friendly one and many roads were built. Gradually as the increase due to this impetus became less conspicuous, the popular tide turned against the railways, but it is again favorable because of a more general present appreciation of the service rendered.

Mr. Bookwalter acknowledged that in the past the public had hampered transportation development. The effect of this hostility was seen in the coal famine this year, as this famine was brought around primarily because of lack of transportation facilities rather than lack of fuel. The great benefits which electric railways can confer on the public are now becoming better recognized. In the past self-appointed guardians of the public welfare in some cities have urged that electric railways in cities should be restricted to the transportation of human beings. But this winter these restrictions have been relaxed to some extent under war conditions. The public need has affected public opinion, and the public now better realizes what electric railway service means to its welfare.

Mr. Bookwalter also discussed the war, and his address was logical and thrilling. He said that the war was primarily due to the systematic inculcation in Germany of the doctrine ever since the Franco-Prussian War that might makes right. This philosophy has permeated the German people and entirely transformed them. We entered the war because we realized that our rights were invaded, but this invasion at home and abroad had begun in August, 1914, when the war broke out. Mr. Bookwalter strongly advocated universal military training, a sentiment which the meeting loudly applauded.

On Thursday evening all of the attendants at the meeting were the guests at a theater party of John F. Ohmer, president Ohmer Fare Register Company, Dayton.

MEETING ON FRIDAY

The program on Friday included an address by Charles A. Gilles, Dayton, on "War Savings," a paper by A. C. Van Driesen, president Central Electric Railway Accountants, on "The Work of the Accountants' Association," and the annual report of the secretary and treasurer. The report by Mr. Neereamer and an abstract of Mr. Van Driesen's paper follow:

REPORT OF THE SECRETARY AND TREASURER

The report of the secretary and treasurer, which was for the year ended Dec. 31, 1917, said that the present railway membership of the association consists of sixty-eight interurban lines operating 4927 miles, and two city lines. During the year there were 140 supply members. A summary of the financial report follows:

Cash on hand Jan. 1, 1917	$1,644	
Receipts	8,352	
Disbursements		$8.398
Cash on hand Dec. 31, 1917		1.608
Total	$10.006	$10.006

The expenses include the amount paid out by the association for the work of the committee on military efficiency and defense, *i. e.*, account of the preparation of the map, $373, and on account of the data sheets $144, making a total of $517. It also includes $737 as investments. Of this amount $273 was stock in the Railroad Men's Building & Savings Association and $500 was a Liberty bond. Among the receipts were an item for the sale of tariffs of the Central Electric Traffic Association, $1,691. The report concluded with the statement:

"Notwithstanding the increased expenses of the association during the past year, our finances are now in the best condition they have been since the organization of this association, and this situation is only achieved by careful watching of each and every expense, thereby preventing waste on useless items.

"The work during the past year has been very heavy owing to the preparation of the map compiled and securing of data showing the physical condition of the interurban lines in this territory, under the auspices of the committee on military efficiency and defense. The work on the map has been completed, and the information asked for in the data sheets has been compiled so far as same has been received from the interurban companies."

The Work of the Accountants' Association

By A. C. Van Driesen

President Central Electric Railway Accountants' Association, and Secretary Toledo Railways & Light Company

THE Central Electric Accounting Conference was organized in Dayton in March, 1907, "to bring together electric railway accountants for the interchange of ideas; to promote the adoption of uniform systems of accounting and to encourage more intimate personal relations." In December, 1911, at Toledo, a new constitution and by-laws were adopted, the name of the Conference changed to Central Electric Railway Accountants' Association, and the association voted to become an auxiliary of the Central Electric Railway Association. The association numbers among its members sixty-seven individuals, representing sixty-one separate and distinct electric railways, including both city and interurban lines. This is practically 90 per cent of the membership of the Central Electric Railway Association, and we trust that the remaining 10 per cent will soon be within the fold.

SOME WORK DONE

The various agreements adopted at the first meeting in March, 1907, relative to the handling of freight and ticket accounting are still in use, merely being revised to meet changed conditions. The committee on uniform report blanks compiled in 1909 a set of blanks for the reporting of interline business, which, with few changes, are in use at the present time. The rules and blanks prepared by this committee were practically adopted as a whole by the American Electric Railway Accountants' Association at Denver, in October, 1909. Our various committees have worked hard and well in promulgating forms, decisions and recommendations to be used in accounting problems. Various accounting forms as used by the different roads are on file in the secretary's office and will be loaned to any member on request. During the early part of 1917 a clearing house for interline traffic accounts was recommended, but to the present, principally because no meetings have been held by this association, it is still in its formative state. The benefits to accrue from the installation of this system are many, principally the elimination of individual drafts with consequent saving in clerical work, besides a large saving in postage and stationery.

In 1916 the association appointed a committee on electric light and power accounting. This is a very important committee, as there is no uniform system of accounts for electric light and power throughout the country. Each state prescribes its own classification, and for an interstate road a large amount of time as well as gray matter is needed properly to report the revenue and expenses and the various statistics required, owing to the clash of different classifications.

On account of the war but one meeting was held in 1917, that on Oct. 27, for the purpose of considering the war revenue act. At this meeting certain motions were adopted relative to the collection of the taxes, and as future events have proved, the decisions then rendered by the members of this association were upheld by the Treasury Department in its interpretations of the law. Thus once again you see this association was in the forefront, as it has been so many times in the past.

It is not often that an accounting official is in the position I stand to-day, whereby he can talk directly to the operating heads and general managers of properties and tell them some of the trials and tribulations he suffers often at the hands of these very officials. Personally, I am fortunate in being able to report directly to our president and general manager, but in a large number of cases the accounting official is obliged to report through a third party, sometimes even to the operating head, which, in my humble opinion, is directly opposed to good accounting. Permit me to quote from an address given by me to embryo accountants about three years ago:

> The accountant of to-day has outgrown the old bookkeeper with his debit and credit system. He must be highly trained. He should be familiar with the laws, both state and federal, governing public service corporations. Nearly all of them affect the accounting department in one way or another. He must be able to analyze; he must know his property, and by that I mean he must know every detail of the operation and organization of the property, in order that he may not only record the figures but that he may also know and understand the reasons for those figures.
>
> In this connection I desire to emphasize the absolute necessity for the greatest co-operation between the accounting and all other departments of a corporation. In many corporations the accounting department is looked upon as a necessary evil, while in my opinion it is the very life of the organization. The secretary, who is usually the head accounting official, should report directly to the general manager or executive head of the corporation. The best results are obtained from the accounting department if it is entirely independent of other sections of the management. All other departments should act in harmony with the accounting department, and endeavor in every way possible to assist it in securing the information requested by it, as such information is necessary for the reports and other statistics used for the officials and stockholders. The accounting officer should have authority to reach directly the sources from which information for accounts is obtained and to secure it when and as asked for. The operating man should remember that a large amount of the accuracy and efficiency of the accountants' records are dependent upon the operating reports submitted by him. On the other hand, the accounting official should use all the tact possible, as sometimes the "deadly parallel," as it is called, by comparison of this year's and last year's figures, tends to make the operating head antagonistic and this in time develops into indifference. The operating men know their activities are being checked, and in many cases blame the accounting officer for the restrictions, instead of going deeper into their own departments to see where expenses can be reduced.

Relief Urged for Boston Elevated

Governor McCall has sent a message to the Massachusetts Legislature urging that the Public Service Commission during the continuance of the war and one year thereafter, or until the Legislature shall otherwise provide, be given power to fix just, reasonable and equal rates of fare upon the Boston Elevated Railway, and to set interim rates pending a hearing on the situation. The Governor is convinced that immediate action is necessary in the interests of the public as well as the company. Under the special legislative act under which the company operates, it is restricted from charging more than a 5-cent fare.

Report on Rapid Transit System for Detroit

The Full Text of the Report by Barclay Parsons & Klapp Recommends Partnership Arrangement with D. U. R., Flexible Fare and Combined Subway and Elevated Structure

THE firm of Barclay Parsons and Klapp, New York, whose first report on the transportation situation of Detroit was made three years ago and was published in abstract in the ELECTRIC RAILWAY JOURNAL for April 3, 1915, has just presented to the Board of Street Railway Commissioners a supplementary report on a suggested rapid transit system.

The present report, which is accompanied by a number of maps and tables, was prepared in answer to the commissioners' request for a statement as to whether the growth of the city, the increased traffic and the conditions of street congestion do not now warrant the initiation of a rapid transit program. The report says that they do and recommends a combined subway and elevated railway system comprising 5.66 route-miles of subway and 21.75 route-miles of elevated railway to be operated by the Detroit United Railway. This company, the report suggests, should enter into a partnership arrangement with the city for the operation of its system within the city limits on the basis of a valuation for its present property and division of net receipts after a return has been paid on this valuation and on the new capital required for rapid transit and surface construction and extensions. After careful consideration a flexible fare is recommended.

The report says that the population of the city and suburbs is increasing at a rapid rate and the prediction is made that by 1920 there will be 1,000,000, and by 1950, 2,000,000 people. This population, with existing density of population, residential locations, and distance from points of occupation brings the city within the rapid transit class, that is, it has reached the stage where other cities have entered upon their rapid transit development. As Detroit is built on a practically level plane with no real physical obstructions to city extensions, the inevitable character of its growth must be toward residence districts of relatively low population density, houses of the one and two-family type predominating. A population, therefore, of more than 1,000,000 people distributed at about twenty per acre involves a city area of about 100 square miles or the necessity of hauling many passengers from 8 to 10 miles. This means, with ordinary electric railway service, a ride of about an hour. Table I shows actual and estimated passenger traffic from 1904 to 1950.

The report does not urge the commencement of actual subway construction in Detroit at the present time when all financial and construction resources in the country are under the strain of a great war. It points out that a considerable number of years must necessarily elapse between a decision to build and the commencement of successful operation, and that of this period much of the time must be employed in working out details of agreement, specifications and plans. This preliminary work does not involve expenditure of large amounts of money, but, when completed, would make immediate construction possible upon the resumption of normal conditions.

Table II gives the total passengers per mile of single track in Detroit, Chicago and New York, showing that the Woodward Avenue line carried in 1917 a denser traffic per mile of track than the heaviest rapid transit lines in this country with the single exception of the New York subway line in 1916. The density of traffic on Woodward Avenue is 44 per cent heavier than Halstead Street, the heaviest street car line in the city of Chicago. In fact, the reporting engineers say that so far as they have been able to ascertain there is no single line of surface cars operating over a distance of 7 or 8 miles that carries as heavy a traffic as this

TABLE I—SHOWING ACTUAL AND ESTIMATED PASSENGER TRAFFIC IN DETROIT

Year	Population	Passengers Total	Passengers Revenue	Revenue Rides per Capita
1904	......	105,641,220	78,349,220	248
1910	500,982	194,388,505	141,690,525	282
1913	614,486	289,130,216	208,945,348	339
1914	660,000	310,010,104	219,606,056	333
1916	820,000	417,780,244	292,043,741	356
1917	914,000	440,544,836	315,498,478	361
1920	1,000,000	518,000,000	370,000,000	370
1930	1,330,000	708,000,000	507,000,000	380
1940	1,660,000	904,000,000	650,000,000	390
1950	2,000,000	1,110,000,000	800,000,000	400

TABLE II—SHOWING TOTAL PASSENGERS PER MILE SINGLE TRACK. DETROIT—CHICAGO—NEW YORK

Line	1914	1917	Per Cent Increase
Woodward	3,069,600	4,640,000	52.0
Michigan	1,737,900	2,280,000	31.1
Jefferson	1,716,500	2,290,000	33.4
Fort	1,074,000	1,400,000	30.3
Halstead Street, Chicago	....	3,230,000*	....
Elevated Railways, Chicago	1,022,000	1,115,000*	9.2
Elevated Railways, Manhattan and Bronx, N. Y.	3,049,800	3,230,000	6.2
Elevated Railways, Brooklyn	....	1,295,000	....
Hudson and Manhattan Tubes, N. Y.	3,447,200	3,673,000	6.6
Subway, New York	4,468,500	4,970,000*	11.3

*1916.

TABLE III—SHOWING RECORD OF PASSENGERS IN DETROIT JUNE 27, 1917 (AN AVERAGE DAY)

Revenue passengers, six tickets for 25 cents	273
Revenue passengers, seven tickets for 25 cents	743,660
Revenue passengers, eight tickets for 25 cents	65,755
Revenue passengers, interurban tickets	2,283
Revenue passengers, 5-cent tickets	877
Revenue passengers, 5-cent cash fare each	51,455
Free riders (employees)	22,720
Transfers, single	275,957
Transfers, double	62,077
Total	1,225,057

TABLE IV—SHOWING COMPARISON OF COST AND FIXED CHARGES ON DETROIT TRANSIT SYSTEM WITHOUT AND WITH RAPID TRANSIT

Item	System	Cost	Interest at 6 per Cent
A	Present D. U. R. city surface lines and equipment	$30,000,000	$1,800,000
B	Item A, with Woodward Avenue subway and elevated, and equipment	51,000,000	3,060,000
C	Item B, with an east and west subway and elevated, and equipment	68,000,000	4,080,000
D	Item C, with surface line extensions to facilitate transfers between rapid transit and surface lines	75,500,000	4,530,000

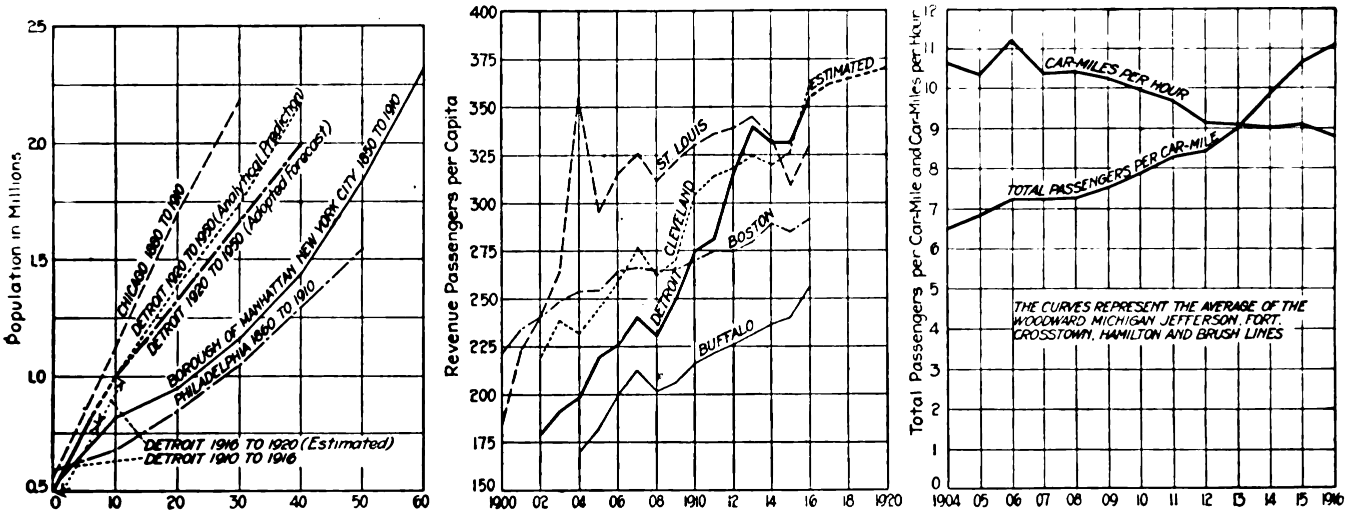


FIG. 1—PREDICTED POPULATION OF DETROIT COMPARED WITH ACTUAL GROWTH OF OTHER CITIES; FIG. 2—REVENUE RIDES PER CAPITA BY YEARS IN VARIOUS CITIES; FIG. 3—CAR-MILES PER HOUR WITH RELATION TO PASSENGERS PER CAR-MILE

Detroit line. Table III gives a record of passengers on June 27, 1907, a typical day, showing the classes with each kind of ticket.

Continuing, the report says that in the heart of the city where the congestion of vehicular and street car traffic and even pedestrian crossing traffic has become very serious, no other solution than by a subway system is possible. Outside of this congested central district overhead railways are recommended. These elevated lines for considerable part of their length, toward the downtown end, are to be built upon purchased right-of-way, using alleys and back ends of lots. Here a structure so designed as to span the right-of-way would be used, thus providing an additional vehicle highway underneath for trucks and commercial vehicles. Where the overhead structure is upon the street, a type with central columns placed between existing surface car tracks to offer the minimum obstruction to the street is recommended.

UNIFIED TRANSPORTATION SYSTEM RECOMMENDED

The report urges the unification of the surface and rapid transit systems to avoid duplication of investment in rapid transit and street car lines and maximum of service with transfers between the two. Such a plan will encourage the use of the surface cars for short-haul local business and the rapid transit system for the long-haul passengers. A flat fare instead of the zone system is recommended, at least "within reasonable limits," and the report quotes from the decision of the Public Service Commission of Massachusetts in the Middlesex & Boston rate case in favor of a flat fare to support the decision. But the rate of fare should be made dependent upon the cost of service or else the city must be willing to pay the difference by levying taxes. Otherwise the city cannot hope to secure the necessary amount of capital for other rapid transit construction. The estimated cost of the system is given in Table IV.

Emphasis is laid upon the absolute necessity of an increase in fare over that at present in effect on the street car system of Detroit in order to support the proposed rapid transit system. The cost of a two-track elevated system of the type described would be eight times and that of the subway twenty-four times as much as the existing surface car line on the same street. The only way in which the present rate of fare has been maintained is through the constantly increasing total number of passengers per car-mile, with a

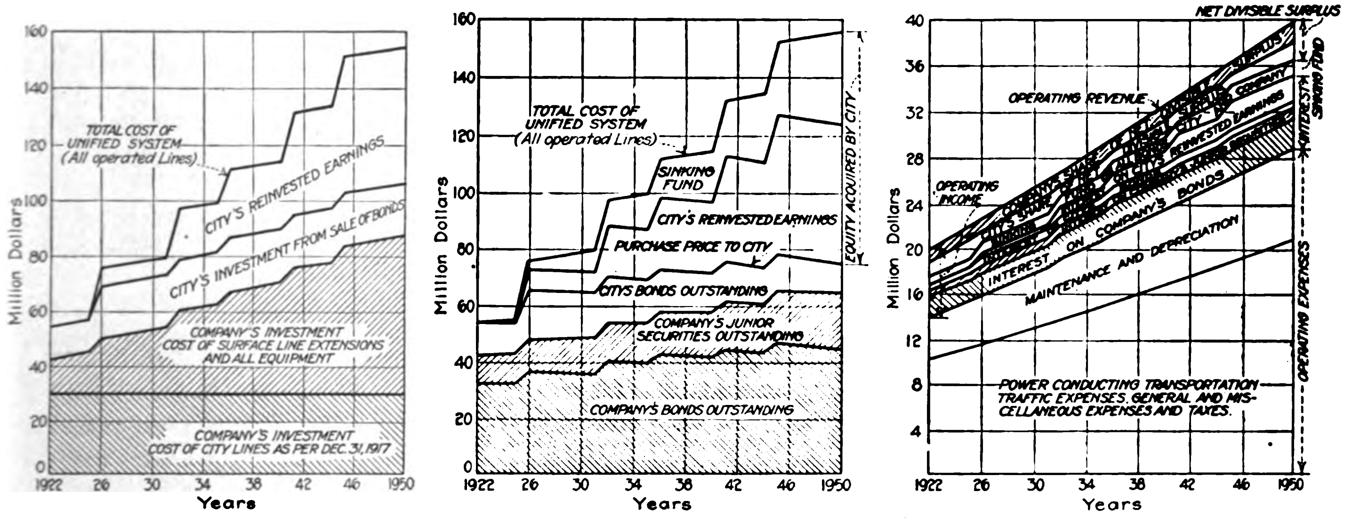


FIG. 4—DISBURSEMENTS FOR INVESTMENT IN ROAD AND EQUIPMENT, UNITED SYSTEM; FIG. 5—EQUITY IN INVESTMENT FOR ROAD AND EQUIPMENT AS AFFECTED BY THE SINKING FUND AND THE CITY'S REINVESTED EARNINGS, UNIFIED SYSTEM; FIG. 6—DISPOSITION OF OPERATING REVENUE, UNIFIED SYSTEM

Fare Boxes Replacing Ticket Choppers on the Hudson Tunnel Lines

Convenience to Patrons Receives First Consideration —Forty-nine Boxes Will Be Used to Collect 5 and 7-Cent Fares

THE Hudson & Manhattan Railroad, which operates more than 18 miles of third-rail track between New York City and points in New Jersey, through tunnels under the Hudson River, has made a study of fare collection methods for the past three years, during which time several tests on station fare boxes have been conducted. The result is that the sale of tickets is now being discontinued and all ticket boxes are being replaced with fare boxes made by the Johnson Fare Box Company.

The main consideration which has led to the adoption of the new system of fare collection has been that of convenience to the public. It is not believed by the railway company that there will be any material increase in revenue, and it is not proposed to lay off any employees. The men who have operated the ticket boxes will now operate the fare boxes and those who have sold tickets will make change.

Strange as it may seem, many people who ride every day on the subway lines of New York City prefer to stand in line and wait to buy a ticket each trip rather than invest a dollar or even 50 cents and save themselves inconvenience and delay nineteen or nine times, as the case may be. Because of this tendency in human nature and also considering the many persons who ride only occasionally and those of the poorer class who can afford to buy only one or two tickets at a time, there is no doubt but that the waiting line at the ticket window can be reduced 50 per cent by the installation of fare boxes. The majority of the patrons, after they become familiar with the system, especially as no investment is necessary, will see to it that they have the proper change before entering the subway.

A total of forty-nine boxes are being installed, different combinations of mechanism being necessary at the various stations as the fare at some points is 5 cents while at others it is 7 cents. All boxes are operated by small motors, inclosed in the pedestal of the box. These draw current through resistors, from the third-rail circuit. The boxes stand rather high and the coins deposited pass down through a series of inclined plates onto a horizontal surface revolving endless-chain fashion. Here they lie in view of the operator and should a question arise as to the correct fare deposited, slight pressure on a small lever at the side of the fare box stops the motion of the box floor and holds the coins in sight. Otherwise the coins pass over the edge into a compartment so shaped that they fall flat against a disk revolving at an angle of approximately 45 deg. This disk has small projections so arranged that a coin is picked up and carried to the top, where it passes under a small wheel. This actuates a small pinion which engages a rack at the back of the disk directly opposite the projection. Each rack represents the denomination of the coin picked up, and records the amount on a counter at the front of the box. The projections for cents, nickels and dimes are so constructed that a coin of but one denomination will fit in a given position. A small "knock-off" hammer prevents more than one coin from passing through the recorder at once. After being recorded the coin drops down into a large container inclosed in the base of the pedestal.

The round base of the pedestal has a large revolving door in the front, the key to which is held by an employee who collects and exchanges the containers once a day. The operation of removing the container from position automatically revolves the top of the container in such a manner that by the time it is free from the pedestal, the top is closed and locked securely and the only key which will open it is held by the treasurer in the main office of the company. The container being removed from the pedestal, the revolving door is automatically locked open so that it is impossible to close it until a new container is placed in position. This is brought from the office of the treasurer with the top open, and should it become locked en route by accident, it is impossible to place it in position. Otherwise it is placed in the base of the pedestal and the revolving door closed and locked. Absentmindedness on the part of the employee is guarded against in that once the key is inserted and the revolving door opened even for the fraction of an inch the key cannot be withdrawn until the door has been opened, the container removed, a new container placed in position and the door firmly closed.

To give facility for making repairs all parts of the fare box have been made easily removable by the loosening of one or two thumb screws. The parts also have been standardized so that a damaged part can be replaced either from stock or in case of emergency from a near-by machine. The gears are packed in graphite grease in a case similar to that used to inclose the differential of an automobile.

(*Concluded from page* 421)

falling off in the speed on practically every line in the city, as shown in Fig. 3. It would be futile to consider an average fare on the new rapid transit system of less than 5 cents per revenue passenger, according to the engineers, even if the undertaking was financed with the city credit.

Under the proposed plan, the city will contribute the funds necessary to build the rapid transit lines, and the company will contribute the existing street car system at a reasonable valuation, which is assumed in the report to be about $30,000,000. Subsequent rapid transit construction is to be financed by the reinvestment in the new structure of the city's share in the surplus from operation. Operation of the entire system is to be by the company under a license which is to continue until terminated by default by the company or by the purchase of the property by the city. A sinking fund to retire the bonds of both the city and the company in sixty years is provided, the equity in the property represented by the bonds retired through the operation of the sinking fund reverting to the city. The net income, after setting aside the interest charges and sinking fund, is to be divided equally between the city and the company, provided the company's income does not exceed 8 per cent on its investment.

Fig. 4 shows the disbursements for investment as divided between the city and the company, Fig. 5 illustrates the equity in the road and equipment for different years, and Fig. 6 gives the disposition of the operating revenue on the basis of the traffic assumed, all as proposed in the report.

LETTERS TO THE EDITOR

Should Larger Axles Be Used on Electric Railway Cars?

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Feb. 23, 1918.

TO THE EDITORS:

I have read with much interest Norman Litchfield's article on axle design and manufacture. He has covered the subject quite thoroughly and has prepared a most interesting article.

However, I am wondering just what can be wrong that has required or prompted so much agitation on car-axle design and manufacturing specifications. As I read between the lines in the article by Mr. Litchfield as well as others which I have read by different authors, it seems as though a number of roads have experienced an unnecessary or possibly an undue amount of axle failure. I am happy to report that we have not experienced any trouble with axle breakage except with some extremely old axles which have possibly been in service for fifteen years. It would be almost natural to expect that axles which have been subjected to continuous vibration for this period of time would some day show fractures and possibly break off entirely.

Mr. Litchfield comments upon the increase in weight of equipment. He does not state whether or not the sizes of the axles have been increased to take care of this increased weight. There must also be taken into account the matters of track maintenance, railroad crossings, etc., and their influence upon the axle failures. I believe that track conditions on this property represent about the average prevailing condition of other properties, and we buy our axles under the American Electric Railway Engineering Association specifications.

We have never felt that we could afford to send a representative to the factory to check up the production of these axles, nor to make chemical analyses. This seems to be the practice on a number of properties, especially the large ones. The Union Traction Company of Indiana might be considered as one of the larger properties. For this reason and because, in spite of the fact that they seem to carry out to the letter the program of checking up axles and making chemical analyses of them, other properties experience so much axle failure compared to ours (which are practically *nil*) it would seem that there must be some other "bug" entering into these failures. They may be partially due to what I have previously mentioned, namely, to the use of axles of insufficient size to enable them to withstand the stresses incident to the service in which they are employed.

Mr. Litchfield's discussion of the testing of axles in service for the purpose of locating fractures interested me very much. I differ from Mr. Litchfield somewhat as to the method of testing, in so far as attempting to test the axles for failures with the wheels or gears on is concerned. I contend that this test cannot be made satisfactorily unless the axle is stripped (that is, to be perfectly safe about the matter), as in a number of cases, particularly with old axles, we have found fractures within those portions covered by the gear and the wheel. If the wheel and the gear are left on the axle during the test such failures would escape detection and the axle might be passed as safe.

The method of procedure outlined by Mr. Litchfield, *i. e.*, dipping the axle in hot oil, wiping the surface dry and coating with whiting, is all right, only we have not found it necessary to dip the axles in hot oil.

In the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 11, 1916, page 1025, appeared an article by the writer in which this test for defective axles is described in detail and illustrated with photographs.

R. N. HEMMING,
Superintendent of Motive Power.

Better Co-operation Between Railways and Technical Schools Is Desirable

PURDUE UNIVERSITY
LAFAYETTE, IND., Feb. 20, 1918.

To the Editors:

Referring to the editorial "Line Losses Are Not All in the Line" published in your issue for Jan. 12, I feel that the ideas set forth therein relative to the subject which forms the caption of this comment are well worth further emphasis. As you point out, the average railway operating official has little time for research work beyond that which occasional emergencies make absolutely necessary. It is also quite true that the special testing equipment which forms part of the necessary laboratory apparatus of the technical school is not available to most railway men.

Aside from the purely cultural portion of its work, I take it that the technical school has two principal functions. These are to develop the engineers of the future and to push back the present frontier boundaries of human knowledge and place in usable form to those interested the results of such pioneer work. Sometimes I am inclined to think that the second-named function is first in order of importance. In the main, America's technical schools have concentrated on the first function, leaving the other to saunter along by itself. As a result our technical schools are not nearly so well linked up with our industries as were the schools of Europe before the war. As a matter of fact, the technical departments in our federal land grant colleges and state universities might in many ways with profit to themselves emulate the endeavors of their agricultural brethren who, while getting a slower start, are now going forward at battle speed. Certain it is at any rate that there is far better co-operation between our agricultural industries and our agricultural schools than there is between our technical industries and our technical schools. But the blame for existing conditions does not all fall in one place. The schools tend to be conservative and, as they are largely supported from public funds, the industries have not felt free to bring to them their problems, despite the fact that the tax returns from the industries form a very important source of these same funds. Political conditions and the suspicion which the public tends to harbor against the industries are important factors in this lack of freedom. Nevertheless, greater co-operation between the industries and schools than now exists is highly desirable and the present national situation tends to increase rather than decrease that desirability.

As far as the electric railway industry is concerned, co-operation is possible along several lines. University extension courses might be organized for railway employees. Just at present such courses for trainmen and power-house employees might be of special value in promoting fuel conservation. Railway operating problems not of an emergency character might be made the subjects of graduate and undergraduate research work. To illustrate, such problems as the relation of fare increases and passenger traffic, effect of type of car on interchange time, rail corrugation, effect of flat wheels, and transmission line and equipment tests of a special nature all furnish possibilities along the research line. Some of the manufacturing industries have established industrial fellowships at several of the larger universities. Similar fellowships maintained under the supervision of some such body as the American Electric Railway Association might well be worth while to the railway industry.

Co-operation of the nature indicated above would be of undoubted value to all concerned. The industry, of course, would be interested in the final results and the securing of the results would tend to quicken both the students and faculties of the schools involved. Everybody knows that the railways have many problems common to the industry as a whole which are yet unsolved. If at present the universities do not have the equipment and other facilities necessary for their share of the work in solving these problems the need will be supplied provided the demand is sufficient. It is partly up to the railways to create the demand.

As most technical schools require a thesis or something equivalent in the way of research work as a prerequisite to graduation, there is no doubt considerable work of a more or less sporadic nature now being done along railway lines by the students and faculties of our technical schools. The results of such work, presented in a style suited to the reading of busy operating officials, should be of some value. Periodicals such as the ELECTRIC RAILWAY JOURNAL, which are widely read by railway men, would seem to be the most desirable vehicles for such presentations. An effort to secure the publication of data from such scattered sources would at least constitute a start along the line of better cooperation.

D. D. EWING,
Associate Professor of Electric Railway Engineering.

Labor Conditions on the Brooklyn Rapid Transit

ACCORDING to a report prepared by A. Maxwell, superintendent Brooklyn Rapid Transit Company, there were practically 50 per cent more appointments as conductors, motormen, guards and "miscellaneous" during 1917 than during 1916, while the number was practically double as compared with 1915. The respective numbers were 8292, 5775 and 4218. By aggressive advertising the company has been able to maintain a correspondingly large number of applications, but it has been necessary to reduce the requirements somewhat and to employ women. The respective numbers of applications for work during the three years mentioned were 34,169, 17,263 and 14,993.

The *B. R. T. Monthly* quotes Mr. Maxwell as saying that as a result of the short experience of the company with women in train service he is pleased to record *bona fide* successful results. Their functions to date have been limited to those of conductors, guards, car cleaners and porters, but their employment as "motormen" is still problematical. The women have proved uniformly courteous and attentive to duty, they get their fares with a minimum of trouble and inconvenience to the public, whom they seem to have "with them," and there is no doubt (the novelty of their inauguration having had full time to subside) that women have come to stay and will become a permanent institution. As to pay and seniority women employees of the company are treated on equal terms with their male colleagues.

The company has now an excused list of men on leave on account of military or naval service which includes 473 names.

AMERICAN ASSOCIATION NEWS

Connecticut Company Section Visits Meriden

ONE of the most successful meetings of the Connecticut Company section to date was that held at Meriden on Feb. 19. The program was of a patriotic and musical character. After opening the meeting, President W. P. Bristol turned it over to Robert P. Lee, superintendent Meriden division, who spoke briefly, and introduced successively Hon. H. G. King, Mayor of Meriden; Charles H. Tredenick, local fuel administrator; and Dr. E. C. Bradstreet of Meriden. All of these speakers referred to the untiring efforts of the management to maintain good service in the city. John J. Daly, a prominent local editor, read an original poem, "A Toast to the Flag." A number of musical selections were interspersed with the addresses.

Varied Program of the Chicago Section

VARIETY was the characteristic feature of the meeting of the Chicago Elevated Railroads company section on Feb. 20, which was attended by about 100 members and guests. The January meeting had been abandoned on account of weather conditions.

After the singing of "America" a motion picture on accident prevention, entitled "The Reason Why," furnished by the National Safety Council, was shown. G. T. Seely followed with an explanation of the objects and accomplishments of the Electric Railway War Board. Next came a film furnished by the Ford Motor Company on "Training Officers for the National Army," and also one on "The Eleventh Regiment, I. N. G., on Its Return from Springfield."

Some stories and recitations were followed by brief talks by H. A. Johnson and coasting instructors from two of the divisions on the successful results of the use of coasting clocks. Finally, the members were entertained by a demonstration of sleight-of-hand, and the meeting adjourned in a patriotic finale with the singing of "The Star Spangled Banner."

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has placed placards in its cars requesting passengers to move up to the front of the car and save delays at crossings.

Recent Happenings in Great Britain

Tramway Workers Ask £1 a Week Bonus—War Causes Operating Problems—Interchange of Electrical Supply Considered

(From Our Regular Correspondent)

An application for an increase of war wages of £1 a week on pre-war rates has been made on behalf of all the tramway men and tramway women workers throughout England and is now under consideration. Nearly 100 municipal and private tramway authorities are concerned, and something like 35,000 workers. The advances already granted range from 8s. to £1 a week on pre-war rates, and by the new application it is hoped by the workers to secure a uniform bonus amounting to £1 a week.

The employees of the Keighley Corporation Tramway recently asked through their union, the Amalgamated Society of Tramway & Vehicle Workers, that the advance of 15s. a week over pre-war rates granted in November last to men more than twenty-one years of age should be extended to women and youths; that Sunday labor should be paid at the rate of time and a half and all overtime paid at the rate of time and a quarter, such Sunday and overtime rates to apply to all the traffic staff. The application was refused, and the matter was referred to the committee on production, which has announced its award. Boys and youths under twenty-one are granted an advance of 7s. 6d. a week above pre-war rates, beginning on the first full payday in January, payable at the rate of 1s. 3d. a day or shift worked. No order is made with respect to the women, having regard to the statutory rules and orders made by the Minister of Munitions in accordance with the munitions of war (amendment) act, 1916. The committee concludes that the claim for time and a half for Sunday labor and time and a quarter for all overtime has not been established by the employees.

MUNICIPAL PURCHASE

The London United Tramways has deposited a Parliamentary bill which states that the undertaking is purchaseable compulsorily by the local authorities at different dates, the earliest of which is 1924. Owing to the financial difficulties of the company it is proposed to postpone the dates for purchase until 1960 or after and to repeal the whole of the enactments and agreements which compel the company to make annual payments amounting to about £4,000 a year to the local authorities for the use of the roads. The bill also purposes from the expiration of six months after the war to increase fares to 1d. a mile for ordinary passengers and a halfpenny a mile during the hours for workmen's cars. Provision is also made to enable the company, if it thinks fit, to take up and abandon certain of its lines in Kingston and part of its light railways in Uxbridge, Hayes, Southall, Norwood and Hillingdon.

War-time difficulties are responsible for several decisions which have been arrived at by the Leeds Corporation tramways committee. In the first place, in order to overcome the congestion of traffic in the center of the city, it is suggested that steps should be taken to rearrange stopping places, with a view to eliminating those which are unnecessary. As it is impossible to obtain new rails, the committee has decided to revise the tram service in order to set free sections of line which do not have to bear very heavy traffic. It is the intention of the committee to take up a single line of rails in each section in the first place, and utilize it for repairs elsewhere. Should it be necessary the other set of rails will be removed later. The committee has arrived at this decision with reluctance, but repairs are so urgently needed on some parts of the service that it feels there is no alternative. The scheme for carrying parcels on the trams, and thus relieving the transport difficulty to some extent, has been advanced a stage further, and it is hoped to begin such operation shortly. Tradesmen in the city have agreed to utilize the trams for the dispatch of parcels, and arrangements are being made to establish receiving stations in the outskirts of the city.

CARRYING WOUNDED SOLDIERS

Complaints were made recently by Birmingham residents that in districts where hospitals for wounded soldiers are situated civilians occasionally have to wait for a long while because the cars are filled with wounded soldiers. It was suggested that during the rush hours each day special cars might be run for the soldiers. The general manager of the tramways has replied that this is not possible, owing to the shortage of labor and materials. There has been a very heavy increase in traffic and there is a reduced number of cars. The tramways committee asked the hospital authorities to instruct the soldiers not to get on cars more than six at one time, but this has not been observed by the soldiers. In reference to a complaint respecting the removal of the covered tops of cars, the general manager stated that there was no system in vogue in the department for the taking away of any of the tops of cars. Certain tops had been removed because they were unstable and the proper material could not be obtained to put them right. In referring to the condition of the tramway track, the general manager said that the committee was faced by the shortage of materials and labor. The war conditions were such that the public had to be satisfied. The committee had not the same quantity of labor as before the war, and what it now had was not the equal in quality. Most of the present employees were men unfit for service in the armed forces or else not acceptable on account of their age.

Negotiations have been completed between Sheffield and Rotherham for linking up the two centers by an interchange of electric supply. The expenditure involved is approximately £1,000,000. The terms provide that the cost of the cables and transformers, together with the metering arrangements estimated at £50,000, be apportioned equally between the two corporations. The cost of maintenance is to be apportioned equally and the supply is to be available for use by either corporation at such times and to such extent as may be agreed upon by the respective engineers. It is proposed to ask the government department concerned for a free grant of a portion of the cost of the linking-up arrangements. The Sheffield Corporation has been authorized to borrow £602,532 for the erection of a new electric power station at Blackburn Meadows.

ELECTRICAL EXTENSION

It was reported at a recent meeting of the Leeds City Council that the Ministry of Munitions, in sanctioning the purchase of a 6,000-kw. turbo-alternator by the electricity committee, recommended the consideration of a linking-up scheme between the Leeds and the Bradford electricity works. The manager of the Leeds undertaking is in communication with the city electrical engineer of Bradford on the subject. The refusal of permission for the carrying out of the main scheme for the extension of the Leeds generating station is in accordance with the Ministry's rule not to allow general developments except in connection with war work. The development was planned before the outbreak of the war. It is expected to cost upwards of £500,000. The work for which sanction is withheld for the present is the extension of the engine and boiler houses and the purchase of a 12,000-kw. turbo-generator at a cost of £300,000. The work with which the corporation will now proceed is the removal of two old engines with a capacity of 1400 kw. each and the installation of a 6000-kw. plant at an estimated cost of £35,000.

EDINBURGH RECEIPTS GAIN

The report of the Edinburgh & District Tramways for the year ended Dec. 31, 1917, states that the agreement between the corporation and the company for the purchase of the company's cars and plant at the expiry of the lease in 1919 has now been signed and sealed on behalf of the parties concerned. The revenue account shows that the total receipts were £375,987, an increase of £58,118 compared with the previous year. The total expenditure was £341,769, an increase of £13,299 over the previous year. The balance carried to net revenue account is £34,218, and after deducting the debit balance from previous year of £19,894, there is left a net credit balance of £14,324.

A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Labor Program Announced

Plan Outlined Is Designed to Secure Quick Action on Labor Troubles and Prevent Strikes

Secretary of Labor Wilson has asked Congress for appropriations of $2,041,811 to put into operation a program of war labor administration worked out by the Council of National Defense and urged by President Wilson. The plans are designed to get quick action on labor troubles and stop them before strikes occur. For the fiscal year ending June 30 next $485,451 is asked. The remainder is for the fiscal year 1919.

The program as set forth by the Secretary is:

A means of furnishing an adequate and stable supply of labor to war industries. This includes a system of labor exchanges, administration of training of workers, an agency for determining priorities of labor demands and agencies for dilution of skilled labor as and when needed.

Machinery which will provide for the immediate and equitable adjustment of disputes in accordance with principles to be agreed upon between labor and capital and without stoppage of work. Such machinery would deal with demands concerning wages, hours, shop conditions, etc.

Machinery for safeguarding conditions of labor in the production of war essentials. This to include industrial hygiene, safety, and also woman and child labor.

Machinery for safeguarding conditions of labor, including housing and transportation.

A fact-gathering body to assemble and present data collected through governmental agencies or independent research, to furnish information necessary for effective executive action.

Public and educational division to develop sound public sentiment, secure an exchange of information between departments of the labor administration and also promote industrial plants locally.

The personnel of the joint conference of employers and union leaders who will lay down a basis of relations between capital and labor during the war was published in the ELECTRIC RAILWAY JOURNAL for Feb. 23, page 381.

Hostile Attitude Assumed

The City Council of Buffalo, N. Y., has voted to accept the recommendation of the municipal traffic commission appointed by the Mayor to start an action in the Supreme Court of Erie County to abrogate the franchise of the International Railway. The city law department is now studying the necessary procedure and the Attorney General of the State has also been asked for an opinion on the course of action that would be necessary.

The Council is allowing jitney buses to run through the city streets in violation of the law. The National League for Women's Service is operating a fleet of almost fifty jitney buses on west side streets. No fares are collected, but every passenger is asked to donate something to the league.

MAYOR FAVORS JITNEYS

When he appeared before the war department at Washington, Mayor George S. Buck painted a picture of munition plants being forced to close down because of lack of adequate transportation and said that the only solution of the problem was the operation of large fleets of jitney buses under public ownership or by a private corporation.

In replying to an inquiry from the Council of National Defense asking for his opinion of the skip-stop plan, which is in operation on local lines of the International Railway, Mayor Buck replied: "A bad situation can be made no worse by the skip stop."

Park Street Station Overcrowded

Downtown Subway Loop Suggested by Boston Transit Commission to Relieve Boston Congestion

The Boston Transit Commission has sent to the Legislature of Massachusetts a new plan regarding transportation facilities in Greater Boston designed to relieve congestion in the Tremont Street Subway, with special emphasis upon conditions at Park Street station.

Referring briefly to the legislative act which provided for the enlargement of the Park Street Terminal, now accomplished, the commission points out that no further enlargement of platform areas is expedient, and that the present congestion of traffic during rush hours is intolerable, due to the use of the station by too many passengers boarding cars at this point.

The only remedy, it is stated, is the distribution of traffic over a number of stations. A downtown loop is recommended, with several stations in the business district, instead of the former scheme of continuing the Boylston Street Subway to Post Office Square. The commission does not recommend a route at this time or discuss the financing of the proposed construction. Unless further extended its term of office will expire on June 30.

M. O. Experience in Lincoln

City of 10,000 Population Reports Success with Short Road Previously Abandoned

The service on the electric railway at Lincoln, Ill., taken over by the city last summer, has been greatly improved and the patronage has been good. According to H. C. Mathein, Jr., the city clerk, a profit has been shown each month under the method of accounting prescribed by the Interstate Commerce Commission. There is still a balance in the bond fund and a considerable balance in the operating fund. The property consists of about 8 miles of road serving 10,000 people.

The election at which the matter of municipal ownership for Lincoln was decided was held on June 19, 1917. The electors decided the question by a vote of ten to one and authorized a bond issue of $30,000 for the purchase of the line.

VARIED PRIVATE CAREER

During its twenty-five years' existence the local railway had a varied career and changed hands many times. It was ever confronted with the problem of paving its right-of-way and for that reason its several owners contended that it was a losing proposition. The last owner had a heating franchise, but allowed his contracts for heating public buildings to lapse and in the winter of 1916 he shut down the plant, discontinuing both heating and railway service. Many attempts were made to sell the plant and railway, but no buyer could be found. After the property had been idle several months, the Lincoln Commercial Club, the merchants of the city and the city officials, after a concerted effort and campaign, convinced the people that municipal ownership was the only means of keeping the railway in operation.

The sum of $11,500 was paid for the plant, equipment and rolling stock, much of which was little more than junk, and $1,650 was paid the owners of the extension line for their track to the cemeteries and to Chautauqua Park.

HOW THE ROAD IS RUN

The Mayor has assumed control of the management and operation of the system, and the auditing, accounting, etc., is done by the city clerk. Three used cars, in very good condition, were purchased, and the plant and tracks put in running condition. After about a month, it was found that the manufacture of power with the old machinery was very expensive and it was decided to dismantle and discontinue the operation of the plant. Power was purchased

Utility Efficiency Is Vital to Nation

President Wilson and Secretary McAdoo Express Conviction that All Steps Reasonably Possible Should Be Taken to Insure Maximum Efficiency

Within the last few days much encouragement has been given to public utilities by government authorities. No less a person than President Wilson has formally recognized the importance of utilities in connection with the national welfare and their needs in order to secure maximum efficiency.

The progress thus far made in securing a better understanding of utility problems has been well summarized by a committee composed of P. H. Gasden, E. K. Hall and H. H. Crowell. These men were appointed to represent the American Electric Railway Association, the National Electric Light Association, the American Gas Institute and the National Commercial Gas Association in bringing to the attention of Washington authorities the critical position of utilities under war conditions. The committee feels that the outlook is decidedly more encouraging than it was two months ago, for

"In the matter of rates, the President of the United States, the Secretary of the Treasury and the Comptroller of the Currency have officially recognized that it is in the public interest that public utilities be maintained at their maximum efficiency and their rates be adjusted to meet the increased costs of doing business.

"The national government through the capital issues committee has outlined a national policy seeking to discourage unnecessary employment of money, labor and materials during the period of the war.

"The war finance bill, now on its passage, makes provision for financing the maturing obligations of public utilities and provides a method for financing necessary extensions and enlargements."

EXPLAINING THE SITUATION

The four phases of the situation to be taken care of, as explained by the committee to the Treasury officials, are as follows:

1. Rates must be increased sufficiently to absorb the increased costs of producing the service.

2. The utilities must be relieved during the period of the war of all non-essential and unproductive requirements, such as paving, undergrounding of wires, duplication and unnecessary extension of service.

3. Some way must be found to enable the utilities to take care of obligations maturing while the war lasts.

4. Assistance must be provided to enable the companies to finance the unavoidable extensions of service made necessary by the nation's war program.

As a result of comments upon this situation by the Comptroller of the Currency, previously mentioned in these pages, and also as the result of additional memoranda and letters given by the committee to W. G. McAdoo, Secretary of the Treasury, the latter presented the matter to the attention of President Wilson in a letter dated Feb. 15. He enclosed the data submitted to the Treasury Department.

SECRETARY MCADOO'S LETTER

In commenting upon the inclosures Mr. McAdoo said:

"These papers indicate the existence of genuine apprehension regarding the adequacy, under present conditions, of the services and rates of local public utilities. The view is expressed that increased wages and the high cost of essential materials and supplies have affected them as they have affected everybody else, and that united effort will be necessary in order to meet alike the public requirements for service and the corporate financial needs upon which that service depends.

"As Secretary of the Treasury, I must take official notice of these matters. It is obvious that every part of our industrial and economic life should be maintained at its maximum strength in order that each may contribute in the fullest measure to the vigorous prosecution of the war. Our local public utilities must not be permitted to become weakened. The transportation of workers to and from our vital industries and the health and comfort of our citizens in their homes are dependent upon them, and the necessary power to drive many of our war industries and many other industries essential to the war is produced by them.

"It may be that here and there, because of the prominence given to less important interests immediately at hand, state and local authorities do not always appreciate the close connection between the soundness and efficiency of these local utilities and the national strength and vigor, and do not resort with sufficient promptness to the call for remedial measures. In such cases I am confident that all such state and local authorities will respond promptly to the national needs when the matter is fairly and properly brought before them.

"Our public service utilities are closely connected with and are an essential part of our preparations for and successful prosecution of the war, and the unfavorable tendencies which the accompanying papers reveal may most effectively be checked, wherever they may be found to exist, and the needed relief obtained only by prompt action on the part of the respective local authorities.

"I earnestly hope that you may feel justified in expressing the conviction that the vital part which the public utilities companies represent in the life and war-making energy of the nation ought to receive fair and just recognition by state and local authorities."

PRESIDENT WILSON'S REPLY

On Feb. 19 President Wilson sent to Mr. McAdoo the following answer, expressing the nation's interest in the proper solution of the utility problem:

"I have examined with care the memoranda and letters which you transmitted to me with your letter of the fifteenth. I fully share the views you express regarding the importance of the public service utilities as a part of our national equipment, especially in war time. It is essential that these utilities should be maintained at their maximum efficiency and that everything reasonably possible should be done with that end in view. I hope that state and local authorities, where they have not already done so, will, when the facts are properly laid before them, respond promptly to the necessities of the situation.

"I shall be glad to have you communicate with the local authorities whenever the information in your possession suggests that such a course is desirable and in the national interest."

UTILITY ASSOCIATIONS TO HELP

The committee has prepared two circulars, one containing its report on the situation and the other the statements by the Comptroller of the Currency, the Secretary of the Treasury and the President. These, it is said, should be distributed generally by the national utility associations among company officers and employees.

The committee recommends that the associations take steps to present this general matter to the commissions in the different states as a national question, entirely dissociated from any concrete local rate question. Until then it suggests that the associations urge their members not to submit formally to the commissions the President's and the other letters, except when immediately necessary in pending cases.

The committee also directs attention to the fact that the authorities in Washington are already overburdened with tremendous and overwhelming responsibilities, and it suggests that under the circumstances members should appeal to Washington only in cases of imperative necessity, and then only after consulting with the secretary of their own association.

(*Concluded from page* 426.)

from the Illinois Traction System for a period of about two and one-half months when a contract was entered into with the Lincoln Water & Light Company, a privately-owned local corporation, for power for a period of ten years at a much lower rate than it could be generated by the city itself or purchased by it elsewhere.

H. & M. Under U. S. Control

W. G. McAdoo, director general of the railroads, issued a formal statement on Feb. 22 explaining why the government had taken over the Hudson & Manhattan Railroad with the steam railroads. The transfer, it seems, was only part of the general scheme, as the Hudson tubes are considered a terminal property, specifically included within the President's proclamation.

Skip-Stop Order Possible

Dr. Garfield Regards It With Favor as Means for Economizing on Fuel Consumption

Dr. H. A. Garfield, Federal Fuel Administrator, expects to reach a decision shortly as to the proposed skip-stop order for the electric railways of the country. Under the proposed order, if carried out, he informed the Washington correspondent of the ELECTRIC RAILWAY JOURNAL this week, Dr. Garfield is convinced a considerable saving in coal will be effected.

"We have had the proposed order under consideration for some time now," Dr. Garfield said; "and it would have been put into effect before this if it were not for the fact that it will undoubtedly cause great criticism, based on misunderstanding, and, perhaps, inconvenience, to the people in large communities such as New York and Chicago, where there is much density of electric railway traffic. In smaller communities, where there is not such a great volume of traffic, there would not be such criticism and such inconvenience."

Dr. Garfield's attention was called to the fact that the people of Washington have made no complaint and have in fact welcomed changes involving skip stops, in certain sections of the capital, just put into effect, although Washington now has a volume of traffic, because of the war, considerably greater than it has ever been.

He said he was glad to know it and remarked that a readjustment of traffic conditions as to stops might be a worthy thing in many cities of the country.

"I was living in Cleveland some years ago," Dr. Garfield said, "when a skip-stop system was put into effect there, as one of the early experiments along that line, and it worked well, according to my observation. I shall have a conference with my associates, as soon as some of them who are now out of town have returned, and I will then decide as to what is to be done in this matter. There is no question in my mind that a tremendous saving in coal could be effected by such an order, and I am informed that the electric railway companies would welcome the order."

It is possible, it is believed in Washington, that a national skip-stop order may be put into effect with several exceptions or modifications in very large cities where there is very dense electric railway traffic.

Short Industrial Line to Be Electrified

The Board of Public Improvements, St. Louis, Mo., on Feb. 19, granted a permit for the electrification in part of the Manufacturers' Railway.

At the offices of the company it was said the change would involve putting two electric locomotives in service in the central portion of the company's yards between the river and Thirteenth Street and Arsenal and Dorcus Streets in the neighborhood of the Anheuser-Busch Brewery, which controls the railway.

The construction of the new Bevo plant, at Broadway and Pestalozzi Street, is such that it will be necessary to run loading trains into the building. Because of the smoke made by steam locomotives it was decided to substitute electrical equipment. On the remainder of the company's terminal system steam will be used. Current will be furnished from the Keokuk dam.

Men Explain Car Situation

Invite Council and Public to Inspect Shops and Carhouse at Youngstown

The International Brotherhood of Electrical Workers Local No. 694, composed of employees of the carhouses and shops of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, recently published and paid for the following advertisement addressed to the public:

"This organization consists of the employees of the car shops and carhouses of the Mahoning & Shenango Railway & Light Company, and comprises some 200 men of all trades.

"We wish to state that on account of the continual snows and protracted cold weather for the last six weeks there have been more disabled cars in the shops and carhouses of the company than in any similar period in our knowledge and that we have been working day and night as long as our strength could stand, in the effort to keep the cars in condition to operate.

"We wish further to state that the company has to our knowledge spared neither time nor money to keep the cars moving, and we pledge our wholehearted co-operation in restoring normal conditions as soon as possible.

"We cordially invite any member of the Youngstown City Council or any interested citizens to visit our shops at Haselton so that they may see that these statements are entirely true and correct."

Wage Increase in Dallas

Savings on Accidents Will Be Shared With Its Men by Dallas Railway

Employees of the Dallas (Tex.) Railway have been granted an increase in wages amounting to 2 cents an hour. At the same time announcement was made of a profit-sharing plan by which employees who by vigilance are able to reduce the number of accidents may increase their earnings and share in the distribution of $60,750, this amount being three-fourths of the annual appropriation of 4½ per cent of the company's gross receipts set aside for accidents as provided in the service-at-cost franchise. The new scale of wages is as follows: First six months, 27 cents an hour; second six months, 28 cents; two years' service, 29 cents; three years' service, 30 cents; four years' service, 31 cents; five years' service or longer, 32 cents an hour.

Government Takes a Hand

Action in Washington, D. C., Telephone Rate Case Opens Question of Control—May Involve Other Utilities

Postmaster-General Burleson, through Washington city post-office officials, has offered to the Public Utilities Commission of the District of Columbia the opportunity to take over the control and the operation of the Chesapeake & Potomac Telephone Company in and around Washington for the period of the war, agreeing, if the offer is accepted, to maintain present standards of pay to telephone employees and guarantee to investors the present rate of return on their holdings. It is believed in Washington that the Public Utilities Commission has no power to accept such an offer, although it is understood that the President could issue an executive order making it possible for the commission to accept such an offer if he deemed it wise to do so. The offer has grown out of the application of the company, long pending, for permission to increase rates owing to increased expenses.

The Washington situation as to public utilities is of special interest because of the power which Congress has given various government departments to act as their exigencies seem to require in regard to public utilities. The Navy Department obtained from Congress some time ago legislation which gave it absolute power to enforce additional electric railway facilities at plants making naval munitions of war; the Shipping Board is now obtaining in legislation just about to pass Congress power to buy electric railway cars under an appropriation for "housing," transportation to and from homes and shipbuilding plants being considered to be part of the housing problem; and other departments are seeking to obtain similar legislation.

Secretary McAdoo of the Treasury Department is quoted as having said in private conversation within the last few days that he does not believe that the government has the right, under either the Presidential proclamation or the pending railroad bill, to take control of the electric railways of the country, but that the people of the United States are now prepared for government control and operation and that he means to open that subject soon. It may be that the plan of the Postmaster-General to bring the Washington telephone system under government control will open up the whole question of municipal ownership of public utilities in Washington.

M. O. Conference in New York

Mayors and other officials of cities in New York State will meet on March 6 at Newburgh in annual conference. It is said that one of the matters they will consider is the subject of State-wide indorsement of the municipal ownership movement. The conference has been called by Mayor Burns of Troy. Opinion among city officials is said to favor a permissive municipal ownership bill with provision for referendum.

Wage Demands Presented

St. Louis Union Submits Terms Practically the Same as Those That Caused Strike—City Says Commission Cannot Raise Fare

The organized employees of the United Railways, St. Louis, Mo., on Feb. 19 presented to the company in contract form their demands for wages, hours and improved working conditions.

The employees ask for a wage of 40 and 45 cents an hour, an increase of 54 per cent, for conductors and motormen; an eight-hour day, and time and a half for overtime. These are the same demands, as to hours and wages, as those before the recent strike, the settlement of which was noted in the ELECTRIC RAILWAY JOURNAL of Feb. 16, page 323. General improvement in working conditions is asked for, and grievances that cannot be settled otherwise shall be arbitrated.

A virtual "closed shop" is provided for in a section which says that the company also shall suspend an employee who has been suspended by the union and shall not reinstate him until the union raises the suspension.

The new contract is intended to supplant the strike settlement agreement made on Feb. 8 and will continue in force for one year. All its provisions date back as of Feb. 1, the day preceding the strike.

The present wage of motormen and conductors is 26 cents an hour the first year and a rising scale of 1 cent an hour each year for four years, and one-half cent an hour for four years to reach a maximum wage of 32 cents an hour. Extra men are guaranteed $60 a month.

A time limit is fixed within which the company is to answer the demands. In the event that they are not granted an arbitration committee will be formed.

COMPANY WANTS ORDINANCE AMENDED

T. M. Pierce and Charles A. Houts, attorneys for the United Railways, appeared before the Public Service Board on Feb. 19 to request a reduction of the tax on gross income from 3 to 2 per cent in the franchise ordinance now in the hands of the board.

The avowed purpose in seeking the reduction is to help raise funds to meet the demands of the employees for increased wages. According to a statement made by Richard McCulloch, president of the company, the increase sought would impose an additional expense of $1,400,000 on the company, while working conditions also demanded by the men would impose a further expense of $700,000, making an annual increase of $2,100,000. The reduction of the tax would save the company about $120,000 a year.

The attorneys also requested the extension of the time limit for acceptance of the ordinance by the company from nine months after its passage, as the ordinance provides, to within six months after the close of the war. They based this request upon the claim that it will be impractical, uneconomical and unpatriotic to float a bond issue for reorganization during the war. The requests of the company were taken under consideration.

The Missouri Public Service Commission decided on Feb. 21 that the question of its jurisdiction in considering the appeal of the United Railways for right to increase fares must be settled before a hearing on the company's plea is given.

CITY FIGHTS FARE INCREASE

The decision followed the objections raised by City Counselor Daues and attorneys for the company and for the city were instructed to file their briefs in Jefferson City by Feb. 25. The legal questions as to jurisdiction will be considered until March 4, when testimony will be presented, if the commission believes it has the right to alter the company's rates.

It is Mr. Daues' contention that a constitutional provision exists in Missouri which vests in local authorities plenary power to give or withhold consent to operate electric railways; that such powers carry the right to impose conditions, and that such conditions, when accepted by the company, are binding and beyond interference by any legislative commission.

Mr. Daues is reported to have said that if the commission decides it has power to increase the 5-cent rate fixed in the present franchises of the United Railways, he will ask the commission to make a new valuation of the property. The State commission, it is said, never has made or ratified a valuation of the United Railways, but has authority to do so.

Critical Labor Situation in Boston

Unofficial Introduction of Accident-Negligence Bill Precipitates Unrest—Two-Cent Increase Granted Despite Existing Agreement

A threatened strike of union employees of the Boston (Mass.) Elevated Railway has been averted by a wage increase of 2 cents an hour, despite the existing agreement effective until May 1, 1919. A strike was set for midnight on Monday, Feb. 25, but after extended conferences a mass meeting voted to postpone the strike for seventy-two hours.

After a conference lasting almost all of Wednesday, between company and union leaders and H. B. Endicott, executive manager of the Public Safety Committee, the latter recommended an increased wage of 2 cents an hour effective March 1. This was accepted for the company by its officers, and the union officials agreed to recommend acceptance by the men at a mass meeting called for Thursday night. At this meeting the men voted to accept the increase.

Mayor Peters of Boston, the Board of the Massachusetts Public Service Commission, the State Board of Conciliation and Arbitration, Governor McCall of Massachusetts, F. P. Colpoys (a federal mediator) and Secretary of Labor Wilson all sent communications urging that a strike be avoided in the interests of patriotism until all other means had been exhausted.

The unrest among the employees seems to have arisen in this way: On Feb. 14 a bill was introduced into the Massachusetts Legislature by Russell A. Sears, general attorney of the company, to place the burden of accident payments upon car-service employees who might be the cause of such accidents through negligence or carelessness Mr. Sears, who is a director in the Liberty Mutual Insurance Company (the State insurance company organized at the time the Massachusetts workingmen's compensation law was enacted), introduced this bill solely upon his own responsibility, without the company's knowledge.

Mr. Sears is deeply interested in the study of industrial accidents and their prevention, and for a long time he has been trying to create a legal stimulus to reduce industrial and other accidents. During many years of able service at the head of the company's legal department, he was not unaccustomed to introduce upon his own responsibility bills which he deemed meritorious.

The bill was seized by the union representatives as a bone of contention, and a concerted active effort was at once developed to secure a wage increase upon the pretext that the company had violated the agreement. It was asserted also that the burdens of the men had been increased and that higher wages should be granted to cover the increased cost of living since the United States entered the war. A vote to strike on Monday night was passed almost unanimously by 7000 employees on Feb. 21.

Before the Feb. 21 meeting was held, a statement emphasizing the call of the strike meeting and attacking the company over the names of the local union officials was published in the Boston dailies.

A letter was then addressed by President Brush to the union officials on the day of the scheduled meeting. This communication reviewed the relations between the company and the union officials under the agreement and outlined the various conferences held with regard to the possibility of some modification of wages, notwithstanding the agreement, through change in outside hours. The firm adherence of the company to the arbitration of all disputed matters was set forth.

To this letter the union replied on Feb. 22, claiming that its members are suffering hardships due to war prices, that many companies outside Massachusetts have voluntarily increased wages despite agreements, and that legislative relief for the company's revenue situation is problematical. On the same day the company replied in full. In this communication President Brush again reviewed the frankness of the relations between the union and the company until the taking of the strike vote. He informed the union that the company would not support the bill which Mr. Sears had filed and that Mr. Sears himself had appeared before the committee on joint judiciary, stated that the measure was his own personal idea and asked for permission to withdraw it. The letter made a strong patriotic appeal to the men to refrain from striking.

On Feb. 25 the Public Service Commission sent to the union leaders a letter reading in part as follows:

"The commission has viewed with grave concern the possibility of a strike by the employees of the Boston Elevated Railway. The results of a tie-up of local transportation in the metropolitan district would be a serious catastrophe in time of peace, but at the present juncture the interruption of war work at the Charlestown Navy Yard, the Watertown Arsenal, the Fore River Shipbuilding Company, the Victory Plant at Squantum and a large number of private plants engaged in war work would be a national calamity. We believe that public sentiment would not approve any interruption of service, especially under present conditions, until every reasonable and honorable effort has been made by both parties to reach a peaceful adjustment of the present controversy."

Strikers Disregard Federal Recommendation

Twin City Ex-Employees Demand That They Be Taken Back in a Body, But Company Refuses

Foster Hannaford, general manager Twin City Rapid Transit Company, Minneapolis, Minn., conferred on Feb. 20 with a delegation of former employees, who presented a demand that the several hundred strikers be taken back in a body. The demand was rejected.

The demand of the men arose from their peculiar interpretation of the findings of President Wilson's mediation commission. This body, as stated in the issue of Feb. 23, recommended that the former employees should offer themselves for reinstatement as rapidly as vacancies occurred. The delegation, according to a statement given out by Mr. Hannaford after the conference, insisted that the ex-employees should be taken back in a body at once and reinstated in their old positions and with the old standings. Mr. Hannaford stated, however, that since the men had left the employment of the company, the company had been forced to hire a number of men. The new men had entered the employ of the company in good faith, and the company could not fairly and honestly now discharge them to make vacancies for the strikers who were now out of employment. Mr. Hannaford also said that a number of the ex-employees had already applied for work and were now in the company's service.

News Notes

Philadelphia Lease Now Before P.S.C.—At a meeting of the directors of the Philadelphia (Pa.) Rapid Transit Company on Feb. 18, the new rapid transit lease between the company and the city was ratified, and the document was signed by President Mitten and Mayor Smith. The lease has now been sent to Harrisburg for the final approval, that of the Public Service Commission.

Toledo Came Through Safely.—Although the Water Street power station of the Toledo Railways & Light Company, Toledo, Ohio, formed an island in a great flood that covered the low ground along the Maumee River for a week, operation was maintained almost at normal. As the water rose about the building the doors were walled up and the pumps kept the seepage below the level of the furnaces and machinery.

M. O. Bill Killed.—The bill to permit New York City to buy and operate public utilities has been killed following a statement by Senator Brown that "there is not enough money in treasury of New York City over and above debt limit to furnish cigarettes for the present administration during its four years in office." The legislature apparently was not willing that the city should experiment even with the Fifth Avenue Coach Company.

Commission Appointments Confirmed.—The Senate of New York has confirmed Governor Whitman's nomination of Thomas F. Fennell, Elmira, and Charles B. Hill, Buffalo, as members of the Public Service Commission for the Second District succeeding Commissioners Carr and Van Santvoord, respectively. Commissioner Fennell gets a two-year term and Commissioner Hill a five-year term. The chairman of the commission has not yet been designated by the Governor.

Freight by Day in New Jersey.—The Legislature of New Jersey has passed a bill introduced by Assemblyman James J. McAteer, Kearny, allowing electric railways operating in streets of municipalities to carry freight. The bill was passed after it had been proved that merchants and manufacturers had difficulty in receiving freight because of the congestion on the railroads. A similar bill was enacted in 1909, but this covered only the night operation of electric railways for freight purposes.

Trenton Indictments Argued.—Argument was concluded in the Supreme Court at Trenton, N. J., on Feb. 21 in the appeal of the officers and directors of the Trenton & Mercer County Traction Corporation from indictments found against them by the Mercer County Grand Jury at the instance of the City Commission for the illegal use of certain streets of the City of Trenton. The officials set up thirteen assignments why the indictments should be set aside, all of them based upon the drawing of the grand jury and the alleged lack of evidence submitted.

Increase in Wages in Des Moines.—The Des Moines (Iowa) City Railway has announced a wage increase effective on March 1. The increase affects only motormen and conductors who have been in the employ of the company for one year and less than two years. The new scale is 33 cents whereas these men are now receiving 29 cents an hour. It is estimated that the new scale will cost the railway an additional $1,000 a month. The increase is voluntary on the part of the company. Some time ago the union officials made an informal application for a general wage increase. They were advised that if the men would use their influence toward securing a rate advance their request would be granted if the rate increase was successful. This the men voted down.

New Use Suggested for Hudson Tunnels.—Governor Edge of New Jersey has written to William G. McAdoo. Federal Director-General of Railroads, suggesting the connection of the New Jersey Central, the Lehigh Valley and the Baltimore & Ohio Railroads with the Hudson & Manhattan Railroad, operating under the Hudson River, in order that thousands of New Jersey citizens living along these lines may have quicker and more convenient access to New York. In a reply on Feb. 24 Mr. McAdoo declared that the project might be feasible, now that the government had taken over the railroads. He thought that a surface connection between the terminal of the New Jersey Central and the old Pennsylvania Station in Jersey City might prove the solution. Mr. McAdoo said that the problem would be taken up as soon as other projects of a more vital nature were carried out.

Programs of Meetings

Arkansas Association of Public Utility Operators

There will be a meeting of the Arkansas Association of Public Utility Operators at Hot Springs, Ark., May 21-23. Headquarters will be at the Arlington Hotel.

Air Brake Association

The Air Brake Association will hold its annual convention May 7-10 at Cleveland, Ohio. Hotel Winton has been selected as convention headquarters. A more detailed program will be made public later, but it is announced that D. L. McBain, superintendent motive power of the New York Central Lines, and Walter V. Turner of the Westinghouse Air Brake Company will deliver addresses. The decision of the association to hold a convention was prompted by the belief that the safety features provided by the air-brake should be kept up to the highest notch in railroad transportation in war as well as peace times.

Financial and Corporate

Full Financing Data Required

Federal Reserve Board Committee Advises Applicants Desiring Approval for New Securities—Conference with Commissions

The capital issues committee of the Federal Reserve Board has prepared a "questionnaire" to be sent to all applicants desiring approval for new security issues. No prescribed form of application is to be required, but suggestions are made to guide applicants. All applications should be addressed to the committee, 718 Metropolitan Bank Building, Washington, D. C.

The committee suggests the following:

"If the purpose is to refund, pay or extend outstanding obligations, describe fully the character of the bonds, etc. If any war purposes are involved, reference should be made to the proper governmental authorities at Washington and elsewhere.

"If the issue is deemed necessary on account of any governmental requirement, national, state or municipal, or of any commission or public authority, describe the same in full. If the issue is deemed necessary for reasons of public health or welfare, or other public economic necessity, describe the same in full.

"In all cases full reason should be given why the proposed issues cannot be postponed until after the war or why the necessity is greater than the need of the national government in conserving the financial resources, materials and labor of the country for the war.

"It will be necessary to identify accurately the issues before a final opinion is expressed. The following information should be furnished:

EVIDENCES OF INDEBTEDNESS

1. Name, amount, date and dates of maturity and serial number of the proposed bonds, notes or other securities.
2. Amount of total authorized issue of which proposed issue is part.
3. Attested copies of votes, ordinances or resolutions authorizing proposed issue.
4. Attested copy of mortgage, deed of trust or similar instrument under which proposed issue is made or by which it is to be secured.
5. Last balance sheet if a corporation and copy of charter and by-laws if in print.

SHARES OF STOCK

1. Total capitalization of company.
2. Last balance sheet and copy of charter and by-laws if in print.
3. Total authorized issue of stock of which proposed issue is part.
4. Amount of proposed issue, method and dates of issue, whether by offer to shareholders, sale or public subscription.
5. Attested copies of votes authorizing proposed issues.

A conference was held on Feb. 28 between the capital issues committee and its advisory committee and representatives of the public service commissions of the whole United States. This conference was indeed of especial value and interest in view of the President's letter to Secretary McAdoo (noted elsewhere in this issue), inviting him actively to promote an earnest consideration on the part of these commissions of the bearing of the exercise of their functions upon the national interests at this time. The committee presented to the commissions in a favorable manner the utility briefs and the Presidential correspondence.

The capital issues committee is interested as to whether or not, and how, it may be possible for the commissions to use their influence in postponing at this time construction and development work, even if contracted for or even though stipulated in franchises, whenever such work is not absolutely and immediately necessary for either the public welfare or the successful prosecution of the war. It must be the committee's effort, it is said, to secure the sympathetic co-operation of the commissions to reduce, as far as may be practicable, any unnecessary use of credit, saving power, material and labor.

Toronto Net Drops

Increase in Gross Earnings for 1917 Is More Than Offset by Higher Operating Costs

While the gross earnings of the Toronto (Ont.) Railway for the calendar year 1917 showed an increase, the net earnings were adversely affected by the increase in wages and the material increases in the prices of supplies owing to the abnormal war conditions. The company's income statement for 1916 and 1917 is shown in the accompanying table.

INCOME STATEMENT OF TORONTO (ONT.) RAILWAY

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Gross earnings	$6,291,759	100.0	$5,973,161	100.0
Operating expenses	3,815,278	60.7	3,350,658	56.1
Net earnings	$2,476,481	39.3	$2,622,503	43.9
Interest on bonds	$146,888	2.3	$156,122	2.6
Percentage on earnings	970,512	15.4	909,881	15.2
Pavements, taxes	264,271	4.2	215,707	3.6
Total	$1,381,671	21.9	$1,281,710	21.4
Surplus earnings	$1,094,810	17.4	$1,340,793	22.5

The passenger earnings in the last year showed an increase of $321,057 or 5.4 per cent, the totals being $5,881,505 for 1916 and $6,202,562 for 1917. The gross earnings gained $318,598 or 5.3 per cent. The operating expenses, however, rose $464,629 or 13.08 per cent. As a result the net earnings declined $146,022 or 5.5 per cent. The operating ratio was 61.5 per cent in 1917 as compared to 57 per cent in 1916. The payments made to the city of Toronto amounted in the last year to $1,187,031, an increase of $74,021. The passengers carried totaled 158,087,984, an increase of 8,558,230; and transfers numbered 62,301,636, an increase of 958,873.

After paying four dividends of 2 per cent each and taking in the 1916 surplus, the surplus at the end of 1917 amounted to $5,543,683.

Federal Finance Bill Amended

Bill for War Finance Corporation Now Specifically Covers Utilities—Early Passage Expected—Government Aid Waiting

The war finance corporation bill, it is said, will probably become a law by the end of next week. This has been amended by the insertion of the words "public utilities" to show that they are to be included in the benefits of the law. The amendment to the bill reads as follows:

> Section D.: To make advances directly (1) to any corporation conducting (directly or through stock ownership) any railroad or other public utility; and (2) to any firm, corporation, or association conducting an established and going business whose operations are necessary or contributary to the prosecution of the war; provided that such advances shall be made only in such cases as the board of directors in their discretion shall determine to be of exceptional importance to the public interest. Such advances may be made for periods not exceeding five years from the passage of this act, upon such terms and upon such security and subject to such rules and regulations as may be prescribed from time to time by the board of directors of the corporation with the approval of the Secretary of the Treasury. The corporation shall have and retain power to require additional security from time to time.

It is pointed out in Washington that this amendment allows the public utility company to deal directly with the war finance corporation and obviates the doing of business with bankers. This is regarded as an advantage, in view of the war circumstances under which all other forms of industry in the whole country are operating.

It is not yet settled whether the officials of the War Board of the American Electric Railway Association are to appear before the House ways and means committee, as they did before the Senate finance committee, nor whether other public utility representatives will be heard. Secretary McAdoo, however, has appeared before the House committee in support of the public utilities, and it will apparently not be necessary for public utility men to repeat their case before the House committee, for no one has appeared there in opposition to them.

Contrary to reports in the newspapers, no government financing of public utilities that is worth mentioning is going on in Washington, and there is not likely to be any until the war finance corporation bill is passed. The exception is in the case of additional railway equipment which may be required in Philadelphia by the Shipping Board, under its appropriation for housing. This appropriation passed Congress Feb. 26 and will be signed by the President.

There have been reports in the newspapers that the Navy Department is financing the building of a short electric railway line at Norfolk. This is categorically denied at the Navy Department. Only the Navy Department has legislation which would permit the financing of public utilities, except that just passed for the Shipping Board.

Electric Railway Statistics

Comparison of Returns for November, 1917, With Those for 1916, Show Slump in Net Earnings

A comparison of electric railway statistics for the month of November, 1917, with figures for the corresponding month of 1916, made by the information bureau of the American Electric Railway Association, indicates that the expenses of electric railways in the United States are constantly increasing faster than the revenues.

Data for November, representing 7370 miles of line of companies scattered throughout the country, figured on the per mile of line basis, show an increase in operating revenues of 5.62 per cent, an increase in operating expenses of 14.30 per cent, and a decrease in net earnings of 9.17 per cent. Data representing approximately 75 per cent of this mileage indicate an increase in the amount of taxes paid of 9.84 per cent and a decrease in operating income of 16.60 per cent.

The returns from the city and interurban electric railway companies, as shown in detail in the accompanying table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups shown, returns for the Eastern, representing 4759 miles of line, indicate an increase in operating revenues of 4.14 per cent, an increase in operating expenses of 12.38 per cent and a decrease in net earnings of 10.33 per cent. Taxes paid by companies represented by approximately 70 per cent of this mileage increased 9.82 per cent, while the operating income of these companies decreased 20.51 per cent.

Returns for the Southern and Western groups show that both have been affected by the rising costs of operation. The operating income of the Southern groups decreased 0.41 per cent, while that of the Western decreased 15.01 per cent. Both groups show increases in the amount of taxes paid.

The operating ratio for the country as a whole has increased from 63.01 in 1916 to 68.19 in 1917. The operating ratio of the Eastern district has increased from 63.71 in 1916 to 68.75 in 1917. The operating ratios of the South and West have also risen.

Third Avenue Passes Income Bond Interest

The directors of the Third Avenue Railway, New York, N. Y., on Feb. 26 adopted a resolution passing the semi-annual interest due April 1 on the $22,536,000 of 5 per cent adjustment income bonds. The resolution stated that "there is no available surplus income of the period of six months ended Dec. 31, 1917, applicable to the payment of the interest." This statement was borne out by the income account, which showed a deficit of $69,014 after all charges. The directors also adopted a resolution deducting $494,386 from the company's income for the six months ended Dec. 31 to secure the proper, safe and adequate maintenance, equipment and operation of its railroad and other properties and to preserve its earning capacity. No part of the money is to be used for construction or the purchase of additional lines.

B. R. T. Defers Dividend Vote

Quarterly Dividend Was Earned, But Company Is Waiting Until Question of Maturing Note Issue Is Settled

The board of directors of the Brooklyn (N. Y.) Rapid Transit Company on Feb. 25 voted to defer for the present consideration of the April 1 dividend. It is customary to declare this dividend at the February meeting.

President Williams said that the net profits justified the usual dividend. It is felt, however, that pending the consummation of negotiations relative to the $57,735,000 of notes issued for rapid transit purposes and maturing on July 1 next, it would be wise not to take action on the current dividend.

The question of the maturity of the notes has been taken up with the federal authorities, and it is understood a decision has been reached that taking care of the notes is not incompatible with the interests of the government. A definite decision as to ways and means has not been reached. Officials of the company declined to comment on the probable issue of preferred stock for the purpose of providing for the maturity of the notes.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS IN NOVEMBER, 1917 AND 1916

Account	United States				Eastern District				Southern District				Western District			
	Amount, November, 1917	Per Mile of Line			Amount, November, 1917	Per Mile of Line			Amount, November, 1917	Per Mile of Line			Amount, November, 1917	Per Mile of Line		
		1917	1916	Increase Over 1916, per Cent		1917	1916	Increase Over 1916, per Cent		1917	1916	Increase Over 1916, per Cent		1917	1916	Increase Over 1916, per Cent
Operating revenues	$13,993,085	$1,899	$1,798	5.62	$8,986,304	$1,888	$1,813	4.14	$1,098,078	$1,293	$1,274	1.49	$3,908,703	$2,219	$2,002	10.84
Operating expenses	9,540,820	1,295	1,133	14.30	6,175,157	1,298	1,155	12.38	653,137	769	740	3.92	2,712,526	1,540	1,253	22.91
Net earnings	4,452,265	604	665	†9.17	2,811,147	590	658	†10.33	444,941	524	534	†1.87	1,196,177	679	749	†9.35
Operating ratio, per cent	1917, 68.19; 1916, 63.01				1917, 68.75; 1916, 63.71				1917, 59.47; 1916, 58.08				1917, 69.40; 1916, 62.59			
Av. No. of miles of line represented	1917, 7,370; 1916, 7,264				1917, 4,759; 1916, 4,726				1917, 849; 1916, 804				1917, 1,762; 1916, 1,734			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$10,377,261	$1,836	$1,734	5.88	$6,047,557	$1,713	$1,658	3.32	$779,462	$1,462	$1,354	7.98	$3,550,242	$2,233	$2,034	9.78
Operating expenses	7,318,454	1,295	1,124	15.21	4,392,618	1,245	1,112	11.96	451,976	848	756	12.17	2,473,860	1,556	1,274	22.14
Net earnings	3,058,807	541	610	†11.31	1,654,939	468	546	†14.29	327,486	614	598	2.68	1,076,382	677	760	†10.92
Taxes	755,849	134	122	9.84	435,512	123	112	9.82	71,509	134	116	15.52	248,738	156	147	6.12
Operating income	2,302,958	407	488	†16.60	1,219,427	345	434	†20.51	255,887	480	482	†0.41	827,644	521	613	†15.01
Operating ratio, per cent	1917, 70.53; 1916, 64.82				1917, 72.68; 1916, 67.07				1917, 58.00; 1916, 55.83				1917, 69.68; 1916, 62.63			
Av. No. of miles of line represented	1917, 5,652; 1916, 5,593				1917, 3,529; 1916, 3,496				1917, 533; 1916, 533				1917, 1,590; 1916, 15,64			

†Decrease.

Financial News Notes

Dividend Action Put Over.—Holders of the 5 per cent cumulative preferred stock of the British Columbia Electric Railway, Vancouver, B. C., will not receive their interim dividend as usual this year as the directors have decided to postpone consideration of it until the end of the financial year in June.

Protective Committee for Unsecured Notes.—Owing to the receivership of the Bay State Street Railway, Boston, Mass., the holders of unsecured notes have been asked to deposit the securities at once with the First National Bank, Boston. This applies to either serial debenture notes or notes given to banks and other institutions.

Oakland Plan Being Distributed.—Copies of the reorganization plan for the Oakland, Antioch & Eastern Railway, Oakland, Cal., are now being distributed to security holders with the request for prompt assent and deposit of holdings with the Union Trust Company of San Francisco. The plan was outlined in the ELECTRIC RAILWAY JOURNAL of Jan. 12.

R. T. Sullivan a Republic Director.—R. T. Sullivan, general manager of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been elected a director of the Republic Railway & Light Company, which controls the utility property at Youngstown. The membership of the board has been cut from twelve to nine.

Another Line to Be Sold.—Herbert Bucklen, South Bend, Ind., receiver for the St. Joseph Valley Railway, has received an order from the Circuit Court of St. Joseph County to advertise the road for sale on March 20 at Elkhart, Ind., to the highest bidder. The road will first be offered as a going concern. If not sold that way it will be offered in parcels. The ties, rails and rolling stock will even be junked if necessary.

Havana Bonds Listed.—The New York Stock Exchange has listed $455,000 of general mortgage 5 per cent sinking fund bonds, series A, of the Havana Electric Railway, Light & Power Company, Havana, Cuba. Moreover, authority is granted to add to the list on or before July 1, 1918, $763,000 of the bonds on official notice of sale. The total then listed will be $6,660,000.

Offering of Manhattan Second Fours.—Hambleton & Company, New York, are offering at 73 and interest to yield 5½ per cent, a block of second mortgage 4 per cent gold bonds of the Manhattan Railway, the elevated division of the Interborough Rapid Transit Company. The bonds are due in 2013. The total authorized is $5.409.000 and bonds aggregating $4,523,000 are outstanding.

Annual Meeting of Texas Line.—The annual meeting of the stockholders of the Texas Electric Railway, Dallas, Tex., was held on Jan. 29, at which annual reports of officers were submitted and officers and directors were elected. The net income of the company for 1917 amounted to $515,848; gross earnings from operation, $2,138,268; operating expenses, including taxes, $1,147,631; net earnings from operation, $990,636; interest on bonds, debentures and floating debt, $474,788. J. F. Strickland, president, reported that business is good.

Wants to Sell Long-Term Bonds.—The Tidewater Southern Railway, which operates a railroad from Stockton, Cal., to Merced and Turlock, has filed with the California Railroad Commission an application for authority to sell $500,000 first mortgage 5 per cent thirty-year gold bonds, at a price sufficient to yield the company 80 per cent of par. The company wants the money to complete its main line from Stockton to Turlock and Hilmar, to build a branch line from its main line at Small to Manteca, and to make an extension from Hilmar to Stevenson.

Fort Wayne Notes to Be Paid.—It is stated that payment of all amounts due will be made on March 4 at the Central Trust Company, New York, by George C. Holt, special master, to the holders of Fort Wayne & Northern Indiana Traction Company's 6 per cent five-year collateral gold notes, on the presentation for cancellation of notes, coupons or claims for interest. The sale of $1,941,000 of first and refunding 5 per cent bonds, pledged as security for $1,146,000 of the notes, was recently held in New York, as announced in the issue of Jan. 19.

Railway Wins Tax Case.—The city of Springfield, Ill., has lost its case against the Springfield Consolidated Railway for money claimed to be due under the pole tax ordinance. The Illinois Supreme Court has denied the motion of attorneys for the city to have the case reviewed on a petition for certiorari. The original suit was filed by the city in the Sangamon County Circuit Court in 1915, and judgment was entered for $1,720. The case was taken into the Appellate Court of the Third District, where the judgment of the trial court was reversed on the ground that the pole rental ordinance was not passed by the city until some time after the franchise was granted to the company.

Exchange of Bonds for Notes.—The Eastern Power & Light Corporation, New York City, N. Y., announces that for the 5 per cent five-year convertible gold bonds of the company aggregating $2,327,500, which fall due on March 1, it offers in exchange par for par 7 per cent collateral trust notes dated March 1, 1918, due on Sept. 1, 1918, $2.327,500 of these notes having been authorized by the directors. The notes are to be issued under a collateral trust indenture to the Equitable Trust Company, New York, trustee, and secured by an equal amount of the maturing bonds when deposited by the present bondholders in exchange for the proposed new notes. The notes will be redeemable at par and interest at any time on thirty days' published notice. The March 1, 1918, coupons of the maturing bonds will be paid in the usual way. Satisfactory extensions of bank loans have been effected. Owing to the large additions and extensions that have been made to take care of increased business, the company has borrowed more than $900,000 from banks. The company contemplated issuing and selling new securities to pay off both its bonds and bank loans.

Electric Railway Monthly Earnings

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$58,916	*$107,057	†$48.141	$14 877	†‡$33,695
1 "	"	'16	87,477	*57,445	30,032	27.550	‡2,618
12 "	"	'17	1,058,729	*1.011,991	46,738	317.907	†‡234,361
12 "	"	'16	999,886	*814,969	184,917	316,667	†‡129,480

CONNECTICUT COMPANY, NEW HAVEN, CONN.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$837,646	*$1,121.520	†$283.874	$109 900	†‡$371,427
1 "	"	'16	808.198	*682.285	125.913	103,218	‡45,262
12 "	"	'17	10,023.162	*8,415,514	1,607,648	1,208.720	‡619,848
12 "	"	'16	9,566,434	*6,976,986	2,589,448	1,182.555	‡1.678,488

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$24,376	*$43.287	†$18,911	$7.982	†‡$26.848
1 "	"	'16	25.295	*24.709	586	7 987	†‡7,366
12 "	"	'17	394,259	*358,141	36,118	95,801	†‡59.017
12 "	"	'16	357,815	*295.615	62,200	95,823	†‡33,082

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$498,252	*$479.060	$19,192	$122,381	$102,347
1 "	"	'16	481.638	*389,001	92,631	119,634	†‡26,107
12 "	"	'17	6,000,602	*5,174.253	826,349	1,454.681	†‡512,849
12 "	"	'16	5,811,996	*4,226,232	1,585,764	1,401,410	‡303,318

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$45,843	*$79 325	$†33,482	§$6,808	†‡$39.515
1 "	"	'16	49,155	*55,436	†6,281	§9,922	†‡14,900
12 "	"	'17	555.413	*587,926	†32.513	§86,315	†‡108.096
12 "	"	'16	564,653	*591,392	†26,739	§95.314	†‡75,104

WESTCHESTER STREET RAILROAD, WHITE PLAINS, N. Y.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$17.564	*$69.300	†$51,736	$2,653	†‡$54,357
1 "	"	'16	14,763	*16.249	†1,486	2.018	†‡3.480
12 "	"	'17	246,023	*326.073	†80,050	27,284	†‡106 988
12 "	"	'16	225,734	*242,393	†16,659	22,032	†‡38,378

*Includes taxes. †Deficit. ‡Includes non-operating income. §Excludes interest on bonds, charged income and paid by the New York, New Haven & Hartford Railroad under guarantee; also interest on notes held by the New York, New Haven & Hartford Railroad, not credited to income of that company.

Traffic and Transportation

New York Passenger Traffic

A Total of 1,900,000,000 Fares Were Collected in a Year—More Than 5,000,000 Fares a Day

The Public Service Commission for the First District of New York in its report to the Legislature says that the electric railway strikes of 1916 in New York City had a material effect upon traffic growth during the fiscal year 1916-1917, reducing to 353 the per capita number of rides taken upon all surface railroads and rapid transit lines from 356, the total for the year previous. In the aggregate this meant less travel than was expected, as the total increase for the year was about 20,000,000 passengers, against an increase of 91,000,000 for the fiscal year 1915-1916. The reduced increase is almost entirely due to the effect of the strike, in the opinion of experts, as in all probability, had there been no strike, the growth for the year would have equaled that for 1915-1916. The loss was the greatest where strike conditions were most severe.

PUBLIC PAYS $94,000,000 IN FARES

The number of passenger fares collected during the year 1916-1917 was 1,918,812,226 as against 1,898,735,615 in the year previous. The daily average of rides was 5,284,417, while the amount paid to the various companies for transportation was $94,547,916, an increase of $1,300,000 or about 1½ per cent. The payment for street railroad transportation during the year is equivalent to $17.19 per capita. Active passenger car-miles decreased 7,146,733 during 1916-1917 due undoubtedly to strike conditions. The thirty-six operating companies had a total trackage of 1839 miles and operated 12,583 cars, a substantial increase over the previous year.

BILLION MARK PASSED

Within the classification of street railroads are included elevated railroads and subways as well as street surface lines. Elevated railroads and subways had a total traffic for the year of 1,058,646,596, passing the billion mark for the first time, while the street surface railroads had 860,165,630. The elevated and subway lines showed an increase of 104,502,679, while there was a net decrease of traffic upon the surface lines of 84,426,068. The largest single increase was upon the lines of the first subway, operated by the Interborough Rapid Transit Company, where the traffic total was 414,193,992 or an increase of 42,688,674 over the preceding year. Next in importance are the figures of traffic on Interborough elevated lines, where a total of 349,380,093 and an increase of 37,133,297 are shown. Subway and elevated lines operated by the Brooklyn company carried a total of 226,515,512 passengers, an increase of 19,417,243. The effects of the street surface railroad strike in 1916-1917 were felt most seriously in Manhattan Borough where, with 349,788,114 passengers carried on the surface cars, there was a decrease of 77,585,733 from the previous year, which had shown an increase of nearly 12,000,000 over 1915-1916.

Would Anticipate Fare Move

Corporation Counsel of Seattle, Wash., Wants City to Appraise Value of Railway Property

Hugh M. Caldwell, corporation counsel, Seattle, Wash., has presented a bill to the City Council providing for the expenditure of from $50,000 to $100,000 to employ experts to make a valuation of the railway properties of the Puget Sound Traction, Light & Power Company. The request is made in anticipation of the company petitioning the State Public Service Commission for an order permitting an increase in the rate of fare from 5 cents to 6 cents. Officials of the company have not definitely stated that such an increase will be asked for, although the Public Service Commission in a recent order denying the company the right to employ women as conductors, announced that such a petition would receive consideration.

In transmitting a draft of the ordinance to the Council, Mr. Caldwell said in part:

"The public service commission law does not compel the company to submit its books and accounts to an investigation by the city, but only to an examination by the commission. The employment of experts by the city would, therefore, avail us nothing unless the company agreed to permit a thorough examination of its account by the city, and kept such agreement. The unprecedented action of the commission in the 4-cent ticket case of the company, in accepting the unsupported verbal statement of an official of the company that the property used in railway business was valued at $16,000,000, may be taken as an indication of what is to be expected of the commission in the event that the company applies for, or the commission desires to grant an increase in its rates beyond the 5-cent limit."

The Council has taken no action as yet on the ordinance.

E. F. Blaine, chairman of the Public Service Commission, has advised the City Council that the valuation of the railway property of the company, undertaken several years ago, and abandoned because of a lack of funds, is to be completed. Chairman Blaine states that while the company has made no application for an increase in fares, the commission expects that such application will be made.

Rerouting in New Orleans

Changes Made Conserve Coal, Eliminate Congestion and Permit More Even Headway

Rerouting of cars of the New Orleans Railways & Light Company to conserve coal, as a war measure, became effective in the city of New Orleans, La., on Dec. 23, 1917. Because of the granting of early competitive franchises, and the building of competitive lines, wasteful and unnecessary service has long been furnished. This caused excessive consumption of coal and created congestion and delay.

New Orleans is peculiar in that it has four live operating tracks through the main street for a distance of approximately 1 mile, in addition to four long sidings, or stand tracks, used for lay-over purposes, together with loops.

It was the practice, prior to the rerouting, for practically all of the lines to use Canal Street for a considerable distance beyond the center of the city to a point known as Liberty Place, near the river. A considerable portion of this journey was made with very few passengers. Traffic checks indicate that approximately sixty-five seats were furnished to each passenger hauled. The congestion and delay occasioned by reason of this unnecessary service was tremendous.

After a careful study, it was found feasible to remove a number of lines from the Canal Street loop by reason of entering Canal by use of the outside track in the direction of traffic on Canal for a short distance. By this short loop system all passengers from lines terminating at Canal Street are landed in the center of the city, within a radius of five city blocks. Those desiring to continue in Canal to the river may do so by use of transfer and passage on any of the six heavy trunk lines, with double-truck cars and frequent headway, using Canal in both directions between Rampart and Liberty Place.

This change conserved the use of approximately 5000 tons of coal per annum, eliminated congestion and permitted a more even headway, aside from speeding up car movement, etc. The following tables show the number of cars moved in each direction through Canal during the peak, before and after the change:

TO THE RIVER

	Before	After	Decrease
Track 1..........	111	80	31
Track 2..........	119	65	54

FROM THE RIVER

	Before	After	Decrease
Track 1..........	111	80	31
Track 2..........	119	77	42

Several days before these changes became effective the public was notified by posters in the end windows of each

Hearing on Increased Fares in Reading

Company Values Its Railway Property at $8,350,428 and Shows What a Six-Cent Fare Will Mean in 1918 as Compared With Other Years

A five-hour hearing was held at Reading, Pa., on Feb. 8 before the Public Service Commission of Pennsylvania on the protests of several municipalities against the 6-cent fare put into effect recently by the Reading Transit & Light Company.

HOW THE RATES WERE CHANGED

On Nov. 6 the rates were increased from 5 cents to 6 cents on all of the suburban lines of the company's system, which comprises about 200 miles of railway extending for a distance of about 15 miles west of Lebanon, Pa., to the city of Philadelphia. On Jan. 10 the rates were increased from 5 cents to 6 cents, with a corresponding 20 per cent increase in commutation rates and other forms of transportation, in the cities of Lebanon, Reading, Norristown and Philadelphia. Protests were filed with the Public Service Commission of Pennsylvania by Lebanon, Reading and Norristown prior to the effective date. As a result, the hearing on the Reading division took place at Reading on Feb. 8. The entire day was consumed with the direct testimony of the Reading Transit & Light Company. The hearing closed without cross-examination, this being indefinitely postponed to come before another hearing, a date for which has not been set.

VALUATION PREPARED WITH GREAT CARE

The company submitted a valuation of its physical property based on average prices for the last five years, and also on the average prices for 1917. The company considers the law at present to be based on the court decision in the Ohio Valley Water case, rendered on Oct. 8, and appealed to the Supreme Court by the Public Service Commission, which decision states that a valuation should be based on the value of the property at the time the rates are questioned. The five-year average figures were submitted for the information of the commission. The 1917 valuation indicated an increase of approximately 31½ per cent over the valuation based on the average prices for the last five years.

The earnings and expenses of the company for the five-year period were submitted as evidence, together with the estimated earnings and expenses for 1918. The increase in earnings, due to the increase in rates, less the revenues which would be discouraged by the higher rates, was assumed to be 10 per cent over 1917. The operating expenses were based on actual figures for January, together with specific increase in various items. The net results of operation for 1918 were shown to be slightly less than those for 1917.

The valuation was prepared with the greatest of care. It consisted of a complete inventory of the company's physical property, and all prices were taken from actual prices paid for materials and labor during the last five years. The costs of bridges, buildings, real estate, special track work, etc., were based on actual quotations from manufacturers, or bids for replacement by some of the best steel bridge companies in the country. The prices of cars were based on actual prices paid or on prices obtained from the manufacturer who built the cars. The quotations and contractors' bids were all based on average prices for the last five years and for the year 1917.

As one of the local newspapers put it, the company "told everything and denied nothing." It showed what it costs to operate the system; what is done with the fares collected and what a 6-cent fare during 1918 would mean in dollars and cents compared with the revenues of other years.

It was brought out that the present value of the railway property in service in Reading and its suburbs is $8,350,428. This is the reproduction cost at normal 1917 prices, after allowing for depreciation. The estimated income for 1918 with 6-cent fare and allowance for depreciation, gives a net return on the above valuation of $75,451, or nine-tenths of 1 per cent. The present value of the property, being its reproduction cost at average prices prevailing for five years ending with 1917, was found to be $6,344,175, with a net return, after deducting depreciation, of $135,451, or 2.12 per cent.

(Concluded from page 434)

car. The daily newspapers made comprehensive announcement of the change, and in order to avoid annoyance and possible confusion, supervisors were located at the prominent street corners for the purpose of properly directing passengers unfamiliar with the change. The patrons of the company have taken kindly to the new system, which appears to have received the approval of the general public.

Lincoln Emergency Petition Denied

Railway Commission of Nebraska Rules Against Emergency Measure, but Will Consider Permanent Appeal

The amended application of the Lincoln (Neb.) Street Railway for emergency rates has been denied by the State Railway Commission, and the original application of the company for a permanent increase in fares is set for hearing before the commission on March 4. In an amended petition filed with the commission the company had alleged that the company's inability to pay operating expenses, interest and 6 per cent dividends upon its preferred stock, constituted an emergency that should be provided for immediately.

THE COMMISSION'S CONCLUSION

In concluding its opinion in the case the commission said in part:

"If a failure to pay dividends on the preferred stock because not earned during the period constituted an emergency, we should have the following results: Net surplus, $109,011; dividends at 6 per cent on the preferred stock, $110,587, leaving a deficit of $1,575.

"Before the commission would declare an emergency and make a temporary rate to take care of a shortage of $1,575, as a result of nineteen months' operation, it certainly would make an investigation as to the surplus balances created and in possession of the company prior to the period under consideration. Here we find that there is a surplus of approximately $159,000 and this should be available for dividends on the preferred stock; but this surplus has been invested in more properties and is not available as ready cash for that purpose.

"From a further analysis, however, we find that the first five months of 1917 cut the surplus that accumulated during the last seven months of 1916, $4,451, and the last seven months of 1917 made another cut of $21,303, making a total deficit for the year of $25,755. This would indicate that if the surplus of $159,000, above referred to, were available cash it would soon be depleted.

"It is apparent that if the operating ratio developed during 1917 is to continue, a greater operating income must come from some source. The evidence is not before the commission to enable it to say what portion of such increase should come from the heating plant, the light and power plant, or from the transportation plant. The commission will have to have full and complete information as to the relation between these several plants, including all operating revenues severally, and the disbursements of the same; information of the allocations of the physical properties devoted to each particular branch of the service, and a complete allocation of the preferred stock and bonds to the several properties before it can intelligently make rates to be paid for transportation.

PREFERRED STOCKHOLDERS REAL PARTIES IN INTEREST

"Another matter of paramount importance necessary to be considered is the relation of the preferred stock to the common stock. The outstanding preferred stock amounts to $1,183,700; the outstanding common stock amounts to $1,652,000. The preferred stockholders are the real parties in interest; the common stock, representing little or no property investment, directs the policies and manages the entire properties through its voting power. Through its management it has paid to itself since Sept. 1, 1912, $198,000 in dividends and has invested in betterments and extensions $159,000 out of the oper-

Electric Does Its Bit

North Shore Road Out of Chicago Comes to the Aid of the Government

The unusually efficient record made by the Chicago, Milwaukee & North Shore Railroad, Highwood, Ill., during the recent severe snowstorm in the Lake region has not passed unnoticed by the daily press. The Evanston *Index* said:

"The day before the first storm broke in all its fury the electric line delivered ninety cars of coal to the Great Lakes naval training station. But for the timely assistance of the electric line the great training camp with its 20,000 jackies would have suffered for lack of fuel.

"From the Borden Condensed Milk Company at Evanston the railroad received two carloads of milk, which were distributed in the towns along the line, thus averting a serious milk famine.

"When the naval station was threatened with a bread shortage in the midst of the storm an electric train crew, under tremendous difficulties, pulled a carload of bread from Libertyville to Great Lakes.

"So successful was the electric road in getting meat cars through and averting a meat shortage in a number of towns that Armour & Company have taken advantage of the facilities and shipped several more carloads of meat from their Evanston branch to supply all north shore towns along the electric line.

ELECTRIC PROVED SUPERIOR

"In other ways the electric line proved its superiority over the steam roads during the storm. Several carloads of motor trucks were hauled from Kenosha to Milwaukee through the snowdrifts when the steam roads could not handle them. The road has made many new friends, who have found that under its present management it is really the 'road of service.'"

Traffic Problems in Kansas City

The Kansas City (Mo.) Railways has recently asked the Public Service Commission of Missouri to consider its proposed plan of rerouting cars. The company has also asked the commission to permit the extension of the skip-stop system to certain lines. These are two of the many matters which heretofore have been the subject of city ordinance and which are now taken up directly by the Public Service Commission. This course is apparently the result of an investigation by Edward Flad, a member of the Public Service Commission, who was assigned to Kansas City for the purpose of helping the railway work out solutions for some of its problems.

Many of the regulatory measures affecting the company are held in abeyance temporarily because of the closer co-operation of the Public Service Commission and the railway. The City Council had, for instance, passed an ordinance requiring the railway to abolish its one-man cars. This ordinance had been signed by the Mayor, but on the request of a Council committee the matter was referred back to it. Another ordinance passed by both houses of the Council required the railway to pay the wages of the crossing patrolmen.

The Aldermen who presented the ordinance made the point that the service of the crossing patrolmen was for the benefit of the railway and that the onus of payment was therefore upon the railway. This ordinance, however, has not yet been called out for the final step to make its operation effective.

(*Concluded from page* 435)

ating income. The management now finds itself unable to replace the $159,000 into the surplus account, and is therefore unable to pay the dividends upon the preferred stock. Certainly this condition would not have arisen had the preferred stockholders (the real parties in interest) been in control of their own properties."

Fare Rehearings Asked

Village of Peekskill Wants New York Commission to Reconsider Its Order of Last December

The village of Peekskill on Feb. 15 filed petitions with the Public Service Commission of the Second District of New York asking for rehearings on petitions of the Peekskill Lighting & Railroad Company and the Putnam & Westchester Traction Company for authority to increase railroad fares.

The commission in December granted the petitions of the companies and the increased fares are now in force. The village authorities ask that the proceedings be reopened and that the commission's order of Dec. 27 be suspended on the ground that the order is erroneous and unlawful.

REASONS FOR REQUEST

1. Because a 5-cent provision in the franchises is a contract and was accepted by the Putnam & Westchester Traction Company and by the predecessor of the Peekskill Lighting & Railroad Company as a contract and was granted under Sec. 18, Article 3 of the Constitution.

2. That the evidence is insufficient to justify the conclusion that the fares heretofore charged were insufficient to yield reasonable compensation or were unjust.

3. That the part of the order providing for the cancellation of the contract as to transfers in Peekskill between the Peekskill Lighting & Railroad Company and the Putnam & Westchester Traction Company is unjust in that it results in the payment of two 7-cent fares by certain passengers.

The decision of the commission in the cases of the Peekskill Lighting & Railroad Company and the Putnam & Westchester Traction Company were referred to in the article "Some More Rays of Hope" published in the ELECTRIC RAILWAY JOURNAL of Dec. 22, 1917, page 1122.

Full Car Signs Go

Maryland Commission Modifies Its Order With Respect to Car Capacity in Baltimore

The Public Service Commission of Maryland has passed an order making less stringent the rules that govern the loading of cars on the lines of the United Railways & Electric Company, Baltimore, Md., which operates 404 miles of electric railway. The new order does away with the full-car sign under the order adopted by the commission in the month of June, 1916, and reviewed in the ELECTRIC RAILWAY JOURNAL of June 17, 1916, page 1159.

WHAT NEW RULES REQUIRE

Under the new rules the requirement is that in the downtown district there shall be operated in the non-rush hours in each thirty-minute period such cars as will provide 100 seats for each 100 passengers. It is provided, however, that if less than five cars of any one line pass at any point where a check is being made, then the average number of seats carried by three consecutive cars shall not be less than the aggregate number of passengers carried by these cars in the same direction.

As to the rush hours, it is required that there shall be provided 100 seats for each 100 passengers carried in any thirty-minute period, provided on lines where the average headway is three minutes or less the cars passing any point in the downtown district in any fifteen-minute period shall contain 100 seats for every 150 passengers carried during that period.

The company, however, is not permitted to carry in any car a greater maximum than that prescribed for each class of car. Under this rule the company may carry forty-seven standing passengers in a car that has seats for only fifty-two and forty-two standing in a car that has seats for forty-six and so on in proportion to the size and seating capacity of each type of car.

Municipal Line to Reduce Fares

Councilman Erickson of the City Council of Seattle, Wash., states that within two months the fare on the city-owned railway between Third Avenue and Pine Street and Leary Avenue and Market Street in Ballard will be fixed at 3 cents.

This decision comes in spite of the fact that Seattle's municipal railway lines were operated between June 1, 1914, and Feb. 1, 1918, at a loss of about $150,000. Within two months the city expects to receive half a dozen or more one-man cars, and they will be utilized in the equipment of the 3-cent route which measures a fraction less than 5½ miles. Councilman Erickson points out that the line between Pine Street and Market Street will relieve the congestion on the system as a whole, and that a ride for 3 cents will attract the patronage of those who now walk a dozen or more blocks rather than pay a 5-cent fare.

Will Not Pass on Jurisdiction

Attorney General of Oregon Refuses Opinion to Commission on Question of Jurisdiction in 6-Cent Fare Case

Attorney-General Brown at Salem, Ore., recently refused to give the Public Service Commission an opinion upon the question of whether or not it had jurisdiction in the Portland Railway, Light & Power Company's 6-cent fare case. He gave as his reason the fact that the voters of Portland had enacted a charter in 1913 giving to the City Council power in the regulation of utilities. In his refusal he cited numerous authorities, upholding his contention that he, as attorney-general, should not give an opinion on a question which is involved in litigation now before the courts.

Although refusing an opinion, Attorney-General Brown said that should the courts hold that the commission had been without jurisdiction to issue its recent order granting the Portland Railway, Light & Power Company a 6-cent fare, the commission would be automatically divested of jurisdiction over most of the public utilities of the State. Cities and towns throughout the State have enacted charters with provisions similar to that in the Portland charter, and if these provisions override the commission's authority, the work of the commission for the last five years will practically be destroyed.

The Public Service Commission, through Chairman Miller, has notified the Portland Railway, Light & Power Company that the attention of the commission has been called to the fact that the company is not furnishing adequate service on its electric railway lines, and that this condition must be immediately remedied. Commissioner Miller also directed Examiner Rasch of Portland to make a survey of traffic conditions immediately and report to the commission. Chairman Miller also asked the company to furnish a comparative statement of the traffic handled as of the present time and thirty days prior.

Electric for Steam

California Commission Recommends Electric Lines as Substitutes for Steam Railroad Service

In a report transmitted to William G. McAdoo, the Director General of Railroads at Washington, the Railroad Commission of California recommends the elimination of all unnecessary passenger service. The commission reaches the conclusion that it is "evident at once that in almost all cases where steam lines compete with electric interurban lines, the latter can as a rule render the service more satisfactorily and more economically, and are able in a number of cases to relieve the steam lines of such competing business altogether."

The commission recommended that in the case of the Los Angeles territory where the Pacific Electric Railway competes with three railroads—the Southern Pacific, the Santa Fé and the Salt Lake lines—the steam lines concerned immediately institute a survey with the view of determining to what extent the Pacific Electric Railway can furnish the necessary passenger service, and to what extent competing steam line service could be eliminated. In this connection the commission says that authority to make such a survey and to put this recommendation into effect should be secured from the Director General of Railroads.

One-Man Cars in Seattle

Puget Sound Company Already Has Two Cars in Operation and Is Planning to Run Twenty-three More

The Puget Sound Traction, Light & Power Company, Seattle, Wash., acting under authority granted ten months ago by the Public Service Commission to operate one-man cars wherever it seemed feasible in the city of Seattle, plans to put twenty-five new one-man cars of the Birney type in operation immediately on the close-in runs. Two of the one-man cars have already been placed in operation on the Summit line. The other twenty-three are being set up, and will be in operation in the near future. A. L. Kempster, general manager, states the company has fifteen more of the small cars on order. The cars now being put on will supplement the present service.

At a joint meeting of the franchise and judiciary committees of the City Council it was decided that the Council would not interfere with the operation of one-man cars, although resolutions had been passed directing the Mayor and the corporation counsel to resist the operation of such cars. Walter F. Meier, assistant corporation counsel, pointed out, however, that the Supreme Court has given the Public Service Commission jurisdiction over service, and that one-man cars might be argued as an improvement of service.

Operation of one-man cars on the Seattle & Rainier Valley Railway in Seattle, between Stewart and Rose Streets, is provided for in a bill recently introduced in the City Council and referred to the franchise and judiciary committees.

N. Y. Fare Hearings Resumed

The Public Service Commission for the First District of New York on Feb. 21 resumed hearings upon the fare applications of several of the electric railways operating in New York City. These applications in most of the cases are for permission to charge 2 cents for transfers. Hearings in these cases were begun last spring, but were discontinued after a short time, first in order that various data desired by the commission might be secured and then in order that vacancies on the commission might be filled. The hearing on Feb. 21 was devoted to the presentation of new financial exhibits for the Third Avenue Railway, and adjournment was taken until Feb. 28 and March 1. The other fare cases are now scheduled to be taken up on March 11.

Transportation News Notes

Skip Stops in Harrisburg.—Following a recommendation in the report by Bion J. Arnold, the Harrisburg (Pa.) Railways recently eliminated many "alley" stops on all city lines.

Stops to Be Eliminated.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., has been authorized by the City Commission to eliminate 101 stops on the various divisions of its Trenton line.

Receipts Jump When Jitney is Curbed.—Enforcement of the recently enacted jitney ordinance in Dallas, Tex., has increased the daily receipts of the Dallas Railways by more than $300 according to Richard Meriwether, general superintendent of the company.

New Rules for Filing Tariffs.—The Public Service Commission of Pennsylvania has issued new rules to be followed by all public service companies of the State in filing and posting tariffs and supplements to tariffs. The new rules are effective on March 15.

Fare Increase Sustained.—The Railroad Commission of Michigan has sustained the Houghton County Traction Company, Houghton, Mich., in the case involving the recent increase in rates by the company between Houghton and Calumet from 25 cents to 30 cents.

Reduced Rate Tickets Discontinued.—The Hot Springs (Ark.) Street Railway has discontinued the sale of six tickets for 25 cents and books of twenty-five tickets for $1. These reduced rates have been in effect for several years. A straight 5-cent cash fare is now charged.

Scranton Fare Increase to Date from March 21.—The Scranton (Pa.) Railway has announced that on March 21 it will increase the fare unit on its lines from 5 cents to 6 cents, in accordance with a tariff filed last August. To facilitate the making of change the company will have the conductors sell strips of five tickets for 30 cents, each ticket being good for one 6-cent fare. The discussion of fares by officers of the company before the city officials of Scranton was referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 16.

Seeks Six-Cent Fare.—The New Jersey & Pennsylvania Traction Company, operating cars between Trenton, N. J., and Lambertville, Newtown, Doylestown, Yardley and Bristol, Pa., and Lawrenceville and Princeton, N. J., has petitioned the Public Service Commission of Pennsylvania for permission to put into effect a 6-cent fare in each of its zones in that State where 5 cents is now charged. The company would make the change on March 25. The company has not made any move for an increase on its New Jersey divisions.

Legal Notes

CALIFORNIA.—*Car Interferes with Fire Truck.*

Where defendant's motorman knows or should know that a fire truck is coming at a great speed and runs his car out on a crossing suddenly, forcing the fire truck to swerve to the walk and injure a passer-by, the company is negligent, whether violating an ordinance or not. (King vs. San Diego Elec. Ry., 168 Pac. Rep., 131.)

CALIFORNIA.—*Widow Has New Cause of Action.*

Code Civ. Proc. Sec. 377, providing for action for damages against a person causing death by wrongful act creates an entirely new cause of action unknown at common law. Hence, as the damage of widow for the wrongful death of her husband includes not only financial loss, but loss of consortium, the husband's execution prior to his death of a release for damages from the injury which finally resulted fatally will not bar the widow's right of action. (Early vs. Pac. Elec. Ry. Co., 167 Pac. Rep., 513.)

ILLINOIS.—*Under Workmen's Compensation Law, Accident Must Arise Out of Employment.*

Where the head fireman of an electric company, in disregard of signs, fences and rules, entered the transformer room on no business of the company, and was there accidentally killed, compensation was not recoverable for his death, although at other times he had frequently been called upon in performing the duties of the engineer to enter the transformer room. (Northern Illinois L. & Trac. Co. vs. Industrial Board of Illinois et al., 117 N. E. Rep., 95.)

KENTUCKY.—*Passes Given as Consideration for Right-of-Way Are Void Under Anti-Pass Law.*

Const. Sec. 196, providing that passenger transportation shall be regulated to prevent unjust discrimination, and Sec. 197, prohibiting free passes, render void as against public policy a railroad's agreement to give free transportation in return for right-of-way deeded it, especially as anti-pass law (Laws 1916, c. 1), enacted pursuant to Sec. 196, specifically prohibits transportation except for a money consideration. (Kentucky Traction & Terminal Co. v. Murray, 195 Southwestern Rep., 1119.)

NEW JERSEY.—*Gross Receipts Include Receipts from Sale of Power.*

Acts 1906 (P. L. p. 644) requiring an annual franchise tax upon the annual gross receipts of any street railway corporation or upon such proportion of such gross receipts as the length of its line in this State upon any street, etc., bears to the length of its whole line, was intended to impose a franchise tax upon the total of the gross receipts of such companies, including receipts from current and power sold, in accordance with its precise language, and not upon gross receipts for transportation, as was the rule under P. L. 1903, p. 232, since the act of 1906 was intended to provide a specific scheme for the taxation of street railway corporations and to differentiate such corporations from those liable to a franchise tax under the act of 1903. (Atlantic Coast Electric Railway, v. State Board of Taxes and Assessments, 101 At. Rep., 64.)

NEW YORK.—*Review by Court of Orders of Commissions.*

Mere allegations that it may be impossible for relators to obtain the cars within the time fixed by the Public Service Commission or within a reasonable time are insufficient to justify a review of the orders of the commission by a certiorari in view of public service commissions law (Consol. Laws, Chap. 48) Sec. 22, providing that, where facts arise subsequent to the making of an order which are deemed to entitle the companies to a modification of the order which the commission has made, the companies have no standing in court until they have exhausted the remedy afforded by the statute and have given the commission opportunity to afford suitably the relief desired. (People ex rel. Brooklyn Heights R.R. Co. vs. Public Service Commission, First District, 166 N. Y. Sup., 825.)

NORTH CAROLINA.—*Use of Street by Freight Cars Does Not Constitute Additional Servitude.*

The use by a street railway of the streets of a city under an act of the Legislature and by authority of an ordinance to transport freight cars two at a time between a railroad's freight yard and various factories within the city, thus saving the expenses of breaking bulk, and minimizing the traffic on the streets is not an "additional servitude" on the streets entitling abutting owners to additional compensation. (Turner et al. vs. North Carolina Public Service Co. et al., 93 S.E. Rep., 998.)

PENNSYLVANIA. — *Assent to Railway Construction Must Stand.*

Township officers who have knowingly and without objection permitted a street railway to be constructed in the township cannot compel its removal. (Wilson Township vs. Easton Transit Co., 101 At. Rep., 983.)

PENNSYLVANIA.—*Validity of a Release Executed on Sunday.*

The law will not lend its aid to enforce an executory contract made on Sunday; but the parties to a contract fully executed on that day will be left where the law finds them, and no relief given to either.

Where a release of damages for personal injury was executed and delivered and the consideration paid on Sunday, the contract was executed and binding upon the parties, and if otherwise valid, discharged the party liable. (Williams vs. Philadelphia Rapid Transit Co., 101 At. Rep., 748.)

New Publications

Proceedings of Electric Railway Section Meeting, Sixth Annual Safety Congress, National Safety Council. Published by the National Safety Council, Continental & Commercial Bank Building, Chicago, Ill. Illustrated. Seventy-eight pages. Paper.

The Council has issued in pamphlet form as Part 7 of the *Proceedings* of the Sixth Annual Safety Congress, held in New York City on Sept. 13, 1917, a full account of the electric railway section meeting. An abstract of the papers and discussions appeared in the issues of the ELECTRIC RAILWAY JOURNAL for Sept. 15, 1917, page 445, and Sept. 29, 1917, page 579. The tables referred to in the abstract are given in full in this pamphlet. The report could be read with profit by every man connected with an electric railway who is responsible for the safety of employees or the public.

Eye Hazards in Industrial Occupations; By Gordon L. Berry, field secretary National Committee for the Prevention of Blindness, with the cooperation of Lieut. Thomas P. Bradshaw, U. S. Army, formerly technical assistant to the director of American Museum of Safety. Published by the National Committee for the Prevention of Blindness, 130 East Twenty-second Street, New York, 150 pages, illust. Price 50 cents.

In this volume the author reviews the chief industrial hazards to eyesight in the industries of the United States. Case reports illustrate each section, the special dangers are described and recommendations made for such changes of working conditions, or installations of protective devices as have been found suitable for protecting workers. The publication is most completely illustrated.

THE SCOPE OF THE BOOK

The following section headings indicate the scope of the book: statistics of eye accidents; chipping operations; machine operations; abrasive wheels; sand-blasting; "mushroomed" tools; riveting radiations from intense light and heat sources; ultra-violet rays in illuminants; radiant energy in arc welding and in molten metal; metallurgic operations; glassblowers' cataract; infections; gage glasses; acids and chemicals; treatment of acid burns; industrial poisons; removal of dangerous fumes, vapors and gases; spray process hazards; methyl alcohol; bottling accidents; mining and quarrying; agricultural hazards; goggles; garment trade hazards; industrial lighting; the safety movement.

Personal Mention

Paul C. Fratessa has resigned as vice-president of the Fresno (Cal.) Interurban Railway.

James F. Kieser has been appointed roadmaster of the Mobile Light & Railroad Company, Mobile, Ala., to succeed L. A. Wilson, resigned.

William Carpender has been elected president of the Sixth Avenue Railway, New York, N. Y., now included in the New York Railways, to succeed the late Frank Curtiss.

M. E. De France, formerly electrical superintendent of the Hot Springs (Ark.) Street Railway, is now connected with the Deming Ice & Electric Company, Deming, N. M.

C. S. Keever, heretofore acting superintendent of transportation of the Union Traction Company of Indiana, Anderson, Ind., has been appointed superintendent of transportation of the company.

Ralph Boardman, a well-known young member of the Minnesota bar, has been appointed claim attorney for the Twin City Rapid Transit Company, Minneapolis, Minn. He succeeds John F. Dahl, who will enter private practice after ten years of service with the railway.

Henry W. Killeen has become a member of the law firm of Norton, Penney & Nye. Porton Norton, senior member of the firm, died a short time ago, and the new firm will be known as Penney, Killeen & Nye. The firm is counsel for the International Railway, Buffalo, N. Y., and Thomas Penney is vice-president of the railway. Mr. Killeen was city attorney of Buffalo from 1898 to 1902. He will make a specialty of legislative matters formerly handled by Mr. Norton.

Robert Thompson, Jr., superintendent of transportation of the Toledo Railways & Light Company, the Maumee Valley Railways & Light Company, and the Toledo, Ottawa Beach & Northern Railways & Light Company, Toledo, Ohio, was placed in direct charge of car operation of the above lines, effective on Feb. 8. Mr. Thompson was formerly assistant general manager of the Manhattan & Queens Traction Corporation, Long Island City, N. Y. The companies at Toledo operate more than 150 miles of electric railway.

A. M. Ludwig, auditor Elmira Water, Light & Railroad Company, Elmira, N. Y., has been authorized to change his name to A. M. Lewis. Mr. Lewis, who was born in 1884, was employed from 1909 to 1915 as accountant in charge for the receivers of the Metropolitan Street Railway, New York City. Prior to taking up his present work early in 1917, he was associated as a general accountant with the United Gas & Electric Engineering Corporation, New York City. Mr. Lewis has also been connected with the Western Union Telegraph Company as a traveling auditor and has served on the staffs of Haskins & Sells, C.P.A.; Deloitte, Plender, Griffiths & Company, C.A., and Patterson, Teele & Dennis, C.P.A., New York City.

W. H. WRIGHT

W. H. Wright has been elected secretary of Georgia Railway & Power Company, Atlanta, Ga. This office has been held by W. H. Glenn, who is also vice-president and operating manager of the company. On account of Mr. Glenn's numerous duties as head of the operating department, it was decided that he should be relieved of the secretary's work. Mr. Wright began work with the Georgia Railway & Electric Company, the predecessor of the Georgia Railway & Power Company, in February, 1906, as secretary to H. M. Atkinson, chairman of the board. Mr. Wright is also private secretary to Mr. Atkinson, and is secretary of the Georgia Railway & Electric Company.

G. A. Strain has been promoted from superintendent of the gas department of the Helena Light & Railway Company, Helena, Mont., to the position of general superintendent of the following properties, with headquarters at Ithaca, N. Y.: Homer & Cortland Gas Light Company, Cortland, N. Y.; Ithaca Gas & Electric Corporation, Ithaca, N. Y.; Norwich Gas & Electric Company, Norwich, N. Y.; Oneonta Light & Power Company, Oneonta, N. Y.; Standard Light, Heat & Power Company, Sidney, N. Y.; Van Wert (Ohio) Gas Light Company; Cayuga Power Corporation, Ithaca, N. Y.; Groton (N. Y.) Electric Corporation; Ovid (N. Y.) Electric Company. Mr. Strain has been associated for the last twelve years with the operating organization of the J. G. White Management Corporation, New York City, the managers of the aforementioned companies.

H. W. Fuller has been appointed vice-president in charge of operation of the Northern States Power Company, with headquarters at Minneapolis, Minn. In this capacity Mr. Fuller will relieve R. F. Pack, vice-president and general manager, of operating responsibilities which have increased greatly due to the rapid growth of the Northern States organization. Mr. Fuller has been with H. M. Byllesby & Company, Chicago, Ill., who control the Northern States Power Company, for seven years, devoting a large part of his time to the solution of special operating problems. He was born in New York and received his education in the public schools of Bayonne, N. J., the State Model School of New Jersey, and Rutger's College, graduating in 1891. He entered the service of the Consolidated Traction Company, Newark, and became assistant superintendent and assistant general manager, leaving this position in 1901 to become general manager of the Washington Railway & Electric Company and the Potomac Electric Power Company.

J. W. Andrews has severed his connection with the International Railway, Buffalo, N. Y., to investigate transportation conditions for the pomological division of the bureau of markets of the United States Department of Agriculture. Upon leaving Syracuse University, Mr. Andrews entered the employ of the Utica & Mohawk Valley Railway, Utica, N. Y., in the power department. Subsequently, he spent three years with the Lackawanna Steel Company, Buffalo, on electrical and mechanical work. In 1908 Mr. Andrews entered the wholesale commission business in Utica and later transferred to New York City. In 1910 he became connected with the Public Service Commission for the Second District of New York as an assistant in the electric railway division. After three years with the commission, Mr. Andrews resigned and became superintendent of the Buffalo-Olcott division of the International Railway, from which position a year later he was transferred to the general office staff of the company, where he has been engaged upon various passenger and freight transportation matters.

August K. Tegtmeier has been appointed engineer of maintenance of way of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, under Charles C. Beckman, superintendent of maintenance of way. Mr. Tegtmeier was born in Conshohocken, Pa., on June 25, 1894, and was educated in the public schools of that town and Conshohocken High School, from which he was graduated in 1910. In September of the same year he entered the University of Pennsylvania, spending the vacation periods in the employ of the Atlantic City & Shore Railroad, the American Bridge Company, and the New York Central Railroad. Mr. Tegtmeier was graduated from the civil engineering department of the University of Pennsylvania in June, 1914. Immediately he re-entered the employ of the New York Central at Albany, but left there in the fall of 1915 to become an engineering inspector in the department of highways in the city of Philadelphia. Six months later he returned to railway work in an engineering position in the maintenance of way department of the New York State Railways at Rochester, N. Y. He continued with that company until June, 1917, when he became connected with the forces of the Republic Railway & Light Company, controlling the Mahoning & Shenango Railway & Light Company.

William R. Davis, chief engineer of Station A of the Springfield Gas & Electric Company, Springfield, Ill., controlled by the same interests that control the Springfield Consolidated Railway, loaned to the United States government for the period of the war, is credited with a very important invention in connection with wireless telegraphy. Mr. Davis has been serving for several months as chief instructor of the naval radio service training school, Minneapolis, Minn. The story of his invention is told in a full-page illustrated article in the *Scientific American.* The device is a high-frequency generator which reproduces the exact sound of the radio dot and dash, so that men to operate buzzers can be eliminated, while an unlimited number of students can be trained at one time. The invention combines the results obtainable from a dictaphone, a high-frequency generator and a telephone. The dictaphone records the message, which may be sent at any speed, the generator reproduces the exact sound of a wireless message, while the telephone transmits the message to the student. By the generator, which gives the high-pitched drone peculiar to wireless, messages are recorded on a wax dictaphone cylinder. Once inscribed, a cylinder may be used again and again to repeat the message, which is transmitted by means of a head phone to any number of students.

Obituary

William J. Holliday, a director in the Indianapolis Street Railway and the Belt Railroad, Indianapolis, Ind., is dead at the age of eighty-nine.

W. B. Schofield, a member of the Illinois State Civil Service Commission and formerly a member of the Illinois Public Utilities Commission, recently died of heart disease at his home in Marshall, Ill.

G. W. Hatch, general superintendent of the Piedmont Railway & Electric Company, Burlington, N. C., is dead. He succumbed to injuries received in an accident to one of the cars of the company following a recent severe snow storm.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporations

Middlesboro (Ky.) Street Railway.—Chartered to construct an electric railway along Cumberland Avenue and other thoroughfares of the city of Middlesboro. The line will also make connections with the Yellow Creek mines and adjacent mining towns. Mayor E. P. Helpburn, Middlesboro, is interested. [Feb. 23, '18.]

Franchises

***Savannah, Ga.** — The Chatham County Traction Company has received a franchise from the County Commissioners to build a line from Stiles Avenue, on the Augusta Road, to the Brampton tract of the Foundation Shipbuilding Company. H. C. Foss, manager Savannah Electric Company, is reported interested.

Muskegon, Mich.—The matter of granting a thirty-year franchise to the Muskegon Traction & Lighting Company will be voted on in April.

Chillicothe, Ohio.—The Peoria & Chillicothe Electric Railway has received a two years' extension of time on its franchise to construct a line in Chillicothe. [Feb. 9, '18.]

Track and Roadway

Muscle Shoals Traction Company, Florence, Ala.—A campaign has been begun by the Chamber of Commerce of Huntsville for the raising of the necessary money for the preliminary work on the proposed electric railway of the Muscle Shoals Traction Company to connect Huntsville and Florence. Thurston Allen, Florence, secretary. [Jan. 26, '18.]

***Alameda, Cal.**—The City of Alameda will construct and operate an electric railway over 1 mile long to serve all the north side industries from Pearl Street westward in the territory reached by a track laid on Blanding Avenue east of Park Street and on Clement Avenue west of Park Street. The money for the construction of the line will be supplied by the city's electric light plant. The road will be a single-track line for freight only and the rolling stock will consist of electric locomotives driven by power from the municipal light plant.

Clear Lake Suspended Monorail Company, Hopland, Cal.—It is reported that Director General of Railroads McAdoo has consented to a permit for the construction of the Clear Lake Suspended Monorail Company's line from Hopland to Lakeport. G. L. Hardison, San Francisco, is interested. [Jan. 26, '18.]

Pacific Electric Railway, Los Angeles, Cal.—This company will double-track its line between Long Beach and San Pedro, about 5 miles, at a cost of about $200,000.

Jacksonville (Fla.) Traction Company.—The extension of the Jacksonville Traction Company's line through Brentwood to the Florida State Fair Grounds has been completed and operation has been begun on the line.

Atlanta, Birmingham & Atlantic Railway, Atlanta, Ga.—A storage-battery car will be used by the Atlanta, Birmingham & Atlantic Railway for passenger service on its line between Brunswick and Thalman.

Suburban Railroad, Chicago, Ill.—A petition has been filed by the Suburban Railroad with the Public Utilities Commission of Illinois to sell all its corporate property and assets to the Chicago & West Towns Railway, by which it is controlled.

Wichita-Walnut Valley Interurban Railway, Wichita, Kan.—The Public Utilities Commission of Kansas has granted the Wichita-Walnut Valley Interurban Railway permission to issue $1,000,000 first mortgage bonds and $200,000 in common stock. The order of the commission grants permission to the company to acquire and own real estate for rights-of-way, terminal and station purposes and to construct and equip that portion of the line which connects Wichita, El Dorado and Augusta, about 41 miles, all in accordance with the terms of a contract dated Dec. 19, 1917, between the company and John R. Scott of St. Louis, Mo., which contract is to be secured by a bond of $500,000, when bonds are underwritten in the amount of $1,000,000. Charles Payne, secretary. [Jan. 5, '18.]

***Jenkins (Ky.) Street Railway.**—The city of Jenkins plans the construction of a 7-mile electric railway in the near future. Connections will also be made with McRoberts, Fleming, Dunham and Burdine.

Kansas City, Lees Summit, Lone Jack & Eastern Railway, Kansas City, Mo.—It is reported that work has been begun on the construction of the proposed line of the Kansas City, Lees Summit, Lone Jack & Eastern Railway. Grading has been completed part of the way to Lee's Summit. The Kansas City terminus of the line will be about Thirty-first Street and Hardesty Avenue. The construction within the city limits will cost about $200,000 and outside of the city $1,000,000. W. E. Winner, Kansas City, is interested. [Nov. 3, '17.]

Columbus, Delaware & Marion Electric Company, Columbus, Ohio.—It has been announced that the Columbus, Delaware & Marion Electric Company plans to spend about $1,000,000 for track and power plant improvements in Marion. It is proposed to centralize all general offices in Marion.

***Lorain, Ohio.**—The City Council has asked Chalmers C. Miller, city engineer, to draw up specifications showing the probable cost of a single-track railway line with two cars from the loop to the Cromwell Steel plant.

Oregon Electric Railway, Portland, Ore.—The Public Service Commission of Oregon has refused to issue an order compelling the Oregon Electric Railway and Southern Pacific Railway to maintain a common user of the Oregon Electric Railway tracks in Hillsboro and a union station in that city, basing their refusal upon the fact that the labor and material required for such joint facilities can be used more advantageously for more important and necessary purposes during the war.

Portland Railway, Light & Power Company, Portland, Ore.—In answer to complaints of the neglect of streets in Portland by the Portland Railway, Light & Power Company, officials have notified the City Department of Public Works that work of repairing tracks and pavement between tracks has been undertaken on a large scale. It is claimed that in two months the traction company has spent $10,000 in making repairs and in rushing other work as fast as possible. Other work to cost $5,000 will be started soon.

Manila Electric Railroad & Light Corporation, Manila, P. I.—A report from the Manila Electric Railroad & Light Corporation states that it will reconstruct 2 miles of track.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—A preliminary survey will be made by the Nashville-Gallatin Interurban Railway for an extension from Madison to Neeley's Bend Ferry to serve the government powder plant.

Nashville Railway & Light Company, Nashville, Tenn.—Surveys will soon be begun by the Nashville Railway & Light Company for an extension of its Gallatin turnpike line to near Hadleys Bend and also for an extension of the Fairfield line along the Lebanon Road.

Bamberger Electric Railway, Salt Lake City, Utah.—Announcement has been made by the Bamberger Electric Railway that automatic block signals will be installed between Robbins and Layton and Kaysville, thus making the entire line either double-tracked or protected by automatic block signals.

Monongahela Valley Traction Company, Fairmont, W. Va.—Announcement has been made by the Monongahela Valley Traction Company that the company plans to extend its lines from Clarksburg to Salem, Philippi and Grafton; from Weston to Orlando and from Fairmont to Morgantown. Work to the amount of $3,000,000 is planned this year.

Shops and Buildings

Chicago, North Shore & Milwaukee Electric Railroad, Highwood, Ill.—This company has leased the building at 185 Second Street, Milwaukee, for a station. Work on remodeling the lower floor will be begun at once. The erection of a station at Sixth and Sycamore Streets has been abandoned for the period of the war on account of the order of the government to railroads to curtail expenditures as much as possible.

International Railway, Buffalo, N. Y.—This company has leased the carhouse of the Niagara Gorge Railroad above the river bank at Second Street, where a car repair shop will be installed.

Sand Springs (Okla.) Railway.—A contract has been awarded by the Sand Springs Railway to H. L. Weir Contracting Company for the construction of a new carhouse.

Portland Railway, Light & Power Company, Portland, Ore.—Residents of Oak Grove have petitioned the Portland Railway, Light & Power Company to construct a new station at Oak Grove.

Philadelphia, Pa.—Sealed proposals will be received by the Department of City Transit, William S. Twining, director, until 12 o'clock noon on March 5 for the following work appurtenant to the Frankford Elevated Railway: Contract No. 529—Furnishing and delivering cast-iron fillet brackets for columns in Frankford Avenue between Church Street and Dyre Street. Sealed proposals will also be received until 12 o'clock noon on March 12 for the following work: Contract No. 537—Erection of brick and reinforced concrete station buildings at the northeast and southwest corners of Kensington and Allegheny Avenues, including the removal of existing buildings on these sites. Contract No. 538—Erection of brick and reinforced concrete station buildings at the southwest and southeast corners of Kensington Avenue and Somerset Street, including the removal of existing buildings from these sites. Copies of plans and specifications may be obtained upon deposit of $10, to be refunded upon return of plans.

Texas Electric Railway, Dallas, Tex.—The new union interurban express building being constructed by the Texas Electric Railway for the Electric Express & Baggage Company has been practically completed. The new structure, which will cost about $30,000, has accommodations for loading and unloading ten interurban express cars and twenty-one trucks at the same time. Delay in the arrival of rails prevents the opening of the building, which covers most of the block bounded by Young, Wood, Market and Jefferson Streets. The structure is fireproof and of modern design. The new building will handle express carried by the interurban railways operating between Waco, Denison and Corsicana.

Virginia Railway & Power Company, Richmond, Va.—This company will repair its brick warehouse at the foot of Twelfth Street, Richmond, at a cost of about $6,000.

Wheeling (W. Va.) Traction Company.—Plans are being drawn by the Wheeling Traction Company for the reconstruction of its Bay Island carhouse recently destroyed by fire.

Power Houses and Substations

Alabama City, Gadsden & Attalla Railway, Gadsden, Ala.—The turbine engines and generators of the Alabama City, Gadsden & Attalla Railway have been sold to the Chicago Utilities Development Corporation and the company will purchase a new outfit.

Little Rock Railway & Electric Company, Little Rock, Ark.—A contract has been awarded by the Little Rock Railway & Electric Company for the installation of a turbine in its power plant to provide improved lighting and electric railway service, at a cost of about $200,000.

Pensacola (Fla.) Electric Company.—The erection of a 13,200-volt transmission line to the Pensacola Naval Station is being considered by the Pensacola Electric Company.

Georgia Railway & Power Company, Atlanta, Ga.—This company has completed its transmission line connecting Royston with its Gregg Shoals plant near Elberton.

Vicksburg Light & Traction Company, Vicksburg, Miss.—A new 1500-kw. turbine is being installed by the Vicksburg Light & Traction Company at its power plant in Vicksburg.

Charleston Consolidated Railway & Light Company, Charleston, S. C.—This company is considering increasing the output of its Meeting Street power house.

Valley Railways, Lemoyne, Pa.—New machinery is being installed at the power plant of the Valley Railways in Lemoyne.

South Carolina Light, Power & Railways Company, Spartanburg, S. C.—Extensive improvements are now being made on the gas plant of the South Carolina Light, Power & Railways Company and a new generator, with a capacity of 50,000 cu. ft. of gas, will be installed.

Washington Water Power Company, Spokane, Wash.—A contract has been awarded by the Washington Water Power Company to the General Electric Company for the installation of a new 22,500-hp. generator at its Long Lake power plant, which will increase the present capacity of the hydroelectric development by 50 per cent and will, with the two other units installed, utilize about three-fourths of the water power available there. The cost of the new equipment is reported to be more than $250,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Boiler Market Best in East

Business Off in Middle West—Deliveries Six to Eight Months Without Priority Order

The business in boilers of large steam capacity can at the present time be divided into three general classifications for analysis. They are, first, commercial business in the district between Pittsburgh and New York; second, commercial business west of Pittsburgh, and, third, marine business. East of Pittsburgh inquiries and orders are being handled in volumes above normal. This is due largely to the great amount of strictly war work in that territory, creating extraordinary demands for power that must be supplied. In the Middle West, where there is less war work, the boiler business while still good has fallen off somewhat. The largest buyers of boilers—the utilities—are not in the market for any more equipment than they must of necessity purchase. A better market for boilers in the Middle West is expected to prevail in the coming months regardless of whether the war continues or ends quickly. If the war continues, it seems inevitable that the war business will spread over a wider territory than it now takes in. There are several good fuel fields west of Pittsburgh, and it is believed that the logic of distributing government business more widely, from a geographical standpoint, will become recognized.

DELIVERIES 6 TO 9 MONTHS

This naturally is expected to help boiler business in the Middle West. On the other hand, if the war suddenly stops, public-service business is expected to again flourish, since the lack of capital is all that is preventing extensions of plant. The business in marine boilers is so heavy that some of the prominent factories are looking for ways to get the business divided between their competitors rather than trying to do all of the work themselves. On the whole, the boiler manufacturing industry is far behind with its orders. Deliveries on commercial boilers are from six to nine months without a priority order. With an A-1 priority order a commercial customer might get a delivery anywhere from two to three months.

Some of the boiler manufacturers are taking advantage of the "sellers' market" that conditions have created to put into effect selling policies that they believe are for the ultimate good of customers but which there was no way of enforcing under ordinary conditions. Manufacturers claim that central stations and some industrial plants are apt to make the mistake of wanting to install boilers that are too large. No boiler in a plant, say these manufacturers, should be so large that its loss in times of peak load will affect the operation of the plant if it is a station that stands alone, or will affect the operation of the system if it is an interconnected plant. In the past all argument to this effect has had little effect on customers. They thought they knew what they wanted and ought to have. In some cases boilers too large for the plant have been sold with a written protest from the manufacturers as a part of the contract. Nevertheless, this has not prevented the customer from coming back on the manufacturer if the boiler went wrong as was predicted. Nothing seems able to prevent that. So at least one company now is making it an absolute rule not to sell boilers that it knows are too large for the plant in which they are to operate. If it cannot convince a customer that he should buy boilers of sensible sizes, it is willing that some other manufacturer should get the business and thereby make himself responsible for future unpleasant developments.

Car Deliveries in Five to Six Months

Materials and Labor Situation Govern—One Large Priority Order Taken on Three Months' Delivery

Nic Le Grand, general sales agent, St. Louis Car Company, is authority for the statement that car builders are now shipping cars as a rule within five or six months from the receipt of the order. He writes commenting upon a note in this department quoting a longer delivery than the period mentioned, and says a longer time is not necessary. He continues:

"Car builders are experiencing some difficulty in obtaining materials promptly, the labor situation is not the best, but notwithstanding these drawbacks the St. Louis Car Company is manufacturing and shipping cars within five to six months from date of contract, delivery depending upon type of car. While we are serving the government to the best of our ability, we are soliciting and actually obtaining car work and can, as already stated, make deliveries of from five to six months."

Confirming Mr. Le Grand is a delivery quotation of three months on a priority order placed within the past month for a large number of cars for use in carrying workmen to and from a shipyard.

New Differentials on Iron and Steel Scrap

Basic Prices Which Were Approved by President Wilson as of Dec. 27 Remain Unchanged

Price differentials on iron and steel scrap, prepared on Dec. 27 last, have been revised by the American Iron and Steel Institute. The fixed base prices as approved by the President are retained, namely:

No. 1 heavy melting, $30 per gross ton; No. 1 railroad wrought, $35 per gross ton; machine shop turnings and cast-iron borings, $20 per gross ton, all delivered to consumer's mill.

On Dec. 28, by the authority of the President, these base prices were continued operative until March 31, 1918.

By this announcement it was intended that no one—producer, consumer, merchant or broker—should buy, sell or deal in scrap iron and steel at any figure in excess of the base prices announced.

The differentials announced on Dec. 27 are canceled, together with any interpretation subsequently announced.

The maximum prices, using the new differentials from the base, on iron and steel scrap as recommended by the sub-committee on scrap iron and steel and approved by the committee on steel and steel products are as listed below:

1. No. 1 heavy melting steel (base)	$30.00
2. Low phosphorous steel scrap:	
Grade A	40.00
Grade B	37.50
Grade C	35.00
3. Steel rails, structural steel, etc.	35.00
4. Standard section old steel tee rails	35.00
5. Nickel steel (1 per cent nickel)	34.00
($4 additional per unit of nickel.)	
6. No. 1 railroad wrought	35.00
7. Iron and steel railway axles	47.50
8. Cast iron scrap:	
Grade A	30.00
Grade B	35.00
Grade C	30.00
Grade D	35.00
9. Machine shop turnings:	
Grade A base	20.00
Grade B base	25.00
Grade C base	25.00
(Plus a differential of not more than $4 per unit of nickel content.)	
10. Cast iron borings:	
Grade A base	20.00
Grade B base	25.00

The above prices are the maximum which may be paid; buyers and sellers may contract at any price below the figures named.

All the above prices and differentials are per gross ton of 2240 lb., and in all cases include all freight and charges delivered f.o.b. cars at the consuming mill. Further information may be had by communicating with W. Vernon Phillips, chairman, sub-committee on scrap iron and steel, American Iron and Steel Institute, Pennsylvania Building, Philadelphia, Pa.

Power House Equipment Quiet

Prices Are Not Softening—Deliveries Running Farther Behind—Much Priority Work in Hand

Power houses have not been buying very heavily of equipment for quite some time. Companies which had made commitments for several years ahead, as in normal times, were confronted with the fact that other arrangements had to be made for lack of capital requirements. Machinery and apparatus purchased for 1918 delivery will doubtless be accepted, but it is a question whether or not contracts entered into for 1919 and 1920 can be canceled or deferred. It is said negotiations of this kind have been under way, but no one feels disposed either to confirm or deny the statement.

Whatever the outcome, it is certain no abatement of price has occurred, and deliveries have not greatly improved. It was judged that if cancellations could be arranged it would have favorably affected both prices and deliveries. One prominent manufacturer, whose line has a world-wide reputation, said very little new development work was being undertaken, and such additions to power plants as had been made or were under way were necessary. He stated there had been no change of price in six months, and, so far as could be understood, none was expected for a long time ahead, unless the unforeseen happened.

Remarks of this nature, however, failed to convince the observant that the volume of buying in the aggregate represented anything but respectable figures. Also it was evident that if guaranteed promises of delivery could be secured the purchase of apparatus, accessories, material and supplies for power houses would be still more active. A manufacturer, in offering the explanation that everything above 200 kva. was rated power-house apparatus, also added that goods of this kind were back from five to nearly eight months on delivery. On a recent order for three transformers of 1000 kva. by special pressure delivery was promised in four and a half months, and generators, which were all of a special type and size to suit requirements, could not be shipped sooner than twenty to thirty weeks, possibly five and a half months. Turbines could not be promised under a year. On the larger sizes the delivery time was very long, from one year to the latter part of 1920. Motors of 25 hp. for auxiliary equipment would not be ready for shipment in from six to eight months. Generators were to be had quickly only on priority orders from the War Industries Board for plants either engaged in the manufacture of munitions or other war material and needing additional power or for established power house or central stations supplying energy either for other industries of the same class or for military or naval needs. These orders superseded everything, and apparatus on order for private uses is being commandeered and appropriated, no matter how essential it might be in the regular business of a commercial enterprise.

Condensers are reported as being in comparatively little demand by power houses. Public utility companies were practically out of the market for the present owing to the abnormal conditions. Deliveries are from nine to eighteen months late. Raw material is difficult to obtain, particularly to fill commercial orders. Advances in price had been made for a while almost every month, though none has been reported since the first of the year, and no further advance is anticipated. Pumps, according to another manufacturer, are a little better on delivery, which for larger size were directly or indirectly for the government.

BUSINESS MAINLY GOVERNMENT WORK

Another manufacturer stated power-house development now was mainly in connection with government work. On commercial orders for engines, boilers, steam superheaters and mechanical stokers, which were all either special types or assembled for special needs, which was the same thing, deliveries were from five to eight months in arrears. No change had occurred in prices and none was expected.

Switchboards, circuit breakers, meters and all current-measuring devices are from seven to nine months behind on delivery. The only material that has decreased in price is copper, but this is so small as scarcely to affect the cost of the finished article. Steel is hard to obtain.

A cable manufacturer stated that no change in the price of his products has occurred since Jan. 1. Very little sale of power-house cable could be reported, and business has fallen off, excepting as regards government orders. Last year at this time the same producer remarked he had orders for several hundred thousand feet of cable on delivery for June and July. This year he had not booked a single order. He could only account for it on the score of slow payment on the part of utilities, which therefore could not assume additional obligations. A second manufacturer was of the opinion that notwithstanding the sale of underground cable was slow, before the end of the year a large and profitable power business would be booked. This assertion was based on the growing demand for energy, which the shortage of fuel had greatly emphasized, and was sure to expand the call for additional service.

New Ordnance Department Official

Waldo H. Marshall, formerly president of the American Locomotive Company and now associated with J. P. Morgan & Company, has been appointed assistant chief of the Division of Production of the Ordnance Department.

Rolling Stock

St. Louis (Mo.) Car Company has received an order from the Saginaw-Bay City Street Railway Company, Saginaw, Mich., for seven 28-ft. double-end, double-truck city cars, and fourteen one-man light safety cars. Ten of the latter will be for double-end operation and four for single-end operation. Both the double-truck and one-man cars will be mounted on St. Louis Car Company trucks. The ELECTRIC RAILWAY JOURNAL of Jan. 5 mentioned the fire that destroyed thirty-five cars and a section of the carhouse, the loss being placed at $200,000.

Capital Traction Company, Washington, D. C., is reported as about to add twenty new cars to its rolling stock equipment. The Public Service Commission of the district has been notified by J. H. Hanna, vice-president of the company and in charge of operation, who is investigating the type of cars to be purchased.

Wheeling (W., Va.) Traction Company is reported to be in the market for new cars, following the fire, on Feb. 4, which destroyed twenty-nine cars and the carhouse, reported in the ELECTRIC RAILWAY JOURNAL of Feb. 9. The Jewett Car Company has an order from the Wheeling Company for fourteen double-truck cars, the delivery of which will be hastened. In the meantime the company plans to reconstruct all of the old motors and trucks as soon as the Westinghouse Electric & Manufacturing Company can supply the needed equipment. The Bay Island carhouse will be rebuilt as soon as possible.

Philadelphia (Pa.) Rapid Transit Company.—In the order for 100 cars now being built by the J. G. Brill Company, as mentioned in the ELECTRIC RAILWAY JOURNAL of Feb. 9, the following equipment was supplied by Holden & White, Inc.: 800 Garland ventilators, 400 Perry side bearings and 400 Anderson slack adjusters; by the National Railway Appliance Company, 400 each of gears and pinions, and 200 Wasson trolley bases; by the General Electric Company, 100 quadruple motor equipment (four motors to a car) and 100 air brakes. The cars are to be 40 ft. long, of the type now in use by the Philadelphia Company, and are to be delivered in ninety days. The order came through the Emergency Fleet Corporation and goes through on a priority certificate, as the new rolling stock is to be operated on the line to the Hog Island shipyards of the American International Corporation.

Brooklyn (N. Y.) Rapid Transit Company, in compliance with the recommendation of the Public Service Commission, First District, referred to in last week's ELECTRIC RAILWAY JOURNAL, to supply fifty trail cars, will rebuild and re-equip the rolling stock in its own shops, and also convert the 100 center-entrance cars for multiple-unit operation, besides the fifty motor cars to serve as leaders for the two-car trains.

Trade Notes

Babcock & Wilcox Company, New York, N. Y., has moved its Boston, Mass., office from 35 to 49 Federal Street.

Asbestos Protected Metal Company, Pittsburgh, Pa., announces the removal of its Boston, Mass., office to the State Mutual Building, to be in charge of William H. Cummings.

Wagner Electric Manufacturing Company, St. Louis, Mo., has insured its 3000 employees, up to $1,000 each, for 1918. The company pays the premium on the entire amount of insurance.

C. W. Hunt Company, Inc., New York, N. Y., manufacturer of coal-shoveling machinery, has removed its offices from 45 Broadway to the Astor Trust Building, 501 Fifth Avenue.

Department of Commerce, Washington, D. C., has published "Foreign Tariff Notes" No. 26, issued by the Bureau of Foreign and Domestic Commerce. The pamphlet has a special chapter on "Effect of the War on Tariff Policies."

General Electric Co., Lynn, Mass., on Feb. 5 distributed bonuses to about 13,000 employees who have worked continuously for it for five years. Five per cent of the total earnings of the past six months was paid, and the total amount disbursed was about $100,000.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces the removal of its branch office from Phoenix to Tucson, Ariz. J. H. Knost and W. G. Wilson, the company's representatives, will have headquarters in the Immigration Building.

Swan & Finch Company, New York, has just celebrated its sixty-fifth birthday, having started in February, 1853, in a small way. At the present day the company has classified 103 industries in which one or more of its products are used. Its main plant at Bayway, N. J., covers more than 15 acres.

H. W. Johns-Manville Company, New York, N. Y., has opened a branch house in its new building, corner of Olive and Eleventh Streets, St. Louis, Mo. It is a six-story structure of modern fireproof construction. Whenever practicable the company's products were used in the finishing of the building.

Esterline Company, Indianapolis, Ind., announces the appointment of the Northern Electric Company, whose main office is at Montreal, as exclusive distributers of Esterline products for the entire Dominion of Canada. The Northern company has branch offices in Halifax, Ottawa, Toronto, London, Winnipeg, Calgary and Vancouver.

Schweitzer & Conrad, Inc., Chicago, Ill., has recently appointed the Frankline Sales Company, Denver, Col., district representative for Wyoming, Colorado, New Mexico, Arizona, Utah, the western portion of Nebraska and the eastern portion of Montana and Idaho. The Frankline company will sell the entire line of S. & C. protecting and switching devices.

Maxwell Engineering & Manufacturing Company, New York, N. Y., is a new company established at 61 Broadway to manufacture electrical specialties, transmission line equipment, transmission line hardware and outdoor and indoor substations. Mr. Maxwell, president and general manager of the company, was for the past five years sales agent for the Hickey & Schneider line.

National Railway Appliance Company, New York, has taken the agency for the South, New England and New York State for "Rimco" rubber insulated pliers, manufactured by the Rubber Insulated Metals Corporation, Plainfield, N. J. The Electrical Service Supplies Company, Philadelphia, Pa., has the sale of this specialty in its territory. The Plainfield company is reported as about bringing out a complete lineman's kit of moulded rubber insulation.

Western Contracting Company, San Francisco, has the contract for constructing two tracks on Market Street, between Geary Street and Van Ness Avenue, for the San Francisco Municipal Railway. The contract calls for the installation of 13,000 ft. of single track, with eighteen pieces of special track work, crossings, branch-offs, etc. The Western Contracting Company was formerly the Western Motor Driving Company. A. J. Crocker, 351 Noe Street, San Francisco, is president.

New Advertising Literature

Harvey Hubbell, Inc., Bridgeport, Conn.: Leaflet descriptive of its Hubbell lamp guard.

W. N. Matthews & Bro., Inc., St. Louis, Mo.: Catalog descriptive of its line-material specialties.

Ohio Brass Company, Mansfield, Ohio: Folder descriptive of its luminous and incandescent type of headlights.

Thompson Electric Company, Cleveland, Ohio.: New catalog, which is more comprehensive than anything the company has had heretofore. Copies may be had by writing.

Fred T. Ley & Company, Inc., Springfield, Mass.: Illustrated catalogs descriptive of the company's transmission systems and power houses, the latter having been built within the last two or three years.

Manganese Track Society and Manganese Steel Founders' Society, Chicago, have just issued Booklet No. 7, giving rules and detailed design for laying out solid manganese steel frogs. The previous books of recommended standards issued have been: No. 1, steam railroad frogs; No. 2, steam railroad crossings; No. 3, manganese steel switch points; No. 4, groove and flare in guard in crossings and frogs; No. 5, manganese steel track work for steam railroads; No. 6, railbound manganese steel frogs.

Farnsworth Company, Conshohocken, Pa.: Illustrated bulletin descriptive of its condensation utilities. The following apparatus are described: Duplex boiler feeder, duplex condenser-vacuum boiler-feed pump, duplex pumping trap, duplex condenser-vacuum pumping trap, direct-return condenser-vacuum trap, direct-return trap, pumping trap, condenser-vacuum pumping trap, high-vacuum trap, separating or non-return trap, variable-pressure trap or combined pumping and non-return or separating trap, and variable-pressure condenser-vacuum pumping and separating trap. A chart showing the coal which can be saved by increasing the temperatures of the feed water by using the machines made by this company with closed system, or keeping the condensation under pressure, is given.

RAILWAY MATERIALS

	Feb. 20	Feb. 27
Rubber-covered wire base, New York, cents per lb.	27-34	27-30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33½ to 38.35	33½ to 38
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.33	$1.35
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.34	$1.36
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	47½	46½

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*Nominal.

NEW YORK METAL MARKET PRICES

	Feb. 20	Feb. 27
Copper, ingot, cents per lb.	23½	23½
Copper wire base, cents per lb.	27	27
Lead, cents per lb.	7	7¼
Nickel, cents per lb.	50	50
Spelter, cents per lb.	8	8
Tin, Straits, cents per lb.	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	34-36	35-37

OLD METAL PRICES—NEW YORK

	Feb. 20	Feb. 27
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	17½	18
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.42	$42.41
Old car wheels, Chicago, per gross ton	$30.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, March 9, 1918 *Number* 10

National and Sectional Associations in War Time

SINCE the publication of the editorial two weeks ago on the holding of conventions in war time we have had the opportunity to observe the Central Electric Railway Association in action, with the result that the opinions expressed in the editorial have been substantially confirmed. The success of the annual meeting has led the association to decide that it should hold some kind of a summer meeting, even if this be of the nature only of a get-together affair.

As one reads of the proceedings of the Dayton meeting of this association, which can be done in this and the previous issue of the ELECTRIC RAILWAY JOURNAL, he is impressed by the fact that those in attendance at such a meeting could not but go home with a stronger patriotism and with a desire to place their properties more completely at the disposal of the government for the winning of the war. When electric railways were more prosperous they could get along fairly well without much co-operation, but as their difficulties have multiplied the need for coherence has become more pressing. Now, under the stress of war conditions, united action is necessary if the railways are to withstand the storm and at the same time lend a hand in the solution of war problems.

For this reason we repeat what was said before, namely, that national and sectional organizations should resume in a modified degree the co-operative activities which they maintained before the war.

Increased Passenger Rates for Steam Railroads Will Help the Electric Railways

A RESOLUTION introduced by Arthur W. Brady at the Dayton meeting of the Central Electric Railway Association contained a plea for higher passenger rates for the steam railroads. While the electric railways have enough troubles of their own without trying to get increased income for the steam roads, this is a case in which both suffer when the steam road rates are too low. It helps an electric railway very little if it secures the right to increase its rate of fare when a competing steam road is held to a rate lower than that which is profitable for the electric railway.

The rate of 2 cents per mile imposed upon steam roads in some places may have been all right when first established, but it is obviously too low now. In the early days the interurban electric railway could compete with its steam rival, even at this rate, but the time when it can do so successfully has gone by. The steam railroad does not depend largely upon passenger business for its profit, so that if money is being made on the freight traffic it may seem possible for a time to conduct passenger business at a loss. On the electric railways, however, the situation is exactly reversed.

Hence, while the steam roads are concentrating attention to a considerable extent on securing increases in freight rates, it is not illogical for the electric railways to help themselves, and incidentally the steam roads, by urging the reduction of restrictions upon the latter. It is to be hoped, therefore, that the resolution introduced by Mr. Brady will be used as effective ammunition in the campaign for higher interurban fares.

An Inconspicuous Piece of Electrical Apparatus That Demands Respect

THE power plant circuit breaker is a more important element of plant equipment than the space available for the subject in the issue of this paper for Feb. 23 would seem to indicate. In the power plant the circuit breakers are usually inconspicuous, being placed in isolated rooms from considerations of safety, and they are housed in compartments that look more like clothes lockers than anything else. Yet the successful operation of the plant depends largely on these simple switches inclosed in steel cylinders filled with oil and operated by solenoid or motor mechanisms placed overhead.

An engineer stated recently that a single breaker has opened a circuit carrying 500,000 kw.—enough power to operate 25,000 ordinary city cars. Such a statement, however, doesn't mean much even to one accustomed to electrical phraseology, but it is worth visualizing as far as possible. There is no analogy between opening an electric circuit and stopping a heavy train in full motion, as has sometimes been suggested. It is more like the breaking of a belt, or a train of gearing connecting a prime mover and its load. That the amount of energy ordinarily concentrated at the contacts in the circuit breaker is not very great is indicated by the fact that the oil absorbs this energy without excessive rise of temperature. The contacts separate so quickly and the oil flows in between them so promptly that there is little opportunity for heat to develop. Under very heavy short-circuits, however, the oil may be expelled from the cylinders violently and the contacts may be burned. Usually, however, the breaker is ready to be closed as soon as it has functioned, safeguarding the apparatus which it has been set to protect.

When one considers the possible extent to which power can be concentrated in a short circuit in a modern power system he realizes how important is the function of the device which has the duty of relieving the system of load under these circumstances. It is "up to" the watchdog of the power plant or substation, the circuit breaker, to be on the job. Thanks to the high degree of engineering skill lavished upon its design, it has kept up with the requirements in a wonderful manner.

Restoring Power Service After an Interruption

THE problem of providing continuous power service has been for some time one of paramount importance. Several articles appearing in recent issues of the ELECTRIC RAILWAY JOURNAL have indicated a number of ways in which interruptions of service are being prevented. Without in any way desiring to detract from the credit due to managers and engineers for the ingenuity and resourcefulness manifested by the application of these expedients, it may be worth while to refer to another phase of the same general subject. A survey of the technical literature dealing with the problem of preventing service interruptions seems to indicate that, in an effort to solve the problem of eliminating all interruptions, too little attention has been given to methods of restoring service once an interruption has occurred. In other words, we have been concentrating on preventive medicine and paying too little attention to remedial medicine. We are told, quite logically, that preventive methods are the best kind to use, but they are not the only ones needed. Think, plan, and insure as we will, we are not yet able to control the elements of nature, and so long as this remains true we shall have service interruptions. However, we can do much in the way of shortening the periods of unavoidable interruptions by foreseeing and planning for possible emergencies. The keeping and analyzing of records of service interruptions constitute an extremely good start in forming a basis for such planning.

The Montreal Tramways Seem Assured of an Adequate Power Supply

VERY few electric railway systems are situated as fortunately as is that at Montreal, Quebec, with respect to power supply. Its neighborhood abounds in water powers, many of which are highly developed. There is possibly 500,000 hp. of supply available now, which is a large quantity compared with the ultimate requirements of the Tramways. The general aspects of the Tramways' power situation were explained recently in an article in this paper, and this week we give some of the details of substation and conduit lines. These articles show that the company is endeavoring effectively to use all possible sources of power, so to insure continuity of service and reasonable cost. When the general rehabilitation of the power system is completed, and it is now approaching completion, the company will have an unusually homogeneous transforming and distribution equipment.

Some engineers will be inclined to criticise the Tramways company for the use of motor-generator sets. In the articles we have endeavored to set forth as clearly as possible the reasons for the use of this type of equipment rather than rotary converters. We assume that if the whole distribution plant were to be renewed, rotary converters might be used. The old motor-generator sets were so satisfactory, however, that it was perfectly natural that they should be continued in use until it has been clearly demonstrated that they must be "scrapped" in the interests of economy. We like to consider a power system, like anything else, as having a kind of personality, its present character reflecting its environment and other causes contributing to its development. For this reason, and in order that JOURNAL readers may examine the present power situation at Montreal intelligently, we have gone more than usually into the story of its growth.

Commissions Should Face Squarely the Question of a Fair Return

TOO frequently in recent fare cases the commission has seemed desirous not of granting the increase needed to bring the rate of return up to a fair average but merely of giving the petitioning company a little more revenue than it had been getting. In other words, a pittance of relief rather than exact justice has been awarded.

Commissions have usually held that low rates of return in some years are balanced by high rates of return in other years and that the utilities are entitled to only a fair average rate of return. They have tended to disregard the fact, however, that there must be a slight margin in the prosperous years if these are to counterbalance bad years. Hence their policy, interesting in theory, has not amounted to much in practice.

The situation has become worse than ever during these war days. Capital is harder to get now than in normal times, and it is a very important question as to what increase should be made in the old restricted rate of return in order properly to reward capital for engaging in the electric railway business. Some commissioners feel that while the rates should not be made so low as practically to be confiscatory, yet the maximum rate of return should not be expected. Bankers and utility operators feel, however, that under present conditions a return of from 10 to 12 per cent is needed to accomplish the results which were formerly secured by a 6 per cent return.

Investors want to know what rate of return can be expected in abnormal times. When regulation began they assumed that the rates of return mentioned by commissions would be assured in bad as well as in good years, or that a fair average would be maintained. But the commissions have not squarely faced the question of a fair average. Forgetful of increasing costs of operation, they have hoped too much that net income would be restored at some time in the future without their aid. As a result the average rate of return on more than one property has seriously declined, rendering the company's investment values unstable.

The investors have learned a lesson. Until the commissions announce frankly and explicitly a liberal rule for calculating the future rate of return, capital is likely to glance askance at electric railway investments. Will the commissions henceforth protect a fair average rate of return by allowing the companies to charge fares high enough to accumulate some reserve for surplus and contingencies? This question is not simply of academic interest. The investor must be made to feel secure. Speculative profit has been removed from utility securities, and commissions should hesitate no longer to assure safety of principal and income in its place.

Why Not Use Automobiles Less and Trolley Cars More?

A COPY of the 1917 Proceedings of the Southwestern Electrical & Gas Association just received, shows that one of the speakers brought up the increasing tendency of heads of railway departments, in their trips around the systems, to travel in company automobiles rather than on the cars. The claim was not made that automobile transportation should be entirely given up. The time saved by this means of transit is important, and on many kinds of trips its use may be warranted. Nevertheless, we think that the critic of this practice at the Southwestern meeting was right when he said that when a manager or the head of a department uses an automobile habitually for getting around his work instead of the cars, he misses seeing a great many things about car operation which he would see if on the car. In fact, one case was reported of a city in which, during an investigation being made of traffic conditions, it developed that the officials of the company knew very little about the traffic conditions of their cars because they never rode on them.

The question of example set to others is one which might also be considered in this connection, especially in the smaller cities where the officers of the company who have to travel about are well known by sight to most of the citizens. In such cases it would be rather difficult for a manager to find fault with others for riding in jitneys or their own automobiles, when he depended habitually upon an automobile himself for getting about.

All Unnecessary Construction Should Cease to Conserve Funds and Labor

GOVERNMENT plans to restrict heavy financing for private enterprises or for purely local improvements having nothing to do with war activities may have the effect of checking the extension of railway lines in cities where such work has been done every year by ordinance requirement. Aside from the patriotic motive which would direct the use of a large proportion of available capital for war purposes, there will be the additional advantage of conserving the already restricted supply of labor for other work. Suggestions from various state councils of defense that public improvement work on streets, bridges, etc., be postponed wherever possible during the coming year have aroused opposition in certain political circles, owing to the prospective loss of this class of "patronage jobs." However, such considerations are not likely to prevail if the higher needs of the nation call for a diversion of labor to other fields.

Meanwhile it should not be out of order to suggest a slacking up in "forced" extensions so as to give electric railways a chance to "recover their breath"—financially—while studying ways to make ends meet. Necessary track repairs for the purpose of keeping roadways up to a proper standard of maintenance should go on as usual, but the prevailing policy in some cities of compelling the local companies to build so many miles of track each year regardless of actual needs would appear out of place, when there are better uses for such funds. Study of cost and earnings will show in many cases that compulsory extensions are not remunerative to the investors and of no actual need to the occasional patrons of the new lines. Doubtless they help certain real estate promoters to dispose of property, but the drain on other remunerative lines is likely to be such that the people as a whole suffer where they might have been aided had such expenditures been made for well-considered traffic betterments.

Some Things the War Is Doing To and For Electric Railways

AS THE FIRST anniversary of the entry of the United States into the world war approaches, it is worth while to attempt to size up the situation so as to utilize the experience so far gained in preparing for the tug-of-war which undoubtedly is to come. The collapse of Russia probably means a considerable prolongation of the war, and if it is to last for several years more, each successive year is going to present greater operating difficulties for the electric railways. There will be a real test of the mettle of the industry here, as there already has been one abroad. In the railway business, as in the country's military, naval and aerial preparations, we must get ready for a long continuation of hostilities.

It would seem as if any business could not be harder hit than was ours during the past year. The war has brought sky-rocket prices of materials, shortage of labor, money and materials, unusual transportation burdens, etc., and it will bring more of these. It's a mighty uncomfortable time for the responsible manager or the responsive employee, but it's a time when there is much of promise visible to those who look on the business as a means of service rather than merely a means of livelihood. The times are separating the sheep from the goats.

The great lesson that the war is teaching is that operating conditions and public standards of service have undergone tremendously rapid changes in but a few years, making it very difficult to meet the requirements with existing equipment. Unfortunately, there is scarcity of money with which to buy new equipment, but such money as is available is being spent more intelligently than ever before. To this end electric railway operation is being analyzed as never before also, and promising economies are constantly being discovered.

Moreover, the public, through its representatives, is permitting the introduction of economies that would have been turned down in peace times. If a public body or official can be shown that a proposed practice will directly or indirectly contribute to the conservation of our war resources, the chances are that this practice will be approved and even encouraged. It is reasonable to assume that privileges granted under stress of war will not be withdrawn afterward if they are proved not to conflict with public interest.

We realize that it is an immense subject that has been touched upon in this and preceding editorials on the war situation. The conditions pictured in outline are very difficult, but they need not be discouraging. The present, however, is no time for either timidity or discouragement on the one hand, or, on the other, for complacency or indifference to the seriousness of the situation which confronts us.

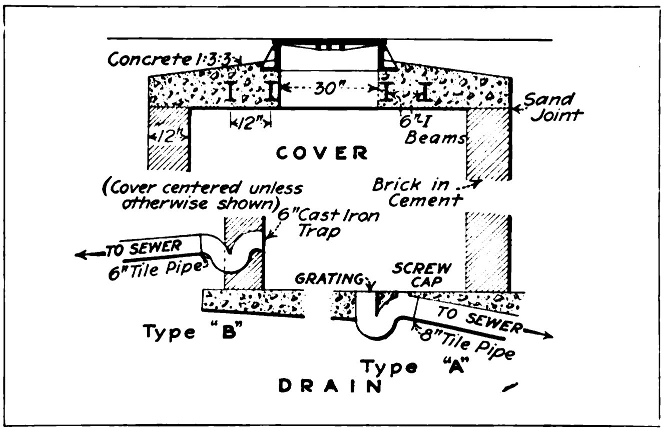

Concrete 1:3:3
30"
12"
12"
6" I Beams
Sand Joint
COVER
(Cover centered unless otherwise shown)
Brick in Cement
6" Cast Iron Trap
TO SEWER
6" Tile Pipe
GRATING
SCREW CAP
TO SEWER
8" Tile Pipe
Type "B"
Type "A"
DRAIN

FIG. 1—CROSS SECTION OF STANDARD MANHOLE SHOWING TWO TYPES OF DRAINAGE

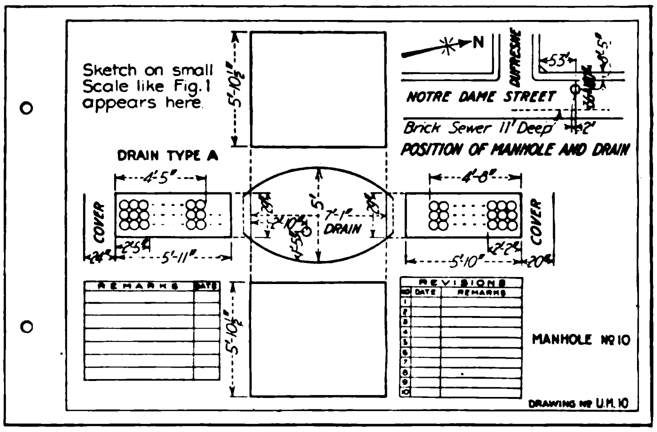

Sketch on small Scale like Fig. 1 appears here.
5'-10½"
DRAIN TYPE A
4'-5"
COVER
5'-11"
7'-1"
DRAIN
5'
N
DUFRESNE
NOTRE DAME STREET
Brick Sewer 11' Deep
POSITION OF MANHOLE AND DRAIN
4'-6"
5'-10"
20"
REMARKS
DATE
REVISIONS
NO
MANHOLE No 10
DRAWING No U.M. 10

FIG. 2—SAMPLE 6½ X 8½ IN. LEAF FROM FIELD NOTEBOOK, SHOWING MANHOLE LAYOUT AND DRAINAGE SCHEME

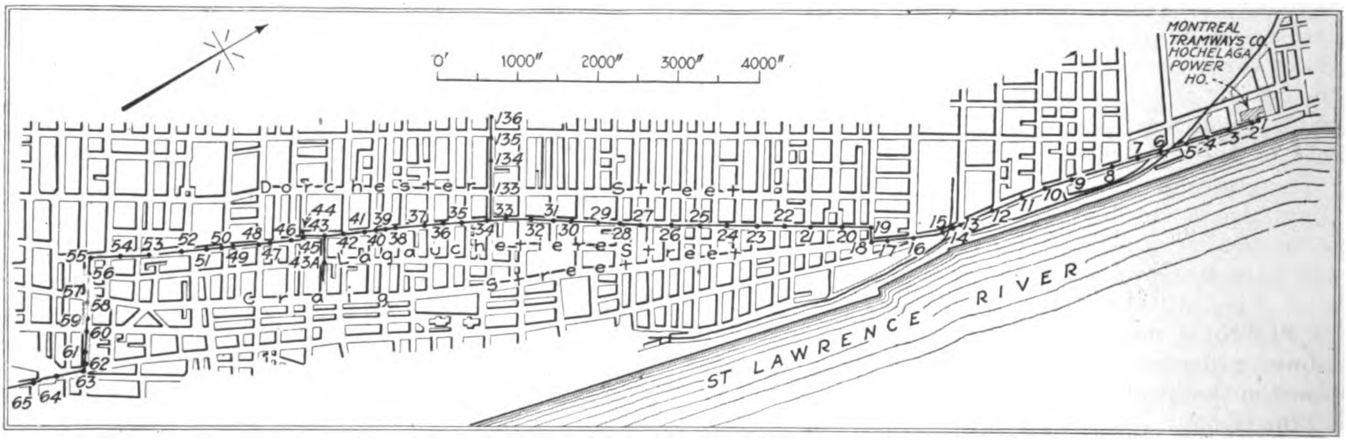

0'
1000"
2000"
3000"
4000"
MONTREAL TRAMWAYS CO. HOCHELAGA POWER HO.
Dorchester Street
Lagauchetiere Street
Craig Street
ST LAWRENCE RIVER

FIG. 3—SAMPLE PLAN USED BY MONTREAL TRAMWAYS FOR IDENTIFYING MANHOLE LOCATIONS. ACTUAL SCALE USED 500 FT. TO THE INCH

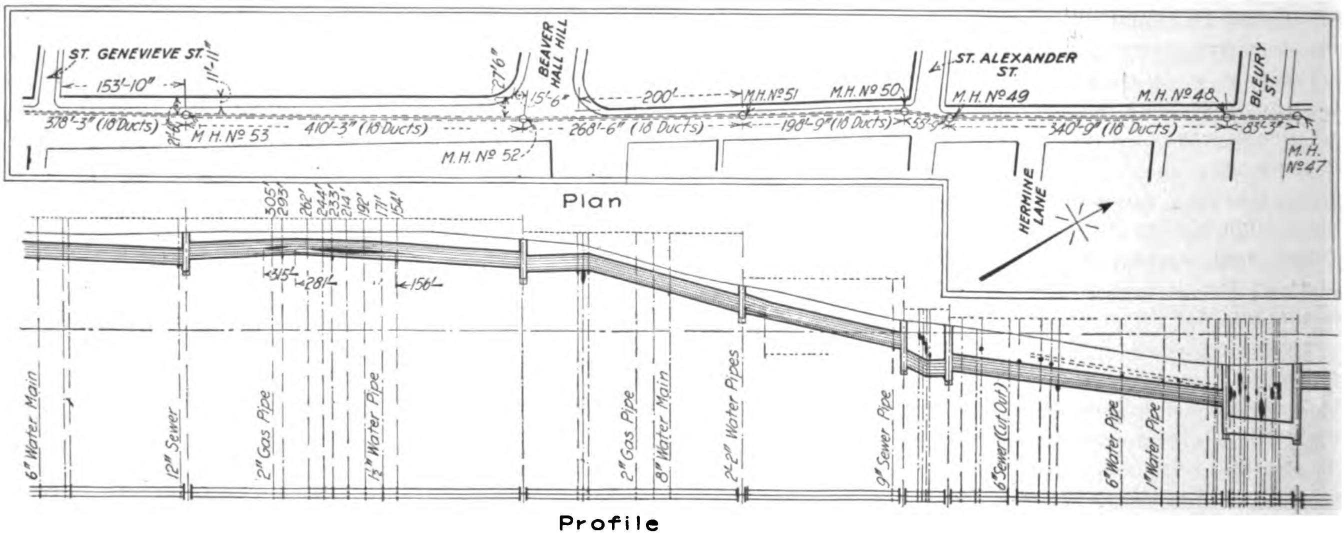
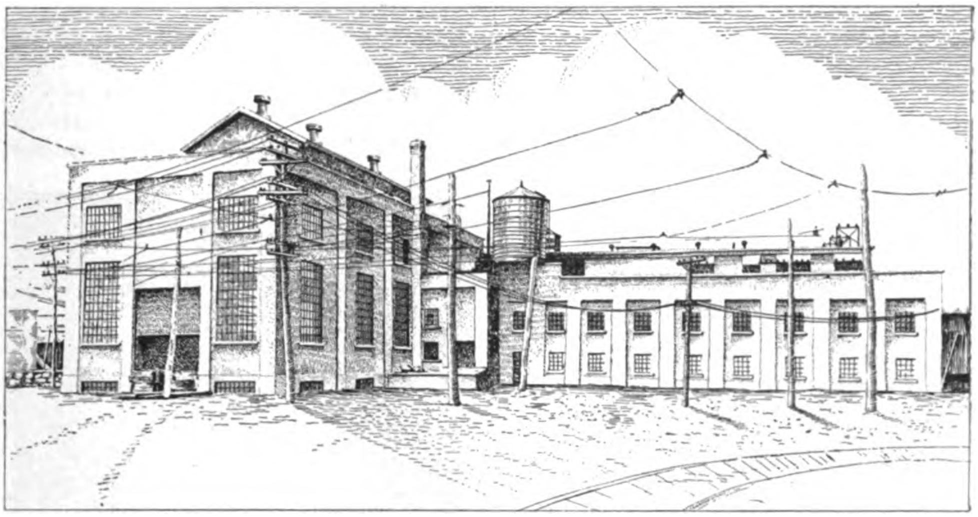

ST. GENEVIEVE ST.
153'-10"
11'-11"
27'6"
BEAVER HALL HILL
15'-6"
200'
M.H. No 51
M.H. No 50
ST. ALEXANDER ST.
M.H. No 49
M.H. No 48
BLEURY ST.
378'-3" (18 Ducts)
M.H. No 53
410'-3" (18 Ducts)
268'-6" (18 Ducts)
198'-9" (18 Ducts)
340'-9" (18 Ducts)
83'-3"
M.H. No 47
M.H. No 52
HERMINE LANE
Plan
305'
293'
262'
244'
233'
214'
192'
171'
154'
315'
281'
156'
6" Water Main
12" Sewer
2" Gas Pipe
1½" Water Pipe
2" Gas Pipe
8" Water Main
2-2" Water Pipes
9" Sewer Pipe
6" Sewer (Cut Out)
6" Water Pipe
1" Water Pipe
Profile

FIG. 4—SAMPLE DUCT LAYOUT AS USED BY MONTREAL TRAMWAYS. ACTUAL SCALE, VERTICAL, ONE-EIGHTH INCH TO THE FOOT; HORIZONTAL, ONE INCH TO FIFTY FEET

Typical Diagrams of Conduit Work of the Montreal (Quebec) Tramways. The Drawings Selected Show Not Only the Technical Features of the Design but Also, and Particularly, the Method Used for Recording the Details of Manholes, Conduits, Obstructions, etc.



VIEW IN THE ANGLE OF THE ST. DENIS SUBSTATION, MONTREAL TRAMWAYS

Power Distribution for the Montreal Tramways

Standardization Combined with Flexibility and the Effective Utilization of Existing Equipment Were Primary Design Considerations in the Rehabilitation of the Power System of This Company

IN PLANNING the comprehensive remodeling of its power generation and distributing system, as outlined in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 12, 1918, the Montreal Tramways had in view the ultimate standardization of equipment, duct lines, etc., so that the power facilities could be kept more intimately related to the extension of the tramway service than it had in the past. As Montreal is located in a district rich in water power, steam will be used only as reserve power, and the substations will be more and more the important elements in the power layout.

At present there are two steam stations in operation and nine substations, including the two steam plants which also act in this capacity. These are indicated on the map in the Jan. 12 issue. In the city proper the substations will be connected by means of a high-tension underground system, and in addition the Tramways Company will utilize, for low-tension distribution, the municipal ducts which the city has installed in the downtown business and residence districts for the use of the power and tramway companies but not for high-tension lines.

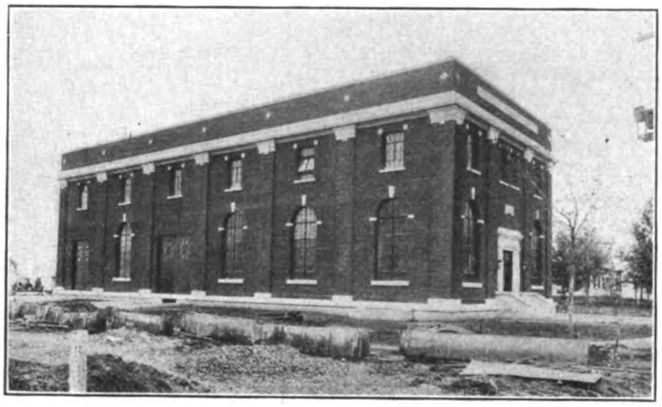
The company has standardized on the use of motor-generator sets, the tendency being toward a unit of 1500-kw. capacity. In general these will be synchronous motor sets, which experience has shown to be easy to operate, both with respect to starting and stopping, and to load distribution.

Connecting its power plant with most of the substations, the company uses duct lines of No. 0000 three-conductor, round-conductor cable, paper insulated. The insulation around individual conductors is ¼ in. thick and there is a ¼-in. jacket around the three. The working voltage is 13,200, so that this insulation gives a very large factor of safety. One of these cables is considered to be good for the maximum output of two substation units, that is, 4000 kva. The cables were fabricated by the Northern Electric Company, and potheads of the Standard Underground Cable Company's manufacture were used.

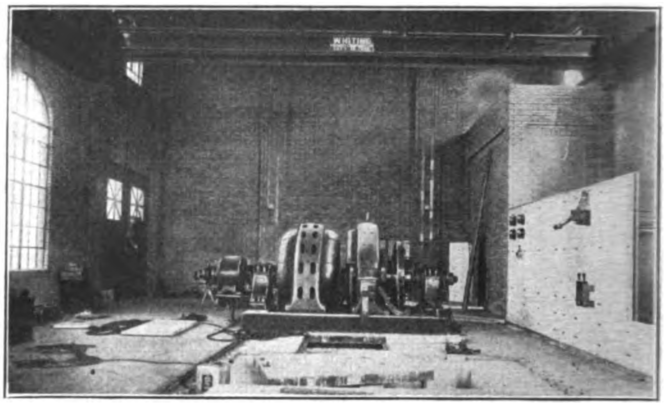
Where cables pass under railroad tracks or are located on hills they are sheathed with lead containing 1 per cent of tin for the purpose of toughening the sheath and increasing its tensile strength. Elsewhere the lead is pure. On the hills anchoring devices are used to prevent creeping. The ducts in the high-tension system are of 4 in. nominal diameter, the conduit being laid up of single duct. While this diameter is larger than is necessary for the cables at present in use, it was selected to provide for a possibility of using larger cables later, to render installation and removal of cables easy and to furnish liberal air space for ventilation. The duct diameter is larger than is used in the municipal conduits, where the standard is 3½ in. nominal. Ventilation is also assisted by the use of perforated covers for the manholes.

THIS IS AN ENTRANCE INTO A SUBSTATION, NOT A CARNEGIE LIBRARY

In the manholes the cables are wrapped with composition metal lath laid over oiled paper to protect the lead from the action of the cement with which the lath is plastered. At every manhole the cables are bonded together and grounded to a ground cone located in the bottom of the manhole. The cone is made of No. 25 gage sheet copper, 24 in. long, 6 in. in diameter at the open bottom and tapering to about one-half this diameter at the top. It is filled and surrounded with coke and is connected by No. 0000 copper cable 4 ft. long to the cable bond.



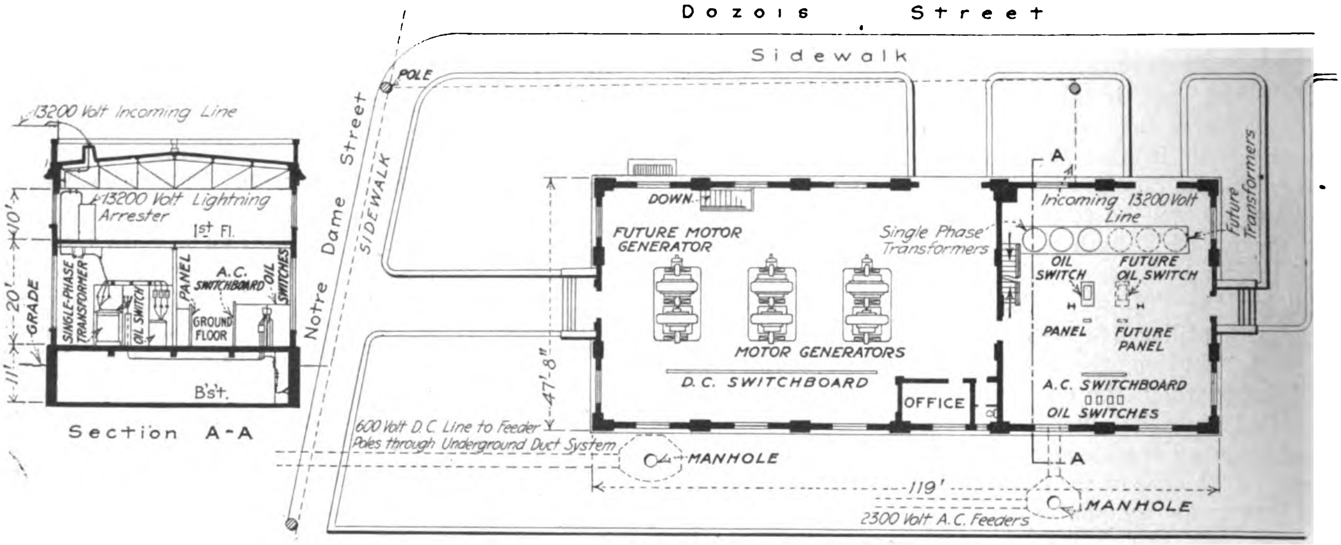
LATEST SUBSTATION OF MONTREAL TRAMWAYS, AT POINTE AUX TREMBLES, SHOWING ARCHITECTURAL TREATMENT



FIRST MOTOR-GENERATOR SET INSTALLED IN POINTE AUX TREMBLES SUBSTATION, MONTREAL TRAMWAYS

In the 9½ miles of conduit there are 184 manholes located so that the maximum length of cable does not exceed 350 ft. These manholes are of standard form, oval in plan. They are 8 ft. long, 6 ft. wide and 6 ft. deep, and have cast-iron covers 30 in. in diameter. The general dimensions and method of drainage are indicated in Fig. 1.

Fig. 2 is reproduced from a standard manhole record sheet to show the method used for keeping track of the cables in each manhole and the method of draining it. On the same sheet is a plan locating the manhole with respect to the nearest street intersection permitting a prompt identification of the manhole when ground is covered with snow by reference to the general conduit plans, one of which is reproduced in Fig. 3. Data sheets like that shown in Fig. 2 are reduced to pocket size, 6½ in. x 8½ in., for insertion in the field engineers' notebooks. These sheets also contain information regarding drainage and grounding, which has been removed in the illustration to simplify the reproduction.


Dozois Street
Sidewalk
POLE
13200 Volt Incoming Line
13200 Volt Lightning Arrester
1st Fl.
10'
20'
11'
GRADE
SINGLE-PHASE TRANSFORMER
OIL SWITCH
PANEL
A.C. SWITCHBOARD
OIL SWITCHES
GROUND FLOOR
B'st.
Section A-A
Notre Dame Street
SIDEWALK
DOWN
FUTURE MOTOR GENERATOR
Single Phase Transformers
MOTOR GENERATORS
D.C. SWITCHBOARD
OFFICE
47'-8"
A
Incoming 13200 Volt Line
Future Transformers
OIL SWITCH
FUTURE OIL SWITCH
PANEL
FUTURE PANEL
A.C. SWITCHBOARD
OIL SWITCHES
A
600 Volt D.C. Line to Feeder Poles through Underground Duct System
MANHOLE
119'
MANHOLE
2300 Volt A.C. Feeders

FIGS. 5 AND 6—SECTION THROUGH TRANSFORMER AND SWITCH ROOM OF POINTE AUX TREMBLES SUBSTATION, MONTREAL TRAMWAYS, AND GENERAL PLAN OF SUBSTATION

The whole conduit system is also charted on a large scale in plan and profile, as shown in Fig. 4, with particular reference to other underground pipes and conduits.

SUBSTATIONS OF MONTREAL TRAMWAYS COMPANY

Name of Substation	No. and Size of Motor-Generating Units	No. and Size of Transformers
Pointe aux Trembles	One 1000 kw. synchronous One 500 kw. induction	Three 800 kw.
St. Henry	Two 500 kw. induction One 1500 kw. synchronous.	Three 500 kw.
St. Denis	Three 500 kw. induction Two 1500 kw. synchronous.	Three 500 kw. Two 3000 kva.
Youville	One 500 induction	Three 200 kva.
Shawinigan	Three 1000 kw. (rotary)	*
Cote des Neiges	One 1000 kw. synchronous.	
Cote St. Paul	One 1200 kw. synchronous.	
Cote St. (proposed)	....	Not decided.
Hochelaga (in power plant)	One 2000 kw. (rotary)	One 3000 kva.
William St. (in power plant)	Six 500 induction motors One 500 synchronous motor. Three 1500 synchronous motors	One 3000 kva.

*Transformers are property of Shawinigan Water & Power Company.

The details of power transforming units in the substations are given in the table above.

As there is much similarity in detail in all the substations and as the Pointe aux Trembles and St. Denis substations are typical of the company's developing standards of construction, these two only will be examined in some detail. The Côte Street substation will be the next one constructed. This will conform in general style to that at Pointe aux Trembles, and will contain about six 1500-kw. synchronous units.

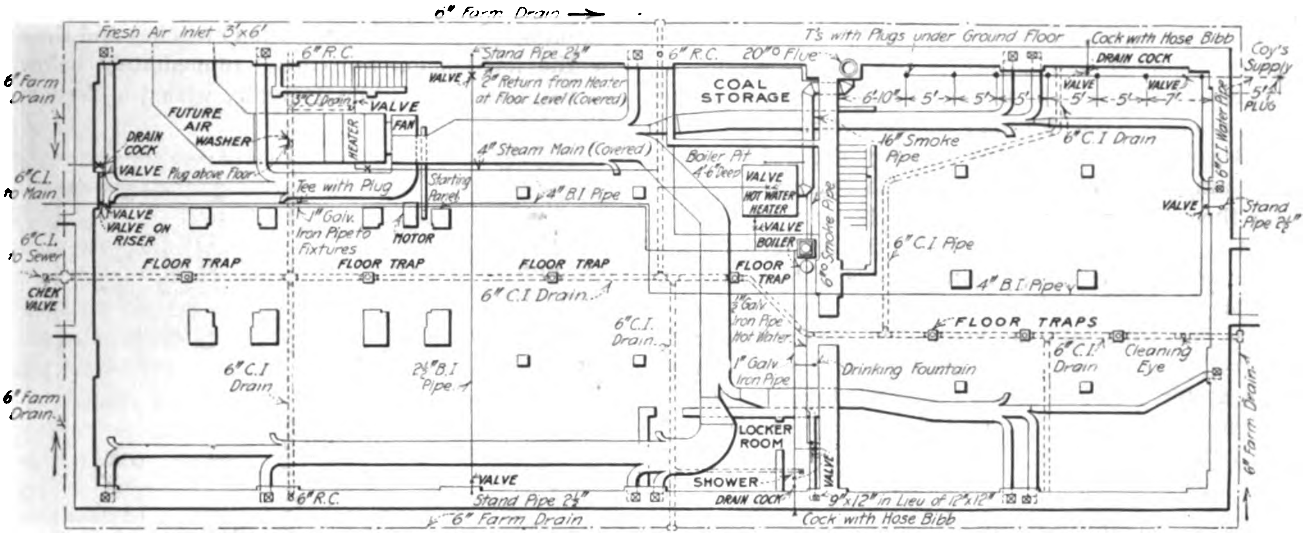
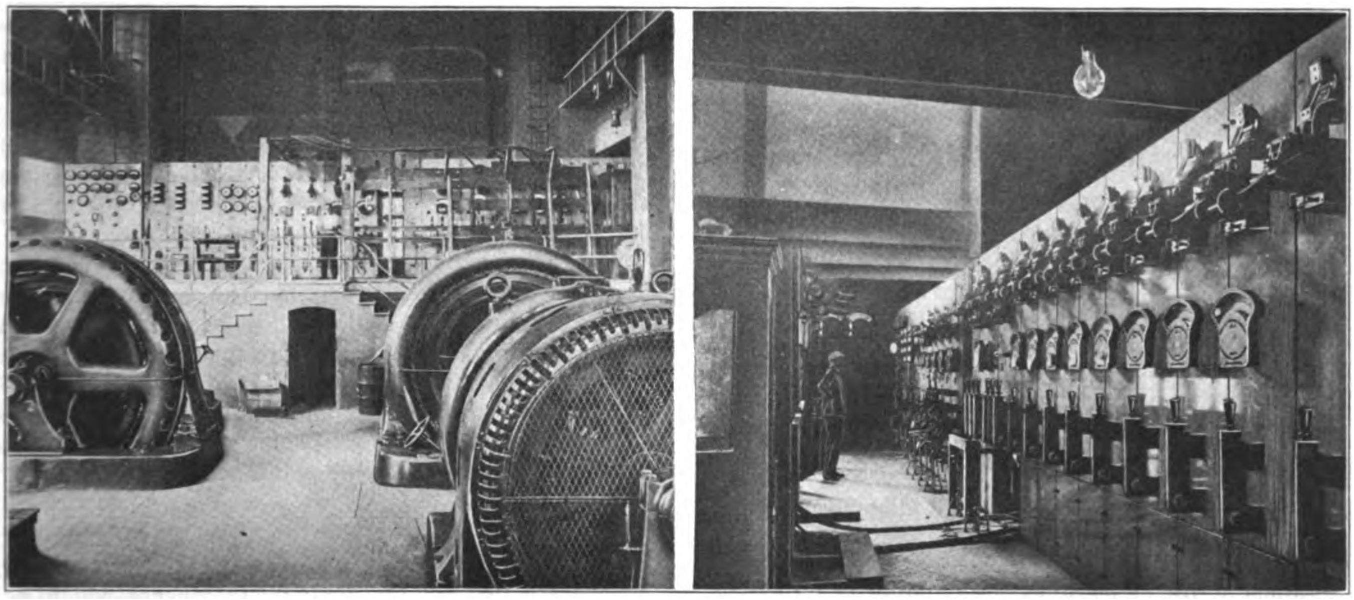

6" Farm Drain
Fresh Air Inlet 3'x6'
6" R.C.
Stand Pipe 2½"
6" R.C.
20" ⌀ Flue
T's with Plugs under Ground Floor
Cock with Hose Bibb
DRAIN COCK
Coy's Supply
5" PLUG
6" Farm Drain
VALVE
2" Return from Heater at Floor Level (Covered)
3" C.I. Drain
VALVE
FUTURE AIR WASHER
DRAIN COCK
HEATER
FAN
COAL STORAGE
6'-10"
5'
5'
5'
VALVE
VALVE
5'
5'
7'
6" C.I. Water Pipe
16" Smoke Pipe
6" C.I. Drain
4" Steam Main (Covered)
Boiler Pit 4'-6" Deep
VALVE
HOT WATER HEATER
VALVE
BOILER
6" C.I. Main
VALVE Plug above Floor
Tee with Plug
Starting Panel
4" B.I. Pipe
VALVE
Stand Pipe 2½"
VALVE
VALVE ON RISER
1" Galv. Iron Pipe to Fixtures
MOTOR
6" C.I. Pipe
6" ⌀ Smoke Pipe
6" C.I. to Sewer
FLOOR TRAP
FLOOR TRAP
FLOOR TRAP
FLOOR TRAP
4" B.I. Pipe
CHEK VALVE
6" C.I. Drain
½" Galv. Iron Pipe Hot Water
FLOOR TRAPS
6" C.I. Drain
6" C.I. Drain
Cleaning Eye
1" Galv. Iron Pipe
Drinking Fountain
6" C.I. Drain
2½" B.I. Pipe
6" Farm Drain
LOCKER ROOM
6" Farm Drain
VALVE
SHOWER
VALVE
6" R.C.
Stand Pipe 2½"
DRAIN COCK
9"x12" in Lieu of 12"x12"
6" Farm Drain
Cock with Hose Bibb

FIG. 7—BASEMENT PLAN OF POINTE AUX TREMBLES SUBSTATION, MONTREAL TRAMWAYS, SHOWING DRAINAGE, VENTILATION AND WATER SUPPLY

In studying this substation work, particularly the reconstruction, it must be remembered that the development has been along lines which might not have been followed if the whole layout of substations had been new. At the same time there has been a definite goal in view, namely, to standardize on a design of which the Pointe aux Trembles substation is typical, in which the apparatus is arranged for convenience of operation and at the same time the buildings are bright, well ventilated and architecturally attractive. It has been found possible at no increase in cost to incorporate simple architectural features along esthetic lines. As the Pointe aux Trembles substation is located in a residence municipality adjacent to Montreal, a special effort has been made here so to design the building that it will not in any way clash with the style of the adjacent buildings; in fact, the hope has been that it will set a mark architecturally for the neighborhood.



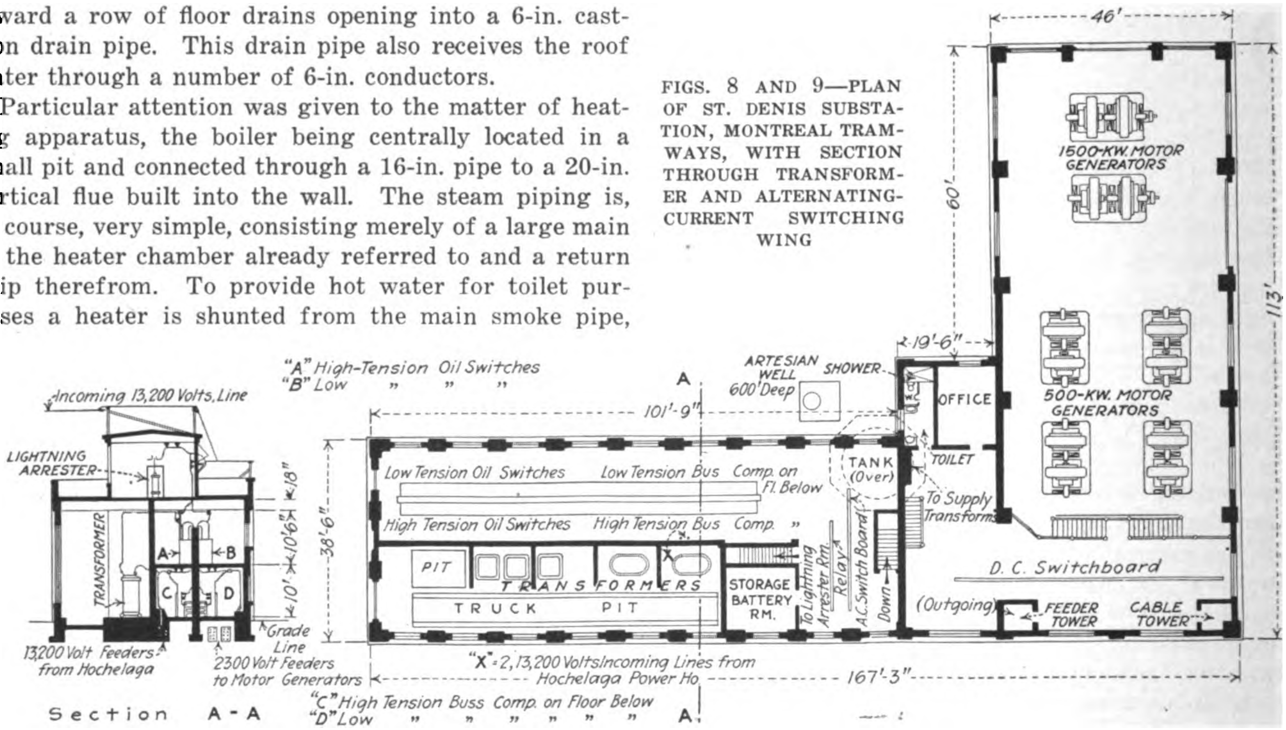
SWITCHBOARD IN MOTOR-GENERATOR ROOM, ST. DENIS SUBSTATION, MONTREAL TRAMWAYS

Figs. 5 and 6 are respectively a vertical section of the transformer room and a plan of the Pointe aux Trembles substation. The drawing shows the high-tension line entering through the roof. Power is supplied to this substation over a pole line rather than a conduit line on account of its remoteness from the power station. The substation supplants an old steam plant which is just now being shut down. The high-tension circuit passes with as few bends as possible through the lightning arrester room and through the bank of transformers below, thence to the motor-generator room at 2300 volts. The plan shows also the outlet to a 2300-volt distribution system which is utilized for local lighting and power purposes. A 600-volt outlet leads underground to the neighboring direct-current feeder poles.

The simplicity of this layout is particularly conspicuous in the plan and in the photograph of the unfinished motor-generator room. The visitor is impressed by the quiet dignity of the installation.

The basement plan of the Pointe aux Trembles substation (see Fig. 7) shows two divisions corresponding to the rooms above. The three features of the basement are the ventilating apparatus, the provision for drainage and the water supply. Fresh air is drawn in from out of doors through a 3-ft. x 6-ft. inlet, and through a washing chamber and heater to the motor-driven fan by means of which it is uniformly distributed over the entire building. For drainage the floor slopes both ways toward a row of floor drains opening into a 6-in. cast-iron drain pipe. This drain pipe also receives the roof water through a number of 6-in. conductors.

Particular attention was given to the matter of heating apparatus, the boiler being centrally located in a small pit and connected through a 16-in. pipe to a 20-in. vertical flue built into the wall. The steam piping is, of course, very simple, consisting merely of a large main to the heater chamber already referred to and a return drip therefrom. To provide hot water for toilet purposes a heater is shunted from the main smoke pipe, the hot water being stored in a small circulating boiler. The convenience and comfort of the station operators are further provided for in a roomy locker compartment, a shower bath, a toilet room, an office, etc., all calculated to make the place a pleasant one to work in.


FIGS. 8 AND 9—PLAN OF ST. DENIS SUBSTATION, MONTREAL TRAMWAYS, WITH SECTION THROUGH TRANSFORMER AND ALTERNATING-CURRENT SWITCHING WING

46'
60'
113'
1500-KW. MOTOR GENERATORS
500-KW. MOTOR GENERATORS
19'-6"
ARTESIAN WELL 600' Deep
SHOWER
W.C.
OFFICE
TOILET
TANK (Over)
To Supply Transform.
D. C. Switchboard
(Outgoing)
FEEDER TOWER
CABLE TOWER
167'-3"
101'-9"
"A" High-Tension Oil Switches
"B" Low " " "
Incoming 13,200 Volts, Line
LIGHTNING ARRESTER
TRANSFORMER
A
B
C
D
18"
10'-6"
10'
38'-6"
Grade Line
13,200 Volt Feeders from Hochelaga
2300 Volt Feeders to Motor Generators
Section A-A
Low Tension Oil Switches
Low Tension Bus Comp. on Fl. Below
High Tension Oil Switches
High Tension Bus Comp. "
PIT
TRANSFORMERS
TRUCK PIT
X
STORAGE BATTERY RM.
To Lightning Arrester Rm.
Relay
A.C. Switch Board
Down
"X" = 2, 13,200 Volts Incoming Lines from Hochelaga Power Ho.
"C" High Tension Buss Comp. on Floor Below
"D" Low " " " " "
A
A

THE ST. DENIS SUBSTATION REMODELING

While the same general fundamental principles were in mind in the enlargement and rehabilitation of the old St. Denis substation, the characteristics of the site, the nature of the existing apparatus to be housed, etc., dictated a construction radically different from the standard typified in Pointe aux Trembles substation just described. The building is in the form of an L, in two sections, one for the six motor-generators, the other for the high-tension apparatus. As there was not a necessity for especially attractive appearance, the building was made of reinforced concrete in the simplest possible style.

In the motor-generator room the original layout was retained as far as possible, the building being extended to accommodate the larger units which were added. The alternating-current wing is new and was laid out in accordance with the scheme indicated in the cross-section *AA*, Figs. 8 and 9. A longitudinal partition divides the building into a transformer section and the bus and switch galleries, while in the roof monitor is the lightning arrester room. In the transformer room a number of wing walls provide compartments for the water-cooled transformers, there being at present two three-phase transformers and a bank of three single-phase transformers. The transformers can be rolled out of their compartments onto a truck running on rails in a pit about 20 in. below the floor level.

The switch gallery is on the second floor and it is divided into two longitudinal sections by a partition, one section being for the high-tension switches and the other for the low-tension switches. Immediately below are the respective bus compartments, with the feeder conduits set into the foundation immediately underneath. This arrangement works out very well, and while the space allowance seems liberal for the equipment accommodated, the lack of crowding undoubtedly conduces to efficient operation.

To provide a supply of cooling water an artesian well 600 ft. deep was sunk on the site and a motor-driven air pump is used to store water in a large tank located on top of the wall in the angle of the building.

The very extensive improvements at Pointe aux Trembles and St. Denis form part of a general shifting of the transforming equipment possessed by the company, affecting most of the substations. When completely standardized the whole distribution system will be extremely flexible, for uniformity in size and style of motor-generator sets particularly will conduce to the shifting of machines to the points where they are most needed.

In a small Western plant recently it was necessary to operate two 400-hp. chain-grate stokers which had been taken out of service owing to holes in the grate as large as a man's hand. Under these conditions wooden barrel staves were placed over the holes as they appeared in front of the hopper. The staves prevented the coal from sifting through the grates until it had coked enough to support itself, and served as efficient substitutes until the company was able to secure the necessary repair parts.

C. E. R. A. Urges Immediate Need for Higher Interurban Fares

At Dayton Meeting of Feb. 28 and March 1 Speakers Showed Keen Appreciation of the Acuteness of the Present Situation Confronting Urban and Interurban Electric Railway Lines—Summer Meeting Favored

ON Feb. 28 and March 1 the Central Electric Railway Association held at Dayton, Ohio, what was considered by those in attendance to be a most successful practical war-time meeting. With the exception of President C. N. Wilcoxon's address, received too late for the purpose, the Feb. 28 session was reported in last week's issue of the JOURNAL. The presidential address is given in extended abstract this week. At the March 1 session A. Swartz, Toledo, Ohio, read a paper prepared by A. C. Van Driesen, Toledo Railway & Light Company, on the work of the Central Electric Railway Accountants' Association. This was abstracted in last week's issue.

The remainder of the meeting was taken up with a number of business matters, interspersed with music by a male quartet organized by J. F. Starkey, Lake Shore Electric Railway, Sandusky, Ohio. Besides Mr. Starkey this quartet was composed of three brothers, Earl Bragdon, E. W. Clark & Company, Columbus, Ohio; Irving Bragdon, Toledo & Ohio Central Railroad, Columbus, and Roy F. Bragdon, Lake Shore Electric Railway, Sandusky. They were accompanied by Charles Buck, a business man of Sandusky.

C. L. Henry reported regarding correspondence between the officers of the association and the Electric Railway War Board as to sectional representation at Washington. The association had offered to co-operate with the War Board in a practical way and had suggested the appointment of a sectional representative. Mr. Henry expressed the opinion that the whole matter for the future should be left entirely with the executive committee of the association, and this suggestion was adopted by the meeting.

A. L. Neereamer then read his report as secretary-treasurer, an abstract of which appeared last week. He stated that the data presented showed the association to be in a very flourishing condition, and that the executive committee will invest $500 of the money surplus in a bond in the Third Liberty Loan campaign.

HIGHER FARES FOR STEAM AND ELECTRIC ROADS

A. W. Brady, Anderson, Ind., outlined the situation regarding higher fares for interurban electric railways, with particular reference to the difficulty of raising rates when competing steam lines are limited to rates lower than those which are profitable to electric railways. He believed that the present is an opportune time for bringing the situation forcibly to the attention of governing bodies, and proposed the following resolutions, which were adopted:

Whereas: Since the entry of the United States into the war, the operating expenses of the interurban lines within the territory of the Central Electric Railway Association, comprising Ohio and Indiana and parts of Michigan, Kentucky and Pennsylvania, have increased at such an alarming rate as to threaten the continued financial stability of the interurban companies and seriously to impair the ability of those companies to furnish to the public adequate and proper service, and

Whereas, it is imperative to the warding off of impending disaster that the interurban properties promptly secure substantial additions to their revenues, and

Whereas, the chief obstacle to a readjustment of the rates of the interurban companies, so as to meet the rapidly increasing costs of operation and maintenance, is found in the 2-cent fare laws of the various states, which laws, either directly by their inclusion of interurban lines within their scope or indirectly by their control of the passenger rates of the competing steam railroads, render it impossible for the interurban companies to secure sufficient increases in their revenues by advancing their passenger rates, and

Whereas, there is a material discrepancy between the intrastate rates of the steam railroads, amounting to 2 cents per mile under the 2-cent fare laws, and the interstate rates of 2½ cents per mile of the same carriers, which interstate rates were approved by the Interstate Commerce Commission as fair and reasonable at a time when operating costs were materially less than now, and

Whereas, whatever the fact may have been when the 2-cent fare laws were originally enacted, a fare of 2 cents per mile is manifestly insufficient to meet the cost of the service under present conditions, therefore be it

Resolved, That the attention of the various federal and state authorities having to do with the regulation of railroad rates be called to the facts stated and to the critical character of the situation thereby created, and that those authorities be urgently requested to take, as rapidly as possible, whatever steps may be necessary to fix new rates for the railroads, both steam and electric, on a basis fairly compensatory to them and at the same time reasonable and just to the public. Be it further

Resolved, That the president of this association be empowered and instructed to arrange for a proper presentation of the action hereby taken to the federal authorities at Washington and to the authorities of the various states.

JOINT STATE COMMITTEES OF PUBLIC UTILITIES

Mr. Brady also digested the reports of the work of a joint public utilities committee,* consisting of P. H. Gadsden, H. H. Crowell and E. K. Hall. This committee has been influential in collecting public utility data and presenting them convincingly and fruitfully to the federal administration. The joint committee has recommended the appointment of state committees to maintain touch with public utility commissions and other state officials to keep these authorities fully informed on utility matters.

Mr. Brady moved that, in conformity with this recommendation, the president of the association appoint an electric railway representative in each of the states in C. E. R. A. territory, this representative to serve with similar representatives of the electric, gas and other utility interests. The motion was unanimously passed and announcement of the names of the appointees will follow in a few weeks.

In bringing up the question of the next meeting Mr. Henry moved that a summer meeting or outing be definitely arranged for by the executive committee, and this motion was passed. In its support he said that, while it had seemed necessary to abandon the lake trip last summer, and while it is still necessary to retrench expenditures during these busy and sorrowful days, yet such retrenchment must not be carried too far. It is not possible to work continuously for several months without some such recreation as the association activities afford.

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*See ELECTRIC RAILWAY JOURNAL, March 2, 1918, page 427.

A resolution was also passed, to be wired to E. B. Peck, who was kept from the meeting by illness, expressing sympathy and appreciation of the preparation by his committee of a most successful program for the Dayton meeting.

ELECTION OF OFFICERS

The last business of the meeting was the election of the men recommended by the nominating committee, as follows: President, F. W. Coen, vice-president Lake Shore Electric Railway, Sandusky, Ohio; first vice-president, J. F. Collins, vice-president Michigan Railway, Jackson, Mich.; second vice-president, R. I. Todd, president Indianapolis Traction & Terminal Company, Indianapolis, Ind.; secretary-treasurer, A. L. Neereamer, Traction & Terminal Building, Indianapolis, Ind.; executive committee—F. D. Carpenter, president Western Ohio Railway; H. A. Nicholl, general manager Union Traction Company of Indiana; L. G. Parker, general sales manager Cleveland Frog & Crossing Company; W. D. Hamer, representative Electric Service Supplies Company; C. N. Wilcoxon, president Chicago, Lake Shore & South Bend Railway; S. W. Greenland, general manager Fort Wayne & Northern Indiana Traction Company; F. J. Haas, general manager Public Utilities Company; R. A. Crume, general manager Dayton & Troy Electric Railway; F. R. Coates, president Toledo Railways & Light Company; E. J. Burdick, assistant general manager Detroit United Railway; E. B. Peck, vice-president Terre Haute, Indianapolis & Eastern Traction Company, and A. C. Van Driesen, president Central Electric Railway Accountants' Association.

After the election of officers President-elect Coen took the chair, announced an immediate meeting of the new executive committee and adjourned the convention.

Radical Readjustment Necessary*

At Dayton Meeting President of C. E. R. A. Analyzes the Electric Railway Situation and Indicates How It Will Likely Be Improved

BY C. N. WILCOXON
President Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.

BURDENS have been piled upon the electric railway industry until the situation now confronting it will require the most careful thought and the greatest effort of all concerned, if the properties are saved from financial ruin. This is a somewhat radical statement, but it is fully justified by the facts.

The conditions under which the majority of our properties have been operated, for the last twelve or fifteen years, have gradually resulted in a reduction of the margin between income and outgo, until, in many instances, there has been nothing left for the owners. In fact, in some instances the income has been insufficient even to pay taxes and operating expenses. Expansions or extensions have long since been a thing of the past.

WAR HAS ADDED TO BURDENS

The worldwide war has caused our burdens to multiply many fold during the last two or three years. Yet our industry has a very important part to play in helping to win the war. I am not referring to the minor task being performed to a limited extent in the movement of men and supplies for the army, or to the possibilities of greater usefulness disclosed by the study of railway conditions. I am rather pointing to the task of properly serving those industries upon which the army, the navy, and, indeed, the whole people are dependent.

The people, if they are properly to solve the problems which must be solved in order that our country shall emerge greater, stronger, abler and better from the crisis, must face the facts in regard to our industry, as they must face facts relating to other important matters. They must recognize the call of necessity. They can no longer temporize with a situation that has become so acute, or indulge in speculation when prompt action is such a prime requisite for the good of all.

There is but one remedy for the situation, and that is to receive more for the service rendered. In a number of instances the rate of fare has been slightly increased; in many other cases relief has been refused. The few increases that have been allowed are not in any manner in keeping with necessities. The majority of the municipalities, in a short-sighted view of the matter, practically refuse any assistance. Many officials oppose us, not because they believe us not to be entitled to consideration and relief, but because they believe such opposition to be politically expedient. In other words, our industry has been the football of politics for years past. We are saddled with all kinds of assessments for public improvements, many of which are no benefit to our companies.

REMEDY MUST BE FOUND

That we must find a remedy for this condition cannot be questioned. This is our big job of the immediate future. An enlightened public opinion, brought about at least in part by honestly and frankly informing the public of the true condition of the average electric railway, must in time manifest itself through the action of the public service commissions, the municipalities and the legislative bodies. If this does not bring us fair treatment and increased revenues, so that we can render good, safe and reliable service to the public, pay fair wages to our labor and earn a reasonable profit for the owners of our properties, then there is no hope for us.

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*Abstract of address delivered before annual meeting of Central Electric Railway Association, Dayton, Ohio, on Feb. 28.

Organization, team work and publicity, seemingly, are the greatest factors at our disposal in bringing about the needed relief. That a radical readjustment of our industry must be made to save it from bankruptcy requires no argument. The accumulating burdens of legislation and regulation, which in many instances amount to strangulation, added to the enormous increase in operating expenses, have brought our industry to a point where relief must be given. If we are to continue to pay the cost of paving streets, keeping them clean and maintaining them in repair for the benefit of the general public, the public must pay by an increase in the price for their rides.

PASSENGER RATE ON MILEAGE BASIS

The best way to accomplish this result must, to a certain extent, be determined by local conditions. As regards the electric interurban railways of the Middle West in which the Central Electric Railway Association is most directly interested, these have apparently developed passenger business to its greatest extent. Any increased revenue from that source in the future must largely be confined to the natural growth of the communities through which the interurban railways operate. This fact seemingly makes an increase in the passenger rates an absolute necessity.

I do not believe it can be questioned that the 5-cent zone system, heretofore largely used as a basis of determining the fares of interurban railways, is in the majority of instances unfair both to the company and to the traveling public. The basic rate should be a certain price for each mile, the so-called "copper zone" system being used with a basic rate sufficient to leave a reasonable profit to the company for each passenger carried.

I am of the opinion that our association could well afford to assume the cost of placing before the public the true condition of the electric railways in its territory, and I recommend that it give the matter careful consideration.

FREIGHT BUSINESS SHOULD BE DEVELOPED

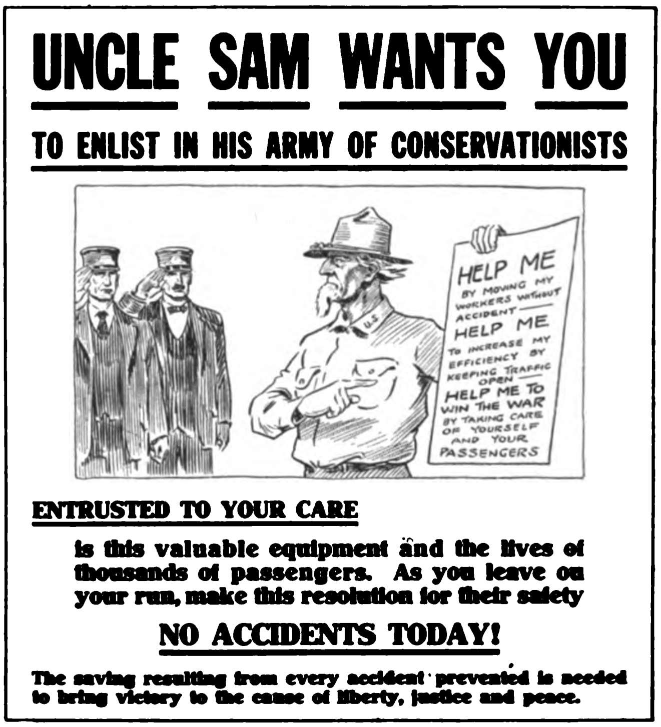
One source of revenue is entitled to most careful consideration—and that is the freight business. Unfortunately many of the older interurban railways are handicapped by certain physical conditions which restrict their usefulness and ability as freight carriers. This situation is not, however, insurmountable. In view of the congestion and the inability of the steam railroads to care properly for the public needs at this time, there is a great opportunity for many interurban companies to extend their facilities for the handling of freight, particularly in carload lots. The cost of correcting the physical conditions, which in many cases interfere with the handling of standard equipment, is not prohibitive. The question of equipping lines to handle standard equipment—thus freeing them from the restrictions of the so-called "package freight" business which exist in the case of the large majority of our companies at this time—should receive the most careful thought.

I believe I am safe in predicting that it will only be a question of time until the steam railroads, which in the past have placed so many obstacles in our way, will be compelled to interchange business with us on a basis fair and just to both parties, to the very great benefit of the general public.

Splendid work has been accomplished by our committee on military efficiency and defense in gathering data relating to our properties and publishing a map showing their location and possible use in national service. I fear, however, that the possibilities have not been made fully known to the government officials. If I am correct, I would most earnestly recommend that the matter receive attention without delay, to the end that everything possible may be accomplished not only for the benefit of our properties but for the greater benefit and duty we owe our country at this time.

Patriotic Poster of N. S. C.

The accompanying poster, showing the relation between accident reduction and patriotism, has been issued under the auspices of the electric railway section of the National Safety Council. It emphasizes the fact that conservation of life and limb is an important factor in winning the war. The Council has also issued a striking wall calendar for 1918.



UNCLE SAM WANTS YOU

TO ENLIST IN HIS ARMY OF CONSERVATIONISTS

HELP ME
BY MOVING MY WORKERS WITHOUT ACCIDENT—
HELP ME
TO INCREASE MY EFFICIENCY BY KEEPING TRAFFIC OPEN—
HELP ME TO WIN THE WAR
BY TAKING CARE OF YOURSELF AND YOUR PASSENGERS

ENTRUSTED TO YOUR CARE

is this valuable equipment and the lives of thousands of passengers. As you leave on your run, make this resolution for their safety

NO ACCIDENTS TODAY!

The saving resulting from every accident prevented is needed to bring victory to the cause of liberty, justice and peace.

A TIMELY AND TELLING N. S. C. POSTER

Employees of Eastern Railroads

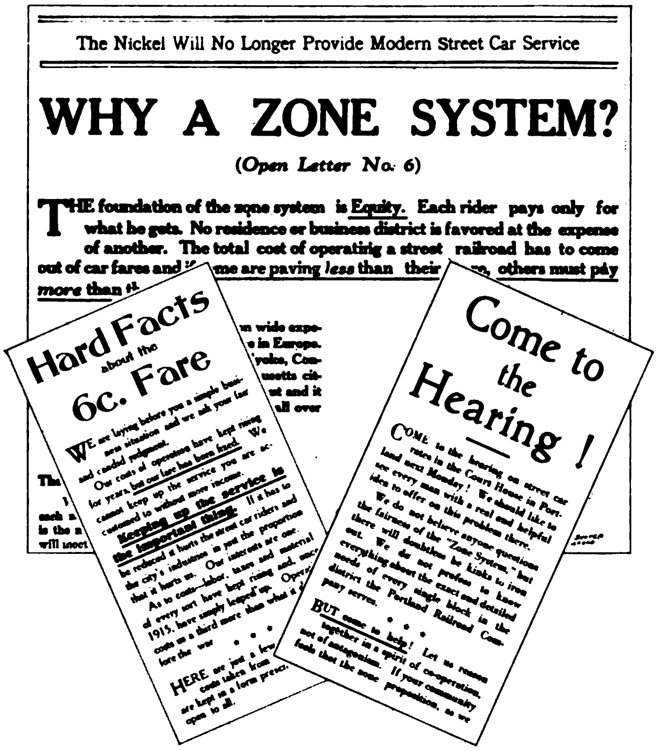
The general operating committee of the Eastern railroads states that there are about 564,300 men in the service of the Eastern railroads, of whom about 301,500 have had one year or more experience. To fill the remaining places 1,138,500 new men have been employed during the first nine months of 1917, or more than three men for every job. This has necessitated the employment, training, and subsequent loss of a man on each job every ten weeks. This is about twice the normal turnover.

Practising the "Public Be Told" Policy

How Portland (Me.) Railroad Confided in Public Before State Commission Began Hearings on Company's Application for Increased Fares

DURING the last few weeks the Portland (Me.) Railroad, which is operated under lease by the Cumberland County Power & Light Company, has been conducting a publicity campaign for higher fares. Owing to the early date set for the first hearing, Feb. 25, the campaign was necessarily highly intensive. It was begun on Feb. 2 with an interview from Albert H. Ford, vice-president and general manager, announcing that the company would, like hundreds of other railways, be forced by rising costs to file a new rate schedule.

From the very start the company laid all its cards on the table. It stated that it would lay the facts before the public exactly as they were to be put before the Public Utilities Commission, and that nothing would be presented that could not be sworn to. Furthermore, the company told the public that its books were open to all.



The Nickel Will No Longer Provide Modern Street Car Service

WHY A ZONE SYSTEM?

(*Open Letter* No. 6)

THE foundation of the zone system is Equity. Each rider pays only for what he gets. No residence or business district is favored at the expense of another. The total cost of operating a street railroad has to come out of car fares and

Hard Facts about the 6c. Fare

WE are laying before you a simple busi-
ness situation and we ask your fair
and candid judgment.
Our costs of operation have kept rising
for years, but our fare has been fixed. We
cannot keep up the service you are ac-
customed to without more income.
Keeping up the service is
the important thing. If it has to
be reduced it hurts the street car riders and
the city's industries in just the proportion
that it hurts us. Our interests are one.
As to costs—labor, taxes and material
of every sort have kept rising and, since
1915, have simply leaped up. Oper-
costs are a third more than what it
fore the war

• • •

HERE are just a few
costs taken from
are kept in a form presc
open to all.

Come to the Hearing!

COME to the hearing on street car
rates in the Court House in Port-
land next Monday! We should like to
see every man with a real and helpful
idea to offer on this problem there.
We do not believe anyone questions
the fairness of the "Zone System," but
there will doubtless be kinks to iron
out. We do not profess to know
everything about the exact and detailed
needs of every single block in the
district the Portland Railroad Com-
pany serves.

• • •

BUT come to help! Let us reason
together in a spirit of co-operation,
not of antagonism. If your community
feels that the zone proposition, as we

SPECIMEN OF NEWSPAPER AD, AND LEAFLETS DISTRIBUTED IN CARS

Next a communication was sent on Feb. 8 to the Mayor and city government. This stated that the company wanted the co-operation and advice of the city government and all civic bodies, and it asked that decision be reserved until the evidence was in. The same day the new schedule was filed with the commission, and Mr. Ford made a public statement explaining the entire plan. The plan in brief provides for a 6-cent city zone, with 2-cents-a-mile zones on the interurban lines. The new city zone, however, is slightly smaller than the old 5-cent zone.

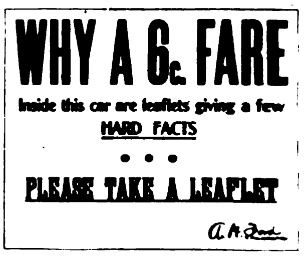
The next day, Feb. 9, maps and the complete schedule of zones and fares were furnished to and printed by all the papers in the district affected. As requested, none of the papers took sides, all awaiting the presentation of the company's case.

Two days later pink leaflets, entitled "Hard Facts About the Six-Cent Fare," were hung on strings in all the cars. Attention was called to them by posters placed in the car windows. The heading on these, "Why a 6-Cent Fare?" was printed in type big enough to be seen from the sidewalk.

Heatless Monday limited the supply of leaflets to 3000 the first day, and all were soon gone. The daily supply thereafter ran to more than 5000. The leaflet frankly stated the company's case, told what the commission would demand as proof before the increase could be granted, gave a table of increased costs and asked intelligent consideration by the public.

The second leaflet, in yellow, went up the next week. It was headed, "Come to the Hearing." It advised the various sections to organize, appoint spokesmen and be represented. It also explained the zone system and gave the reasons for the rates determined upon for the various suburban points.

A publicity campaign was started on Feb. 13 in the afternoon paper, the same advertisement being repeated in the two morning papers the next day and in the suburban dailies in the afternoon. The plates were supplied to the suburban papers from the Portland afternoon papers of the previous day. In this way all the advertisements were certain to be without error and of good typographical appearance.



WHY A 6c. FARE

Inside this car are leaflets giving a few

HARD FACTS

• • •

PLEASE TAKE A LEAFLET

A. H. Ford

POSTER CALLING ATTENTION TO LEAFLETS

The advertising slogan was: "The Street Car Nickel Will No Longer Provide Good Service." The advertisements ran as open letters to the public. The first two were entitled "What We Must Prove" and "The Value of Service." The third letter, on "Our Winter Service," contained a frank admission of lapses due to the storms, and a reproduction of a newspaper item in regard to service being stopped by storm in other cities.

The fourth letter, entitled "Our Rising Costs," began the story of materials. The next one, on "Taxes and Labor," continued the subject and explained how the paving cost bore unduly on car riders. The sixth letter was an advertisement on the zone system, with a map. This was published in the Sunday papers, which have a large suburban circulation. The seventh letter, entitled "Your Prosperity and Ours," explained how they depended upon each other. The others covered the company's margin of safety and dividend records.

The usual crop of *pro bono publico* writers began to send in letters to the editors, crying about "watered stock," a stock dividend passed seventeen years ago, poor service and the like. But Mr. Ford answered personally or in letters to the editors every real and pertinent point made.

The spirit of the whole campaign was that the public was entitled to know. Constant stress was also laid upon the value of continued service, upon the ability of the company to give only the kind of service the car-riders would pay for, and upon the joint interest of the community and the company.

Raising the Fare from Seven to Ten Cents at the Public's Request!

How the Fair-Minded Communities Served by the Worcester & Warren Street Railway Came to Approve a Higher Rate of Fare, One-Man Cars and Freight-Express Operation—An Example of Better Public Relations Realized

THE Worcester & Warren Street Railway is one of those half-town, half-country railways built in the halcyon days when the magic of the word "electricity" was expected to cancel such trifling drawbacks as lack of population and passengers to pay for rails, wire, power, cars and crews! For nearly a score of years it struggled manfully against growing odds before the inevitable receivership; but with the jitney and war prices added the problem was reduced to this phase of finality: "To junk or not to junk?"

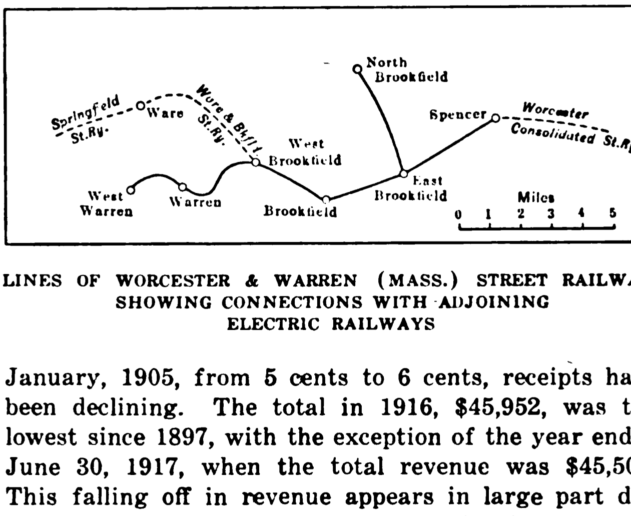
The temptation to give up the fight when metal could be sold at fabulous prices was strong, but the owners courageously determined to learn if engineering advice and public relief combined would enable the railway to continue the service on which five communities had depended for more than twenty years. To this end E. W. Holst of Boston was engaged as consulting engineer. As will appear in the sequel, his activities were not confined to saying that one man cars, express-freight service and 10-cent fares were necessary, but were expanded to include a successful campaign for the approval of these suggestions by the communities themselves before going to the Public Service Commission of the State!

ROAD HAS HAD CHECKERED HISTORY

The total length of the road is 19.6 miles. The main line extends from the terminus of the Worcester Consolidated Street Railway in Spencer, through East Brookfield, Brookfield, West Brookfield and Warren to West Warren, a distance of 16.06 miles. A branch line extends from a point just west of East Brookfield to North Brookfield, a distance of 3.54 miles. The lines were built by the Warren, Brookfield & Spencer Street Railway in 1896. This company, after an unsuccessful financial career, went into receivership in 1912 after defaulting its bond interest. Its liabilities were about $321,000.

In April, 1915, it was sold at auction to a bondholders' committee and shortly afterward was purchased by the present company, organized for the purpose. The "fair cost of replacing the railway and property so acquired" was found by the engineering department of the Massachusetts Public Service Commission to be about $160,000, and the property was taken over at this figure. As a result of the reorganization all the capital stock and the floating indebtedness of the original company, amounting to about $200,000, were wiped out. The total authorized capitalization is at present $186,000, or $9,623 per mile of road, an exceedingly low figure.

In the entire history of the property dividends have been paid in only four years—4 per cent having been paid in 1896, 2.5 per cent in both 1899 and 1900, and 2 per cent in 1901. Earnings have been decreasing for some time. Yearly receipts reached their maximum in 1903, when they totaled $65,415. Since then, and notwithstanding the fact that the fare was increased in January, 1905, from 5 cents to 6 cents, receipts have been declining. The total in 1916, $45,952, was the lowest since 1897, with the exception of the year ended June 30, 1917, when the total revenue was $45,502. This falling off in revenue appears in large part due to the 25 per cent decrease in population in the towns served:



LINES OF WORCESTER & WARREN (MASS.) STREET RAILWAY, SHOWING CONNECTIONS WITH ADJOINING ELECTRIC RAILWAYS

	1895	1915
Spencer	7.614	5,994
Brookfield	3,279	2,059
W. Brookfield	1,467	1,288
Warren	4,430	4,268
N. Brookfield	4,635	2,947
Total	21,425	16.556

The normal schedule is maintained by four cars operated on an hourly headway, the running time from Spencer to West Warren being one hour and thirty minutes. Fares were increased from 6 to 7 cents on April 5, 1917, with the approval of the Public Service Commission. This made the total through fare 35 cents, and overlaps applied only to town boundaries.

(*Concluded from page* 456)

The effect of this policy was noticeable in many ways. The Chamber of Commerce, the city government and various suburban communities, appointed committees to be present at the fare hearing. The position taken, however, was not one of opposition, but merely of investigation. The strongest objections to the new zone rates arose in certain sections which were hit hardest, because for years they had had the best of it in long rides. There was not much objection to the 6-cent fare itself, though many objected to the reduction of the old 5-cent city zone. More than one hearing will probably be needed, but it is expected that a decision will then be given without undue delay, perhaps in three weeks.

No transfers are used. Workingmen's tickets are sold at the rate of 6 cents, these being valid between 6 and 8 a. m. and 5 and 7 p. m., according to the Massachusetts law.

The operating results for the year ended June 30, 1917, covering nine months with the 6-cent fare unit and three with the 7-cent unit, were as follows:

Income from passenger cash fares	$42,110
Income from ticket sales	3,123
Total income (including miscellaneous)	$45,502
Transportation and traffic	$15,306
Power	16,566
Maintenance	12,400
Taxes	1,282
Salaries, office and general expenses	3,221
Total expense (including all items)	$50,433
Interest	3,153
Total	$53,587
Deficit	$8,084

Since its incorporation the company has operated the property at an actual loss, the accumulated deficit from May, 1915, amounting to $6,846 on Nov. 1, 1917. During this period the income has not been sufficient to enable the company to pay any compensation to its officers or any dividend. The inability to meet operating expenses has been due to the increased cost of labor, fuel and supplies and to the decrease in population. Maintenance cannot be properly cared for with the present revenue, and traffic has undoubtedly been lost through the inability of the company to keep up proper service.

HOW THE NEW MANAGEMENT ANALYZED CONDITIONS

When the increased fare was established, the directors realized the necessity of improving the service in order to derive any material benefit from the new rates and secured the services of the consulting engineer mentioned. After going over the property, he prepared a report pointing out that with the institution of various economies, rehabilitation and the use of one-man cars, combined with the establishment of a light freight and express service and the purchase of power, prospects would be favorable for curing the chief evils from which the road was suffering.

Immediate attention, he said, should be given to the track on account of the long-deferred maintenance. The line and bonding should receive attention with the track; the rolling stock should be cared for, and power should be purchased in place of the expensive service of the company's generating plant. The present power plant is operated under the handicap of unsuitable machinery of an out-of-date type, high coal cost and an exceedingly poor load factor. It was believed that purchased power from a company able to supply hydroelectric energy as the service required would certainly save $3000 a year. In July, 1917, an arrangement for purchasing power was effected with the Central Massachusetts Power Company, but as yet the railway has been unable to take advantage of it owing to lack of funds for conversion apparatus. Operating changes were also recommended, such as through connection over the Ware & Brookfield Street Railway (now also in difficulties) to Ware, thereby encouraging through riding between Spencer and Palmer.

This analysis, reduced to figures, showed the following:

ANALYSIS OF BETTERMENT COSTS

Expenditures:	
Five light-weight prepayment one-man safety cars	$26,000
Power substation equipment for purchased energy	8,000
One snowplow	3,000
Two express cars	6,000
Miscellaneous equipment and tools	500
Track, line and bonding improvements	30,000
Heating and building repairs	3,500
Total	$77,000
Credit: Old power station equipment and rolling stock	8,000
Net betterment costs	$69,000

OPERATING SAVINGS

Savings per annum:	
Platform labor by use of one-man cars	$4,800
Power	3,000
Maintenance	3,000
Total	$10,800

ESTIMATED INCOME STATEMENT

Operating income (1917 fiscal year)	$45,502
Estimated increased income on account of improved service and increased fares (10 per cent)	4,550
Estimated income from freight and express service (20 per cent)	9,100
Total income	$59,152
Operating expenses (revised to cover 1917 fiscal year)	$53,587
Less savings	10,800
Expenses	$42,787
Balance	$16,365
Possible increase in operating expenses	5,500
Balance	$10,865

IMPROVEMENTS ALREADY BEGUN

During the last summer track improvements costing $8,758 were carried out in addition to the regular maintenance outlay. All this work was in the nature of permanent improvements and therefore was charged to capital accounts. In the rehabilitation of track mainly the old rail was used, the rail being bonded with an oxy-acetylene equipment. This equipment was used in cutting off rails too much worn at the ends, new holes being drilled and new tie plates being attached. It is expected that the life of the old rails will be considerably increased by the use of one-man cars.

RECEIPTS ABOUT SAME UNDER 7-CENT FARE

The increase in fare to 7 cents has been offset by decreased riding, so that the net receipts are about the same as before. This is shown by the following table:

		April	May	June	July	August	September
Cash passengers.	1917	42,017	51,661	53,923	69,897	70,537	60,894
	1916	47,014	63,979	59,198	74,462	76,998	70,163
Ticket passengers	1917	2,068	7,058	5,712	1,657	1,567	3,377
	1916	4,859	8,522	7,748	3,826	3,856	7,527
Total passengers.	1917	44,085	58,719	59,635	71,554	72,104	64,271
	1916	51,873	72,501	66,946	78,288	80,854	77,690
Revenue	1917	$3,149	$3,762	$4,089	$4,964	$5,015	$4,494
	1916	$3,083	$4,104	$3,864	$4,662	$4,804	$4,619

In the foregoing table the revenue from cash passengers was based upon a 7-cent fare unit, taking effect April 5, 1917. In any of the months following the fare increase the revenue from 7-cent fares can easily be obtained, therefore, by multiplying the total cash passengers by 7 cents. The total passengers carried in the fiscal year 1917 was 370,368, as compared with 428,152 in 1916, a decrease of 57,784.

The traffic distribution is shown by the following typical passenger counts, taken during three months in 1917 from 4 P. M. to 5 P. M.:

	April	May	June
Spencer—East Brookfield	1,009	1,051	1,258
East Brookfield—Brookfield	600	815	773
Brookfield—West Brookfield	431	562	613
West Brookfield—Warren	282	457	398
Warren—West Warren	298	360	321
East Brookfield—North Brookfield	454	614	693

These figures indicate that the traffic density increases as one travels eastward, attaining a maximum in the Spencer-East Brookfield and North Brookfield district. It is hoped to increase the density of traffic on the central and western sections by improving the connections with the Ware & Brookfield line and hence to the Springfield Street Railway at Palmer. A connection with the tracks of the Worcester Consolidated Street Railway in the town of Spencer was also considered desirable. This has since been obtained, as hereinafter noted.

LABOR COST WILL BE HIGHER

From Oct. 25 to Nov. 3 the union men on the road went on strike, following demands for an increase of 2½ cents per hour. The schedule of wages for motormen and conductors prior to the strike was as follows: First year, 22.5 cents; second year, 23½ cents; third year and thereafter, 25 cents. The management took the position that it could not grant the men an increase until the revenue was greater, and after a conference it was agreed that the company would pay the men 2 cents more per hour thirty days after the beginning of electric express service. It is estimated that the promised wage increase will add approximately $2,000 per year to operating expenses.

GOING STRAIGHT TO THE PUBLIC WITH A STRAIGHT STORY

In the foregoing paragraphs the history of the Worcester & Warren Street Railway has been presented in detail. But this is not the main point of the story, for electric railway men are only too familiar with this sort of thing. What is important and encouraging is the way the public has shown its confidence in the good faith of electric railway operators.

No sooner had the report on "Analysis of Betterment Costs," "Operating Savings" and "Estimated Income Statement" been presented by the consulting engineer than copies thereof were given to an official representative of each town, so that the people would have the opportunity to study all of the facts for themselves. The report was then followed up by personal discussion on the need for the express-freight franchise and connection, one-man car operation and a 10-cent fare. As to the last, it was pointed out that since a 7-cent fare had failed to produce more revenue, it was useless to ask for a 10-cent fare unless the public thought the electric railway service was necessary enough for the majority of people to have them pay that figure willingly.

This straightforward line of argument met with immediate favor.

On Nov. 14, 1917, a conference of leading citizens was held before the commission, at its suggestion, to discuss the financial condition of the road. At the close of the conference the attendants arranged to call a public meeting at Brookfield of all the towns. At the latter each of the five communities elected two men to serve on a committee of ten. By Nov. 22 this committee had drawn up, and on Nov. 24 submitted to the officials of the railway at a formal hearing at Brookfield, the document reproduced herewith, probably the first of its kind in America or anywhere else.

Of the nine out of ten members (one Brookfield representative being absent) who signed this memorable statement, Mr. Kane is an attorney and counsel for the town of Spencer; Mr. Young, president of the Spencer National Bank and a representative in the State Legislature; Mr. Fullam, president of the National Bank of North Brookfield; Mr. Beebe, treasurer of the North Brookfield Shoe Company; Mr. Butterworth, attorney and counselor for the town of Brookfield; Mr. Richardson, chairman of the Board of Selectmen of West Brookfield; Mr. Hauck, retired civil engineer and gentleman farmer; Mr. Sullivan, chairman of Board of Selectmen, Warren, and Mr. Hosley, secretary Warren Board of Trade. The positions which these men hold in their communities is pretty clear proof that the railway's troubles had been put before men who needed the electric railway much less than the working people, whose favored rate they did not suggest raising.

An Unique Document in Better Public Relations

BROOKFIELD, MASS., *Nov.* 22, 1917.

TO THE DIRECTORS OF THE WORCESTER & WARREN STREET RAILWAY.

Gentlemen:

At a meeting of a committee representing the towns of Spencer, The Brookfields and Warren, held on Thursday, Nov. 22, 1917, at the Selectmen's Room, Brookfield, Mass., the following recommendations were made.

That we suggest to your board that it would be advisable to advance the regular passenger fare to 10 cents, the workmen's ticket remaining at the present price.

That the car service be curtailed by stopping the regular cars at 10 p. m. to lessen running expenses, and that, when necessary, special cars could be run to accommodate the demands of special occasions;

That the Selectmen of the towns mentioned above be urged to grant the freight franchise to your company at once;

That we are ready to go before the Public Service Commission, if necessary, to assist you in carrying out these plans.

Signed:

Spencer—JERE R. KANE
M. A. YOUNG
West Brookfield—C. D. RICHARDSON
ALBERT L. HAUCK
North Brookfield—WILLIAM F. FULLAM
CHARLES A. BEEBE
Warren—EDWARD D. SULLIVAN
W. D. HOSLEY
Brookfield—A. F. BUTTERWORTH

THE FARE INCREASE EFFECTED

Acting upon the good feeling and recommendations expressed by the citizens' committee, the railway on Dec. 3, 1917, filed a new tariff increasing the 7-cent fare to 10 cents. Ordinarily thirty days' notice is required before a fare increase can go into effect, but upon the representations of the company the commission allowed the new fare to go into effect after ten days, or on Dec. 13.

Thus through the cordial co-operation of the communities, no protracted arguments and hearings were necessary.

On Jan. 24, 1918, in accord with a petition filed on

Oct. 30, 1917, the town of Spencer granted the Worcester & Warren Street Railway the right to make track connection at Spencer for the handling of freight. In the meantime the right to carry newspapers, packages, express matter and freight had been granted by Spencer on Dec. 13, 1917; the Brookfields and Warren, on Dec. 10, 1917, and by the Public Service Commission itself after due hearing on Feb. 6, 1918. At the State hearing no one appeared against the track connection permit. On the contrary, Mr. Richardson, chairman of the committee of ten, appeared for it!

The same frankness and direct dealing that characterized the arguments for the need of more revenue and express-freight were applied to the question of the one-man car. Instead of leaving the public in the dark, a safety car was leased for demonstrations to the committee of ten. They were so well pleased that when formal application was made before the Public Service Commission for the general use of one-man cars there was no opposition whatever.

THE PRESENT SITUATION

At this time the company needs about $70,000 for new equipment and about $30,000 to pay off a floating debt of $30,000. It is hoped that with further co-operation by the communities and with such legislative relief as is now pending. this property will not only be able to survive but to give ever-improving service to the towns which have shown such an intelligent and liberal understanding of its difficulties.

Since Jan. 17, 1918, service has been temporarily suspended owing to inability to secure fuel.

COMMON SENSE NEWSPAPER COMMENT

Speaking of the situation the Worcester *Telegram* of Nov. 1 said in part, editorially:

"In a small town of New York State the people were shocked when the trolley outfittings were sold to a junk dealer who took up the tracks and closed the service. Over there they were sorry, though they had refused to submit to having the fare raised above the 5 cents they had paid for many years. The people even thought too late that it would have been better to pay 10 cents a ride than to lose the service. It was a distinct loss to them because it meant commercially being pushed back into the woods. * * * If the one-man cars cannot save the Worcester & Warren system, even with an increased list of fares, the junk buyer will arrive at his own sooner or later. But the people should have reasonable means to get to the city markets. They are not inclined to go back to the days of half a century ago, and the automobile is not yet so economical that every village or farm family can own one for hurrying back and forth to the city."

The effect of coal shortage and the readjustment of business on account of the war are beginning to show in the returns made by electric utilities. Reports of the central stations for December, 1917, indicate an increase of 11.5 per cent in revenue from the sale of energy and of 9.6 per cent in the kilowatt-hour output as compared with December, 1916. Estimated from returns for 55 per cent of the industry, the business for the whole industry in December was: Revenue, $44,450,000; output sold, 2,345,000,000 kw.-hr.

Saves 2000 Tons of Coal a Month

This Economy Secured in Cincinnati by Skip Stops—Other Savings Put Into Force by Street Railroad Commissioner Culkins

AN ACCOUNT of the savings made by economy measures introduced this winter on the Cincinnati electric railway system is given in a report recently submitted to the Cincinnati advisory committee of the United States Fuel Administration by W. C. Culkins, director of the department of street railroads of the city of Cincinnati. The department had prepared a plan for undertaking these reforms more gradually early this year, but when the request came from the federal administration for early action it was decided to put the changes into effect promptly. In many respects the conditions were not propitious for the change. During last winter the city experienced the heaviest fall of snow, the lowest temperature and the longest duration of cold weather in its history. In addition, there were two floods. For this reason the report of results made by Director Culkins is of especial interest.

REPORT ON SAVINGS IN CINCINNATI

Pursuant to the order issued by you on Jan. 14, 1918, directing the Cincinnati Traction Company to take measures for the conservation of coal, this department undertook the general supervision of the execution of that order. I have the honor to report herewith, relative to the progress made in the carrying out of such order up to this date.

The Chapel and Seventh Streets lines and all of that portion of the Third-Fifth Street line lying east of Fifth and Baymiller were abandoned on Jan. 19, 1918. In the year 1917 these lines operated approximately 500,000 car-miles. Taking the statistics of the Cincinnati Traction Company for the month of November, 1917, it is found that it requires 15.9 lb. of coal for each car-mile of operation. On this basis the saving of coal by the discontinuance of these lines will amount to about 4000 tons of coal per year.

Referring to that portion of your order directing the elimination of double stops, you are advised that this department has already eliminated the double stops in Cincinnati by order issued on January 1, 1918.

Your order directing the installation of the skip-stop system has been carried out under the most unusual and adverse conditions. In no city, where this plan has been adopted, has it been attempted during the winter or upon all lines at the same time.

In Cincinnati the installation was made during the most severe weather in the history of the city when the streets and sidewalks were covered with ice and snow. Notwithstanding this fact, evidence that the public generally are in sympathy with the plan is found, in that complaints and suggestions were received on less than 3 per cent of the stops changed.

At the time of the issuance of your order, there were on the lines of the Cincinnati Traction Company, 5331 stops. There are now 3301, 2030 having been eliminated or approximately 38.3 per cent. This does not include the double stops eliminated, which would bring the average up to 41.8 per cent. The average former distance between stops was 440 ft., and the average distance under the new plan is 694 ft., making the average added distance between stops 254 ft. Since it requires one minute to walk 266 ft., it will be seen that no great hardship has been entailed. Under the old plan the average number of stops was 12.1 per mile. This has been reduced to 7.8 stops per mile.

The actual saving of coal, by the elimination of these stops, can be determined only by experience, since each city presents its own peculiar conditions. However, a fair estimate may be had by taking as a basis the report on fuel saving by the introduction of the skip-stop system in Washington, D. C. This report was made by a board consisting of Clarence Renshaw and Myles B. Lambert of the Westinghouse Electric & Manufacturing Company, and John F. Layng of the General Electric Company. Their report was approved by L. B. Stillwell, consulting engineer, chairman, W. F. Durand, professor of mechanical engineering Leland Stanford University, and Comfort A. Adams, professor of electrical engineering Harvard University.

Why a Crisis Exists

F. J. Macleod Points Out Inherent Defects in Electric Railway Situation and Present System of Regulation

FOR present conditions in the electric railway industry, which are rapidly becoming intolerable for both the investors and the public, the war, in large measure but not wholly, is responsible. Indeed, the war has served only to disclose and intensify certain troubles and defects which are inherent and of long standing. Such is the opinion of F. J. Macleod, chairman Massachusetts Public Service Commission, as expressed in a recent address before the Economic Club of Boston.

INHERENT RAILWAY TROUBLES

One inherent trouble, Mr. Macleod said, is over-production. Massachusetts has more electric railway mileage in proportion to its population and area than any other state in the Union. This mileage is in many cases badly located. Such a condition is the result of the era of speculation which set in with the advent of electrification. Competitive lines were built where there were traffic possibilities for a single line only, and lines were extended anywhere and everywhere in the sparsely-settled rural districts where there was no reasonable financial excuse for building at all. Most of these lines were saved from bankruptcy or the scrap heap by consolidation on a share for share basis with the more prosperous lines. From this union of prosperous and potentially bankrupt companies there emerged a number of electric railway systems with just sufficient vitality to keep their heads above water during fair weather, but incapable of meeting the stress of hard times or war conditions.

Broadly speaking, Mr. Macleod stated that Massachusetts electric railways immediately before the opening of the war were paying dividends as large as the average paid during the last twenty years, and were neither better nor worse off than at any previous time during this period. During this time the companies were content to provide for the bare needs of current repair and maintenance. The large units of property were, however, gradually becoming worn out or obsolete, and the time was constantly growing nearer when replacements could no longer be deferred. As practically nothing was being done to make provision in advance for meeting this situation, the real financial condition of the companies was not disclosed by the dividends paid, or by the apparent results of operation, and the war merely precipitated a crisis which was imminent in any event, though probably in a less acute form.

Up to the present time the average dividends paid have been less than the going interest rate, and the rates of fare in some cases have probably been too low to support the properties. The companies, however, prior to the establishment of the Public Service Commission, made little serious effort to increase their rates or to face the problem in any thorough-going fashion. It was not until 1913 that rate-making powers were assumed by the commonwealth. Since that date, in Mr. Macleod's opinion, the commission has found it necessary to go farther than any other board in the country in allowing increases of electric railway fares, and in part as the result of war conditions to go farther even than the companies are willing to go on their own responsibility during the entire period when the rate-making power was practically in their own hands.

The commission has also endeavored, to the best of its ability and within the limitation of its powers, to stimulate greater operating efficiency on the part of the companies, and has succeeded in bringing about changes in methods which have resulted in substantial increases in net revenue. It was impossible, however, by any scheme of public regulation to put back at once the values which had been gradually drained out of the properties during a long series of years, and even the gradual rehabilitation of properties and credit which was about to set in was offset by war conditions.

DEFECTS IN REGULATORY SYSTEM

The present regulatory system, Mr. Macleod averred, has failed, at least in the electric railway field, to meet the fiery test of war. Possibly the personnel of the public service commission is in part responsible, and abler and wiser men might have secured more satisfactory results. With similar conditions prevailing throughout the entire country, however, and in the light of the practical break-down of the regulatory system in the steam railroad field under war conditions, it is felt that the causes must lie deeper than mere defects of personnel in a single commission.

In the first place, there has been a lack of proper co-operation and co-ordination of activities between the companies and the regulating authorities. The present system in effect makes the companies and the commission jointly responsible for results and by its very nature requires them to work in double harness and pull together. In practice, however, the commission has been obliged in the main to leave practical operation

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(*Concluded from page* 460)

According to their report, if, on the traction lines in Washington, D. C., the number of stops were reduced 40 per cent, the effect would be the saving of one-eighth of the coal used. The Cincinnati Traction Company consumes approximately 150,000 tons of coal annually, and upon the basis of their report, the saving would be approximately 19,000 tons per year. However, Washington is a flat city, requiring less power to start cars, and in addition its power houses are operated with an economy varying from 1.9 lb. per kilowatt-hour to 4.1 lb. per kilowatt-hour as compared with 4.72 lb. per kilowatt-hour in Cincinnati, therefore the saving in Cincinnati might be even greater than in Washington, and the total from the elimination of stops and the discontinuation of the three lines may result in the total saving upward of 25,000 tons per annum. The full benefits of this plan of operation both for conservation of coal and for the convenience of the public have not been realized because of weather conditions preventing the revision of schedules.

I have this day issued an order requiring the Cincinnati Traction Company to proceed with schedules and will suspend any further changes until this has been accomplished.

The company has conformed with your other orders, with the exception of that relative to the shortening of certain lines, which is now under consideration.

entirely in the hands of the management and periodically to hold a post-mortem on past financial and operating methods in capitalization and rate cases.

To Mr. Macleod's mind, one needed reform is for the commission to keep in constant and intimate touch with practical electric railway operation, and to give the companies the benefit of the advice and suggestion of its experts in regard to the most efficient and advanced methods of operation. In the past, Mr. Macleod said, such a program would not have received a very cordial welcome from the operating officers of the companies, but a different spirit now exists. In his opinion significant evidence of that fact is an editorial in the ELECTRIC RAILWAY JOURNAL of Feb. 9, advocating the admission of public service commissioners to full membership in the American Electric Railway Association.

Mr. Macleod thinks that the present system would be greatly improved if the commission were empowered to employ an adequate technical staff whose main function would be to prevent possible mismanagement or inefficiency of operation, rather than to sit in judgment upon past errors and to attempt to correct them after the damage has been done. In other words, public regulation must in large measure be preventive rather than punitive if the best results are to be obtained.

In the second place, there must be a fuller recognition of the absolute necessity of maintaining electric railway credit in order to obtain satisfactory operation and service. Under the present system the companies are dependent on voluntary contributions of private capital, and this capital will not be supplied unless the companies are in a position to pay a reasonable dividend and at the same time to lay aside a proper amount for depreciation and other reserve funds in order to prevent an impairment of assets.

Mr. Macleod emphasized the fact, however, that under proper public regulation dividends do not represent profits but merely interest upon invested capital. The man who invests his money in electric railway stock is entitled to the prevailing interest rate for the use of his money equally with the man who makes his investment in the form of bonds. Indeed, in so far as the stockholder assumes the risk of having his principal impaired or entirely wiped out before bonds are affected, he is entitled to something more than the bond interest rate. Public service companies, however, should be so managed and regulated that the risk to the investor and other speculative elements shall, so far as possible, be eliminated, and the dividend return practically limited to the going interest rate. But if the possibility of speculative profit is removed, it is essential that the investment be reasonably secure or private capital will not enter the field.

In the third place, Mr. Macleod pointed out that the effective carrying out of this policy requires a constant equilibrium between the company's revenues and its costs of operation. This in turn implies a greater flexibility in fare adjustments than is practicable under the present system. If there is a proper determination of the amount of the legitimate investment, if provision is made for securing economical and efficient operation and if the element of profit is eliminated, there is no reason why readjustments of rates should involve the delays and controversies which have marked rate proceedings in the past.

The idea that there is some mysterious sanction and virtue in a 5-cent fare, that the price of an electric railway ride should never be either more or less than that amount, although every element in the cost of service is constantly fluctuating, is to Mr. Macleod's mind an extraordinary fallacy, but one that is responsible in large measure for present electric railway troubles. The public must rid its mind of the idea that the revenue requirements of an electric railway are forever fixed by an accident of coinage, and that it is possible to ignore those business laws and economic principles which control all other enterprises. In the absence of any contribution from public taxation, the fare paid by each passenger should be neither more nor less than his proper fractional part of the total cost of operation, and with constant fluctuations in traffic, in the expenditures necessary for labor, fuel supplies and fixed charges, the proper fare for each passenger is bound to be a variable rather than a fixed amount.

REMEDIES SUGGESTED FOR MASSACHUSETTS

Mr. Macleod then discussed the service-at-cost plan devised by Homer Loring and described in the ELECTRIC RAILWAY JOURNAL of Nov. 17. The commission without expressing any official opinion in regard to the plan and terms of any particular bill embodying this plan, has indorsed the service-at-cost plan in principle, and believes that it should be enacted into law. For most of the important electric railways in the state, Mr. Macleod said, the plan will undoubtedly result in a substantial improvement in present financial and operating conditions, even if it may not in all cases fully restore financial credit and prosperity.

Mr. Macleod then explained why the commission has recommended a special means of settling the difficulties of the Boston Elevated Railway. As noted in the issue of Feb. 9, the essential features of the commission's plan for Boston are full public control, an absolute guarantee of dividends, the possibility of requiring a portion of the cost of operation to be borne out of the general tax levy, and the assurance of comprehensive improvements in existing service and facilities. The special character of the Boston problem, owing to the expensive tunnels and rapid transit lines which form such a large proportion of the Boston Elevated system, is recognized in the existing law under which the rights and obligations of the company in regard to fares and many other matters differ from those of other electric railways. Possibly, Mr. Macleod said, some of the special features embodied in the Boston Elevated plan might also be adopted in the case of other electric railways, but for the present, and until this plan is actually tried, it does not seem desirable to extend its application to all electric railways of the commonwealth.

The construction gang of the Central Kansas Power Company of Gypsum, Kan., recently, with fifteen men, including a foreman, set and tamped 120 30-ft. and 35-ft. creosoted yellow-pine poles in one day. On this job the labor was subdivided as follows: Instead of the erecting gang tamping the poles in as is the usual custom, they did nothing but lift the poles into the holes. Two gangs of tampers of four men each followed. The work was so arranged that each man was kept busy all the time.

Sliding Scale of Rates Recommended

Percentage of Return Allowed Dependent Upon Economies Effected in Operation—Fixed Rates Unsatisfactory and Contrary to Public Interest

IN VIEW of the interest of electric railway companies in flexible fares, all recognition by commissions of the advantages of the principle of a sliding scale of rates, even when applied to a lighting company, is of interest. A recent decision of this kind is that rendered by the Indiana Public Service Commission "in re the Hydro-Electric Light & Power Company" (P. U. R. 1918-A, page 325). This corporation has a considerable excess capacity over prevailing demands. In formulating a new rate schedule, the commission pointed out that users of current were paying the interest charges upon an investment considerably greater than that necessary to supply their present needs. The development of new business and the more complete saturation of the territory would reduce the cost of energy. It was therefore in the interest both of the utility and of the public that every incentive be given to the utility to develop its business.

With this end in view, the commission adopted a sliding scale of rates under which, for every 10 per cent reduction in rates, the permitted earning power of the corporation should be increased one-half of 1 per cent per annum. At the same time, the commission provided that, if the utility found it necessary to increase rates, the permitted rate of return should be decreased by one-half of 1 per cent per annum for every 10 per cent increase in the rate. The commission fixed a base rate schedule calculated to produce 6½ per cent on the ascertained valuation of the property and figured that the complete development of the business would enable the corporation to earn a return of 8½ to 9 per cent.

The commission makes it clear that its decision is prompted by a desire to assure to the company "a safe, sustaining rate of return under any conditions that are likely to arise" while at the same time giving to the corporation the strongest possible incentive to strive for an "increased percentage of earnings measured by its own success in creating economies and increasing the volume of business."

The most significant feature of the decision is the recognition of the fact that fixed rates, which can only be changed with the approval of the commission after protracted delay, are unsatisfactory and contrary to the public interest. As the commission remarks, no one can tell what the future holds in store for the utilities. They must be free to act, but, at the same time, a company's self-interest must be made to coincide with that of the public so that rates will not be advanced unless necessary and will be lowered as soon as it is possible to do so.

Getting More Energy Out of Fuel

IN ONE of a long series of articles on the transformation of energy appearing in the *General Electric Review*, Eskil Berg in the March issue gives some especially valuable data on the results of using high pressure and superheat. Two diagrams are reproduced to depict graphically the results of his analysis.

In Fig. 1 is a half longitudinal section of a steam turbine cylinder in which there are ten expansion stages. At each stage the diagram shows the temperature, steam condition (superheat or percentage saturation) and pressure. The thermometers are so placed that a curve can be drawn through the tops of the mercury columns. Fig. 2 is a summary of the whole subject, indicating how an increase in the working range of temperature increases the heat available for power production. The significance of these curves can be appreciated by reference to the report of tests of the Interborough Rapid Transit 30,000-kw. turbines, abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for May 13, 1916, page 903. It must be remembered that of the percentage of heat in the steam given as available all cannot be recovered, as there are radiation and mechanical losses to be provided for. However, in the best modern machines as high as three-fourths of the heat can be changed into mechanical form, or say nearly one-fourth of the heat in the steam coming over from the boilers, with practical pressure and superheat.

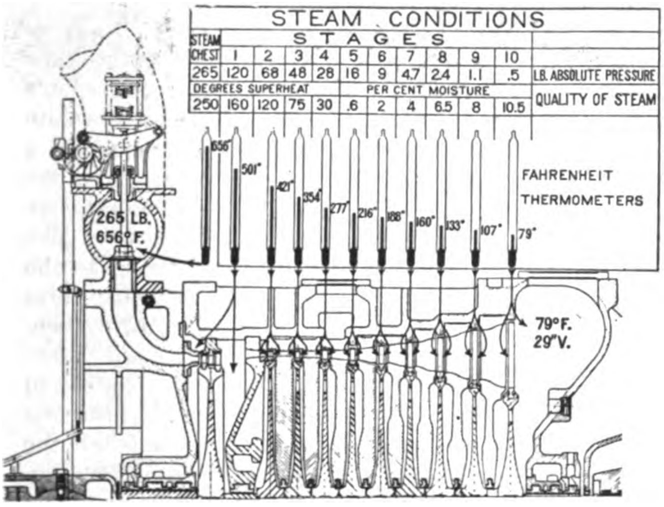


FIG. 1—SECTION OF TEN-STAGE TURBINE SHOWING CONDITION OF STEAM IN EACH STAGE

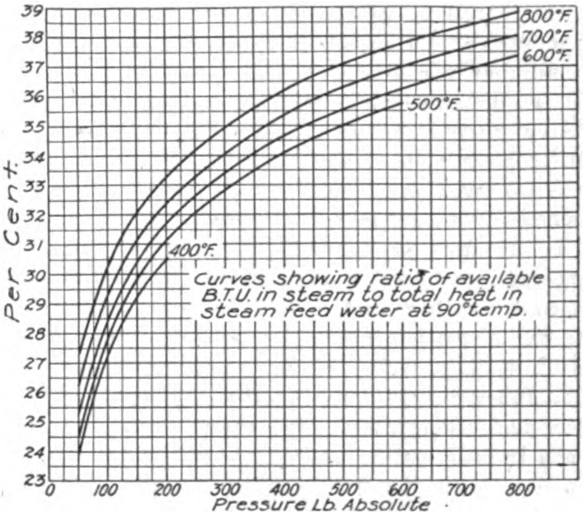


FIG. 2—RELATION OF IDEAL THERMAL EFFICIENCY AND PRESSURE; FEED WATER AT 90 DEG. FAHR.

Retail Food Prices Up 39 Per Cent Since 1907

Increase in the Cost of Living, However, Is Not So Great as the Change in Common Index Numbers

THE retail food prices were 12 per cent higher in 1916 than in 1915—a much greater increase than in any other year since 1907. Retail food prices have risen each year since 1907 except in 1911 and 1915, and in 1916 they were more than 39 per cent higher than in 1907. This information in contained in Bulletin 228 of the Bureau of Labor Statistics of the United States Department of Labor, entitled, "Retail Prices, 1907, to December, 1916."

To enable the reader to see the percentage charges more readily, the retail prices of twenty-seven articles of food are reduced to relative prices, the average for 1916 being taken at 100. Individual relative prices have been computed for as much of the period since 1907 as possible, and general weighted relative prices for all combined have been calculated, the price of each article being weighted according to the quantity consumed in the average workman's family.

Every article reported for the period has increased in retail price each year almost without exception save for 1911 and 1915. The general weighted relative prices for all the commodities follow: 1907, 72; 1908, 74; 1909, 78; 1910, 82; 1911, 81; 1912, 86; 1913, 88; 1914, 90; 1915, 89; 1916, 100.

Bulletin 226 of the Bureau of Labor Statistics covers wholesale prices. This shows that the upward movement of wholesale prices which began in the latter part of 1915 continued without interruption through the whole of 1916, becoming most pronounced in the closing months of the year. In December the weighted index number for all the 342 articles studied stood at 118 as compared with 89 in January, indicating an average increase in wholesale prices of nearly 33 per cent. The increase over the level of prices in December, 1914, was more than 49 per cent. During 1916 phenomenal advances were recorded in the wholesale prices of many commodities belonging to the groups designated as farm products, food, cloths and clothing, fuel and lighting, and metals and metal products.

A similar statement, covering a more recent period, has just been issued by a committee of university economists under the leadership of Prof. Irving Fisher of Yale. This committee, acting for the Treasury Department, has been making a study of the purchasing power of money in war time. According to its first statement, the committee has found that the average of wholesale commodity prices in January, 1917, were 81 per cent above that of July, 1914, while the rise in retail prices was 57 per cent.

Commenting upon this statement, the *Engineering & Mining Journal* says in a recent issue:

"This confirms the opinion, not infrequently expressed, that the cost of living has not increased so much as is indicated by the common index numbers, which reflect the basic commodity prices. The individual is more concerned with retail prices, but even they enter but partly into his cost of living. Other things, such as rent and the use of public services, constitute important parts. It is doubtful if rents on the average have increased as much as 57 per cent during the last three years, and it is well known that the charges for public services have increased but slightly in any cases, and not at all in most cases. Therefore, if the finding of Professor Fisher's committee be correct, it is certain that the present cost of living is not 1.57 times that of July, 1914, and that the actual increment is materially less than that."

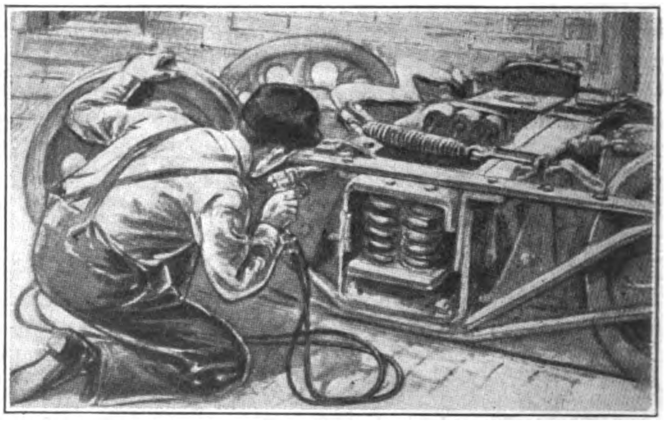
Paint Gun Conduces to Economy in the Shop

By C. M. Pettinger

Master Mechanic Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio

MANY progressive electric railway shops are already using paint guns for work which does not require personal touch or which is difficult of access. Many others, however, do not realize the extensive use to which this handy apparatus can be applied with a consequent saving of labor and cost.

We have had a "Spraco" paint gun manufactured by the Spray Engineering Company, Boston, Mass., in our shops for some time and find many profitable uses for it. Among our rolling-stock units are some modern light-weight steel cars which have been in service for about two years. As the pressed shapes used in the underframe construction as well as the sheets used on the sides are of very light material, they would soon be destroyed if they were not protected by a coating of paint to prevent the rust from attacking the steel.


PAINT GUN IN SERVICE WHERE BRUSH WORK IS DIFFICULT

To protect the underframe of these cars from rust we have inaugurated the following system: All our steel cars, when going through the paint shops, are first jacked up out of doors. After removing the trucks, the entire bottom of the car is thoroughly cleaned with wire brushes, scrapers and compressed air blast, removing all the accumulation of mud and any rust that is found in any part of the underframe. After the car has been thoroughly cleaned it is sprayed by means of the paint gun, using a mixture of red lead and oil.

The cost of applying this paint has averaged about $2 per car for labor, taking about five or six hours' time at 35 cents per hour. As we have never done this particular work with a brush, it is impossible to give any comparison as to the cost of doing it with a brush and with a gun. It is evident, however, that it would be very difficult to do this particular work with a brush and impossible to do it as efficiently as with the gun, for the reason that the paint is driven into the recesses and joints that would be hard to reach with a brush.

The paint gun is also used for painting trucks, and we find that it makes quite a saving. Thoroughly to paint the trucks of a double-truck car with a brush requires the labor of one man for three or four hours, while with the gun he can do it in a half hour. The cost, of course, depends on the wages paid the man, but we usually employ an apprentice or laborer for doing this class of work.

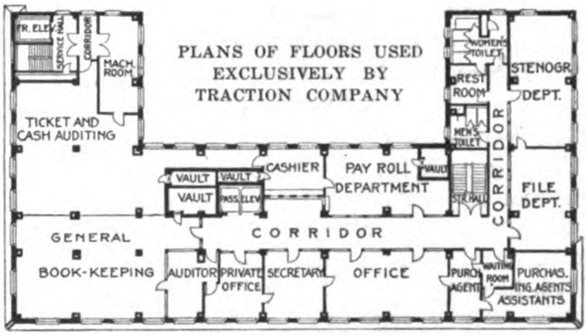
There are, in addition, a great variety of uses to which the paint gun is applicable, such as painting the interior of motors, controller covers, and in fact practically any painting where insulating paint is used.

New Interurban Terminal Building at Akron, Ohio

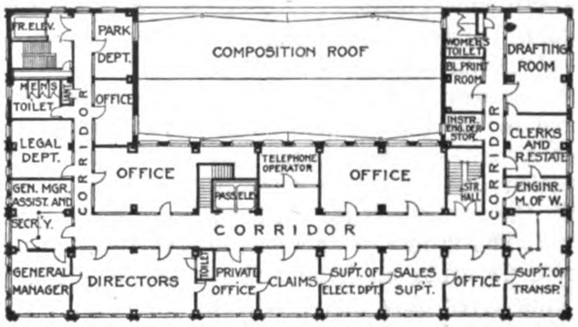
THE Northern Ohio Traction & Light Company, Akron, Ohio, now has in the course of construction an attractive new terminal building which will provide a large waiting room and many comforts for the traveling public. There will also be an eight-track train shed of sufficient capacity to shelter at least twenty-four cars. The building is expected to be completed next summer to a temporary height of four stories, the first three of which will be used principally by the traction company and the fourth for general office purposes. The arrangement of the first three floors is shown in the accompanying drawings.

The street side of the first floor will be occupied by stores, with a wide entrance corridor extending back from the center of the building into a large waiting room. The ticket office will be located opposite this corridor, and an exit from the waiting room to the concourse will be made on either side of the ticket office. A tunnel from the concourse will extend along the rear end of the train shed and communicate with the concrete walks between each pair of tracks. The tracks will be built with open-type construction and ballasted with crushed stone. By means of the tunnel and the general arrangement of the station, there will be no crossing of tracks by passengers at any time. The cars entering the station will circle around the rear end over a single track and then turn to the left into the various tracks in the station. The switches for both the incoming and outgoing cars will be controlled from a tower so that any trains can be routed in and out as they arrive without the motorman being obliged to make a number of stops to throw switches.

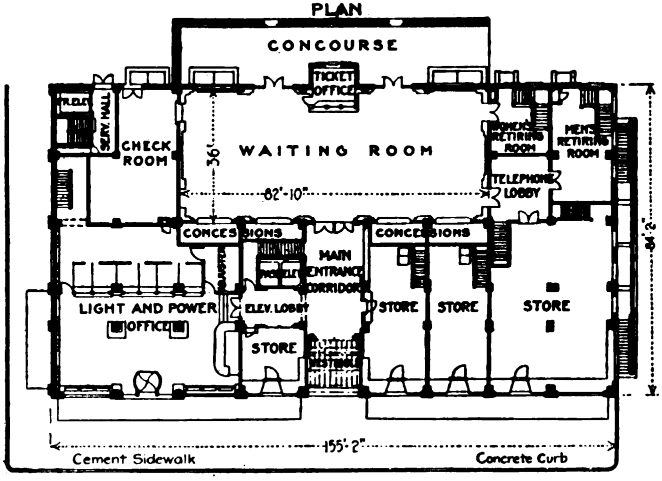
The new terminal is located on the street which will connect with the new viaduct to be built across the river to the north of Akron, so that ultimately trains will come over this viaduct and directly into the station, without any traverse of other streets in the city.


PLANS OF FLOORS USED EXCLUSIVELY BY TRACTION COMPANY
FR. ELEV.
SERVICE HALL
CORRIDOR
MACH. ROOM
TICKET AND CASH AUDITING
VAULT
VAULT
VAULT
PASS. ELEV.
CASHIER
PAY ROLL DEPARTMENT
GENERAL BOOK-KEEPING
CORRIDOR
AUDITOR
PRIVATE OFFICE
SECRETARY
OFFICE
PURCH. AGENT
WAITING ROOM
PURCHAS. ING AGENTS ASSISTANTS
WOMEN'S TOILET
REST ROOM
MEN'S TOILET
STR. HALL
STENOGR. DEPT.
FILE DEPT.

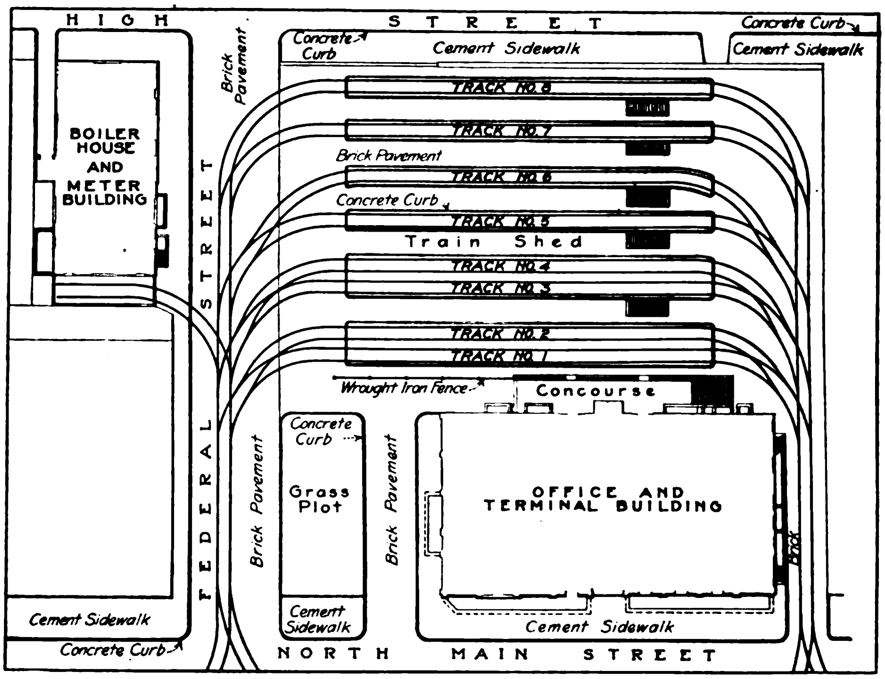
THIRD FLOOR PLAN


FR. ELEV.
PARK DEPT.
OFFICE
MEN'S TOILET
LEGAL DEPT.
GEN. MGR. ASSIST. AND SECR'Y.
CORRIDOR
COMPOSITION ROOF
OFFICE
TELEPHONE OPERATOR
PASS. ELEV.
OFFICE
CORRIDOR
GENERAL MANAGER
DIRECTORS
TOILET
PRIVATE OFFICE
CLAIMS
SUPT. OF ELECT. DEPT.
SALES SUPT.
OFFICE
SUPT. OF TRANSP.
WOMEN'S TOILET
BL. PRINT ROOM
INSTR. ENG. DEPT. STOR.
STR. HALL
DRAFTING ROOM
CLERKS AND R. ESTATE
ENGINR. M. OF W.

SECOND FLOOR PLAN


CONCOURSE
TICKET OFFICE
FR. ELEV.
SERV. HALL
CHECK ROOM
36'
WAITING ROOM
62'-10"
WOMEN'S RETIRING ROOM
MEN'S RETIRING ROOM
TELEPHONE LOBBY
CONCESSIONS
CONCESSIONS
MAIN ENTRANCE CORRIDOR
LIGHT AND POWER OFFICE
ELEV. LOBBY
STORE
STORE
STORE
STORE
84'-2"
155'-2"
Cement Sidewalk
Concrete Curb

FIRST FLOOR PLAN


HIGH STREET
Concrete Curb
Cement Sidewalk
Concrete Curb
Cement Sidewalk
Brick Pavement
BOILER HOUSE AND METER BUILDING
TRACK NO. 8
TRACK NO. 7
Brick Pavement
TRACK NO. 6
Concrete Curb
TRACK NO. 5
Train Shed
TRACK NO. 4
TRACK NO. 3
TRACK NO. 2
TRACK NO. 1
Wrought Iron Fence
Concourse
FEDERAL STREET
Concrete Curb
Grass Plot
Brick Pavement
Brick Pavement
OFFICE AND TERMINAL BUILDING
Cement Sidewalk
Cement Sidewalk
Cement Sidewalk
Concrete Curb
NORTH MAIN STREET

GENERAL LAYOUT OF TERMINAL BUILDING AND TRAIN SHED

Women and War Work

The Employment of Women in Transportation Work as Viewed by the Women, the Public and the Labor Union

THE New York (N. Y.) Evening Post has been conducting a series of articles dealing with the new industrial opportunities for women brought about by the change in labor conditions resulting from the war. The scope of these articles, so far as they have appeared, has been devoted largely to the employment by electric railway companies of women conductors and guards. The first of the series was contributed by Col. T. S. Williams, president of the Brooklyn Rapid Transit Company, and was published in the ELECTRICAL RAILWAY JOURNAL for March 2.

The second article by "A Woman Conductor" appeared in the Post on March 2. Some of the points emphasized were that girls seek work in the transportation department because of the novelty of the work, the higher wages received and the "fresh air" claim. The writer of this article states that the girls receive 27 cents an hour and can make $21 a week working seven days and overtime. The particular run on which she is employed is from 1 to 3:35 in the afternoon and from 7:19 in the evening until 2:29 in the morning. The intervening hours are spent at the carhouse rest rooms, so that the girl is actually away from home about 16 hours. More trouble is encountered from women passengers than men and no ill-treatment is received by the girls from the motorman or men conductors. It is obvious that all of the girls do not have runs like the above, but have more opportunity for home and social life.

The third article, appearing March 4, was contributed by a member of the National Consumers' League. This writer questions the general opinion that there is a shortage of labor and that women are performing a "patriotic service." It is stated that although the wages are higher than women are accustomed to receive, they are conspicuously low in New York for the class of service demanded. Emphasis is placed upon the point that exploitation of women in place of men should be avoided.

The writer believes that inasmuch as night work in practically all industries in New York has been forbidden by law, some legislation should be passed at once to prevent women from being employed on night runs. The fact that the women often have to be on duty 14 hours to get in less than 10 hours' time and that on many cars they have to stand for long periods is also objected to.

The fourth article, which was contributed by the president of the New York Allied Printing Trades Council, appeared on March 5. In this article the writer states that organized labor is not opposed to the employment of women in any occupation which is not detrimental to their health. He brands as false the statement that there is a scarcity of labor and declares that the railways are representing this to be the condition "with the deliberate intention to deceive the public and defraud the unfortunate women who may be induced through 'patriotic' reasons to do their 'bit,' as well as earn a livelihood, by going into occupations that have been exclusively for men in the past." He declares the condition to be a result of the refusal of railways to pay the men the "prevailing rate of wages." The solution to the problem which organized labor would present is to organize the women into unions for the purpose of exerting collective pressure on the corporations.

Trend of Labor Decisions

Latest Government Bulletin Shows Important Court Findings About Compensation Laws, Wage and Hour Legislation, and Strike Injunctions

AN UNUSUAL array of important decisions is presented by the United States Bureau of Labor Statistics in its annual compilation of court decisions on labor questions, just published as Bulletin No. 224. A number of the decisions of the Supreme Court of the United States, handed down since December, 1916, are included in this bulletin, but for the most part the decisions were made in the calendar year 1916.

Most notable among the Supreme Court decisions, on account of the circumstances attending the enactment of the law construed by it, is the decision sustaining the constitutionality of the Adamson eight-hour law for trainmen in interstate commerce and declaring at the same time the right of Congress compulsorily to arbitrate disputes between the railroads and their employees for the benefit of the public.

The first broad decisions ultimately deciding the constitutionality of workmen's compensation laws are also noted in this volume. Although a number of state courts of last resort had passed upon laws of this type, it was not until the Supreme Court of the United States had given the seal of its approval that the matter could be considered as finally settled. In upholding the compulsory compensation law of New York and of Washington, the latter also providing for a compulsory state insurance fund, the farthest reach of compensation legislation has received judicial approval. The elective law of Iowa was likewise sustained.

Another important decision by this highest court was that sustaining the Oregon ten-hour day for factory employees without regard to sex or age—a marked reversal from the action of the same court in 1905 in holding the ten-hour law of New York applicable to bakeries unconstitutional. The power of the State to enact laws limiting the hours of service of adult males in private employment, as well as the hours of females and of children, is now recognized. The fixing of wages for women and minors under eighteen is also a valid exercise of the police power according to another decision of this court, the Oregon minimum wage law being left undisturbed in its position of constitutionality as determined by the Supreme Court of that State. On this point the federal supreme bench was equally divided, one justice not voting.

Of hardly less interest than these decisions of the Supreme Court is the action of the court of last resort of Massachusetts in declaring unconstitutional an act which undertook to limit the issuance of injunctions in labor disputes, declaring that injunctions should issue only when property rights are affected and that labor is not property. The court took the view that this attitude excludes from the protection of the law those who have no other property than their right to work, and it held that such a deprivation could not be effected by statute.

Jitneys in Los Angeles Losing

Report of Board of Public Utilities Shows Unprofitable Operation on Car-Mile Basis—Many Complaints from Public

JITNEYS in Los Angeles, Cal., are operating at a net loss per car-mile ranging from 0.47 cent in January, 1917, to 0.11 cent in June, 1917. These figures are given in the report of the Board of Public Utilities of that city for the year ended June 30, 1917.

Jitneys began operating in Los Angeles during July, 1914. By the end of 1915 the number had increased to 1300, and it was impossible for the Board of Police Commissioners to regulate them properly under the ordinance in effect at that time. The conditions became worse as time went on, and the city finally passed a restrictive ordinance in October, 1916, placing the jitneys under the supervision of the Board of Public Utilities. In March, 1917, another ordinance was passed increasing the license fees according to the average charges in sixty-two cities. The jitneys operating during the latest check reported on June 25, 1917, numbered 250. Of 323 in service on Jan. 1, only 159 had survived.

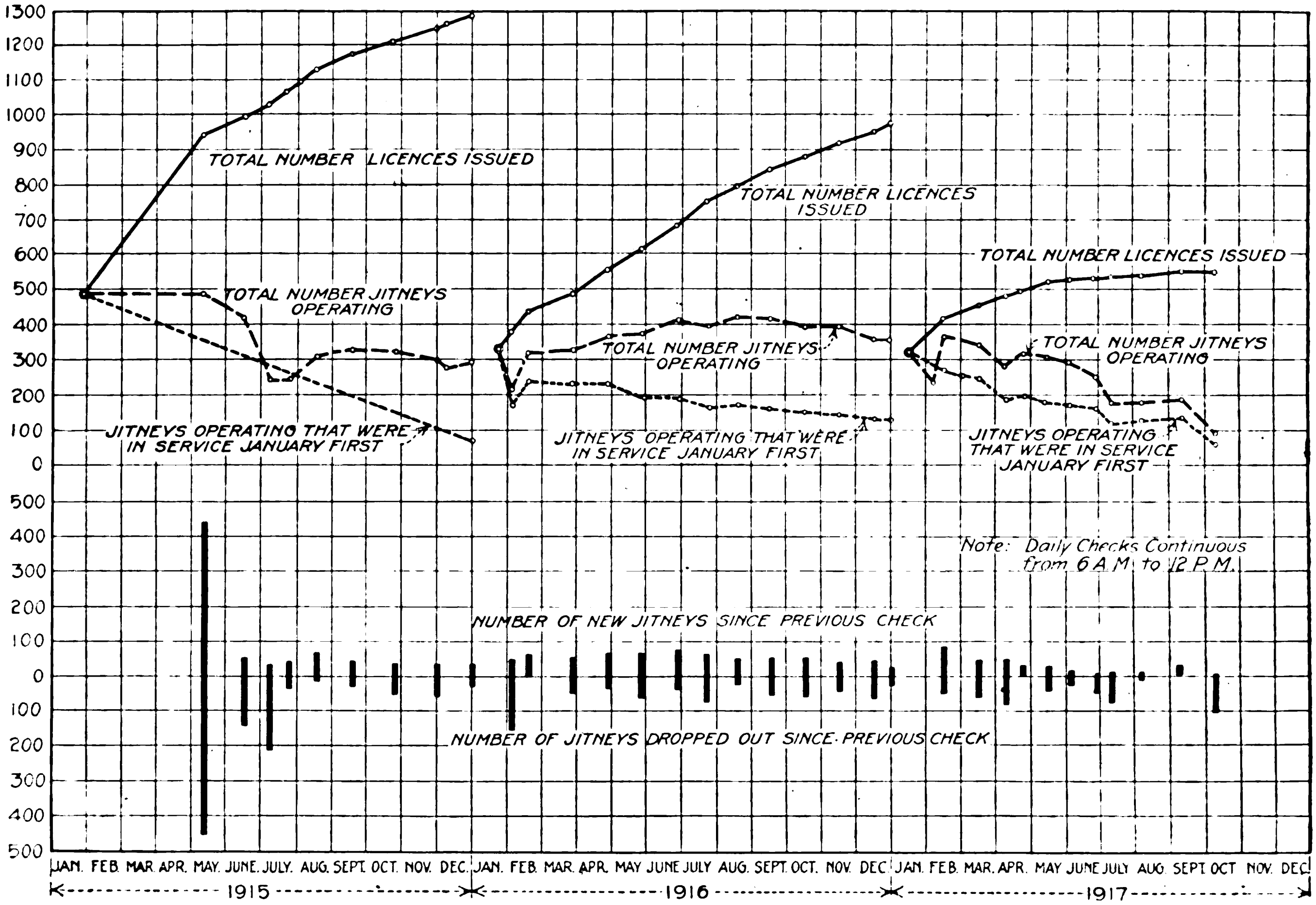
LOS ANGELES JITNEY OPERATING STATISTICS FOR 1917
(Compiled from Monthly Reports Made by Operators to the Board of Public Utilities)

	Jan.	Feb.	Mar.	April	May	June
Miles run per car	3241	3057	3641	3330	3641	3649
Passengers carried per car	3330	3353	3660	3651	3941	3920
Passengers per car-mile	1.027	1.095	1.005	1.095	1.081	1.073
Earnings per car	$167.66	$168.98	$186.69	$184.60	$199.04	$197.64
Expenses per car, exclusive of driver's wages, depreciation and interest	$93.68	$92.01	$98.15	$101.50	$100.31	$105.87
Earnings per car-mile (cents)	5.17	5.51	5.13	5.54	5.47	5.42
Expenses per car-mile (cents):						
As reported	2.89	3.00	2.70	3.05	2.76	2.90
Including depreciation and interest	3.54	3.77	3.26	3.67	3.22	3.43
Including depreciation, interest and driver's wages	5.64	5.87	5.36	5.77	5.32	5.53
Net gain per car-mile (cents)	...	...	...	...	0.15	...
Net loss per car-mile (cents)	0.47	0.36	0.23	0.23	...	0.11

MANY SERIOUS COMPLAINTS AGAINST JITNEYS

The number of complaints against jitneys for the year ended June 30, 1917, was 1212. The largest numbers of complaints were 268 for reckless and hazardous operation, 129 for deviation from and turning on routes, 119 for discontinuance of operation without cause and 103 for operation without city license and indemnity bonds. Other complaints covered such topics as failure to report accidents (fifteen), drivers charged with crimes (seven), misconduct of drivers towards passengers (seven), drivers smoking on duty (three), short-changing passengers (three), dirty appearance of drivers (two), boisterous and objectionable conduct at terminals (two), excessive fares charged (ten), cars operated without proper sign on windshield (forty-three), and cars operated in unsafe condition (four).

The operating loss of the jitneys during the period from January, 1917, to May, 1917, inclusive, is as shown by the accompanying table. It should be noted that 40 per cent yearly depreciation and 6 per cent interest are allowed on the cost of equipment to the op-



GRAPHIC HISTORY OF THE JITNEY AT LOS ANGELES, CAL.

erator. Drivers' wages average $2.50 per day, or 2.1 cents per car-mile on a basis of 120 miles per car per day. The accompanying diagrams show how since 1915 the jitney service each year has fallen off as the months passed.

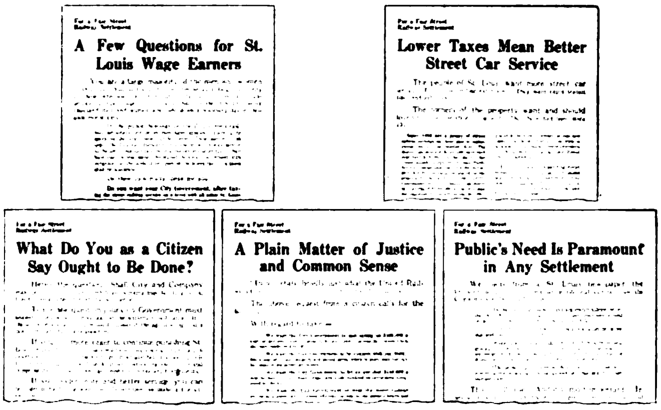
For a Fair Settlement

St. Louis Company in Series of Advertisements Has Been Securing Public Support in Tax and Franchise Controversies

THE United Railways of St. Louis has been publishing in daily and weekly newspapers a series of forty-five advertisements to procure public approval for a fair readjustment of tax and franchise controversies between the company and the city. These advertisements, which were written by Frank Putnam, appeared during the period from August, 1917, to January, 1918, inclusive. They have now been reissued by the company in the form of a complete set of proof pages, with an index.

In introducing the series of advertisements, some of which are shown in part in the accompanying illustration, the company stated that it wished its customers to know all about the proposed settlement and the electric railway situation generally, so that the great power of an informed public opinion might help to get a fair settlement and open the way for more and better service. The company in subsequent advertisements proceeded to explain the proposed ordinances, the merits of various clauses, the importance of service over taxes and the need of a prompt settlement. It was always ready to answer in detail any queries made by any of its patrons.

The last advertisement stated that there had been a great change in public sentiment during the year, because a large majority of the people now understood that the company needed their good-will, that it was trying to give the most and the best service possible under present conditions, and that any further betterment was impossible until a settlement was effected.



A Few Questions for St. Louis Wage Earners

Lower Taxes Mean Better Street Car Service

What Do You as a Citizen Say Ought to Be Done?

A Plain Matter of Justice and Common Sense

Public's Need Is Paramount in Any Settlement

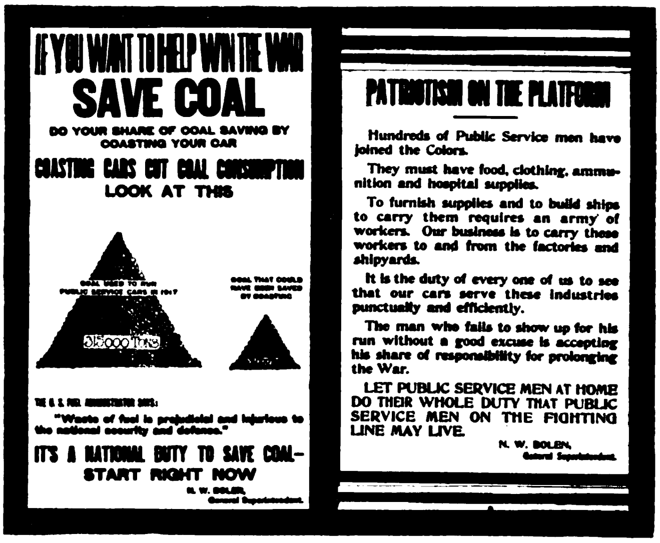
UNITED RAILWAYS FARE READJUSTMENT CIRCULARS

The course of the negotiations in St. Louis has been followed in the ELECTRIC RAILWAY JOURNAL from time to time.

Public Service Commissioner Whitney has written Acting-Mayor Smith that unless the Legislature empowers the commission and the city to make concessions to contractors engaged in building new subways in New York the work will be held up indefinitely.

Patriotism on the Platform

IN ORDER to impress on its employees their ability substantially to help in carrying on the war the Public Service Railway, Newark, N. J., has posted in its carhouses copies of two posters which are reproduced herewith that they may tell their own story. They have been well received by the men.



IF YOU WANT TO HELP WIN THE WAR

SAVE COAL

DO YOUR SHARE OF COAL SAVING BY COASTING YOUR CAR

COASTING CARS CUT COAL CONSUMPTION

LOOK AT THIS

COAL USED TO RUN PUBLIC SERVICE CARS IN 1917
315000 TONS
COAL THAT COULD HAVE BEEN SAVED BY COASTING

THE U. S. FUEL ADMINISTRATOR SAYS:

"Waste of fuel is prejudicial and injurious to the national security and defense."

IT'S A NATIONAL DUTY TO SAVE COAL—START RIGHT NOW

N. W. BOLEN,
General Superintendent.

PATRIOTISM ON THE PLATFORM

Hundreds of Public Service men have joined the Colors.

They must have food, clothing, ammunition and hospital supplies.

To furnish supplies and to build ships to carry them requires an army of workers. Our business is to carry these workers to and from the factories and shipyards.

It is the duty of every one of us to see that our cars serve these industries punctually and efficiently.

The man who fails to show up for his run without a good excuse is accepting his share of responsibility for prolonging the War.

LET PUBLIC SERVICE MEN AT HOME DO THEIR WHOLE DUTY THAT PUBLIC SERVICE MEN ON THE FIGHTING LINE MAY LIVE.

N. W. BOLEN,
General Superintendent.

POSTER INTENDED TO INCULCATE PATRIOTISM AT HOME AS WELL AS AT THE FRONT

The posters are on white cardboard, 15½ in. x 26 in. in size. The one shown at the right-hand side in the cut is printed in blue and red to enhance the distinctly patriotic character of the text.

Connecticut Company's Power-Saving Campaign

AS A CONTINUATION of the power-saving campaign described by William Arthur in the March 2 issue of the ELECTRIC RAILWAY JOURNAL the Connecticut Company has just distributed to its platform men copies of a booklet by Mr. Arthur entitled "Trolleymen's Handbook on Efficient Car Operation." This, it is understood, will be available at cost to other electric railways. It is of a patriotic character, outlines general principles and has no reference to any apparatus used in power-saving campaigns. The author is supervisor of coal conservation for the company.

With the booklets the company distributed copies of a leaflet on the coal situation containing a reprint of Federal Letter No. 18 from the United States Fuel Administration to the state fuel administrators. (See ELECTRIC RAILWAY JOURNAL, Dec. 8, 1917, pages 1033 and 1037.) The leaflet also contains the platform man's pledge suggested by the Electric Railway War Board.

Company Supplies Employees with Fuel

The Georgia Railway & Electric Company, Atlanta, Ga., has made every possible effort to supply employees with coal for home use this winter. According to W. H. Smaw, purchasing agent, the company has delivered coal to many when the fuel was badly needed to keep the steam plants going. Every team which the affiliated gas company could spare was employed in making deliveries.

American Association News

EXECUTIVE COMMITTEE *of American Association Held Important Meeting at New York on March 5. War Board Announces P. H. Gadsden Will Be Resident Member at Washington, and E. C. Faber, Manager*

SECTION ACTIVITIES *Are Resumed After Lull Caused by Operating Difficulties Incident to Winter of Record-Breaking Severity*

Changes in the War Board Organization

PHILIP H. GADSDEN, president Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has been requested by the American Electric Railway War Board to assume direct charge of the work as resident member. His duties in connection with the financial problems of public utilities will make it necessary for him to remain in Washington most of his time. E. C. Faber, formerly traffic manager of the board, has been appointed manager. W. V. Hill, representative of the electric railways of the State of California, has been appointed assistant manager. The resignation of C. Loomis Allen as director of the board has been accepted as of Jan. 10, 1918.

Coal for Electric Railways

THE War Board has issued Bulletin No. 12, giving information as to changes in the organization mentioned above and announcing certain changes in the method of handling emergency orders and requests regarding the distribution of bituminous coal made by the department of distribution of the National Fuel Administration. These are as follows:

First, all assignments of men to deal with emergencies affecting particular industries or classes of consumers are hereby canceled, except as they relate to railroad and bunker coal and to coal for gas and by-product plants and for steel and munitions plants.

Second, situations which can be passed upon by state administrators should be, so far as practicable, referred to them for action.

The department of distribution has divided the country into territorial districts grouped as follows:

Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Kentucky, Mississippi, Arkansas, Louisiana, Oklahoma and Texas.

Ohio, Michigan, Indiana, Wisconsin, Illinois, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Arizona, Nevada, Washington, Oregon and California.

New England, New York, New Jersey, Delaware, Maryland and Pennsylvania.

District of Columbia.

The War Board suggests that if relief on coal matters cannot be obtained after conference with state fuel administrators, the War Board office should be communicated with and the matter will be taken up with the manager of distribution.

October Convention to Be Held

Executive Committee Favors Meeting But Without Exhibits—Recent Work of Association Committees Reviewed

AT A MEETING of the executive committee of the American Electric Railway Association held in New York on March 5, the principal action taken was a decision to hold a convention next October. The convention will be one for all of the affiliated associations, as well as for the parent organization, but there will be no exhibits. Probably the convention will be two days in duration. No city has been selected as a place of meeting. These details have been left to President Stanley, who will announce his plans later.

The executive committee at its meeting this week also heard a report from Chairman McCarter on the work of the War Board; from J. K. Choate on that of the committee on electric railway revenue, and from P. H. Gadsden on the work of the joint committee with other public utility associations on higher rates. The executive committee also took up the subject of committee work of the affiliated associations. This matter was finally left in the hands of the president to act after consultation with the presidents of the affiliated associations.

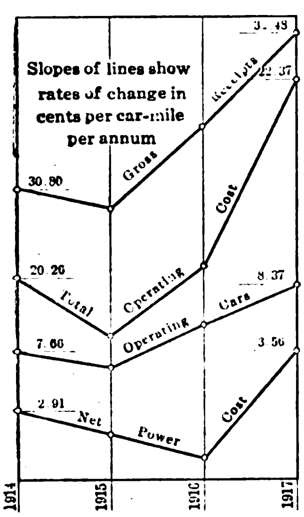
A change was made in the rules governing the award for the best paper presented at a company section meeting. Hereafter, no one will be eligible to receive this medal who has the rank of general superintendent or a higher rank than that. The executive committee decided to remit the dues of individual members in military service for the duration of the war. It also approved the following resolution which it asked the Chamber of Commerce to consider at its annual meeting to be held in Chicago on April 10-12:

> *Whereas*, the maintenance of the country's public utilities in the highest possible state of efficiency is essential not only to the war program of the United States but also to the Nation's business and industrial interests, and
>
> *Whereas*, such efficiency depends upon the preservation of the credit of the companies providing public utility service, and
>
> *Whereas*, the increase of costs and the unusually onerous conditions of operation brought about by the war seriously threaten the ability of the public utilities to continue the furnishing of the necessary services they perform, and
>
> *Whereas*, the protection of the credit of public utilities is very largely in the hands of regulatory commissions and other public authorities rather than in the utilities themselves, therefore be it
>
> *Resolved*, that the Chamber of Commerce of the United States of America recommends to the state and local authorities that they recognize the unusual and onerous conditions with which public utilities are contending, and that in the interest of the nation, of business and of the public, they give prompt and sympathetic hearing to the petitions of such utilities for assistance and relief.

Those in attendance were: President John J. Stanley; Vice-Presidents John H. Pardee and T. S. Williams; members of executive committee, M. R. Boylan, R. E. MacDougall, Thomas Finigan and John G. Barry, who represented E. W. Rice, Jr. Past-Presidents McCarter, Sergeant, Storrs, Ely and Henry were present, as were also P. H. Gadsden, J. K. Choate and C. C. Peirce, on invitation.

Some Startling Data Presented at Public Service Meeting

THE meeting of the Public Service Railway company section held on Feb. 21 was an "economy" meeting in that all of the discussion centered around the necessity for doing things which will offset the rapidly mounting cost of operation. Martin Schreiber, chief engineer, read a carefully prepared paper on "Some Problems of the Railway Business." R. E. Danforth, general manager, gave a forceful talk on the seriousness of the situation confronting the electric railways. He read a letter from a prominent steam railroad man commending Public Service Railway for its service on one line, and he stated that he believed that this particular line was no more worthy of commendation than many others. Mr. Danforth attributed much of the present difficulty in maintaining equipment to the frequent labor turnover. Further, he urged that never was it more important for the men to be careful of the equipment, as it is almost impossible to get supplies. Not only are parts such as car wheels, field coils, etc., very scarce, but operating conditions tend to use them up more rapidly than when they are plenty. For example, recently a supply of 1600 car wheels was received by the company, but in four weeks they had all been used.



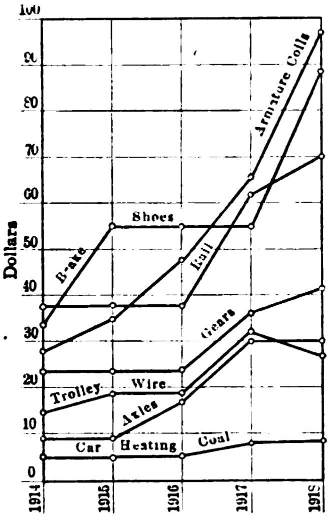


FIG. 1—DIAGRAMS TO SHOW RATES OF CHANGE OF ELECTRIC RAILWAY INCOME AND COSTS. FIG. 2—DIAGRAM SHOWING HOW MATERIALS COSTS HAVE INCREASED IN FIVE YEARS

Mr. Danforth said, however, that while conditions are bad they will not compare with those in the trenches at the front, and the men should do their work willingly and cheerfully.

J. W. Brown, assistant superintendent, spoke on the subject of optimism. He explained that the railway was pulling out of the worst winter in thirty years, the average temperature for the winter being 25 deg., as compared with the general average of 34 deg. for December; that one snowstorm had cost the company $140,000, and that there was a large loss of men from the service. Nevertheless he held that the future is bright. He urged all of the men to work, not in a spirit of hopelessness, but in one of cheer and courage.

Taking up Mr. Schreiber's talk more in detail, it may be said that it centered around the two charts reproduced. Fig. 1 shows the rate of change of gross receipts per car-mile and total operating costs, and two of its components. The diagram is arranged for comparison of the slopes of the lines and not of their absolute values. Mr. Schreiber went into some detailed explanation of the reasons for the depressions in the graphs, which had to do with increase in schedule speeds, commissioning of a new power plant, etc. He emphasized the fact that when the slope of the cost line is equal to or greater than that of the receipts the situation requires careful attention.

The second chart shown by Mr. Schreiber, Fig. 2, shows how the costs of materials have been going up. Advantageous contracts held some of these costs to a lower rate of increase than they otherwise would have had. This chart is based on an analysis of $400,000 worth of materials purchased.

Because of the difficulties encountered in making ends meet, Mr. Schreiber emphasized the necessity of the measures which are being taken to increase economy and urged hearty co-operation on the part of all members of the company's organization.

Milwaukee Holds "Electric Court" on Attorneys' Night

THE regular meeting of the Milwaukee Electric Railway & Light Company section was held on Feb. 14 with an attendance of two hundred. This being attorneys' night the scene was that of a court room and a fake complaint was prearranged, involving serious charges against the attorneys. A full court and jury was provided and the regular court form adhered to. The defendants were found guilty and the judge, being unable to pass sentence, discharged them.

After court dismissal the following talks were given: "Why Public Utilities Differ from Other Industrial Enterprises," by Attorney E. S. Mack; "Public Prejudice Against Street Railways," by Attorney C. Nuskat; "Closer Relations of Company to Employees," by Attorney J. D. Shaw; "Some Cases in Court," by Attorney Drew; "Paving," by Attorney J. C. Hardgrove; "Street Car Service," by Attorney W. A. Jackson.

G. T. Seely of the Chicago Elevated Railway was present and spoke briefly regarding the local car service.

History Reviewed at Portland Dinner

THE Cumberland County Power & Light Company section held its regular meeting on Feb. 18 and dinner was furnished by the company. A. H. Ford made a few remarks on the 6-cent fare case, which was shortly to come before the Public Utilities Commission. C. F. Berry, treasurer, and one of the oldest men, as regards years of service, in the employ of the company gave a history of the Portland Railroad from the beginning of horse-car operation.

The company section orchestra furnished music and Deane Payne, a local newspaper man, entertained with stories.

The American Museum of Safety, which in normal times awards annually the Anthony N. Brady and other medals for achievement in safety work, will not make any medal awards this year. This step has been taken as a war-time economy.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Transit Commission Cases Heard

Supreme Court of Ohio Asked to Pass on Acts Creating Cleveland Transit or Subway Commission

Two cases affecting the Cleveland subway or rapid transit commission were argued in the Ohio Supreme Court on Feb. 19. One of them, filed by Prosecuting Attorney Samuel Doerfler, asks that the commission be ousted. The other, entered by City Law Director W. S. Fitzgerald, asks that C. J. Neal, city finance director, be restrained from paying the expense of the commission. Mr. Doerfler is said to be in earnest in his contest, but the other suit is a friendly one, intended to establish the constitutionality of the law under which the commission is established. A similar suit from Cincinnati is pending.

Former Appellate Judge Walter D. Meals and former Municipal Judge Pierre A. White appeared for the commission. Attorneys for the city and county argued that the Bower act, under which the commission was appointed, is unconstitutional and that no provision was made for it in the city charter. Judge Meals declared that the subway commission ordinance is constitutional and is the freest exercise of home rule imaginable. The charter was adopted as a home rule proposition.

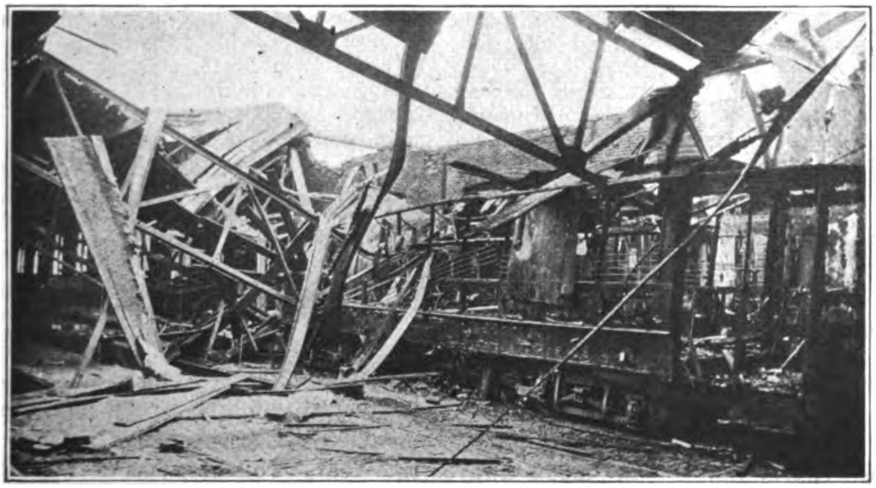
It was contended by some that a charter amendment, instead of the ordinance, should have been submitted to a vote of the people and that in its present form there is no authority for the commission.

Rebuilding Trenton Carhouse

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has arranged for the rebuilding of its carhouse destroyed by fire recently. Newton A. K. Bugbee & Company, Inc., will do the steel work on the new structure; Edward La Rue the carpentry and Burton & Burton the mason work. The loss to the company through the destruction of the old building was estimated at $65,000. Three new cars and two old ones were destroyed and five others were damaged. An idea of the damage to the building and its contents is conveyed in the accompanying illustration.

London Purchase Agreement

The directors of the London (England) United Tramways have signed an agreement with the County Council, "settling all matters of difference," with reference to the purchase by the Council of the company's tramway undertaking in Hammersmith. Under this agreement the Council will pay to the company the sum of £235,000 "in satisfaction of all the items" included in the arbitrator's award, dated Feb. 12, 1912, which, until the signing of this agreement, has been the subject of litigation. Included in this purchase money is the Chiswick power station and depot of the company. The purchase money is to be paid on or before the expiration of one year from the termination of the present war, but until the purchase money is paid the company is to remain in possession of the purchased tramways and to take the receipts thereof for the benefit of the company. From and after the completion of the purchase the Council and the company are to have reciprocal running powers over the lines of the other, and the present arrangement between the company and the railway for through bookings at Shepherd's Bush and Hammersmith are to be continued by the company until the completion of the purchase.



REMAINS OF TRENTON CARHOUSE

Local Transportation Provision

Bill Before the House Would Provide $50,000,000 for Housing and Local Transportation

The committee on public buildings and grounds has favorably reported to the House of Representatives a bill authorizing the expenditure of $50,000,000, through the Secretary of Labor for the purpose of providing housing, local transportation and other community facilities for war needs. If the bill passes Congress, as it is expected it will, in view of the fact that it is an administration measure, the necessary money must be appropriated in an appropriation bill, following the passage of an authorization.

The report on the bill calls attention to the fact that it "gives to the Secretary of Labor the power to acquire by purchase or otherwise such local transportation and other community facilities, or parts thereof, and equipment, as in his judgment may become necessary for the proper execution of the trust created."

The committee's report in conclusion says, in part:

"Necessarily legislation of this character must lodge very broad discretion with those who are to administer it. It is a temporary expedient, and entirely new to our government, and, as we stated in the beginning, can only be justified by the conditions now existing, but those conditions seem to us to imperatively demand its enactment."

Tacoma Purchase Vote on April 2

At the municipal election in Tacoma, Wash., on April 2 a proposition will be submitted to vote $6,500,000 of utility bonds for the acquisition by condemnation or stipulation of the entire electric railway system of the Tacoma Railway & Power Company by the city of Tacoma. U. E. Harmon, city attorney, has been authorized to draw up an ordinance for presentation to the City Council, placing the proposition on the ballot at the spring election. It is proposed to vote approximately $6,000,000 for the actual purchase of the system and $500,000 for repairs and rehabilitation of rights-of-way and the purchase of additional equipment. Commissioner Atkins points out that the voting of utility bonds would not mean any increase in taxes, as the money to meet principal and interest on the bonds would come from the returns on the city's utilities. Mayor Fawcett of Tacoma opposes the plan to vote a $6,500,000 bond issue. He asserts that the figure is double the value of the properties.

Massachusetts Governor's Relief Message

Immediate Readjustment of Fares for Boston Elevated Urged by Governor After Recent Labor Settlement

Governor McCall of Massachusetts, in a special message to the Legislature on March 1, recommended an immediate readjustment of fares on the Boston Elevated Railway, to continue in force during the war and for one year thereafter, in order that the company may be provided with the funds necessary to meet the wage increase granted as a result of the threatened strike of employees. The Legislature is studying electric railway finance, but the Governor believes immediate steps should be taken to meet the situation arising from the war crisis and the differences between the company and its employees.

GOVERNOR'S SECOND RAILWAY MESSAGE

The message of March 1 is the second the Governor has sent to the Legislature on matters pertaining to the finances of the Boston Elevated Railway. On the closing day of the 1917 session, the Governor anticipated the passage of a bill to provide for purchase by the State of the Cambridge subway, and sent a special message to the Legislature expressing disapproval of that act. In his message at that time, Governor McCall recommended the enactment of legislation which would give the Public Service Commission power, after investigation, to abrogate the contract made between the State and the elevated in 1897, under which a maximum fare of 5 cents could be charged on the company's lines. The Legislature refused to enact a law, but adopted an order directing the Public Service Commission to report to the Legislature this year on the financial condition of the company. The report of the commission is now pending before the committee on street railways, as is also a report of a special recess committee on the electric railway situation throughout the State.

The Governor's message of March 1 to the Legislature, is as follows:

SITUATION SERIOUS

"A serious condition which in my opinion demands your immediate consideration, exists upon the Boston Elevated Railway. During 1916 a contract was entered into between the railway and its employees, fixing a scale of wages for a period of three years. Since the contract was made the cost of living has increased rapidly so that the wages fixed in the contract do not amount to-day to a living wage, especially in the case of an employee with a family to support. The men demanded an increase. The railway on the other hand had only such income as the law permitted it to receive. The cost of the operation of the road has also increased greatly, and it is claimed that the fare it receives to-day is inadequate to enable it to render efficient service as a common carrier even upon the scale of wages fixed in the contract. I do not believe that the public desires transportation which must be furnished in considerable part at the expense of men who are underpaid, or any transportation, the fair cost of which it does not pay, but which must in part be paid by somebody else.

FARE FIXED TWENTY YEARS AGO

"The present fare was established by the Legislature some twenty years ago, and only the Legislature has power to deal with it now. This fare was fully adequate at the time it was established and for many years afterward, but it is very widely claimed that it is inadequate in the conditions that now exist. I imagine it will not be disputed that the railway should be permitted to received an income which with economical management .will enable it fairly to perform its obligations as a common carrier. More than that it should of course not be permitted to receive. But less than that means poor service, underpaid employees, and ultimate bankruptcy. The Legislature, I am informed, is considering the general question of electric railway transportation both within the city of Boston and outside of it. But something should be done immediately to meet the conditions existing in Boston; and it may be done without prejudice to any of the propositions which the Legislature is now considering, as a method of dealing with the existing emergency.

IMMEDIATE ACTION NECESSARY

"I recommend that anything in the charter of the railway or in the law to the the contrary notwithstanding, our Public Service Commission during the continuance of the war and for one year thereafter, or until the Legislature shall otherwise provide, be given power to fix just, reasonable, and equal rates of fare upon the Boston Elevated Railway; and pending a hearing upon any application for change of rates, that the commission shall have power from time to time to fix interim rates to have force and effect until they shall finally make decision upon the application. It is, of course, not possible to foretell how long the present abnormal conditions regarding prices will continue after the war, but we may follow the analogy of the bill providing for the taking of the railroads for war purposes by the national government. Of course if conditions during the time proposed should warrant a decreased fare, it would be the duty of the Public Service Commission to establish it. I am convinced that immediate action on this subject is necessary in the interest of the public as well as those who own and operate the elevated railway."

The message was referred to the committee on street railways, and that committee arranged to begin hearings on March 5.

Governor McCall, at his noon conference with the State House reporters, following the reading of his message in the House, said, in answer to questions:

"I have been contemplating seriously my action of to-day for a long time. Since Monday my conviction that something should be said along the line of what I have now said in my message has become acute. I made up my mind that now was the time to say it. But I believed that I ought not to say it until this threatened strike was disposed of, lest the two be linked together in the public mind. So I kept my intention secret."

At the hearing before the committee on street railways on the Governor's message counsel for the company stated that it preferred the cost-plus proposition as suggested by the Public Service Commission rather than the plan laid down in a general way by the Governor. The road preferred, if relief was to be given, that it have a tendency toward permanency.

Praise for President Ahearn

Thomas Ahearn, president of the Ottawa (Ont.) Electric Railway, had some very complimentary things said about him and the company of which he is the head by the daily press recently. One paper remarked:

"The Capital City is fortunate in being served by a railway of undoubted excellence. This is due in no small degree to the organizing ability and the executive genius of Thomas Ahearn, president of the company, who has himself taken a personal interest in everything relating to the railway and the men who work for that corporation. It is rarely that any friction arises between the company and the municipal corporation, and everybody in Ottawa is proud of its street railway service."

Major Belmont Takes a Hand

Major August Belmont, chairman of the board of the Interborough Rapid Transit Company, New York, N. Y., played an important part in the work of arranging the trade agreement by which some of the needs of the American forces in France will be supplied from Spain. His work is described by *Financial America* in part as follows:

"General Pershing soon found that many supplies he had been buying in Spain were not being delivered.

"The United States then stopped licensing exports to Spain. Then General Goethals selected Major August Belmont to aid our Ambassador in negotiations. When America entered the war, Mr. Belmont offered his expert knowledge of horses and business to the government. He received a commission as a horse buyer for the army.

"When General Pershing's difficulty arose Major Belmont was sent to Spain and on his recommendation a deal was made by which a reasonable amount of petroleum, cotton and other needs of Spanish industry will be allowed to be exported from America, together with equipment for Spain's much neglected railroads. General Pershing, in return, will be allowed to draw on Spain's surplus products for his supplies. This checks Germany's evil influence with a friendly neutral, enlarges our source of supplies and also saves in ships, the exports to Spain occupying less cargo space than the bulkier products needed by General Pershing, which otherwise must be sent from America."

Fuel Priority Revoked

Administrator Garfield Suspends Provisions of Order of Jan. 17 Relating to Utilities and Other Industries

United States Fuel Administrator Garfield on March 5 issued an order revoking Sec. 1 of the regulation promulgated on Jan. 17, in all states east of the Mississippi except Pennsylvania, Maryland, West Virginia, Ohio and eastern Kentucky. The order, effective on March 5, suspends certain provisions relating to priority in furnishing coal to public utilities, railroads, domestic consumers, army and navy cantonments, hospitals and other preferred consumers.

REGULATION CONTINUES IN FIVE STATES

The five states in which the regulation continues in full force embrace the anthracite and bituminous producing fields which supply the eastern section of the country, and coal operators therein will continue to give preference to shipments for consumers in the order named in the regulation. It is also provided that in those states the provisions of Sec. 1 shall be extended to include contracts for coal made or accepted after Jan. 17, as well as contracts and orders on hand on that date.

The provisions of Sec. 1 of the order of Jan. 17 were:

> Until further order of the United States Fuel Administrator, all persons selling fuel in whatever capacity, shall, in filling their contracts or orders now on hand, give preference to necessary current requirements of: Railroads, domestic consumers, hospitals, charitable institutions, army and navy cantonments, public utilities, by-product coke plants supplying gas for household use, telephone and telegraph plants, shipping for bunker purposes, the United States for strictly governmental purposes (not including factories or plants working on contracts for the United States), manufacturers of perishable food for necessary immediate consumption and municipal, county or state governments for necessary public uses. Any tonnage remaining after the foregoing preferred shipments have been made may be applied to filling any other contracts or orders.

SITUATION GREATLY IMPROVED

Improved transportation conditions and other helpful factors have contributed to a material improvement in the coal situation in the territory where the coal priority list has been suspended. It was deemed to be no longer necessary because the flow of coal into those states is sufficient to meet normal needs.

Continuance of the order for a longer period would have resulted in the accumulation of reserve stocks of coal for the consumers benefited by priority. In the states where the regulation will continue to operate the car shortage has not been entirely overcome.

San Francisco Traffic Needs

City Engineer O'Shaughnessy Discusses Question of Financing and Extension of Municipal Railway

City transportation problems were discussed at length at a recent meeting of the San Francisco Commonwealth Club by M. M. O'Shaughnessy, city engineer. Judging from annual receipts of street railways, and taking the population at 550,000, he stated that San Francisco afforded the greatest patronage per capita of street railroads of any city in the United States. The receipts of the railways he estimated to be $20 per head a year, or a total of $11,000,000 a year.

MATTER OF EXTENSIONS A PROBLEM

In referring to the plan to build the outer tracks down Market Street, he said this was being done not because it was desirable so much as because it was the only thing to do unless elevated or subway lines were built. The two tracks now used were insufficient to carry the traffic, and would be less able to do so as the population increased.

According to Mr. O'Shaughnessy, one of the problems to be solved in directing the affairs of the municipal system was to decide the question of extensions. Applications were being constantly received for the extension of the system, but care was being taken to see that extensions were made only where additional facilities were really needed. For example, there were now three lines in the Richmond District only one block apart, while the industrial area south of the Union Iron Works, which is becoming well populated, was not served at all. Attention was therefore being given to possible connection with crosstown lines that would serve that section.

WOULD RECAPTURE BAY TRAFFIC

With regard to other extensions of the municipal system, Mr. O'Shaughnessy pointed out the desirability of trying to recapture traffic, estimated at 60,000 persons a day, now taken across the bay. He would do this by improving facilities for reaching desirable sections down the peninsula. A connection with San Mateo County on good grades and curves, by way of the Twin Peaks Tunnel, was thought to be entirely feasible, and a broad right-of-way was advised. The desirability of buying a right-of-way 300 ft. wide between Mission and Howard Streets from Fourteenth to Twenty-fifth, was mentioned. It was pointed out that an elevated line for rapid transit could be built down the center of such a route while provision for surface boulevards could be made on either side. This wide strip would have a great advantage as a fire protective measure, particularly desirable in that quarter of the city.

The bond limitation upon the city would have to be enlarged in order to accomplish the several transportation extensions which were likely to become necessary. At the present time the maximum of 15 per cent on the assessed valuation of $600,000,000 gave only $90,000,000 maximum for the purchase of utilities. Of this, $44,000,000 was now outstanding, leaving only $40,000,000 to complete the Hetch Hetchy scheme, to purchase Spring Valley, and provide for transportation. Since San Francisco was irrevocably given to public ownership of utilities, a way must be found to permit acquisition beyond these limitations, and to this end Mr. O'Shaughnessy was of the opinion that the charter must be readjusted by putting a limitation of say 8 per cent on non-earning utilities such as schools and parks, then removing the limitation on self-supporting utilities. Mr. O'Shaughnessy was in favor of extending the boundaries of San Francisco and consolidating public utilities.

Help the Red Cross

Unselfish Action of Southern Public Utilities Employees Commended by Public and Press

Early in December there came to Z. V. Taylor, president of the Southern Public Utilities Company, Charlotte, N. C., from various cities and towns served by that company, suggestions that the annual banquet to the employees be called off and the funds donated to the American Red Cross. President Taylor directed that a referendum vote of the employees be taken, and as a result it was found that 99.93 per cent of the entire organization favored giving the funds to the Red Cross.

$1546 TO RED CROSS

The company, with which the Southern Power Company is affiliated, ascertained that the average cost per man for the banquet was about $3, so that it was decided that each man should receive a year's membership in the Red Cross, a paid-up subscription for the *Red Cross Magazine*, each costing $1, and that the remaining $1 be donated to the various chapters in the cities and towns in which the employees are located, for work either locally or nationally, as the chapter deemed expedient. In this way 1546 new members were added to the rolls of the Red Cross, this number of new subscriptions was turned over to the *Red Cross Magazine* and a similar amount of money, $1,546, was turned into the various local Red Cross Chapters in North and South Carolina.

MANY EXPRESSIONS OF GOOD-WILL

In his letter of New Year's greeting to the employees President Taylor complimented the employees on their action in voting to give up the banquet this year for the Red Cross.

The publication of these facts in the various newspapers in territory served by the companies brought out many expressions of good-will.

News Notes

Roof of Car Blown Off.—During the windstorm and blizzard on Feb. 26 the roof of a car on the Rome (N. Y.) Railway was blown clean off and fell in the street by the side of the track.

Eighteen Cars Destroyed.—Eighteen double-truck cars of the Public Service Railway were destroyed by fire on March 3 and the carhouse at Camden, N. J., was badly damaged. The loss is estimated at about $150,000.

Winnipeg Men Ask Increase.—The trainmen in the employ of the Winnipeg (Man.) Electric Railway have asked the company for an increase in wages of from 2 to 3 cents an hour, effective from May 1. The present scale calls for wages from 28 cents an hour for the first six months to 36 cents an hour for the third year.

Fort Dodge Officials Complete Tour.—G. T. Motz, purchasing agent of the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa, and J. N. Duncan, master mechanic of the same railway, have finished their tour of inspection of the Illinois Traction System shops and power plants, as well as of track and line conditions.

Wage Discussion Awaits Fare Award.—Following a conference on March 2 between officials of the United Railways, St. Louis, Mo., and representatives of the newly formed union, it was announced that negotiations relative to the demands for higher wages will be put over until such time as the Missouri Public Service Commission decides whether the company may increase its revenue.

Tax and Fare Cases Set for March 13.—Hugh M. Caldwell, corporation counsel of Seattle, Wash., has been advised that March 13 has been set for arguing before the Supreme Court the case of the Puget Sound Traction, Light & Power Company for the collection of the 2 per cent tax on 1916 railway revenues. The 4-cent ticket case, decided against the city by the Superior Court of Thurston County and appealed by the city, has also been set for March 13.

Agreement Reached on Lay-Offs.—Officials of the Rhode Island Company, Providence, R. I., and the union of employees have reached an agreement for the payment of platform men for the lay-offs resulting from the discontinuance of all-night schedules. The company has agreed to pay the men for the time they lay off at the carhouse as if they were on trips. It is part of the agreement, however, that these men are subject to call and can be used for any work performed by platform men.

Increase in Wages in Galveston.—Trainmen in the employ of the Galveston (Tex.) Electric Company and of the Houston (Tex.) Electric Company, have received wage increases. The raise amounts to 2 cents an hour and will make the schedule range from 27 cents an hour for men in their first year to 32 cents an hour for men in their fifth year. The same scale is announced for both Galveston and Houston. This is the fourth voluntary increase granted by the companies within the last two years.

Hudson Tunnel Bill Signed.—Governor Edge of New Jersey has signed the three bills formally launching the interstate projects of linking New Jersey to New York City by a vehicular tunnel under the Hudson River and connecting New Jersey with Pennsylvania by a bridge over the Delaware River between Camden and Philadelphia. It has been estimated that the cost of the tunnel and bridge will be approximately $25,000,000, of which New Jersey will pay half. New York will spend about $6,000,000 as her share of the tunnel work.

Sees Help in Electric Railways.—The use of the electric railways of New Jersey for carrying freight and the construction of a barge canal from the Hudson River at Piermont, N. Y., to the Hackensack River at New Milford, N. J., are among suggestions made by Archibald N. Jordan, to the New York-New Jersey Joint Port Improvement Commission. Mr. Jordan also suggests that as a part of a general plan to relieve the present congestion of freight in the New York district, the abandoned piers at Piermont and Sandy Hook should be immediately rebuilt and extended to provide for the export of army supplies.

Recommends Putting Off Transit Construction.—W. S. Twining, director of city transit of Philadelphia, Pa., has recommended to Mayor Smith the abandonment, during the war, of the extensive high-speed transit program to be constructed out of the city loan for $67,100,000, authorized on June 19, 1916. Action will probably be taken on the recommendations shortly, but it is planned that the work on the contracts held by the Keystone State Construction Company will not be started. This company has the awards for the subway lines south from City Hall to Pine Street and north from City Hall to Buttonwood Street. The two contracts aggregate $6,000,000.

Would-Be Regulator Has Change of Heart.—The elaborate measure for regulation and prospective purchase by the city of the properties of the Louisville Railway introduced by Alderman W. H. Zeiser, in the General Council at Louisville, Ky., has been withdrawn by its author. In withdrawing the bill the Alderman stated that he did not believe Louisville was ready for the reforms and also that he did not think the railway was in position to stand the extra expense that would attach to the operation of the measure. Some of the things which the painter-regulator sought to bring about were referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 9, page 291.

Discharge of Employee Sustained.—A board of arbitration has approved the action of the Cleveland (Ohio) Railway in the discharge of Motorman Louis Yellon, whose car ran down and killed another employee of the company. The claim was made by Yellon that the accident was due to a frosted window. The board recommended that Yellon be employed in some other capacity by the company if he asked for it, and that further study be made of plans for preventing windows in the vestibules from frosting. Miss Florence Allen, attorney and suffragette, was chosen by the men as a member of the arbitration board to decide the matter.

Programs of Meetings

New England Street Railway Club

The eighteenth annual meeting and dinner of the New England Street Railway Club will be held at the Copley-Plaza Hotel, Boston, Mass., on March 28. The club has secured John W. Weeks, United States Senator from Massachusetts, and Thomas N. McCarter, chairman of the Electric Railway War Board and president of the Public Service Railway of New Jersey, as speakers for the meeting. Guy A. Ham will preside as toastmaster. The club urges those who plan to attend to make their reservations at once.

New York Railroad Club

The fourteenth annual electrical night of the New York Railroad Club will take place on March 15. The subject is: "Recent Electric Locomotive Design." Edwin B. Katte, chief engineer electric traction of the New York Central Railroad, and chairman of the committee in charge, has announced the following program:

The New Haven Railroad's new 180-ton passenger locomotive; to be described by F. R. Hill.

The St. Paul Railroad's new gearless, bi-polar passenger locomotive under construction by the General Electric Company, will be described by A. H. Armstrong, with lantern slide illustrations from photographs of the general drawings.

The St. Paul Railroad's new quill-geared locomotive under construction by the Westinghouse Electric & Manufacturing Company, will be described by F. H. Shepard of the Westinghouse Company and illustrated by lantern slides.

The New York Central Railroad's latest electric passenger locomotive will be briefly described by Mr. Katte and illustrated by lantern slides.

There will also be moving pictures showing a heavy steam passenger train on the New York Central arriving at Harmon, the electric terminal. An electric locomotive will be shown being attached to the train, and the train will later be shown under electric operation.

Financial and Corporate

Port Arthur Loses Money

The Net Loss on All Municipal Undertakings for the Year Was $55,425

In 1916 2,748,213 passengers traveled on the cars of the Port Arthur (Ont.) Municipal Railway. On July 25, 1917, the railway fares in the city were reduced. On the main line the rates are doubled at the boundary between Port Arthur and Fort William. During 1917 tickets totaling 3,246,953 were sold.

On the main line, as well as on each belt line, the number of passengers traveling steadily increased each month, but the increase was not sufficient to make up the decrease in the price of tickets within the city. The main line, however, made up at least $2,000 each month since the change.

The electric railway revenue in 1917 amounted to $125,000, being an increase of $19,000 over 1916. The net deficit on the railway, however, was $8,000 less than in 1916. The net earnings exceeded the operating expenses by $23,000, but this excess was not sufficient to clear the interest on investment, depreciation charges and in sinking fund payments.

To sum up the position as regards public utilities during the last year Port Arthur faced a loss on its railway, telephone and water, and had a surplus on its light and power and Current River improvement accounts, the net loss for the year being $55,425.

Dallas Return 4½ Per Cent

An approximate annual return of 4½ per cent on the fixed valuation was shown by the Dallas (Tex.) Railway during the three months ended Dec. 31, 1917, according to the report just filed with the City Commission. The new service-at-cost franchise permits the company to make a return of 7 per cent. The report shows a total balance of $22,241.88 available for authorized return. A summary follows:

Gross earnings:	
Railway	$126,523
Interurban terminal	9,103
Total gross earnings	$135,627
Operating expenses, plus appropriations to reserves:	
Railway	$108,086
Interurban terminal	5,298
Total	$113,385
Balance available for authorized return	$22,241

Commissioners Confer on Finances

Travis H. Whitney of the Public Service Commission for the First District of New York went to Washington recently for a conference between the special war committee of which he is a member and state commissions throughout the country. The principal purpose of the conference was to express the attitude of the national government on the matter of the issuance of securities by public service corporations so that the various state commissions may work in harmony with the federal authorities. It is the desire that expenditures for public utilities shall be kept down to a minimum and in consequence a considerable amount of work previously considered necessary for the completion of the dual system of rapid transit lines has been postponed.

The Brooklyn Rapid Transit Company is required to refinance about $60,000,000 of notes falling due on July 1 and the Interborough Rapid Transit Company desires to issue $40,000,000 of additional bonds already authorized by the Public Service Commission for equipment expenditures under the dual system contract. The city of New York will also need to make an issue of bonds during the year in order to provide for the payment of subway construction.

Indiana Road May Be Junked

Thomas Flinn, who purchased the property of the Bluffton, Geneva & Celina Traction Company, Bluffton, Ind., at foreclosure last fall, has been authorized by the Indiana Public Service Commission to junk the road after grain in the elevators along the line has been moved to railroad connections. The road was sold at a receiver's sale on Oct. 13, 1917, for $118,000. Farmers along the road promptly appealed to the commission to prevent Mr. Flinn from abandoning the road. In his answer to the commission Mr. Flinn declared that the Circuit Court ordered the road sold unconditionally after it had been ruled that the company operating it was insolvent; that he bought the property without any conditions, and that the railroad was his to do with as he pleased. For these reasons he asked the Public Service Commission to deny the petition of the people living along the line.

Interest on Income Bonds Passed

Announcement is made that the New York (N. Y.) Railways has passed the interest on its adjustment income 5 per cent mortgage bonds for the six months ended Dec. 31 last. The company paid no interest on its income bonds during the first six months of 1917. This is the first year since 1912 in which nothing has been disbursed to the income bondholders. In 1916, 5.17 per cent was paid on the issue; in 1915, 3.14 per cent; in 1914, 3.63 per cent; in 1913, 3.88 per cent, and in 1912, 0.77 per cent.

There are $30,626,977 of these bonds outstanding, the interest upon which is adjusted at the end of each six-month period, all surplus over and above interest requirements on the company's other outstanding bonds being available for the adjustment 5s. At the time the strike of employees of the New York Railways began a little more than a year ago the company appeared to be in line to pay the full 5 per cent on its adjustment income bonds as its earnings were showing up well in comparison with previous years.

The company has allowed 20 per cent for depreciation and has approximately $2,000,000 in its depreciation fund, which in the event of the decision of the lower court being overruled by the higher court will be made available for such purposes as may be determined by the management. The income bond holders maintain that they are entitled to the money, whereas the management of the company asserts that it should be utilized for other purposes, or perhaps retained in that particular account to safeguard against the developments of the future.

Des Moines 1917 Earnings

After paying all expenses, including depreciation, the Des Moines (Iowa) City Railway had a surplus of only $14,239 as a result of 1917 business. Gross earnings for the year showed a gain over the previous year of $140,000, but the operating expenses increased about $180,000. The amount spent for improvements during the year totaled $803,199.

The annual financial statement of the company for the calendar year 1917 as filed with the City Council is as follows:

Operating revenue	$1,527,121
Operating expenses	976,823
Net operating revenue	$550,297
Taxes	93,792
Operating income	$456,504
Non-operating income	2,898
Gross income	$459,403
Interest charges	324,682
Net income	$134,721
Depreciation	120,481
Surplus	$14,239

Some of the larger increases in expense for 1917 were as follows:

Wages, conductors and motormen	$35,772
Interest	47,273
Taxes	18,791
Fuel for power	29,923
Power plant employees	3,453
Carhouse employees	6,054
Miscellaneous car-service expense	5,360

$100,000 for Seattle Valuation

H. M. Caldwell, corporation counsel of Seattle, Wash., has advised the City Council that in his judgment $100,000 is the amount that should be filled into the bill authorizing the employment of experts to make a valuation of the properties of the Puget Sound Traction, Light & Power Company. To date the company has not intimated that it will ask for an order increasing the rate of fare from 5 cents to 6 cents, although the Public Service Commission has given notice that it will consider such an application.

Financial News Notes

Reduction in Par Value Put Off.—The directors of the Cities Service Company, New York, N. Y., have abandoned the plan to issue ten shares of new common stock for each $100 share outstanding.

New St. Louis Director.—F. O. Watts, president of the Third National Bank, St. Louis, Mo., has been elected a director of the United Railways, St. Louis, Mo., to replace John C. Roberts, resigned.

Additional Bonds to Be Sold.—The Ohio Public Utilities Commission has authorized the Western Ohio Railway, Lima, Ohio, to sell $500,000 of its general mortgage 6 per cent gold bonds at 80, the proceeds to be used in making additions, extensions and improvements.

Toronto Dividend Reduced.—The directors of the Toronto (Ont.) Railway have declared a quarterly dividend of 1 per cent on the capital stock, payable on April 1. This compares with a previous quarterly rate of 2 per cent, which has been paid regularly since September, 1911.

Middle West Stock Dividend.—The directors of the Middle West Utilities Company, Chicago, Ill., have declared the regular quarterly dividend of 50 cents a share on the common and a stock dividend of $1 a share, both dividends payable on April 1 to stock of record of March 15.

Notes Extended a Year.—The Illinois Public Utilities Commission has authorized the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., to extend for one year the $800,000 of outstanding three-year 6 per cent notes which matured on March 1. The notes are secured by pledge of $1,067,000 of Aurora, Elgin & Chicago Railroad first and refunding mortgage, 5 per cent bonds due in July, 1946.

Common Dividend Passed.—The directors of the Virginia Railway & Power Company, Richmond, Va., have omitted the semi-annual dividend payment on the common stock usually payable in April. The board announced this action necessary in view of "the heavy expenditures required to provide the extraordinary service demanded by war activities, and the large increase in operating expenses due to wage increases and the heavy increases in cost of all supplies that are used by the company."

$150,000 Depreciation to Be Used.—The California Railroad Commission has authorized the United Railroads, San Francisco, to use $150,000 deposited in its depreciation fund to reimburse its treasury in part for expenditures for additions and betterments to its system from July, 1915, to December last. In a former decision in August, 1915, the commission directed the United Railroads to charge annually because of depreciation, $550,000, of which $300,000 might be expended for construction of additional facilities and extensions, and for the purpose of fulfilling franchise obligations, or for the improvement of service as authorized by the commission. The company reports that from July 1, 1915, to Dec. 31, 1917, it has expended for the improvement of its system $617,742. By former orders, the commission has authorized the company to draw upon its depreciation fund to the extent of $450,000 for the purpose of paying in part for the improvements.

Modified Refunding Plan Operative.—The protective committee representing the depositing certificate holders of the Dry Dock, East Broadway & Battery Railroad, New York, N. Y., has announced that the modified refunding plan adopted on July 7, 1917, has become binding upon all the depositing certificate holders. On Nov. 28, 1917, the Public Service Commission granted a final order providing for the refunding of the $1,100,000 of certificates of indebtedness by the issuance of $650,100 Series C refunding bonds. The protective committee has accordingly instructed the Union Trust Company to surrender all the 5 per cent deposited certificates of indebtedness to the Central Trust Company, New York, as trustee under the refunding mortgage made by the Dry Dock Railroad on Nov. 28, 1917. The new bonds will be registered in the names of the holders of deposit receipts as on the books on Feb. 15, but if desired the bonds may be converted into coupon bonds of the par value of $100.

City a Hard Taskmaster.—Receivership proceedings are reported to have been brought in the district court at Nevada, Mo., by the Light & Development Company, St. Louis, Mo., against the Fort Scott Gas & Electric Company, Fort Scott, Kan., operating 7 miles of electric railway in that city. The local company at Fort Scott is feeling the war-time pinch. It would seem that it considers itself unduly burdened by municipal restrictions. Relief from these might furnish a way out. Conferences looking toward that end have been arranged according to one of the local papers which said recently: "Judge Kelso, chief counsel for the Light & Development Company, who filed the receivership suit, and Mr. Porter, one of the chief operating officers of the company, are in conference with the company's officials and with members of the Chamber of Commerce, to determine whether or not there is a possibility of getting the city off the company's back so as to make it possible for it to continue the operation of the plant without the cost incident to a receivership."

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$83,790	*$45,341	$38,449	$19,665	$18,784
1 "	"	'16	73,741	*41,805	31,936	18,654	13,282
12 "	"	'17	886,120	*502,053	384,067	228,442	155,625
12 "	"	'16	829,988	*460,877	369,111	214,916	154,195

CHATTANOOGA RAILWAY & LIGHT COMPANY,
CHATTANOOGA, TENN.

1m.,	Dec.,	'17	$132,286	*$131,844	$442	$31,164	†$30,722
1 "	"	'16	110,760	*88,869	21,891	30,159	†8,268
12 "	"	'17	1,356,342	*1,138,903	217,439	359,785	†142,346
12 "	"	'16	1,235,623	*823,444	412,179	356,324	55,855

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m.,	Jan.,	'18	$2,031,462	$30,971	$2,000,491	$205	$2,000,286
1 "	"	'17	1,854,449	21,729	1,832,720	297	1,832,423
12 "	"	'18	19,429,505	366,471	19,063,034	2,770	19,060,264
12 "	"	'17	11,301,249	242,904	11,058,345	216,291	10,842,054

CUMBERLAND COUNTY POWER & LIGHT COMPANY,
PORTLAND, ME.

1m.,	Dec.,	'17	$249,608	*$181,090	$68,518	$70,201	†$1,683
1 "	"	'16	245,904	*163,667	82,237	66,210	16,027
12 "	"	'17	3,081,927	*2,054,046	1,027,881	820,400	207,481
12 "	"	'16	2,866,997	*1,775,487	1,091,510	809,342	282,168

COLUMBUS RAILWAY, POWER & LIGHT COMPANY,
COLUMBUS, OHIO

1m.,	Dec.,	'17	$385,269	*$290,974	$94,295	$49,535	$44,760
1 "	"	'16	336,954	*200,513	136,441	43,565	92,876
12 "	"	'17	4,024,186	*2,943,929	1,080,257	558,589	521,668
12 "	"	'16	3,537,399	*2,105,124	1,432,275	516,373	915,902

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY,
GRAND RAPIDS, MICH.

Period			Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m.,	Dec.,	'17	$1,996,288	*$1,338,117	$658,171	$454,220	$203,951
1 "	"	'16	1,733,278	*972,807	760,471	420,273	340,198
12 "	"	'17	19,723,736	*12,285,005	7,438,731	5,289,106	2,149,625
12 "	"	'16	16,962,607	*9,276,038	7,686,569	5,034,827	2,651,742

EAST ST. LOUIS & SUBURBAN COMPANY,
EAST ST. LOUIS, ILL.

1m.,	Dec.,	'17	$357,987	*$243,634	$114,353	$69,883	$44,470
1 "	"	'16	296,312	*184,854	111,458	63,749	47,709
12 "	"	'17	3,692,471	*2,481,519	1,210,952	785,382	425,570
12 "	"	'16	3,027,699	*1,820,774	1,206,925	755,033	451,892

GRAND RAPIDS (MICH.) RAILWAY

1m.,	Dec.,	'17	$117,238	*$87,260	$29,978	$19,945	$10,033
1 "	"	'16	119,184	*61,871	57,313	17,740	39,573
12 "	"	'17	1,303,860	*910,176	393,684	218,215	175,469
12 "	"	'16	1,297,586	*828,025	469,561	186,919	282,642

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY,
LEWISTON, ME.

1m.,	Dec.,	'17	062,331	*$61,625	$706	$15,665	†$14,959
1 "	"	'16	63,270	*50,711	12,559	15,401	†2,842
12 "	"	'17	898,373	*683,684	214,689	186,689	28,000
12 "	"	'16	803,660	*553,296	250,364	187,773	62,591

NASHVILLE RAILWAY & LIGHT COMPANY,
NASHVILLE, TENN.

1m.,	Dec.,	'17	$223,117	*$136,403	$86,714	$40,137	$46,577
1 "	"	'16	216,914	*124,162	92,752	42,128	50,624
12 "	"	'17	2,458,321	*1,589,418	868,903	490,071	378,832
12 "	"	'16	2,383,041	*1,453,188	929,853	508,971	420,882

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*Includes taxes. †Deficit.

Traffic and Transportation

Northern Ohio's Case

Company at Akron Presents Statement of Earnings for the Years 1917 and 1916

A. C. Blinn, vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, recently made public a statement in which he set forth the conditions under which the company has been operating and the necessity for increasing its revenues. The statement was made in connection with the financial report of the company for the year 1917. The results for 1917 were compared with those for 1916, together with columns showing the increase and decreases in earnings and the percentages. In conclusion Mr. Blinn said:

"From these facts it can be readily seen that the Northern Ohio Traction & Light Company stands little chance of raising the new capital needed for extensions, new equipment and betterments, if its earnings continue to diminish as they must unless its revenues can be increased.

"The cold logic of the situation is that without increased earnings extensions and improvements must be postponed until more favorable conditions develop.

Any Let-up in Work a Calamity

"I do not believe any thinking citizen wants affairs to take this turn. Personally, I should regard any let-up of improvement to this property as a public calamity. The industrial and commercial growth of the territory demands the largest possible development of the transportation and power services of this company; and anything that would retard the latter would seriously hamper the former. I do not believe the people of this territory want such a condition to arise.

"It can be prevented only by increasing revenues. This can be done in but one way—by permitting a fair and reasonable increase in fares and rates. When the situation is known and understood, I do not believe any reasonable person will object to paying a trifle more for his car ride—as he does for his bread and meat and everything else he eats and everything he wears. The majority of people have accepted philosophically the advanced prices charged for everything they use. They are paying their war taxes in postage and on tobacco, theater tickets and the like without a murmur. They realize that the manufacturer and merchant must have more for their wares or go out of business and they accept the situation without complaint.

"When it is realized that this company is in the same position as the individual and every other business enterprise—that it, too, is paying advanced prices for everything, I do not believe there will be serious objection to the trifling increase which will enable it to carry on its work of serving the public efficiently and earning a fair and reasonable profit.

The Public's Interest

"The situation is one in which the public has a vital interest—I think an interest as great as that of the company. It should be understood that the company is not a thing apart from the communities it serves. On the other hand it is a vital part of those communities. It has the same interest in the growth and prosperity of these places as all other industries. When the city prospers, the company shares in the general good times. When the city meets with adverse conditions, the company must suffer with it. The interests of city and company are inseparably bound together, and in proportion as they work together both will prosper and grow.

"I have stated the facts frankly and openly because I believe the people are entitled to know just what the conditions are, to the end that, through better understanding and closer co-operation, we may get together and bring about a better service and go forward with the industrial and commercial development of this great section of Ohio."

The company has placed in its city cars in Akron and Canton, on its interurban cars and at its most important agencies a four-page bulletin containing the letters of President Wilson and Secretary McAdoo on public utilities and the report made to Congress by John Skelton Williams, Comptroller of the Currency.

One Way Out

Portland Committee Thinks Its Tentative Franchise Draft Offers Solution of Fare Problem

A tentative draft of a proposed railway franchise, covering all the present lines of the Portland Railway, Light & Power Company, Portland, Ore., has been prepared by a committee from the Chamber of Commerce and various civic organizations, and presented to Franklin T. Griffith, president of the company, for his consideration. The franchise would relieve the company of all costs of street improvements, bridge tolls, free transportation for firemen and policemen, car license tolls, and provide for a 5-cent fare in the city.

It is pointed out by the committee in support of the franchise that under the grant the company could probably furnish adequate service for 5 cents. G. L. Rauch is chairman of the committee.

Commission Has Power

Missouri Body Rules It Is Authorized to Hear Appeal for Fare Increase in St. Louis

The Public Service Commission of Missouri, by a vote of three to two, has overruled the contention of the city counselor of St. Louis, Mo., that the commission had no power to hear the application of the United Railways, St. Louis, for an increase in fares because of the fact that the company's franchise constituted a contract between the company and the city and limited fares.

The city counselor sent his brief to the commission in opposition on Feb. 25. In support of his contention Counselor Daues urged three points, as follows:

1. That the State Constitution contains a provision that no law passed by the General Assembly shall be valid unless the local authorities having control of the streets consent to such use.
2. In giving the consent required by this constitutional provision, the city may attach such conditions thereto as it deems necessary and proper.
3. That the ordinance under which the United Railways obtained consent to maintain and operate its system in the streets of St. Louis contains a provision limiting the fare of adults to 5 cents and of children to 2½ cents, and provides for universal transfers.

The brief said that the real question for the commission's decision was the construction that should be put upon the word consent. Mr. Daues held that the word as used in the Constitution has been judicially interpreted by the Supreme Court of Missouri. He quoted six decisions of the Supreme Court in support of his contention that the word "consent" has been construed as bestowing large powers on municipalities.

The United Railways brief, answering the contentions of City Counselor Daues and Mr. Woerner, set out the following:

1. That the constitutional provision cited by Counselor Daues and Mr. Woerner is intended merely as a limitation on the Legislature and is not a grant of power to the city.
2. That the conditions imposed by the city as the price of its consent for the use of the streets are subject to and must necessarily be in consonance with the laws of the State in force at the time of giving such consent or subsequently enacted.
3. That the city, in imposing franchise conditions such as the rate of fare, does not act in a sovereign capacity, or in its own behalf, but merely as the agent of the State, and the conditions it prescribes are therefore subject to modification or abrogation by the State.

In the company's brief attention was called to President Wilson's letter to Secretary of the Treasury McAdoo, on Feb. 22, in which the hope was expressed that to maintain street railways at their maximum efficiency during the war local authorities respond to their relief.

New Jersey Company Seeks Seven-Cent Fare

Public Service Railway, Operating 840 Miles of Line, Needs More Revenue to Meet Present Unusual Conditions

Seven-cent fares and 2 cents for a transfer, with an additional cent where a second transfer is issued, are requested by the Public Service Railway, Newark, N. J., operating 840 miles of line, in a petition filed on March 5 with the State Board of Public Utility Commissioners at Trenton. The board has fixed March 14 at Trenton as the date for a hearing on the petition. The company has been instructed to furnish copies of the application to all municipalities, 146 in all, affected by the proposed increase.

SUMMARY OF TEXT OF PETITION

The company set forth its petition in part as follows:

"In the year 1917 the cost of maintaining and operating your petitioner's railway system largely increased and will still further increase in 1918.

"In the year 1917 on account of increased costs of labor and materials the cost of maintenance and renewals of way and structures was $405,514 more than it would have been at 1916 prices, and that due to the same causes the cost of maintenance and renewals of equipment of 1917 was $183,657 more than the same would have been at 1916 prices.

"In the year 1917 the cost of power was $658,339 more than the same power would have cost at 1916 prices.

"In the year 1917 the cost of conducting transportation, excluding the cost of power, was $235,231 more than the same would have been at 1916 costs.

"In the year 1917 the taxes levied against your petitioner were $279,142 more than those levied in 1916.

EXCESS COSTS $1,761,885

"The sum of the excess costs in 1917 over 1916, as set forth above, is $1,761,885.

"Notwithstanding the increased costs of labor and materials in the year 1917 over the costs of the same labor and materials in the year 1916, these costs have now very largely increased over the average 1917 costs, and will continue to increase during the year 1918.

"At the present costs of labor and materials the cost of maintenance and renewals of ways and structures in 1918 on the basis of work done in 1917 will be $505,981 more than the cost of such maintenance and renewals in 1917, and the cost of maintenance and renewals of equipment in 1918 at present costs for labor and materials on the basis of work done in 1917 will be $411,638 more than the cost of such maintenance and renewals in the year 1917.

"The cost of conducting transportation in 1918 at present costs on the basis of business done in 1917 will be $621,236 more than the cost of the same in 1917.

"The sum of these increased cost for the year 1918 at present prices, on the basis of the 1917 business, over what the same would have cost at 1917 prices as set forth above is $1,538,856.

"The sum of these excess costs for the year 1917 over the year 1916 and of these excess costs for the year 1918 over the year 1917, all as shown above, is $3,300,741.

"The cost of rails is now 94.6 per cent higher than the average cost of rails in the year 1916.

OTHER COSTS

"The cost of track special work is now 109.5 per cent higher than the average cost of such special work in the year 1916.

"The cost of track labor is now 61.7 per cent higher than the average cost of such labor in the year 1916.

"The cost of car bodies is now 52.2 per cent higher than the average cost of car bodies in the year 1916.

"The cost of electric equipment of cars is now 66.7 per cent higher than the average cost of such equipment in the year 1916.

"The cost of all other materials and labor required by your petitioner, in the conduct of its business, has increased a large percentage over the average cost of such materials and labor in 1916.

"Your petitioner made capital expenditures for extensions and improvements in 1916 and 1917 of $4,444,894, 8 per cent on which is $355,591, and now needs large sums of money to maintain and improve its railway system in order to enable your petitioner to meet the present demands for service and to provide for the growing demands for service required by the government and by the public, and your petitioner, without the relief hereby asked for, will be unable to obtain the new capital necessary for such additional construction, equipment and extensions.

"In the year 1917 your petitioner carried 461,354,364 revenue and transfer passengers, of which number 22.15 per cent, or 102,201,402, were transfer passengers.

WHAT THE COMPANY ASKS

"A charge of 7 cents in the rate of fare where 5 cents is now charged, a charge of 2 cents for the first transfer, and additional charge of 1 cent for a transfer issued on a transfer, would increase the annual revenue of your petitioner $3,700,000.

"The present rates of fare charged by your petitioner are unjust, unreasonable and insufficient to allow your petitioner to furnish reasonable and adequate service, and maintain the integrity of the physical property, and that the increased rates of fare as stated previously are just and reasonable.

"Your petitioner therefore prays that your honorable body approve and by order fix 7 cents as the rate to be charged by your petitioner where 5 cents is now charged, and in addition thereto a charge of 2 cents for each transfer issued on a cash fare and an additional charge of 1 cent for a transfer issued on a transfer, and that your petitioner may have such other and further relief as may seem reasonable and proper."

PRESIDENT MCCARTER'S STATEMENT

Thomas N. McCarter, president of the company, issued a statement as follows:

"In making an application to the State Utility Board for more revenue Public Service Railway is attempting to meet a most unusual situation which confronts it as the result of economic conditions arising out of the war. Abnormal demands have been and are being made upon the railway to provide transportation facilities for shipyards, munition plants and other industries that are directly engaged in war work and at the same time every element of cost that enters into the electric railway business has been going up to hitherto unheard-of levels.

"If the company is to meet the demands made upon it, if it is to provide cars for the thousands of extra war workers and if it is to keep its track and equipment in proper operating condition, it must have more revenue. The 5-cent fare does not cover the cost of electric railway transportation under existing conditions. It is obvious that such a state of affairs cannot go on indefinitely and the public must face the fact that it cannot continue to get its railway service for less than cost. In making up the revised rates of fare we have sought to secure only such additional revenue as will enable the company to provide adequate service and meet the abnormal costs of labor and material which the war has produced in our business as well as in all other businesses."

City Marks Time

The City Council of Seattle, Wash., recently determined to take no action with respect to a possible increase of fares in Seattle until the Puget Sound Traction, Light & Power Company petitions the State Public Service Commission for such an order. The decision was made by the Council when a bill introduced by Corporation Counsel Hugh M. Caldwell was taken up. This measure provided for an appropriation of $100,000 to employ experts to make a valuation of the company's property. Mr. Caldwell did not expect that this entire amount would be expended, but set the sum as a maximum expenditure. The judiciary committee was, however, directed to prepare a bill authorizing the corporation counsel to assist in the presentation of Tacoma's defense against complaints filed with the Public Service Commission against the company, charging inadequate service in that city. The corporation counsel warned the city that if the Public Service Commission assumed jurisdiction in the Tacoma case, and the case was disposed of at an early date, a construction of the law might be obtained adverse to municipalities without the city of Seattle having an opportunity to participate in the litigation until after the law has been settled.

Maine Fare Hearing

Portland Case Adjourned by Utilities Commission for Several Weeks—Proposed Tariff Suspended

The Public Utilities Commission of Maine on Feb. 25 opened the hearing on the application of the Cumberland County Power & Light Company, Portland, for increased fares on the lines of the Portland Railroad, operated under lease. The application is for a 6-cent fare in the central zone, covering the thickly populated sections of Portland and South Portland, and 2 cents on the mile zones on the interurban lines. The company consumed the day on the valuation made by George E. Haggas.

The valuation report as presented by Mr. Haggas included the following figures:

Cost of reproduction (new) as of Dec. 31, 1917, the basis upon which the rate of return should be established	$8,614,361
Cost of reproduction (new) less depreciation	7,518,458
Mr. Haggas estimated that the proper annual reserve for depreciation was	134,500
From his traffic survey he said he expected the proposed raise in rates to yield an increased gross revenue annually of	205,600

In his testimony A. H. Ford, vice-president and general manager of the company, said that the increased revenue was needed for expected increases in operating expenses for labor, materials, taxes, power and to provide a margin of safety on the fixed charges.

Before adjourning the meeting on Feb. 27 to meet again after two or three weeks the commission announced that the proposed increase in fares, which was to become effective on March 11, would be postponed for a period not exceeding three months.

Another I. T. S. Hearing March 20

At the hearing of the objectors to the blanket petition of the Illinois Traction System for increased rates before the Illinois commission on March 5 and 6 witnesses for the company who appeared on Feb. 19 were cross-examined, and further testimony was presented following the objecting citizens. Champaign, Urbana, Danville, Bloomington, Granite City, Ottawa, Cairo, Galesburg and the Clinton Council approved the proposed rates and did not object. Jacksonville and Quincy waived cross-examination. The commission took all the motions under advisement and set March 20 for oral argument. By agreement the case of the Peoria Railway was postponed for sixty days. That city has retained Prof. E. W. Bemis to assist in opposing the straight 5-cent fare. The commission accepts the blanket petition as an emergency matter, and if the increase is granted it will retain jurisdiction.

Portland Six-Cent Fare in Court

Oregon Commission Regards Its Existence Threatened in Suit Brought by the City Against That Body

Arguments in the case of the city of Portland versus the Portland Railway, Light & Power Company, in the matter of the 6-cent fare authorized by the Oregon Public Service Commission on Jan. 10, were begun in Circuit Court at Portland on Feb. 26. The city's case is presented by City Attorney La Roche, Martin L. Pipes and Wilson T. Hume. The Public Service Commission is represented by Attorney-General Brown and Deputy Attorney Bailey. The company is represented by Attorneys Harrison Allen, Frederick V. Holman, R. A. Leiter and W. C. Benbow.

EXISTENCE OF COMMISSION THREATENED

Assistant Attorney-General Bailey, representing the Public Service Commission, in his speech on the opening day of the hearing, stated that the very existence of the commission was threatened in the court action now in progress, and that the commission will have lost its usefulness should the Courts decree that it has not the power to fix rates. Mr. Bailey reviewed the entire 6-cent fare controversy. He declared that the justice or injustice of the 6-cent fare was not at this time an issue before the court. He said:

"The only thing we have to consider in this case is whether or not the Publice Service Commission had the jurisdiction to change these rates. It is the sole question here involved."

One of the points brought out by Attorney Bailey was the fact that a municipality at all times is only an agent of the State, and that any franchise or rate which is fixed by a municipality must be given or fixed with the understanding both by the city and by the public utility to whom the franchise is given that the State can at any time it sees fit step in and make different rules, rates and regulations. Attention was also called to the fact that Federal Judge Bean, in a case affecting the Portland Railway, Light & Power Company, where the City Council passed an ordinance compelling the railway to sell six tickets for 25 cents, granted the company a permanent injunction, holding that rate-fixing was vested in the Public Service Commission only.

PREVIOUS CASE AS PRECEDENT

Frequent reference was also made to the Woodburn case, wherein the Supreme Court held that the Public Service Commission has the power to fix telephone rates, over the objections of the city of Woodburn. Attorney Bailey pointed out that the briefs to be filed in the present case will be almost identical in character to those filed in the Woodburn case.

Mr. Bailey's argument was based largely on the theory that the city of Portland is attacking the constitutionality of the act creating the Public Service Commission.

It is stated that the city will not contend that the act is unconstitutional, but that the action of the commission in ordering the increase was a legislative act upon the part of its members, and therefore comes under the provisions of the laws of the State regarding the initiative and referendum. It is expected that this will develop as the strongest feature of the city's case, and it is stated by Commissioner Kellaher and City Attorney La Roche that a referendum vote on the 6-cent fare is possible.

It is expected that the city authorities will contend that the members of the State Commission were in session on legislative business when they directed the increase in fares, and that, therefore, under the law, a referendum may be filed by the people of Portland within ninety days time from the date such order was enacted.

Fares in Ogdensburg

Railway in That City Seeking Increase Has Paid No Return on Stock Since 1902

The Ogdensburg (N. Y.) Street Railway recently presented its argument to the Public Service Commission of the Second District, under a petition which it has filed for authorization to increase its fares. There was no appearance by the city in opposition, and Judge Irvine, who presided, announced at the close of the hearing that he would correspond with the Ogdensburg officials and ascertain their views.

SOURCE OF POSSIBLE DISCRIMINATION

State Hospital Commissioner Morgan asked that employees of the Ogdensburg hospital be afforded the same reduction privilege in the purchase of tickets as allowed mill employees, but N. F. Towner, representing the railroad, objected on the ground that the hospital was located at a distance from the city, that the haul was much longer and that there was a large added cost in operating in the winter months. Mr. Morgan said the hospital acted under an agreement with the railroad. He said he did not desire any preferences for the State employees over that accorded others. This discussion raised the question of whether there is a right to allow one person to ride on a ticket which cost him 3 cents and another person on a 5-cent ticket.

Paul B. Murphy, secretary and treasurer of the company, presented figures covering operation of the road for ten years. It developed that until in recent years the railroad has not been compelled to pay for power. No dividends were paid from April 1, 1902, to Dec. 31, 1917. It was shown that operating charges and tax valuations had increased and that contemplated street improvements would add to the company's expenses.

Zone Fares Best for Rhode Island

Special Legislative Commission Orders Adoption of System With Five-Cent Central Areas—Recommends Taxation and Franchise Reforms

An increase in fares through the adoption of a modified zone system, the abolition of municipal franchises, the elimination of paving obligations and a substantial reduction of taxes, are among the methods of relief recommended on March 7 by the special commission on Rhode Island Company affairs. This commission was appointed by the General Assembly early in 1917 to investigate the company's condition.

In accordance with the law creating the commission, that body has certified its findings to the Public Utilities Commission, and has ordered that the new rates of fare and the new transfer privileges be put into full force prior to April 1, 1918. The remainder of the commission's report is in the nature of recommendations made to the State Assembly.

ZONE SYSTEM IS FAVORED

The special commission declares that the flat 6-cent fare is inequitable and unjust, and it recommends and orders established a modified zone system with 5-cent central areas. In Providence the existing 5-cent fare limits are also adopted as new 7-cent fare limits, thus making a uniform increase for all persons in the area between the old and the new 5-cent zone limits.

Between the various central zones there will be intermediate 2-cent zones, and in general, it is said, the rate will be less than 2 cents a mile. To fit existing conditions, the length of zone varies somewhat, according to village or town lines.

The increase in fare between Providence and Woonsocket is 6 cents, from 20 to 26 cents. The fare between Providence and Pawtucket is increased to 7 cents, but the patron will hereafter be allowed to have a transfer at either end of the ride, a privilege now denied.

VALUE OF PROPERTY

The special commission finds that the true value of the company's property is $29,000,000, and that it is entitled to a 6 per cent return on that sum, which would amount to $1,740,000. It is also found that the company is now rendering service that compares favorably with service in other cities.

The commission has determined that the actual cash invested in the company is $28,802,590. It reports that the Narragansett Pier division, being a steam road, has no logical position as a branch of the Rhode Island Company, and, therefore, does not figure it in the valuation of the company.

OTHER REMEDIES RECOMMENDED

The subject of taxation is discussed at considerable length in the report, and it is shown that the Rhode Island Company pays more than $500,000 a year in the form of taxes. This sum, the commission finds, is "extremely excessive." The company, the report shows, is under the jurisdiction of forty-two different authorities.

It is recommended that all municipal franchises be repealed and that all franchise taxes be cancelled. Local control should also be abolished, the report finds, and the Public Utilities Commission should have original and full jurisdiction over the company. The special commission recommends that the paving obligation be abolished, as it now stands, and the company pay only for what it destroys.

Fare Request Refused

Council of Columbus, Ohio, Rejects Appeal for Advance from Eight to Six Tickets for a Quarter

The City Council of Columbus, Ohio, on Feb. 26, refused the request of the Columbus Railway, Power & Light Company for an increase of fare from eight tickets for 25 cents to six tickets for 25 cents. This refusal was based on the following reasons:

1. It would be considered unlawful.
2. The request is unjust and unwarranted.
3. Present fares are thought adequate with efficient management.

Councilman Weinland argued that the company has no more right to ask for an increase in the rate of fare than he would to ask for a reduction of the rate of interest on a real estate loan.

Councilman Zimpfer asserted that it is not more revenue the company needs, but more efficiency in management.

Councilman Alcott based his objection on Section 3771 of the General Code which, he said, provides that "The municipality shall not, during the term of such grant or renewal, release the grantee from any obligation or liability by the terms of such grant or renewal of grant."

INVESTIGATING COMMITTEE PROPOSED

At the suggestion of City Attorney Scarlett, a committee will be appointed to employ a railway expert to make a survey of the company's property and books and ascertain the facts in the case.

The company has begun a series of advertisements in the local newspapers to acquaint the public with the necessity for an increase in the rate of fare.

PRESENT BURDEN TOO GREAT

The company says that the unusually low rate of fare was made in the interest of the public, and the terms of the franchise might have been carried out successfully under normal conditions, but now that revolutionary changes have come about, the company finds the present burden beyond its power to bear.

Attention is also called to a mistake people have been making in interpreting the terms of the contract. The franchise provided for a reduction in the rate of fare when the gross receipts reached $1,750,000. The gross receipts exceeded this amount in 1912 and the ticket fare was reduced to eight tickets for 25 cents. Gross receipts and profits have accordingly become confused in the minds of many, with the result that the impression prevails that the company is already making money and still wants to increase its fares.

Another advertisement appeals to the women of the city. Women use the cars more than do men. It is believed they will see the analogy between the greatly increased prices of other commodities and the requested increase in the rate of fare. They understand the fact that an income or allowance, fixed several years ago, will not cover the necessities of the household at present, and there is a similarity between this and the income of the company which was likewise fixed when there was no thought of the prices asked now for materials and the necessary demands of labor.

Wants Fare Case Dismissed

City of New York, Through Assistant Corporation Counsel, Wants Third Avenue Railway Appeal Denied

The Public Service Commission for the First District of New York was asked on Feb. 28 to dismiss or postpone the hearings on the application of the Third Avenue Railway for permission to charge 2 cents for transfers as a means of financial relief. The motion in question was made by John P. O'Brien, assistant corporation counsel representing the city of New York.

NORTH SHORE DECISION QUOTED

He based his motion on a recent decision of the commission in the New York & North Shore Traction Company case, in which the commission held that it had no power to grant the company the desired increase, because the franchise fixed the maximum fare at 5 cents. This decision was abstracted in the ELECTRIC RAILWAY JOURNAL of Jan. 19, page 125.

Mr. O'Brien contended that in some of the franchises granted to the Third Avenue Railway and its subsidiaries, provisions were made for a maximum 5-cent fare. He further contended that the proposal to charge 2 cents for transfers was tantamount to a proposal to increase the fare, and hence the case stood in exactly the same position as that of the North Shore company, namely, that the commission had no power to act. Mr. O'Brien's motion was denied, with the right to renew it on a future occasion should it develop that his contention was sound.

The hearing on Feb. 28 was largely taken up with the preliminary examination of Charles E. Schuyler, a real estate appraiser, who had made an inspection of the company's land and buildings. The hearings have been adjourned until March 11.

Low Fare Tickets Stand

New Jersey Court of Appeals Holds Company Must Sell Six-for-a-Quarter Tickets

The New Jersey Court of Errors and Appeals handed down a decision on March 4 sustaining the Supreme Court of New Jersey and the Board of Public Utility Commissioners of New Jersey in the fight by the people of Trenton to prevent the Trenton & Mercer County Traction Corporation from abolishing the six-for-a-quarter tickets in Trenton. If the case is carried up it must now go to the United States Supreme Court. The same question is now hanging fire in the United States District Court. Justice Swayze of the New Jersey Supreme Court says that the Board of Public Utility Commissioners had jurisdiction in the case after the company claimed the State board was without jurisdiction. The Supreme Court says in part:

"We think there was a valid contract requiring the company to sell six tickets for a quarter, and hence the Board of Public Utility Commissioners might well conclude that such a rate was just and reasonable under the circumstances of the case."

Brooklyn Service Order

B. R. T. Required to Carry Time-table Data in Each Car on its Surface Lines

The Public Service Commission for the First District of New York announced on March 5 the adoption of an order directing the Brooklyn Rapid Transit Company to place in each surface car a sign bearing the run number of the car and the schedule on which it is being operated, together with the time-table for the line operating the car. The order was presented by the committee on complaints, consisting of Commissioners Charles S. Hervey and F. J. H. Kracke, as the result of an investigation extending over several weeks into complaints against the company.

The order affects the operating units of the Brooklyn Rapid Transit System, and covers all surface lines in the Borough of Brooklyn.

Failure of the companies to operate their cars according to the schedules on file and within the prescribed limits of the new regulation will constitute a violation of the order and will be subject to the penalties imposed by the public service law.

Commissioners Hervey and Kracke made public a memorandum, submitted by them to the commission in connection with the new order, in which they said:

"Almost immediately upon taking up its work the committee on complaints became convinced that, because the operating schedules of surface railroad lines generally were not under formal commission order, satisfactory control was practically impossible. The committee now feels that the maintenance of regular and adequate service on street surface lines can be enforced only if the companies are required to file definite schedules and if non-compliance with those schedules is made a violation of an order of the commission."

Passenger May Elect

Where Two Rates Exist Between Points the Passenger May Decide Under Which He Will Travel

The Public Service Commission of Indiana on Feb. 22 held "that where a railroad publishes and files two passenger rates between two points on its lines, one a through rate, the other a combination of two intermediate rates, the passenger may elect as to which rate he will contract for passage under."

The case concerned was one brought by the Carmel Commercial Club against the Union Traction Company of Indiana. The company has a regular rate of 30 cents between Indianapolis and Carmel and vice versa. Also it has a rate of 19 cents between Carmel and Forty-sixth Street, Indianapolis, and 5 cents between Forty-sixth Street and the Traction Terminal Station and vice versa. Under the combination of fares the rate is only 24 cents.

Some time ago a number of Carmel business men got on an interurban car at Carmel, proposing to pay the two rates of 19 and 5 cents. The conductor contended that he must charge them 30 cents and the case was carried to the commission. In its decision the commission held that the point involved was one of law and found what it believed to be a parallel in an Appellate Court case and its order was based on this ruling.

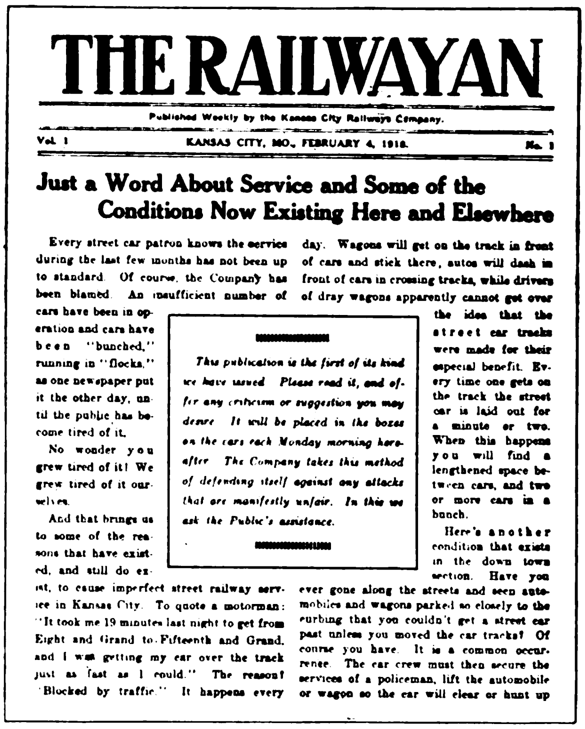
A Weekly Railwayan

Kansas City Railways Carries Its Case Direct to the Public in a Paper Distributed on the Cars

The Kansas City (Mo.) Railways, assisted by a member of the Public Service Commission of the State, by weather conditions and advertising, was able by the second week of February to restore the schedules that had been maintained last July. The active co-operation of the commission was extended through a member who at the request of the company was appointed to spend some time in Kansas City to observe the operation and problems of the railway.

The company had for several months been advertising extensively over the territory for men. While there has been a comparatively satisfactory response to the advertising, an insufficient number of applicants has proved to be qualified either in preliminary examination or in trial. The company was willing to go to the limit in securing additional men, and on Jan. 21 increased the rate of pay for men while in training from 50 cents to $1.50 a day. The company also reduced the requirements of deposits by new men from about $12 to $5. Warmer weather late in January made it more comfortable for men to get out in the morning and schedules became fairly well restored.

On Feb. 4 the company began to issue once a week a leaflet for distribution in the cars to the public. It is called *The Railwayan.* The company said that it took "this method of defending itself against any attacks that are manifestly unfair."



THE RAILWAYAN

Published Weekly by the Kansas City Railways Company.

Vol. 1 KANSAS CITY, MO., FEBRUARY 4, 1918. No. 1

Just a Word About Service and Some of the Conditions Now Existing Here and Elsewhere

Every street car patron knows the service during the last few months has not been up to standard. Of course, the Company has been blamed. An insufficient number of cars have been in operation and cars have been "bunched," running in "flocks," as one newspaper put it the other day, until the public has become tired of it.

No wonder you grew tired of it! We grew tired of it ourselves.

And that brings us to some of the reasons that have existed, and still do exist, to cause imperfect street railway service in Kansas City. To quote a motorman: "It took me 19 minutes last night to get from Eight and Grand to Fifteenth and Grand, and I was getting my car over the track just as fast as I could." The reason? "Blocked by traffic." It happens every day. Wagons will get on the track in front of cars and stick there, autos will dash in front of cars in crossing tracks, while drivers of dray wagons apparently cannot get over the idea that the street car tracks were made for their especial benefit. Every time one gets on the track the street car is laid out for a minute or two. When this happens you will find a lengthened space between cars, and two or more cars in a bunch.

Here's another condition that exists in the down town section. Have you ever gone along the streets and seen automobiles and wagons parked so closely to the curbing that you couldn't get a street car past unless you moved the car tracks? Of course you have. It is a common occurrence. The car crew must then secure the services of a policeman, lift the automobile or wagon so the car will clear or hunt up

This publication is the first of its kind we have issued. Please read it, and offer any criticism or suggestion you may desire. It will be placed in the boxes on the cars each Monday morning hereafter. The Company takes this method of defending itself against any attacks that are manifestly unfair. In this we ask the Public's assistance.

FIRST PAGE OF FIRST ISSUE OF NEW WEEKLY

Transportation News Notes

Fare Increase Sought in Memphis.—The Memphis (Tenn.) Street Railway has petitioned the Board of City Commissioners for an increase in fare from 5 cents to 6 cents.

May Ask Fare Advance.—There is a possibility that the Des Moines (Iowa) City Railway will ask for a rate increase at the spring city election on March 25, but no formal notice has yet been served to this effect.

New Paper at Los Angeles.—The Los Angeles (Cal.) Railway has begun the publication of *A-Z-U-R-I-D-E*, described by the company as "facts about street car service and thoughts by the trolley philosopher." The publication is 3½ in. wide by 6¼ in. high and contains four pages.

Skip Stop Used in Fort Wayne.—The Fort Wayne & Northern Indiana Traction Company has begun to use skip stops on the city lines of Fort Wayne, Ind. More than 40 per cent of the stops in the residence district will be eliminated. No stops will be eliminated in the business district.

Five-Cent Fare for Fort Wayne.—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., on March 4 was granted permission by the Public Service Commission of Indiana to charge a straight 5-cent fare and eliminate reduced rate tickets during the period of the war.

Freight Bill Signed.—Governor Edge of New Jersey has signed the bill passed by the last Legislature which permits electric railways to carry freight and express under rules to be fixed by the Board of Public Utility Commissioners. The Newark *Ledger* regards legal authority for the use of trolley cars for freight and passenger service as "a step in the right direction."

New B. R. T. Talks.—The Brooklyn (N. Y.) Rapid Transit Company began the publication of a new series of transit talks on March 5. The first one was headed "Other People's Troubles—and Ours." The company closed its appeal as follows: "If you will read these publications as they appear from time to time you will appreciate more keenly some of our difficulties, and, perhaps, to the extent of your ability, you will help us alleviate or remove them."

1,300,000 Passengers a Day.—Figures given out by the Public Service Railway, Newark, N. J., show that an average of 1,300,000 passengers were carried every day last year over its lines. The total for the twelve months was 476,974,983, a gain of about 25,000,000 over the previous year. The company operates in 146 municipalities. About three out of every ten revenue passengers use transfers. The passengers carried on transfers figure in the total of 476,974,983.

Publicity for Staggered Hours.—The Philadelphia *Public Ledger* in its business section for Wednesday, Feb. 27, contained a dispatch from Cleveland under date of Feb. 26, in which it played up the plan of Fielder Sanders, City Street Railway Commissioner of Cleveland, to reduce the rush-hour peak by having stores, factories and other establishments stagger their times for opening and closing. Mr. Sanders' proposal was reviewed recently in the ELECTRIC RAILWAY JOURNAL.

Women Conductors Must Stand.—All employees of the Brooklyn (N. Y.) Rapid Transit Company in uniform riding on the cars of the company as passengers must stand when there are other passengers unseated in the cars. The question was raised in connection with women conductors. The company has recently restated its rule on this point as follows: "An employee in uniform always should defer to a passenger of either sex. An employee is to stand when there are other passengers unseated in the car."

Service Hearing Dates Set.—The Public Service Commission of the State of Washington has set March 11 as the date for hearing of the Seattle service complaints against the Puget Sound Traction, Light & Power Company and definitely set March 14 for the hearing in Tacoma. If the above dates are agreed upon, the Seattle case will be given priority as to hearing and probably as to decision, unless both rulings are rendered jointly. The question of a possible increase in fare in Seattle is more directly involved than complaints of service.

Seattle Authorizes One-Man Cars.—The joint committees on franchise and judiciary of the City Council of Seattle, Wash., recently voted unanimously to recommend that the Council pass an ordinance permitting the operation of one-man cars by the Puget Sound Traction, Light & Power Company over such of the routes named in the petition of the company as the Board of Public Works deems practicable. A. L. Kempster, manager of the company, advised the committee that the twenty-five one-man cars which had been received would be used merely to supplement the present service, and none of the larger cars will be displaced.

Accident Fund Dividend Distribution.—Payment of the 1917 annual safety-first dividend to its platform men was recently made by the San Diego (Cal.) Electric Railway. For several years it has been the policy of the company to set aside a fixed percentage of the gross earnings for the payment of accident claims and to divide any balance left in the fund among the men, in accordance with the number of hours each man has been on duty during the year. Last year the total saving was $12,225 and the total hours of service of all men was 642,761. The dividend was 1.902058 cents per man per hour. If a man worked 1000 hours during the year his dividend was $19.02. About 270 men participated in the dividend distribution.

Fare Increase Request Renewed.—The Northampton, Easton & Washington Traction Company, Easton, Pa., is making another effort to increase its rates from 5 cents to 6 cents in each of its seven zones between Phillipsburg and Port Murray. The increase was asked some time ago and was opposed by Franklin Township, which pointed out a clause in the franchise of the company prescribing that only 5 cents should be charged in that township. The commission refused the request on that ground. The Supreme Court, however, in a recent decision held that such franchise contracts cannot obtain to the detriment of companies.

Trenton Differences Up to Commission to Decide.—The City Commission of Trenton, N. J., has turned down the proposal of the Trenton Chamber of Commerce to have a board of arbitration appointed to adjust the differences between the citizens and the Trenton & Mercer County Traction Corporation. The City Commission, through City Solicitor Charles E. Bird, says that matters must be adjusted by the Board of Public Utility Commissioners. The Mercer County Central Labor Union has asked the City Commission to call a mass meeting so that the entire community may have an opportunity to express an opinion as to whether the city of Trenton should purchase the property of the Trenton & Mercer County Traction Corporation. The labor unions propose to form a municipal ownership league to work to that end.

Binghamton Tariff Suspended.—The Public Service Commission of the Second District of New York on Feb. 21 ordered the Binghamton Railway to suspend until April 30 the proposed discontinuance of the sale of certain reduced-rate tickets and ordered the railway to publish and file a proper tariff amendment containing notice of the suspension. More than 400 employees of the International Time Recording Company at Endicott, 8 miles from Binghamton, on Feb. 16 filed with the commission a protest against the proposed discontinuance of a twelve-ride ticket book, good between Binghamton and Endicott and sold for $1, making each ride 8 1/3 cents. The regular round-trip fare is 25 cents. Protest was also filed against discontinuing a twelve-ride book between Johnson City and Endicott, which sold for 60 cents when the regular round-trip fare is 15 cents. The company planned to discontinue the sale of tickets on Feb. 25. The railway has been served with the complaint and the commission will investigate the reasonableness of the proposed action of the railway. On March 4 the railway filed its answer to the complaint. It is expected that a hearing will soon be held.

Personal Mention

F. W. Coen Elected

Vice-President and General Manager of Lake Shore Made President of C. E. R. A.

F. W. Coen, vice-president, general manager and purchasing agent of the Lake Shore Electric Railway and affiliated properties, was elected president of the Central Electric Railway Association at the meeting in Dayton, on March 1. Mr. Coen has been connected with the Lake Shore Electric and its predecessors for twenty-five years. When in 1893 he took a clerical position with the Sandusky, Milan & Norwalk Electric Railway he had been employed in a bank in Vermillion for some time. At this time the railway mentioned had been in operation only a week. There were then about 18 miles of line, which made it one of the longest electric interurban roads in the world at the time. The interurban line was gradually combined with local city properties, leading eventually to the formation of the Lake Shore Electric Railway in 1901. Of this system Mr. Coen was made secretary. In the meantime, however, in 1895, he had been assistant secretary of the Lorain & Cleveland Railway. After the formation of the Lake Shore Electric Railway Mr. Coen was successively promoted to be secretary and treasurer in 1906; general manager, continuing as treasurer only, in 1907, and vice-president and general manager in 1908. The last-named position he has occupied ever since. In his present position Mr. Coen is in active charge, with the same title, of the Lorain Street Railroad, the Sandusky, Fremont & Southern Railway, the People's Light & Power Company and the Bellevue Illuminating & Power Company He is also a director of the Fostoria & Fremont Railway. Along with his administrative work Mr. Coen has identified himself with a number of activities closely related to railway operation. He was secretary of the Ohio Interurban Railway Association for several years and promptly transferred his interest to the Central Electric Railway Association when it was formed. He has served successively as second and first vice-president of this association, and also as a member of its executive committee. He was a member of the original committee appointed by the American Electric Railway Association to formulate plans for co-operation with the federal government. As manager of a road which was a pioneer in through, high-speed passenger service Mr. Coen has made a special study of heavy traction matters. He has been very successful also in developing cordial relations between political bodies and the Lake Shore Electric Railway and in fostering a spirit of loyalty to the company among its employees. His election to the presidency of the association was, therefore, a logical development, particularly as he has had practical experience in personally working in nearly every department of the electric railway.

F. W. COEN

W. T. Bailey, formerly roadmaster of the Peninsula Railway, San Jose, Cal., is now on that company's pension list.

E. P. Haquette, formerly purchasing agent of the Oakland, Antioch & Eastern Railway, Oakland, Cal., has become connected with the sales division of the Pratt & Whitney Company, San Francisco, Cal., tool makers.

H. A. Clarke, general manager of the Central New York Southern Railroad and Ithaca Traction Corporation, Ithaca, N. Y., has secured a leave of absence in order to do some special engineering work in connection with applications of several electric railway properties for increased fares that are now pending before the Public Service Commission of New York and other states.

Arthur Gaboury, superintendent of the Montreal (Que.) Tramways, has received from the French government the title of Officer of the Academy, as a recognition of his signal services for the advancement of French activities. Knowing of Mr. Gaboury's unselfish and hearty interest in many matters outside of his profession, this distinction is regarded by his friends as well deserved.

E. C. Faber, formerly traffic manager of the Traffic Bureau of the Electric Railway War Board of the American Electric Railway Association, has been appointed manager of the War Board, a new position created as part of the reorganization following the resignation of C. Loomis Allen as director. An illustrated biographical sketch of Mr. Faber appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Feb. 2, 1918, page 256.

E. J. Smith has been appointed auditor of the Kentucky Public Service Company, Bowling Green, Ky., succeeding G. D. Warden, who has enlisted in the National Army. Mr. Smith was formerly assistant secretary and assistant treasurer of the Cayuga Cement Corporation, Portland Point, N. Y. Both companies are operated by The J. G. White Management Corporation, New York, N. Y. Mr. Smith for a number of years was connected with the accounting department of the Lehigh Valley Railroad at Sayre, Pa., previous to which time he served in the auditing department of the Ithaca (N. Y.) Traction Company.

Julien H. Harvey, superintendent of efficiency of the Kansas City (Mo.) Railways, has resigned to accept the management of a public safety campaign being started by the Rochester (N. Y.) Chamber of Commerce and the local Safety Council. The campaign will last from March 1 to Sept. 1. It will be conducted with the co-operation of the National Safety Council. It is planned to make the Rochester campaign the most comprehensive effort at public safety work that has been undertaken by any community, and it is likely that it will provide an example for safety work throughout the United States. Mr. Harvey has been with the Kansas City Railways for fifteen years. He started as timekeeper and advanced through the positions of chief timekeeper, secretary to the president, superintendent of employment, division superintendent and superintendent of efficiency. He had held the last-named office for two years, and during that time organized and established the company's safety work, its power-saving system, its welfare building and loans, and similar enterprises in behalf of the employees, made general studies and established programs for the promotion of efficiency in operating, maintenance and administrative departments of the company, all of which work is now going forward in the hands of superintendents in such departments. Mr. Harvey was one of the organizers of the local Safety Council in Kansas

J. H. HARVEY

City two years ago and served two terms as president. He declined reelection as president of the local council because of duties connected with work of the National Safety Council. He has served one year as secretary of the electric railway division of the National Safety Council, and last fall was elected chairman of this section. Mr. Harvey was also elected to the executive committee at the national convention of the council. He had been named as chairman of the Public Safety Committee of the Kansas City Local Council and had been appointed chairman of this branch of work of the Kansas City Chamber of Commerce. The Rochester work, on account of its very wide scope and national importance, demanded a man of Mr. Harvey's special experience and equipment.

Obituary

George F. Hargis, general manager of the Los Angeles & Mount Washington Railway, Los Angeles, Cal., is dead as a result of injuries received when he was struck by an electric railway car in that city recently. Mr. Hargis was one of the organizers of the railway of which he was the manager. He was well known in financial circles in Los Angeles.

H. Clark Prather, who recently left the service of the Peter Smith Heater Company to accept a commission as first lieutenant in the Ordnance Department, died at Davenport, Ia., on Feb. 21. Although Mr. Prather was still in his thirties, he had made a notable mark as an electric railway operator. Beginning as a lineman on the Union Traction Company of Indiana in the late nineties, he worked his way through the various mechanical departments on different properties until he became shop foreman successively on the Brooklyn Rapid Transit System and the Public Service Railway. On leaving the latter company he became superintendent of the Roanoke Railway & Electric Company and then entered the car equipment business as a member of the firm of I. R. Nelson & Company. He was soon called, however, by the Buffalo, Lockport & Rochester Railway as master mechanic where, after several years' service, he became general manager in October, 1913. In 1914 he was appointed manager of the Rochester-Syracuse division of the Empire United Railways and in 1915 assistant general manager of the Empire United Railways with headquarters at Syracuse. Following the breaking up of the original Empire United system he became connected with the Peter Smith Heater Company. Mr. Prather was a typical hard-working American who acquired his technical and general education through study at night. His kindly personality endeared him to all who knew him, whether they were below or above him in rank.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Fredericton, N. B.**—Application for a charter will be made for the construction of a new line from St. John Valley Road near Pokiok to a connection with the proposed Eastern Maine Railway at a point near the international boundary at North Lake in Orient, Aroostook County, 24 miles. It is proposed to ask for a charter to generate, use and sell hydroelectric power. The Eastern Maine Railway, Bangor, Me., is interested.

Franchises

Los Angeles, Cal.—The City Council of Los Angeles will advertise the sale of two street railway franchises in Los Angeles, one being for the operation of the Temple Street line and the other for the operation of the Maple Avenue line. Both franchises cover lines long in operation by the Los Angeles Railway.

Venice, Cal.—The City Council of Venice will advertise the sale of a ten-year franchise to operate an electric railway on the ocean front.

Track and Roadway

Birmingham-Tidewater Railway, Birmingham, Ala.—It is reported that this company will construct additional tracks from Pratt City to Ensley.

***Tennessee Coal, Iron & Railroad Company, Mobile, Ala.**—It is reported that the Tennessee Coal, Iron & Railroad Company will build 1½ miles of electric railway to connect with the Mobile Light & Railroad Company's tracks, to provide service to the new Chickasaw Shipbuilding Plant. George Gordon Crawford, Birmingham, president.

Washington Railway & Electric Company, Washington, D. C.—Clarence P. King, president of the Washington Railway & Electric Company, on Feb. 28 asked the permission of the Public Utilities Commission of the District of Columbia to construct a single-track loop about the triangular block bounded by Twelfth, H and Thirteenth Streets Northwest for Washington, Baltimore & Annapolis Railway cars. According to the plan, Washington, Baltimore & Annapolis cars would leave New York Avenue and Twelfth Street, pass south to H, west on H to Thirteenth and back to New York Avenue. This would permit unloading and waits on H Street and would not interfere with city cars, as is now the case on New York Avenue between Fourteenth and Fifteenth Streets. Use of the ground floor of the Masonic Temple as a station and waiting room is proposed. Mr. King said it would be necessary to widen the streets, the expense to be borne by the company. He asks prompt action. John A. Beeler, consulting engineer, recommended to the commission that Washington, Baltimore & Annapolis cars be removed from the Columbia line tracks and that the city terminal be located at Fifteenth and H Streets, Northeast.

***Chatham County Traction Company, Savannah, Ga.**—This company proposes to construct a line to the Brampton tract of the Foundation Shipbuilding Company. All material for the line is on hand. H. C. Foss, secretary of the Savannah Electric Company, is reported interested.

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii.—This company contemplates the relocation of its tracks on King Street to the center of the street.

St. Joseph Valley Railway, Elkhart, Ind.—It is reported that an extension may be built of the St. Joseph Valley Railway Company's line from Elkhart to Toledo.

Boston (Mass.) Elevated Railway.—Orders have been placed by the Boston Elevated Railway with the Union Switch & Signal Company, Swissvale, Pa., for material required for the signaling system in connection with the extension of its lines to Everett. The new work consists of a complete revision of the interlocking at tower "A," Sullivan Square; fourteen automatic block signals between Sullivan Square and Everett, and mechanical interlocking at Everett. A new electro-pneumatic interlocking machine, having a seventy-nine-lever frame, will be installed at tower "A." Provision is being made in the final scheme for operating all switches in the terminal and yards from this machine. Style "N" light signals will be used throughout. Alternating current is to be used for the control of all switches and automatic stops and for the control and operation of all signals, track circuits, relays and indicators. Model 15 double element track relays are being provided on all track circuits.

Manufacturers Railway, St. Louis, Mo.—The Board of Public Improvements of St. Louis has granted a permit for the electrification in part of the Manufacturers Railway. Current will be furnished from the Keokuk dam.

Ohio Electric Railway, Springfield, Ohio.—A movement has been started by the City Commissioners of Middletown to compel the Ohio Electric Traction Company to construct a permanent bridge south of the city which will withstand high waters. None of the structures erected in the past have been substantial, and it was pointed out that such bridges as were constructed are a menace to the public safety.

Oklahoma (Okla.) Railway.—According to a report from Oklahoma, J. W. Shartel, vice-president and general manager of the Oklahoma Railway, states that extensive interurban railway construction in Oklahoma will be undertaken as soon as the war ends, all of the lines planned under various auspices connecting more or less directly with Oklahoma City, which would be a center of interurban roads in that part of the country. The Oklahoma Railway will build from 30 to 40 miles of interurban railway every year. Plans for such extensions have been practically completed, but financing at present is out of the question, and it is doubtful whether materials could be obtained even if the money could be had. An extension of the Guthrie line is to be made to Stillwater and Cushing, about 40 miles, and the Norman line is to be extended to Lexington and Purcell. It is also proposed to construct a line from Oklahoma City to Shawnee, 40 miles.

Oklahoma Union Railway, Tulsa, Okla.—Announcement has been made that this company's extension from Tulsa to Sapulpa will be placed in operation by April 1.

Pennsylvania Railroad, Philadelphia, Pa.—The finishing touches are now being put on the electrification of the Philadelphia-Chestnut Hill branch of the Pennsylvania Railroad and April 1 has been set as the tentative date for the formal opening of the line. The Chestnut Hill line is 14 miles long and has been under construction since September, 1913. Originally the cost was placed at $1,250,000. The war acted both to postpone the work and increase the cost to about $1,500,000.

Dallas (Tex.) Railway.—Plans for changes in the street railway facilities at the State Fair Grounds so twenty cars can be loaded or unloaded at once and as many as fifty cars can be kept immediately available for rush crowds during the State Fair or at other times have been announced by Richard Meriwether, general manager of the Dallas Railway. Preliminary details have been arranged, blue prints and specifications have been made and the special work for the new loop and switches at the Fair Grounds has been ordered, to insure early completion of the work. These changes at the Fair Park will be part of the general plan for rerouting the car lines in that part of Dallas. The total cost of the changes and improvements, including the new car line out Second Avenue from First and Parry Avenues, just south of Fair Park, to the city limits a few blocks north of the Texas & New Orleans Railroad, will be $121,000. Two and one-half miles of new track and a great deal of special work in the way of switches and curved tracks will be laid. The work on the Second Avenue extension, which will serve a section of Southeast Dallas heretofore without car service, will begin as soon as the city can complete the work of widening the street and laying service pipes. The work at the Fair Grounds will begin as soon as the special work arrives, probably within sixty days. As part of this work, the railway company also will remove its tracks from Exposition Avenue, alongside the Fair Grounds, so that Fair Park may be extended across that street to include the old Gaston Park, now the property of the city.

Dallas (Tex.) Southwestern Railway.—At a recent meeting of the board of directors of the Chamber of Commerce of Dallas, the committee on railways and transportation indorsed the proposed interurban line from Dallas to Irving and recommended that the Chamber of Commerce and Manufacturers' Association stand ready to co-operate with the Dallas Southwestern Traction Company in procuring such right-of-way as was necessary to construct the road. E. P. Turner, president. [Dec. 29, '17.]

Houston (Tex.) Municipal Railway.—The City Council of Houston has awarded a contract to the Houston Construction Company at $59,000 for the construction of the first unit of the proposed municipal line from a connection with the International & Great Northern Railroad north of Harrisburg Boulevard to the plant of the Sinclair Gulf & Refinery Company east of Simms Bayou, 4 miles.

Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—A new station will be built by the Pacific Electric Railway at Los Angeles Harbor.

Union Street Railway, New Bedford, Mass.—A contract has been awarded to J. W. Bishop Company, Worcester, by the Union Street Railway for the construction of the superstructure of a building to be used for a boiler house and turbine room. The structure will be 98 ft. x 126 ft., two stories, of brick and steel construction, and will cost about $135,000.

Kansas City (Mo.) Railways.—This company will erect a one-story repair shed to cost $8,200.

Public Service Railway, Camden, N. J.—The carhouse of the Public Service Railway at Camden was badly damaged by fire on March 3 and eighteen double-truck cars of the company were destroyed. The loss is estimated at about $150,000.

Dayton & Troy Electric Railway, Dayton, Ohio.—The City Commission of Dayton has granted permission to the Dayton & Troy Electric Railway to erect a shelter station on the west side of Keowee Street, opposite Leo Street

Toronto & York Radial Railway, Toronto, Ont.—The carhouse of the Toronto & York Radial Railway on the Kingston Road, East Toronto, together with four cars, was recently destroyed by fire. The loss is estimated at $25,000.

Three Rivers (Que.) Traction Company.—A new station will be built by the Three Rivers Traction Company at Gervais and St. Philippe Streets, Three Rivers, at a cost of about $3,000.

Power Houses and Substations

San Diego Consolidated Gas & Electric Company, San Diego, Cal.—The Railroad Commission of California has granted authority to the San Diego Consolidated Gas & Electric Company to purchase the Del Mar Water, Light & Power Company, which will be immediately connected with the system of the San Diego company.

Gary (Ind.) Street Railway.—It is reported that this company will construct a new power station at Eleventh Avenue, Gary.

Sioux City (Ia.) Service Company.—The improvements begun last spring by the Sioux City Service Company and costing approximately $500,000 are practically completed. A greatly increased capacity for supplying power and carrying on the business of the organization with more efficiency is the result of the extensive addition of equipment, according to E. L. Kirk, general manager of the company. Among the larger items in the long list of improvements made recently are the substation installed beneath the business office in Fifth Street; a turbine and two boilers put in at the main power station, forming a complete new generating unit; new switchboards; the transmission line to Riverside, and underground work.

Worcester & Warren Street Railway, Brookfield, Mass.—Fire on March 4 practically destroyed the power house of the Worcester & Warren Street Railway at Brookfield. Four cars and two snowplows were destroyed. The loss is estimated at $75,000.

Harrisburg (Pa.) Railways.—Three new transformers have been received by the Harrisburg Railways for installation at its substation at Reilly and Marion Streets. The substation primarily will take care of the Second, Third and Fourth Street lines, but all lines will use the power in rush hours.

Valley Railway, Lemoyne, Pa.—This company is installing a skip hoist ash remover at its local electric plant and it is anticipated that this work, in connection with other improvements, will be completed about April 1.

Puget Sound Traction, Light & Power Company, Bellingham, Wash.—This company is contemplating the erection of an electric transmission line to the Cokedale Mine.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Census Statistics on Car Manufacture

Production of Electric Road Equipment in 1914 Valued at More Than $10,000,000

Census figures of the production of street and electric railroad cars for 1914 by establishments engaged primarily in their manufacture have just been published. They show fourteen of these establishments, with an output of 2348 cars valued at $8,078,348, as compared with 1922 cars in 1909 valued at $4,602,435, and 3966 cars in 1904 valued at $8,302,512. In addition to the cars reported for this industry in 1914, there were 194 electric railway cars, valued at $711,198, built by establishments engaged primarily in the manufacture of steam railroad cars; 304 cars, valued at $811,104, by repair shops of electric railway companies; and seventeen cars, valued at $562,500, by establishments engaged primarily in other industries, making a total of 515 cars, valued at $2,084,802, as compared with 850 cars, valued at $2,660,574 in 1909.

TABLE I

Product	1914	1909	1904
Total value[1]	$10,494,953	$7,809,866	$10,844,196
Electric railway:			
Number	2,348	1,922	3,966
Value	$8,078,348	$4,602,435	$8,302,512
Passenger:			
Number	2,174	1,787	3,677
Value	$7,439,906	$4,346,098	$7,878,470
Closed:			
Number	1,876	1,323	2,621
Value	$6,802,764	$3,500,781	$5,777,257
Combination:			
Number	143	369	502
Value	$383,694	$704,309	$1,240,864
Open:			
Number	155	95	554
Value	$253,448	$141,088	$860,349
Freight, express and mail:			
Number	66	92	10
Value	$174,334	$179,293	$24,022
Other varieties:			
Number	108	43	[2]273
Value	$464,108	$77,044	[2]$400,020
Steam railroad:			
Number	17	167	136
Value	$72,034	$111,813	$59,663
All other products, value	$2,344,571	$3,095,618	$2,482,021

[1] In addition, 515 cars, valued at $2,084,802, in 1914; 850 cars, valued at $2,660,674, in 1909; and 418 cars, valued at $994,654, in 1904, were made as a subsidiary product by establishments engaged primarily in other industries.

[2] Includes thirty-eight horse cars, valued at $29,182.

Table I shows the number and value of cars constructed in the industry, by class, for 1914, 1909 and 1904.

There were fewer electric railway cars built in 1914 than in 1904, a decrease of 40.8 per cent, while the value of these cars shows a decrease of only 2.7 per cent. The average value of electric railway cars in 1904 was $2,093 and in 1914, $3,441. In 1914, 12.2 per cent of the electric railway cars were all steel; 23.7 per cent were steel body with wood interior; 46.1 per cent steel underframes, and 17.9 per cent, all wood.

Table II shows, by character of construction, the number of each class of cars built in 1914, together with the value.

TABLE II

	Number				
Class	Total	All Wood	Steel Under-frame	Steel Body with Wood Interior	All Steel
Aggregate	2,365	434	1,083	560	288
Electric railway, total	2,348	421	1,083	557	287
Passenger	2,174	360	1,022	523	269
Freight	66	34	18	6	8
Other varieties	108	27	43	28	10
Steam railroad	17	13	....	3	1

Table III summarizes the statistics of establishments engaged in the manufacture of electric railway cars for each census from 1889 to 1914, and gives percentages of increase.

There has been very little change in the number of establishments in the industry since 1889, but the number of wage earners, capital, and value of products have increased very materially. For the decade 1904-1914 there was a decrease in the average number of wage earners and in value of products of 18.8 per cent and 3.2 per cent, respectively.

TABLE III

	Number or Amount				
	1914	1909	1904	1899	1889
Number of establishments	14	14	14	20	17
Persons engaged	4,286	4,005	4,997	3,736	([1])
Proprietors and firm members	......	1	3	7	([1])
Salaried employees	446	421	264	144	([1])
Wage earners (average number)	3,840	3,583	4,730	3,585	1,78
Capital	$14,751,582	$14,167,999	$12,975,703	$7,615,397	$2,468,31
Salaries and wages	3,199,674	2,770,566	3,237,825	2,185,379	1,174,79
Salaries	732,617	593,617	398,246	234,503	([1])
Wages	2,467,027	2,176,949	2,839,579	1,950,876	([1])
Paid for contract work	129,904	233,508	......	3,000	([1])
Cost of materials	6,349,779	4,260,470	5,341,444	3,966,863	1,699,23
Value of products	10,494,953	7,809,866	10,844,196	7,305,368	3,302,11
Value added by manufacture (value of products less cost of materials)	4,145,174	3,549,396	5,502,752	3,338,505	1,602,880

[1] Figures not available.

Administration Statement on Coal Price Regulation

Fuel Administration to Announce Decision on All Applications for Revision Made Prior to April 1

In connection with the government regulation of coal prices the following statement is authorized by the United States Fuel Administration:

"The regulation of coal prices by the Fuel Administration is the first attempt ever made, at least on a large scale, by the United States government to fix and establish prices for any of the great industries. It is very important to both the public and the coal industry that the prices so fixed should be based on accurate information as to the conditions prevailing in different fields, and that, when once this information has been received, the right principles should be employed in making use of this information.

"The Fuel Administration believes that it has devised a speedy and accurate method for using the cost information which it has in hand, and that it has worked out the fundamental principles which should guide it in considering applications for modifications of coal prices.

"It is the purpose of the Fuel Administration to announce decisions on all applications for price revisions now before it, prior to April 1, 1918, and, prior to that time, to make such changes in the classification as seem to be necessary, in order to relieve uncertainty on this score as far as possible before the beginning of the new coal year.

"By this statement, the Fuel Admin-

Commutator Brushes Subject to Graphite Supply

An Active Market Existing—Quotations Take a Sharp Jump Upward—Deliveries Prompt

While a few manufacturers of commutator brushes state that the trade is steady and that there have been advances of no particular consequence, the majority declare the market is extremely active. With this variance of opinion, perhaps it may be well to consider the opinion of a maker who is of the belief that it is necessary to know what is required in order to fill specifications with the proper brushes. In other words, "anything will do" is no longer permissible; for the reason, as this brush man asserts, "cheap brushes are put on the motor, the dope runs out, and the sparks bore and wear streaks in the commutator, and all sorts of disorders take place." The demand for commutator brushes has grown steadily, the sale increase being fully 30 per cent over last year's selling record. After an apparatus is installed there is a continuous call for brushes, so the market is never stagnant or at a low level.

Advances in graphite from time to time have occasioned mark-ups in the price of brushes. On Oct. 1 last the increase was fully 50 per cent, which was considered by the trade an extraordinary price enhancement. Since then, so far as can be ascertained, no further price advance has been attempted. Graphite is short of the market, is high and possibly may reach a still higher quotation, if the word of responsible brush manufacturers is to be accepted as authoritative. Brush makers handle their grade of graphite as a secondary finished product, the bakers of the metal being the primary handlers.

Ceylon graphite, the best grade, sells for $160 a ton, and under the British embargoes the importations are curtailed. The market is easing off slightly, but the producers are sold up to 1919. Prices to consumers of brushes are made on the quantity basis. For example, buyers of 10 brushes of divers sizes are quoted net on the list. On 50 to 100 brushes of a miscellaneous character 20 per cent is given. On 1000 brushes of the same size and quality 40 per cent, and an inside special of 50 and 10 is granted when larger orders are placed.

So far the greater number of commutator brush manufacturers have anticipated their requirements on graphite and have had an ample stock for manufacturing. This was the condition for several years and up to the present time. It is now admitted nearly everyone is buying at the market, with possibly a couple of exceptions. Such factories have fortunate connections, thus enabling them to get raw material, possibly not at any better price, but insuring a sufficiently large supply to meet the requirements of their trade contracts.

Deliveries of brushes are prompt out of stock and go forward either by express or parcel post. With the growing demand, however, the manufacturers, while apparently confident of the possibilities of the future, still confess, if current conditions continue, there may be a reversal not altogether pleasing or satisfactory either in price or deliveries.

Cost of Ball Bearings Going Higher

Deliveries Expected to Become Longer Owing to the War Demands of the Government

Deliveries of ball bearings are expected to get worse during the next three months at least owing to the war demands of the government on the manufacturers. Indications are that prices will advance owing to the condition of supply and price of raw and manufacturing materials. Owing to the increasing volume of rejections, the cost of steel is much greater to the manufacturers. The cost of labor has gone up in the past two years from 50 per cent of ball production cost to 60 per cent and is still advancing. It can thus be imagined to what extent labor costs have risen when everything else has advanced so much. Files and grinding machinery, diamonds for truing wheels, etc., have been increasing very rapidly and represent a real item of cost.

The most pertinent facts of the market are, therefore, a greatly curtailed available production for commercial purposes, increasing delay in deliveries, and advancing prices.

(*Concluded from page* 486)

istration does not wish to be understood as stating that the examination of the prices now being made will complete its price work. On the contrary, the administration will continue to collect and study facts relating to the cost of production of coal and the prices at which it is sold. It will make such further readjustments from time to time as are necessary to keep the prices on a scale fair to the public, fair to the coal industry, and sufficiently high to encourage production. It hopes, also, to take measures in the very near future to encourage and insist upon the use of less wasteful methods of mining, the sale of clean coal, and the more definite recognition of the different qualities of coal in the government prices."

Rolling Stock

New York Municipal Railway Corporation, Brooklyn, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Feb. 23 as having ordered 100 new cars for its subway system has specified the appended details for this equipment. No delivery date, however, is designated.

Number of cars ordered	110
Name of road	New York Municipal Ry.
Date order was placed	Feb. 26, 1918
Builder of car body	Am. Car & Foundry Co.
Type of car	Subway
Seating capacity	78-90
Weight (total)	86,160-light lb.
Bolster centers, length	47 ft. 0 in.
Length over bumpers	67 ft. 0 in.
Length over vestibule	64 ft. 7¼ in.
Width over all	10 ft. 0 in.
Height, rail to trolley base	12 ft. 2 in.
Body	Steel
Interior trim	Steel and Agasote
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse, type A. M. U. E.
Axles	New York Municipal Railway
Bumpers	Hedley Anti-Climber
Control type	Westinghouse A. B. F.
Couplers	Westinghouse
Curtain fixtures	Curtain Supply Co., No. 089
Curtain material	Pantasote
Designation signs	Elec. Ry. Supplies Co.
Gears and pinions	Gen. Elec. Co., grade F.
Hand brakes	Peacock, with Kling Shieve
Heaters	Peter Smith
Journal boxes	McCord
Motors, type and No.	Gen. Elec. Co., 248-A
Motors	Outside or inside hung, inside
Sash fixtures	Edwards
Seats, style	Hale & Kilburn, cross and longitudinal
Seating material	Rattan
Springs	Elliptic and spiral
Trolley wheels or shoes	Third-rail shoe, New York Municipal Ry.
Trucks, type	New York Municipal Ry. A-55
Ventilators	Perry
Wheels (type and size)	32 in. and 34¼ in.

Harrisburg (Pa.) Railways, referred to as ordering five new cars in the ELECTRIC RAILWAY JOURNAL of Feb. 23 for its road, specify the following details for this equipment, which were to be delivered March 1:

Number of cars ordered	5
Name of road	Harrisburg Ry. Co.
Date order was placed	Sept. 29, 1917
Date of delivery	March 1, 1918
Builder of car body	J. G. Brill Co.
Type of car	Semi-convertible
Seating capacity	48
Weight (total)	40,000 lb.
Length over bumpers	43 ft. 10 in.
Length over vestibule	42 ft. 10 in.
Width over all	8 ft. 2 in.
Height, rail to trolley base	12 ft. 9/16 in.
Body	Steel
Interior trim	Cherry
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	Forged steel
Bumpers	Hedley Anti-Climber
Car trimmings	Bronze
Control, type	K-35
Curtain fixtures	National "B"
Curtain material	Pantasote
Designation signs	Keystone
Door operating mechanism	Nat. Pneumatic
Fare boxes	None
Fenders or wheelguards	Own make
Gears and pinions	Nuttall Co.
Hand brakes	Peacock
Heaters	Consolidated
Headlights	Golden Glow
Journal boxes	J. G. Brill Co.
Lightning arresters	Westinghouse
Motors, type and number	Four 514-C
Motors	Outside or inside hung, outside
Registers	International
Sanders	National
Sash fixtures	Edwards
Seats, style	Hale & Kilburn
Seating material	Rattan
Step treads	American abrasive
Trolley catchers or retrievers	Kuntson
Trolley base	Nuttall Co.
Trolley wheels or shoes	Kalamazoo
Trucks, type	27 M. C. B. Brill
Ventilators	Railway Utility
Wheels (type and size)	33 in. cast iron

Philadelphia (Pa.) Rapid Transit Company will place in its service the 100 new passenger cars ordered recently from the J. G. Brill Company by the Emergency Fleet Corporation. Possibly the additional rolling stock may reach 150 in number. The cars are of the same general type now being operated by the Philadelphia company. They will be forty feet long, with General Electric Company equipment, and the cost is about $6,000 each.

Ocean Shore Railroad Company, San Francisco, Cal., is reported as being in the market for new cars.

Public Service Railway, Newark, N. J., lost eighteen double-truck cars in a fire on March 3 at the Camden carhouse.

Tri-City Railway.—This company has received the first of twenty cars purchased from the Chicago Surface Lines in January. Four others will be received and placed into service at once.

Worcester & Warren Street Railway Company, Brookfield, Mass., had its power house practically destroyed by fire on March 4. Four cars, one new and valued at $5,000, besides two snow ploughs, were burned. The entire loss is estimated at $75,000, fully covered by insurance. Defective insulation is reported to have caused the fire. The road suspended service Jan. 16, and the power house has not been in use since Dec. 16.

Toronto & York Radial Railway, Toronto, Canada, on Feb. 24 had its Scarboro divisional carhouse totally destroyed by fire, together with four cars. The damage is placed at $25,000. The cars were valued at $5,000 a piece. The loss is covered by insurance. On Feb. 5 this company also had six interurban cars destroyed by fire, which also burned its Metropolitan division carhouse, as mentioned in the ELECTRIC RAILWAY JOURNAL of Feb. 16.

Professional Note

Robert H. Whitten, formerly with the Public Service Commission, First District, New York, has opened an office for consulting work on city planning at 277 Broadway, New York. Mr. Whitten has had some five years' experience in city planning and zoning work in New York City, following his connection with the New York Public Service Commission, First District. He is the author of an authoritative treatise on the valuation of public service corporations and also of a monograph on the regulation of public utilities in Great Britain. Mr. Whitten is a member of the American City Planning Institute.

Trade Notes

George Siess, who has been stores manager of the Cleveland office of the Western Electric Company, was recently appointed assistant manager of that office.

Waverly, Sayre & Athens Traction Company, Waverly, N. Y., has equipped its one-man cars with the Johnson fare box, furnished by the National Railway Appliance Company.

J. B. Howell of the sales department of the Bound Brook Oil-less Bearing Company has entered active service in the United States Army and is now training at Camp Dix.

W. W. Briggs has resigned as general agent of the Great Western Power Company to become manager of the New York division of the Westinghouse Lamp Company, taking effect April 1.

Guide & Signal Light Company, Indianapolis, Ind., has been incorporated by Richard McClellan, L. Greenburg and Robert Eaglesfield. The company is capitalized at $100,000 and proposes to manufacture electrical devices.

Nelson P. Hall has been appointed district sales manager for the Chicago territory of the Van Dorn & Dutton Company. He was formerly connected with the sales force of the Electric Service Supplies Company of Chicago.

Moloney Electric Company, Ltd., Toronto, Can., announces that it has opened a branch office and warehouse at Halifax, N. S., for the Maritime Provinces. E. A. Seath, who has been transferred from the Montreal office, will have charge of that territory.

Raymond W. Murphy, who was until recently in charge of the Pacific Coast offices of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has been transferred to the Philadelphia office of the company, where he is assistant manager.

J. D. Todd, who until recently was connected with the Western Electric Company at Kansas City, Mo., as assistant sales manager, became associated with the Missouri Valley Electric Company, Jan. 1, as vice-president and manager. Mr. Todd will make his headquarters at Kansas City.

Stephen A. Staege announces the dissolution of the firm of Staege & Dewey, and that he will continue in consulting engineering practice, with offices in the Light & Power Building, Watertown, N. Y.

War Trade Board, Washington, D. C., in an official announcement states that after Feb. 1 a new export application form will be used in place of all forms hitherto in existence. It will be the only application form in use. Copies of the blanks, with information pertaining to their use and other pertinent directions, may be had on application to the board.

New Advertising Literature

Stow Manufacturing Company, Binghamton, N. Y.: Bulletin entitled "Portable Tools of Proven Value."

Allis-Chalmers Manufacturing Company, Milwaukee, Wis.: Circular descriptive of its type "S" centrifugal pumping unit.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Leaflet 3998 descriptive of the company's automatic railway substations.

Vulcan Steel Products Company, New York, N. Y., is publishing a spirited illustrated monthly house organ entitled *Vulcan.* It is a journal of coöperation and help for the Vulcan company's interests, particularly in its rapidly developing export trade.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Technical information regarding Bakelite Micarta-D gears is contained in a pamphlet recently published by the company. The distinctive feature of this material for noiseless gears and pinions are listed, together with, its physical properties. Methods of turning and drilling and gear cutting are described and illustrated with many half-tones and drawings. Methods of attaching to the driving shaft which have proved suitable for gears of all sizes are shown and tables of pitch, teeth and other gear data are also given. There are formulas for the horsepower rating, the amount of power which can be transmitted through press fit and for calculating other variables in gear practices.

RAILWAY MATERIALS

	Feb. 27	March 6
Rubber-covered wire base, New York, cents per lb.	27-30	30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33½ to 38	33.42 to 38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.85
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.35	$1.43
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.36	$1.44
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	46½	45½

*Nominal. †Government price in 50 ton lots f.o.b plant

NEW YORK METAL MARKET PRICES

	Feb. 27	March 6
Copper, ingot, cents per lb.	23½	23½
Copper wire base, cents per lb.	*27	*27
Lead, cents per lb.	7¼	7¼
Nickel, cents per lb.	50	50
Spelter, cents per lb.	8	7.875
Tin, Straits, cents per lb.	$85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	35-37	†32

OLD METAL PRICES—NEW YORK

	Feb. 27	March 6
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	18	18
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6	6
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.41	$42.41
Old car wheels, Chicago, per gross ton	$30.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, March 16, 1918 *Number* 11

Are Car Shop Kinks Always Real Economy?

"NECESSITY is the mother of invention," but there have been a great many inventions for which it would be difficult to prove the necessity. Some shop foremen think they are not earning their salaries unless they are continually inventing something. Without any desire on our part to discourage ingenuity and progressiveness, it is nevertheless true that men with a leaning towards invention are apt to waste a lot of their own time and that of their employees as well as a great deal of money and energy in devising new "stunts," when there are commercial products already available for accomplishing the purpose desired, and doing it better and cheaper than it could be done by the proposed invention.

Anyone who has a problem of this kind before him would do much better to investigate the methods and apparatus which have already been devised for doing work of this kind rather than to attempt to manufacture something of his own. The manufacturing companies have engineering specialists whose services are at the disposal of their customers. These experts are always willing and eager to help in solving knotty problems in construction or maintenance, and a small customer will receive the same consideration as a large one. In addition, the ELECTRIC RAILWAY JOURNAL is always at the disposal of railway men and others who wish assistance in solving any particular problem. Of course, there are many opportunities for progressive master mechanics to render real service by introducing economical practices in their shops, but the real duties of such men should always be kept in mind. Anything that interferes with these duties, even if it is the invention of a shop device, involves the danger of not being in the line of real economy.

"Organize—Deputize—Supervise"— A Formula for Administrative Success

E. P. RIPLEY is president of the Atchison, Topeka & Santa Fé Railroad system. The story of his rise from a dollar-a-week job to this presidency is told by a writer in the current number of the *American Magazine*. Mr. Ripley summarizes the experience of a long business career, in so far as it relates to administration, in stating that success on the part of executives consists in organizing, deputizing and supervising. Never was such a formula more urgently needed in our country than at the present moment, when we are struggling to throw off the shackles of inefficiency in preparation for winning the war. Of these three essential duties of every individual who is responsible for the work of others the one most neglected is the second. It is the height of folly at any time, and especially now, for any man not to be doing the thing that he can do best, that he can do better than anyone else. But this means turning over to others the responsibility and commensurate authority for doing other things that might at one time have been proper for him to do. Many a man wears himself out, fails to develop his subordinates, clogs the machinery of his organization—in short, fails of his full duty to his superiors by failure properly to deputize his work.

Scarcity of Common Track Labor—A Menace to Maintenance

TWO years ago, in commenting editorially upon the scarcity of track labor, we said that the high wages then being paid common labor in this country in munitions work and other fields where this class of labor could be used was having a demoralizing effect upon other industries and that the situation was becoming critical even then. Since that time the construction ot the great military camps and the vast work now going forward in the shipbuilding field have made conditions many times worse. The government contractors, doing their work upon the cost and percentage basis, have bid against each other and have even revived the abominable padrone system in their efforts to obtain labor to such an extent that other industries, including the electric railways and even the big subway and sewer contracting firms, are being seriously handicapped in their efforts to secure and hold laborers.

The electric railway industry, as has frequently been pointed out in these columns, is tied to a fixed income, but the contractors mentioned above are now almost in the same fix, since their contracts were based on a pre-war labor cost base, while the present wage price has advanced by leaps and bounds until they can bear the strain but little longer. It is even predicted that the subway and sewer contractors in New York will have to stop soon unless some means is adopted to relieve the situation. With these powerful contracting firms in such a position, the situation of the electric railways must be worse, and it is safe to predict that they will not be able to undertake much reconstruction this year. In fact, they will be lucky if they are able to retain a sufficient supply of labor to carry on even ordinary maintenance work to the extent that this work should be done.

The Public Service Commission for the First District, State of New York, has recognized this critical condition in the labor market and has made certain suggestions for legislative enactments which may help the subway contractors to complete their new work without profit. As yet no similar relief from these conditions has been suggested for the electric railways, although one would think that the maintenance in good condition of existing roads should be as important to the public as the completion of new lines. Yet it is quite apparent that the existing roads cannot be adequately maintained if the labor is not available.

Car Equipment Failures Should Be Carefully Analyzed

THE need for analysis is evident in all phases of railway service. In none is it more so than in the division of the subject which has to do with the failures of car equipment. It is the very essence of successful operation that cars be kept on the street with a minimum of interruption, and to this end it is imperative that the many detailed defects influencing this result shall be carefully recorded and diligently analyzed.

Too much stress can hardly be laid on the need for analysis, as without a thorough understanding of the failures and their underlying causes it is impossible to form any definite policy for their correction. This means either the replacement of the offending part with a duplicate of the original, bound sooner or later to repeat the breakdown of its predecessor, or the arrival at a "half-baked" conclusion as to the cause of the trouble and the adoption of a new and supposedly improved part. The latter may require considerable outlay yet be really of a nature which will not solve the problem because it does not touch the heart of it. Many a piece of apparatus has been thrown into the discard and replaced with another for which wonders have been prophesied, when the original one would have proved entirely satisfactory, with some slight detailed attention or maintenance. The expenditure was therefore incurred simply and solely as the result of a lack of proper analysis.

This is a function which, though not possessed by all in an equal degree, is like many others in that it is susceptible of development by use, and the commencement of its growth is the recognition of its necessity. A broader understanding of this fact and its intelligent application would go a long way toward raising the standard of operating methods.

Front-End Fare Collectors As Rear-End Accelerators

IT WILL BE recalled by our readers that the first Washington report recommended front-end fare collection at certain places in the congested zone of the Capital Traction Company. The latter company was not slow to try this plan of accelerating passenger movement. As worked out under J. H. Hanna, general manager, the front-end collector actually accelerates traffic at both ends of the car. After he has passed a reasonable number of people through the front entrance, he hastens to the rear to help the conductor. It is well known that the fellow who holds up a car longest at a stop is the late arrival who insists on boarding the car, regardless of the conductor's efforts to close the doors and clear the way for the next car. Here is where the gentle but firm arm and voice of the experienced street inspector prove very useful, both in saving time and avoiding accident.

Chicago Authorities Might Profitably Read the Beeler Report on Boston Traffic

PUTTING aside for a time all consideration of the legal and financial aspects of a proposed ordinance for unified operation of the surface and elevated lines in Chicago, the authorities have been debating some interesting features of service requirements. Speaking for the management of all companies, President Busby has been discussing the recommendations made last year by the Traction and Subway Commission and a few modifications proposed by the companies.

The discussions have had to do largely with rapid transit improvements. This is the all-important transportation topic in Chicago where the surface cars operate on nearly every section and half-section line throughout the city, while elevated construction has been at a standstill for years. Rapid transit facilities are costly, and Mr. Busby has made the point that subways should not be required where elevated lines will answer the purpose, and elevated construction should not be insisted on where the public can be accommodated by surface lines.

All the authorities have agreed that subways are needed in the downtown district of Chicago where the capacity of elevated and surface lines has long since reached the point of saturation. They may be required later on in other heavy centers of travel. Elevated construction, while more costly than surface tracks, is also under certain circumstances more desirable, but there is a limit fixed by good judgment to the distances for which such extensions should be built.

The Chicago aldermen on a trip to Boston last year were impressed by the combination of surface and rapid transit facilities in that city. If they have read the Beeler report to the Massachusetts Public Service Commission, however, they may discover a basis for serious reflection in the finding that the total cost of service for each 5-cents' worth of gross revenue is 7.23 cents on rapid transit lines, 4.86 cents on surface lines, and 8.10 cents on surface cars using subways, tunnels and viaducts.

In the long run the people must pay for what they get. If it is more convenient to have a rapid transit line within one block of everyone's home, it is also more costly. The 5-cent car fare is not made of rubber. It has been supposed that it would pay reasonable charges for labor and material and a fair return to the investor. But when labor and material costs increase as they have in recent years, these charges must be met in some way. Either the passenger must pay an extra fare or the public must agree to eliminate all non-transportation charges, such as paving right-of-way, maintaining such pavement and reconstructing tracks torn up for sewer construction and other city work. If the people not only refuse to make these concessions but insist on the most expensive type of construction for service in the least remunerative sections of their community, they must be prepared in some other way to reimburse the company for the service thus demanded.

The proposed plan for Chicago does not contemplate burdening the public with additional taxes. For this reason any system which is arranged for must be self-supporting. All charges for return on the investment as well as for operation must come out of the rate of fare which is agreed upon. This means that the fare must either be increased or it must be relieved of all non-transportation charges.

Chicago seems well on the way toward a settlement of its transportation problem. This attitude must be encouraged. The city authorities and the people will do well to disregard the obstructive tactics and specious arguments of the small group of fanatics who have so long held up a settlement while other cities have been making fair arrangements designed to give the people better urban railway facilities.

Why Must We Waste 85 Per Cent of the Heat in Fuel?

IT IS RATHER unfortunate that, in general, we must depend upon such an elusive source of energy as heat for the propulsion of electric cars. A pound of good coal contains 3½ kilowatt-hours of potential energy recoverable in heat form. Of this we are doing remarkably well if we deliver 15 per cent at the power-plant busbars. The fundamental reason for the difficulty in the uphill work of changing heat energy into electrical energy is that such transformation is opposed to the natural tendency of energy. In other words, all energy tends to degenerate into the form of heat. The various points at which energy shunts off into space, in heat form, during transformation upward are mentioned by B. H. Blaisdell in an article printed elsewhere in this issue. Some data pointing the way to heat saving were given in an abstract of an article by Eskil Berg last week.

It is loss, loss, all along the line, but there is no reason for discouragement in this if we consider what progress has been made in the last few years. A coal consumption of 4 or 5 lb. per kilowatt-hour is no longer respectable. Many plants are getting along with 2 lb. and the very best with 1½ lb., high-grade coal being used in such cases, of course. When one considers the elusive nature of heat and the number of transformations and transmissions through which it must go between coal pile and busbar (to say nothing of the transmission system), the wonder is that more does not get away. There are losses in combustion (big ones), in steam production, in transformation to mechanical energy (enormous losses), in friction, in electric resistance and in radiation all along the line.

The very magnitude of the heat losses impels vigorous effort toward economy. The best equipment that can be afforded must be installed. Measuring instruments must be provided to indicate operating conditions. Someone qualified to do so must be studying operation constantly. Every effort must be exerted to stimulate intelligent co-operation on the part of those who ultimately control fuel consumption.

That such procedure will produce results is being proved in many plants. An example is the Manila (P. I.) plant where, under the bonus system outlined in the Feb. 16 issue of this paper, combined with station betterments, the fuel consumption has been reduced nearly 20 per cent in three years.

Even when doing our best, however, we shall still waste from 85 to 90 per cent of the energy theoretically available in the fuel, at least until some genius invents a radically new way to obtain it.

"Intelligent Economy" Must Be the Slogan for 1918

A BUILDER of devices for facilitating track construction and repair recently said to the writer that it is much easier to sell such equipment to contractors than to railway men. The idea seemed to be that the contractor, through the nature of his work, looks at the ultimate saving due to the use of a given machine rather than to the first cost. The reverse, he thought, is true with the operating man due to his wholesome fear of swelling the capital account. Economy in the large sense may mean spending money as well as saving it, even if the money may at times be difficult to secure. Whether or not the diagnosis outlined above is correct, it is, nevertheless, extremely urgent that the railway business be conducted now with a view to ultimate economy rather than immediate expense reduction.

The present is no time for generalities; concentration of purpose—"getting down to hard tacks"—is the order of the day. For this reason the annual maintenance issue of the ELECTRIC RAILWAY JOURNAL is dedicated to the cause of true economy. A number of qualified men in different sections of the field have been asked to analyze the possibilities of energy, labor and material savings in lines of work with which they are particularly identified. It is not necessary for them to "qualify as experts" as each has established a reputation for thoroughness in his individual field.

As assistant manager of the railway department of a manufacturing company, Mr. Lambert occupies a vantage point from which he can command a wide survey of this field. Mr. Harte has work of a diversified character as construction engineer of one of the very large systems, particularly in electrical distribution. Mr. Litchfield is a specialist who has had unusual opportunity in analyzing car design problems and testing materials which enter into the construction of high-grade cars. Mr. Squier has had long experience in the rolling stock department of a large city railway system, and now, as engineer of a public service commission, can view railway work from another angle. Mr. Smith is in charge of the testing work of an important rapid-transit system where he comes in contact with a tremendous variety of investigation problems to handle. Mr. Hellmund is an experienced designer of electric railway equipment and has made a specialty of analyzing equipment problems in a large way, as well as in specific details. Mr. Cram is in a position to know "what is what" in way and structure, from his daily contact with the big questions in that line.

This group of seven experts has produced what must be considered a veritable treatise on means for saving everything that is savable in the power plant and on the track and line. They discuss not only the means available for saving but also the intelligent use of the means. Their work, however, is only a part of this issue, for it contains many short articles which bear on the central theme. If the whole thing taken together does not have a powerful influence in directing the thought of the industry to the fundamentals of economy, then nothing of this nature could do so. The editors take this opportunity cordially to acknowledge the splendid co-operation which they have had from the industry in preparing this summary for its benefit.

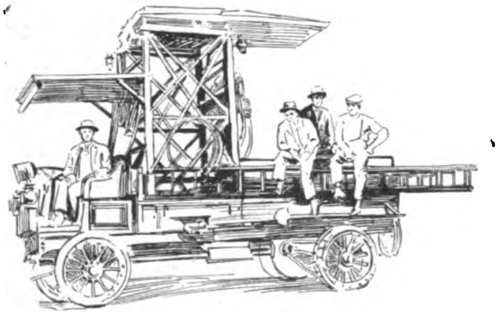
Certain Overhead Department Economies

Specifications Play an Important Part Particularly in This Field—The Author Lays Stress Especially Upon the Opportunity to Save Operating Costs by Doing Overhead Repair Work with Power Equipment

By Charles R. Harte
Construction Engineer The Connecticut Company,
New Haven, Conn.

OCCASIONALLY, through slow development that has not been appreciated, or even from pure shiftlessness, there exist on a system poor material, bad construction, and inefficient methods which result in heavy losses annually. Such conditions are obvious except to those who have grown up with them, and their correction is only a question of treatment. These are exceptional cases, but there are many instances where leaks exist which in the aggregate cause serious loss without any clear indication of the trouble.

Sometimes the apparent waste is not a net loss because the cost of correction would be greater than the saving secured thereby, but there are comparatively few companies where careful study will not show an opportunity to save a few dollars. Such a study is best made jointly by an old-timer and a man comparatively new to the system. Working alone the latter fails to appreciate the real local peculiarities, although there is no form of excuse for freak ideas which approaches that stock expression of standpatters—"local conditions." On the other hand, the old-timer is apt to be "too sot in his ways" properly to realize the local faults.


The automobile tower wagon permits overhead repairs to be made with minimum interference with traffic

The conditions of to-day demand that no penny be permitted to escape without "doing its bit." As an indication of lines for investigation there are here set down some of the possible sources of leakage in the overhead departments, and a few reminders of what has been done by others in increasing the efficiency of men and appliances.

Loss Through Unwise Specifications

Rigid adherence to fixed standards will naturally stifle improvement, but on the other hand until sufficient demand is established any new material varying from usual practice means increased cost. The manufacturer must be paid not only for the labor and materials which go into the devices, but for the idle capital locked up in patterns and the space and labor used in storing them. The larger the quantity of the device used the less extra charge per unit. As a rule, however, the demand is very limited, and the first cost unduly high, and because special designs are almost never kept in stock there is serious loss of time in making replacements.

In some instances the gain more than offsets these disadvantages, but far too often such material owes its existence to accident, to speak charitably, and its continued use to the fact that no test has been made to determine whether or not it is really worth while. If there is to be real efficiency and economy it is extremely important that all materials used should be put through tests carried out with thoroughness, of the sort fully to bring out the essential facts. The costliest mistakes are often those which approach success, for, while a really bad failure sticks up like a sore thumb, a "near success" frequently "gets by" to cause steady and long-continued waste, because such merit as it has is prominent and it is accepted on the strength of that without tests which would develop its bad points.

Lack of Standardization Makes Supplies Costlier

The American Electric Railway Engineering Association has approved as standard the specifications for overhead material and construction which were submitted by its power distribution committee after careful and extended study. The articles are regular stock patterns with all of the larger makers, and most if not all of the smaller ones, but as yet the association has not made that aggressive campaign which is necessary to establish any standard in an open field.

Here is an opportunity for a decided saving through the definite agreement by the majority of the company members to use one type of article only. This would enable the manufacturers very materially to reduce the capital now tied up in the many varieties which have to be carried, and in the much larger number of patterns which are used only once in a long time. A fair share of this saving should go to the user in the shape of reduced prices.

Until such concerted action is taken little reduction in ruling prices can be hoped for, but even so, as between special and stock designs, there will be found a considerable price difference which in many cases is not by any means paid for by difference in quality. It is greatly to be hoped that the day is not far distant when the term American Electric Railway Association material will be as specifically descriptive, and as universally accepted, as are American Society of Civil Engineers' rails or Master Car Builders' standards.

No less costly than the choice of out-and-out special devices is the specifying of what is apparently stock material, but requiring it to meet special conditions. Here, too, the gain may offset the extra cost if the requirements are rational, but the insistence, for example, that hangers, pull-overs and wood strains, in which the weight except as fixed by dimensions has little relation to strength, shall weigh "not less than" a fixed value is little short of criminal. Not only must the extra material and the extra labor—and frequently special patterns—be paid for, but every extra ounce that goes into the overhead tends to decrease the life of the trolley wire. Unless this extra material is placed where it will materially increase the service life it is an actual detriment; and if the material already has a sufficiently large factor of safety, added strength is simply wasteful.

Sometimes what is a most desirable test for one class of material is merely a source of expense when applied to similar material having a different use. As yet, nothing has been developed that shows up as does the twisting test the flaws and cracks which do not appreciably affect the tensile strength of trolley wire, but which do constitute its most serious weakness. For similar wire employed as a conductor, but not also forced to act as a track as is the trolley wire, however, this torsion test is entirely unnecessary.

The material, special or otherwise, should be given such tests as will determine whether or not it complies with the requirements specified. If they are rational it is essential they be met; even if they are irrational, so long as they are specified the material ought to meet them. In checking there is always a chance that their undesirability may show up; besides, since good money must be paid for the privilege of imposing unusual conditions, it is well to get something for the outlay.

On the labor side it is equally desirable that the chief of overhead go carefully over the specifications to see that there are written into them no requirements which add largely to the cost and time without a corresponding gain. Special methods, like special material, are only warranted when their use shows a probable net gain, not alone for the immediate present but for a reasonable time in the future. In estimating on the result it is always well to bear in mind the dislike of the average man for anything "new-fangled," and the fact that such prejudice until overcome will prevent immediate realization of the efficiency and economy which may come later.

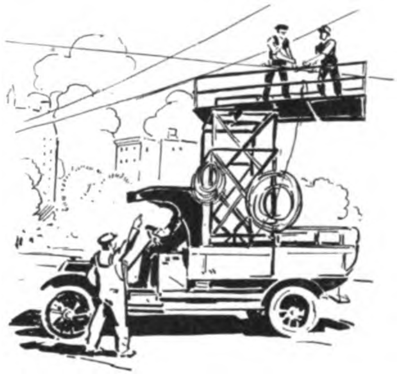
Labor Economy Does Not Mean Running Short-Handed

In general the economies which can be effected on the labor side are not in direct savings but instead result in the doing of more work by the same force. The tendency of most companies is towards short-handedness rather than the opposite; the payroll is always a shining mark for the axe. Clearly the ideal condition is to have just enough men in the gangs to insure that everyone will be reasonably busy all the time. On interurban and suburban lines this may be possible, but in the heavy service sections considerations of relations with the city as well as the cost of delay demand enough men to provide in the minimum of time for any contingency, particularly if due to fire. What constitutes the most efficient force for the purpose depends entirely upon the "local conditions" which in this instance are of the utmost importance.

In a very interesting article with a characteristic title ("Keep-Up Versus Pick-Up in Overhead Maintenance"—ELECTRIC RAILWAY JOURNAL, Aug. 4, 1917), S. L. Foster, chief electrician United Railroads of San Francisco, describes the prevention practice of his company. Mr. Foster modestly suggests that San Francisco's freedom from ice, snow, sleet and thunderstorms may account for the success of the plan, but he fails to mention the exceedingly corrosive salt fogs with which he has to contend and which nearly balance the score. Such a thorough and continuous "combing" as he describes, if applied on many of our Eastern systems, would unquestionably effect a reduction in overhead breakdown. It might not prevent a reduction in forces, particularly in the older, large cities, where the narrow and crooked streets prevent quick work with the wagons and compel a larger number of emergency crews than are necessary when the tower or repair wagon can really hustle. Advantage of this condition is sometimes taken by making the emergency crew really a wrecking crew to administer mechanical first aid to whatever goes wrong, the regular repair gangs following up if the trouble is too extensive for the emergency men to finish it themselves.

Watching the Repair Gang in Action

Watching a crew at work is about the best way to test the efficiency of its organization. Idle men, however, do not necessarily prove that a gang is too large. A poor arrangement of the men, of course, will overload some, while the others have little to do, a condition showing that the foreman is not onto the job as a whole. Whether this is due to actual incompetency, the result of an endeavor of the foreman to do everything himself, or due to the use of a gang so small that he is obliged to work as one of the men, can be readily determined by watching the work for a time if a few questions do not bring out the facts.

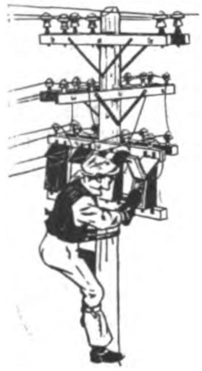


"Watching a repair gang at work is the best way to test the efficiency of an organization."—*Harte*

It is true economy to have each gang so large and so well balanced that the foreman can give most of his attention to its work as a unit. If he is a good boss he will save his wages many times in the team work he can get. Further, by watching from the side lines, if he is at all ingenious, he can probably work out better methods or show why changes are inadvisable. Before any radical readjustments are made it is essential to good results that all the circumstances be understood. The fact that once or twice a gang has been working inefficiently calls for further investigation to determine whether the trouble is chronic, and needs treatment, or whether the work at those particular times was unusual.

The Cost of Good Tools and Appliances Is Justified by the Results

Inefficient work by a crew may be due to man-trouble or it may be the result of poor or inadequate equipment. Good tools cost money and a mistaken idea of economy sometimes leads to the purchase of too few or, worse yet, of cheap makeshifts. Poor tools are costly at best. Even in the shop, where their inefficiency and breakdowns cause only delay, and that to the particular piece being worked on, the losses are large. In line work, where delay means not merely the loss of time of the gang, but the hold-up of traffic as well, and in addition an unexpected failure of a tool is apt to cause serious injury if not death to one or more of the men, the use of anything but the best is most unwise.


Standardization of transmission line material tends to economy

In the smaller line tools have been standardized to a large extent through the long experience of telegraph and telephone practice. Even here, however, helpful minor improvements are made from time to time. In the approach and attack, however, there are marked differences both of method and of appliances.

Power Lifts Should Be Provided on Tower Cars

The steadily increasing density of street and highway traffic is fast limiting the tower car to new construction and heavy repair work, where the track can be blocked for considerable stretches of time, and to work on open track which prevents the use of horse or auto wagon. On the other hand this limitation makes possible the use of heavy equipment with power devices, in fact, a traveling shop, the platform of which is almost as steady as the ground itself.

Power is required to raise this platform and various devices have been tried for the purpose. The use of a motor, taking current from the line permits, in conjunction with suitable clutches, its employment on winches, reeling devices and the like. An air cylinder, either in connection with an elevator-sheave-type rig, or better lifting directly, is probably the simplest arrangement. In some installations the platform has "danced" in service on account of the elasticity of the air, but the Washington Water Power Company, which has had an excellent example of this type of car in service since May, 1909, has had no such trouble, although safety chains are by this company used when the tower is to be long in service.

A combination system, having hydraulic lifting cylinders but obtaining the pressure by air fed to the top of the oil reservoir, has the rigidity of the hydraulic type and the simplicity of the air system. Straight hydraulic forms of lift require special pumps and seem particularly subject to trouble if power-operated. If hand-operated they are not enough better than the old-fashioned hand-winch rig to pay for the much higher cost.

Getting down to dollars and cents, it is difficult to measure the economy of power-operated lifts, but it is substantial. When the platform can be practically instantly shifted without effort it will naturally be adjusted to the most comfortable, which is the most efficient position, while under hand operation shifts are made only when absolutely necessary. The slowdown, and liability to slipshod work, when the men are tired from stretching or stooping, becomes quite an item if the work is at all continuous.

Modern Power-Operated Tower Cars Have "Men Under the Hood"

The early towers were light and easily raised. Changing conditions have steadily increased the weight, and this has been largely overlooked except in the case of the cars. So long as horses were used on the wagons there was a limit to the loading possible and no opportunity for power lifts. But the advent of the auto truck put an admirable power plant just where it could be utilized readily, and where it was completely overlooked. For many purposes this power plant furnished the equivalent of several men under the hood. It is surprising, therefore, that so little has been done to get the benefit of this circumstance.

It would be a poor "bunch" of linemen who could not raise a tower by hand and then do something on the overhead. But effort and time saved for the job itself means a corresponding reduction in the time an affected district is tied up. The cost of that effort and time is small as measured by the payroll, but measured by its effect on the tie-up it is quite another matter.

So important is speed in correcting troubles in the traffic centers, and they rarely occur except at rush hours, that at least one large company uses a light hurry-up wagon carrying ladders which are used in pairs, the feet placed so that when the ladder is vertical it just clears a car. For service the tops are leaned together, forming an "A," from which the lineman can quickly descend while the two parts are held vertical to permit cars to pass. The same result is aimed for in the use of overhang platforms, but if these are built sufficiently strong to swing with the men, the movement is apt to be slow. Presently, however, some one will remember the possibilities of the auto engine and effect another time economy.

Time-Savers Are Money-Savers as Well

The devices just described are time-savers rather than money-savers, at least directly. It is not always easy to persuade the "man higher up" that the two are the same. For this reason power winding devices, invaluable in handling feeder, are more apt to be found on systems having underground lines, where they serve as pulling rigs as well.

The economy of several types of pole-setting devices, however, is beyond question, if many poles are handled. For city work on the larger systems they are almost indispensable. The home-made gin-pole, on a truck with block-and-fall, worked by man power, shows a saving over piking. The more elaborate machines, on a property of any size, will soon pay for themselves if the time gained can be utilized. But here as in many other instances the economy which can be capitalized is often very different from the actual time saved. With a new and well-constructed system advantage can be taken of every efficiency. As a rule, however, there are weak links which fix the size and number of repair crews, and time-saving devices, which otherwise would permit of a cut-down in force, are of value chiefly in shortening the time the crews are busy on the line.

This saving can be utilized to some extent in making up spans and brackets, cutting strand into convenient lengths, and salvaging partly used material. But with the best of management there is bound to be much lost time.

The high cost of copper, and unfortunately it is a "safe bet" that no marked reduction will be made in the immediate future, points to supplies made from it as a field where savings may be possible. Malleable iron has already proved a successful and materially cheaper substitute for bronze in frogs, crossings and mechanical ears, but whether a satisfactory iron clinch ear can be produced more cheaply than one of bronze remains to be seen.

"Believe me, this talk about 'local conditions' is greatly overdone"

Steel trolley wire has been employed fitfully for at least ten years, but there is almost as much uncertainty over it to-day as when the first experiments were made. Part of this is doubtless due to failure to appreciate its limitations. If the steel wire is subjected to heavy service the cost of the larger number of feed taps required equalizes the trolley wire cost. If not so fed it soon fails, as it also does in any case if there are hard spots to cause arcing. If left unprotected there is apt to be trouble from rust, not so much by weakening the wire as by streaking up the cars when rain falls.

Most of the installations of steel wire have been in solid round or grooved form, but some very interesting results have been secured in the use of common "seven-strand." In one case where there has been a total of several miles put up, largely on down grades of double-track, the chief troubles have come as the indirect result of sleet. The cars bunched and apparently started together, burning some of the strands. Whether the use of that portion of the span wires between the two trolley wires as an electrical equalizer would correct this difficulty, and if so, whether there would remain a saving, and for that matter, whether there is really any saving anyway, remains to be seen. However, as said before, the field at least holds out promise.

Three-Wire Distribution and the Automatic Substation

Two other interesting developments have to do largely with the substation. "Three-wire" distribution, one "wire" being the rail, with sections of the trolley wire alternately positive and negative, has been discussed more or less for several years. Installations have been made both in this country and abroad. As the rail serves only as an equalizer the tendency to electrolysis is reduced. In the past the complications of the system have resulted in its discontinuance after a short use. There are, however, at least two properties (Pacific Electric Railway at Los Angeles, installed about three years ago, and Omaha & Council Bluffs Street Railway, spring of 1917), which are to-day using it. The Springfield Street Railway is also arranging a new substation for three-wire operation.

As a means of reducing high-potential gradients the change to the three-wire system is much less costly than a new substation or additional insulated negative returns. There is, however, as yet not enough evidence available to say how much of the benefit is offset by the operating complications and to the fact that the potential difference between alternate sections and corresponding parts of the switchboard is double the operating voltage.

The automatic substation finds its chief economies through the large cut-down in station labor, about 60 per cent in several instances. By distributing the capacity of one or more substations with long feeder lines among more frequent and smaller automatic stations it may also be possible to take down very considerable amounts of copper. At the same time power losses can be cut down in addition to saving labor and current by the use of the automatic operation itself.

But what can wisely be done in any case, as regards automatic substations, as well as all other possible means of saving, cannot be safely determined by theorizing on the part of the official concerned, let alone an outsider. All circumstances bearing upon the case must be brought together and considered. The conditions of to-day, and of to-morrow, as they now appear, call for far more such consideration than has been heretofore given to this matter.

Re-use of Line Insulators

IN the opinion of L. M. Klauber, San Diego Gas & Electric Company, companies having lines of various voltages are sometimes enabled to use old insulators on lower-voltage systems. This seldom pays, however, if the voltage steps are large, so that cumbersome insulators, subject to breakage and unnecessarily large pins, must be provided for use at the lower pressure. Some companies serving extensive territories in which a variety of service conditions are encountered find that insulators which have become inadequate in one district may be utilized for lines of similar voltage in sections where conditions are less severe. For instance, companies with lines along the seacoast may find that insulators which have proved to be inadequate under fog and spray conditions will give perfect service on the same lines in interior valleys.

On the whole, porcelain insulators, on account of their limited uses, offer a difficult problem when obsolete, and large numbers must be scrapped. It pays to have a few old types available for emergency connections and testing about any plant, for insulating stools and staging and for temporary service during construction work.

Strain insulators are more flexible devices, and if in good condition use may be found for most obsolete types. Glass "bobs," formerly used in large quantities in guys, are being abandoned for more dependable porcelain, but they will be found quite adequate for the house ends of service loops. They may also be used in the lighter types of guys, such as arm and bridle guys, and in dead-ending light secondaries. Two-bolt and small obsolete three-bolt guy chains should also be used up on these light guys.

Savings Attainable with Present-Day Car Design

This Article Shows How Each Element of the Car Design Affects Operating Economy Either Directly or Indirectly—Special Reference Is Made to Common-Sense Methods of Specifying and Testing Materials

By Norman Litchfield

IN his previous article introducing the subject of car studies the writer pointed out that a car is essentially a machine tool for the production of mileage. In any study of economies that can be effected in the operation of cars on an electric railway, therefore, there are three distinct general lines along which to pursue the possibilities, the first being an increase in production of mileage through reduction of the idle hours, the second an increased efficiency in the rate of production, and the third an improved quality of the product. It is readily seen that it is impossible to obtain results along these lines without co-operation of both the transportation officials and those responsible for the care of the cars, although in the first line, namely that of production, the transportation engineer stands more alone.

Getting More Revenue Miles from a Given Car

By the increase in production is meant the additional profitable mileage that can be produced with a given number of cars, by stimulation of travel through pleasure riding, special excursions, etc., or by other agencies which will permit the company's rolling stock to be used a greater number of hours per day than is now the case. On the average property this probably does not now exceed eight or ten hours.

This low figure, of course, is due to the fact that during the hours when people are going to and from their work there may be as many as sixty per cent more cars required than are needed during the remainder of the day, the latter number being determined largely by the interval necessary to be maintained between cars in order not to lose business. That is to say, during the middle of the day a prospective passenger will walk a reasonable distance rather than wait an undue time, or if the distance be too long to walk comfortably, he will complain either to his neighbors or to some regulating body, and if possible, withdraw his patronage altogether.

On the other hand, during the rush hour, the problem is chiefly that of transporting a maximum of passengers in a minimum of time, which often requires as many cars as can physically be operated over the tracks. This large number of cars, of course, is greatly in excess of the number required to maintain a reasonable interval in the middle of the day, and hence all operators have bent their efforts toward an increased use of these excess cars during the off hours.

By the efficiency in the rate of production is meant the increase in active mileage per car without the actual creation of new business, and the reduction of idle mileage. This phase of the subject has rather more angles to it than that of increasing the amount of production, being more affected by details. Among the chief possibilities are the following:

The reduction of the idle or non-revenue-producing mileage through storage facilities at both ends of the line, and the short-routing of cars by a careful study of the origination and destination of travel.

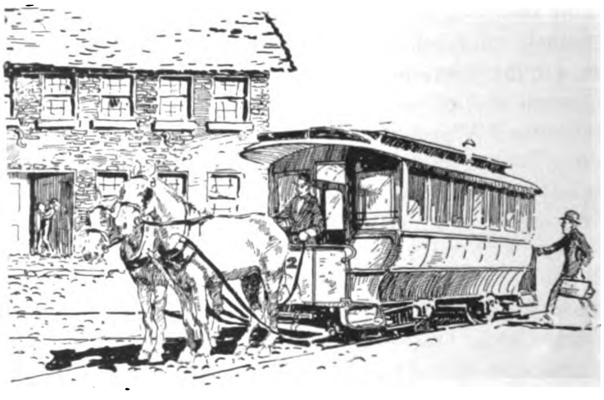
The increase of schedule speed through adoption of skip stops, higher rates of acceleration and braking, quicker interchange of passengers in loading and unloading through improvements in car design and fare collection facilities.

The reduction of platform charges through the use of one-man cars, two-car train operation, or double-deck cars.

The reduction of accident claims by providing conveniences for the motorman in the handling of his car, thus helping to prevent front-end accidents, and by improving the interchange arrangements so as to eliminate the boarding and alighting accident.

Last, but not least, the provision of all facilities possible to enable the large majority of honest conductors to obtain all the fares, and to restrain the small minority of dishonest employees from purloining fares. In this branch of the subject come also the use of devices to stimulate an increase in coasting, and of other devices and methods of saving power.

By the quality of the product is to be understood those features which tend to make the passenger satisfied, such as good lighting, heating, ventilation, and riding qualities, and freedom from delay or the discomfort and exasperation induced by the request to "take the next car," due to failure of the car equipment.

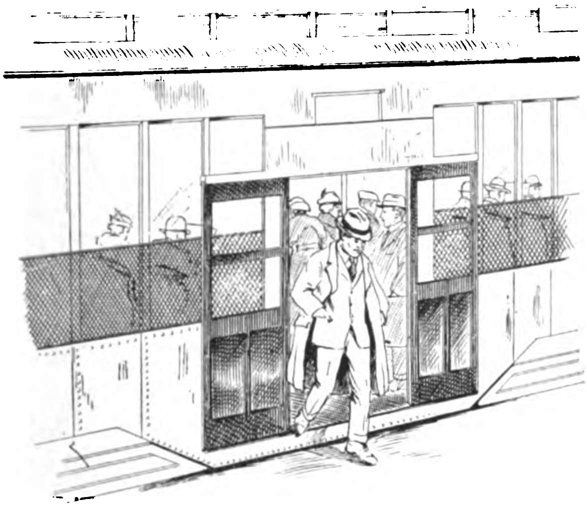


The form of the platform didn't make much difference when this car was built

As these studies have to do only with cars, we shall not dwell further on the subjects of short-routing and car storage other than to call attention in passing to the fact that an increased length of car means a larger house, and a heavier car, a stronger and more expensive building construction.

When we pass to the question of the increase in schedule speed, however, we find that the car itself becomes a vital factor in many ways. Much attention has recently been given to the so-called skip-stop system, and special stress has been laid on the increased schedule speed and the saving in power through the reduction in the number of stops and starts. It is evident that if the number of stops is reduced more people must be handled per stop and consequently platform and fare collection arrangements must be adopted to take care of the increased number of passengers without congestion.

But in addition to this feature there enters one which has not received so much consideration, namely, the fact that in low-speed operation such as city service, the cost of car maintenance is very largely affected by the number of stops per mile.


Make it as easy as possible for passengers to board and alight

The cost of maintenance of car equipment on a well-managed road will run from 2 to 2½ cents per car-mile. Taking an average of say eight stops per mile this would amount to a maintenance cost of about ¼ cent per stop. It cannot be claimed, of course, that the cost of maintenance increases or decreases in exact proportion to the number of stops, but on the other hand it is quite clear that if a car needed to make but one start during its whole trip, the wear and tear on the equipment would be tremendously less than under the actual conditions, where many stops per mile have to be made. Trolley poles, controllers, motors, doors, brakes, wheels and so on *ad infinitum* would bear eloquent testimony to the difference in operating conditions.

No car equipment man needs to have pointed out to him the difference in life of the same type of brakeshoe on different lines having unequal numbers of stops per mile and the humble brakeshoe may well serve as a measure of the severity of the service. Thus it is certain that the skip-stop has a marked effect on the cost of car equipment maintenance.

Proper Stepping of Resistors Permits High Rate of Acceleration

The possibilities through increased rates of acceleration and braking, use of proper gear ratio, and coasting devices, all have their influence on the schedule and the cost of power. They have received so much attention, however, that it seems unnecessary to dwell upon them here, further than to point out that a high average rate of acceleration can be maintained without danger of slipping the wheels and without discomfort to the passengers, provided the individual resistance steps are properly proportioned so as not to deliver a violent blow either to the passengers or to the wheels.

It must be borne in mind that any shock is the result of two things—the moving mass and the instantaneous rate of acceleration. That is to say, with an average rate or acceleration as low as 1 m.p.h.p.s. and an improperly graduated resistance, excessive instantaneous or momentary rates of acceleration are encountered—(possibly as high as 10 m.p.h.p.s.), which are exceedingly uncomfortable and which slip the wheels. On the other hand, if the resistance is properly graduated and the controller is skillfully manipulated a steady rate of 2 m.p.h.p.s. or even more can be maintained without difficulty. Similarly the rate of braking can be increased, either by an increase in the cylinder pressure or some slight change in the brake rigging so that the maximum force on the brakeshoes can be exerted which experience has shown to be desirable.

Making It Easy for Passengers to Board, Alight and Pay Fares

No phase of car design has perhaps received greater attention in the last few years than that of passenger interchange and fare collection, resulting in the development of a number of very interesting types of cars, and consequently in the formulation of certain fixed fundamentals. Among these are the carrying of the floor as close as possible to the ground, the reduction or elimination of steps, the provision of convenient means for operating doors, the use of fare boxes, and safety interlocks between doors and car control. All of these features contribute to the ease of operation of the car, increasing its schedule speed and reducing accidents. They are therefore classed as economies.

The one-man car, the double-deck car, and the two-car city train are in the same category in regard to economies to the extent that all are designed to provide transportation facilities of character equally as good as the more nearly standard types of car, and at a reduced platform cost. It would seem that the small one-man car of very light weight should prove increasingly popular in many classes of service, just as the two-car train is doing in others. While the double-deck car has not come into general use, it is probable that its capabilities and possibilities have not as yet been fully exhausted.

Passenger Comfort Features Can Be Improved at a Saving

When we come to consider the quality of the product which the car, considered as a tool, turns out, such comfort features as lighting, ventilation, heating, riding qualities, etc., would seem to be in the nature of luxuries, rather than economies. But inasmuch as they all form features of present-day car equipment that cannot be dispensed with, a little consideration will show that quite considerable economies can be effected by proper design and maintenance.

Take, for instance, the matter of lighting. The successful development of the tungsten lamp soon led to its general adoption for car lighting, and now the practical discontinuance of the manufacture of carbon lamps makes the use of the tungsten lamp imperative. It becomes important, therefore, to select very carefully the characteristics of the lamp which is to be used. The old carbon lamp in general use was of 16 c.p., consuming about 60 watts. Where voltage conditions were reasonably good this was generally considered to provide adequate lighting.

In changing to the tungsten lamp, consideration should be given to the points on the line where low voltage occurs and to the importance of maintaining adequate lighting at these points. A question also is the amount of light which it is necessary or desirable to provide. For instance, it is generally agreed that from 1½ to 2 foot-candles at a plane 36 in. from the floor give adequate illumination, but if very wide fluctuations of voltage occur, and the lighting is designed to give 1½ foot-candles at the lowest point, then at the high-voltage points a very much greater degree of illumination is obtained. As the life of the tungsten lamp falls off very rapidly with increases in voltage, it is important that a lamp of proper characteristics be selected, so that a reasonable life will be obtained.

The photometric determination of illumination in a car is very simply made, and a check-up of this kind will often point the way to considerable operating economies. A step further, and one which in many cases is desirable, is to purchase the lamps to a specification requiring certain tests to be made in the presence of an inspector. Study of the operating and manufacturing conditions will finally dictate the selection of a lamp which will have the most desirable balance of life, power consumption and illumination.

A further point is that considerable increase in illumination can be obtained by a change in the color of the ceiling. These points, it is to be noted, are exclusive of any change in the arrangement of the lamps or of addition of reflectors, all of which may involve alterations to an extent not always justified.

Facility of passenger interchange is an essential of quick transportation

With regard to heaters the most obvious possibility of economy is in some method of operation whereby no more than sufficient heat will be provided. Much can be done by proper co-operation with the transportation officials in the issuance of orders for the use of the heaters and the control of the doors, especially in cars having end doors. A simple test of heating any car to a given point, then turning off the heat and recording the temperature, say, every minute, with the car standing still, and then repeating the test with the car in actual service, will prove very instructive. It will show how much heat is lost through opening doors, ventilation, etc.

Thermostatic regulators are also now receiving some attention, but inasmuch as they require an extra investment and add a hazard or element of failure and possible complaint, it is well to make a careful study of the actual total amount of heat used for power in an average year, and the actual amount of excess heat that is supplied by the existing graduations of heat control by the ordinary switches. These data, together with the cost of power (coal and water only if the company manufactures its own power) will give an indication as to whether regulators will prove desirable or not.

Keep the cars out on the line—run-ins are expensive

The conclusion will be influenced by the relation between the total numbers of cars owned and of car-hours operated. That is, sufficient regulators must be purchased to equip all cars, whereas only a certain proportion of these cars will be used enough hours each day to make the current saving profitable. The matter is also further influenced by the character of the climate, frequency of stops, kind of service, etc., so that it is essentially one in which the existing local conditions must be carefully studied. In studying this question it should be understood that the difference between the power used in winter and that used in summer does not necessarily represent the heater load, as in winter season, more passengers are often carried, more stops are made per mile, vehicular congestion is greater, etc., these items sometimes in themselves causing a large increase of energy used per car-mile.

Heavy Trucks Not Essential to Easy Riding

Good riding qualities in a car are naturally desirable and are often thought to be obtainable only at the expense of excessive weight. It is very questionable whether even very high speeds require weight, in itself, to produce ease of riding, and it is certain that ordinary speeds, say up to 45 m.p.h., do not. The essentials are chiefly a proper side-swing motion adequately damped against excessive lurching, sufficient side-bearing and pedestal clearance, and correctly designed springs. Inasmuch as the cost of each additional pound has been estimated by various authorities to amount to as much as 5 cents per pound per year, it is evident that it is exceedingly wasteful to apply weight to a car simply with a view to improving its riding qualities, when this result can be accomplished otherwise. Instances have been met where it was possible by careful redesign to eliminate as much as 8000 lb. per car. For each lot of 100 cars this would amount therefore to $40,000 per year, a very substantial saving.

In the elimination or reduction of run-ins caused by car equipment failures we strike a mine whose depths cannot be plumbed in the limits of such an article as this. There are, however, certain outstanding features to which attention may be called, the chief of which is the constant recording and analyzing of recurrent failures.

From the analysis comes the knowledge making possible the redesign of the offending part, or the formulation or adoption of a specification or practice which will prevent the repetition of the failure. The word "specification" should be taken in its broadest sense, not necessarily a detailed statement, but possibly simply the adoption of some one make of article which has proved satisfactory. The chief thing is not to keep on replacing the very thing which has proved a failure.

LOCAL
EXPRESS

Some people are naturally in a hurry—Utilize this trait by providing suitable entrances and exits

Instances of the above will immediately suggest themselves to all familiar with car equipment, one of the most striking being that of gearing, where improvements in materials and their proper selection for the service have resulted in an increase in life from a former figure of 50,000 miles to one of more than 200,000 miles.

Each Road Needs at Least One Defect Analyst

Two questions naturally arise for the average road, one being how to make use of the scientific knowledge available from different sources, the other how much use should be made of specifications and inspection services. Should each road have its own force, however small, for the scientific analysis of problems, should it go for information to other and larger roads, or is it desirable to employ outside consulting engineers? Similarly, should the road attempt to inspect its own materials, or employ the services of inspection bureaus? This is a problem which can, of course, be settled only by each individual management. Roughly speaking, it may be said that in each organization the attempt should be made to include at least one man whose duty shall be to attend to the recording and analysis of failures and to keep in touch with those roads and engineering associations which are developing or recording methods and materials which have proved satisfactory.

As to detailed specifications, their uses are twofold: first, to insure obtaining the material desired, and second, to yield the advantages of competition which could not be made use of if but one definite make of material were named to the exclusion of all others.

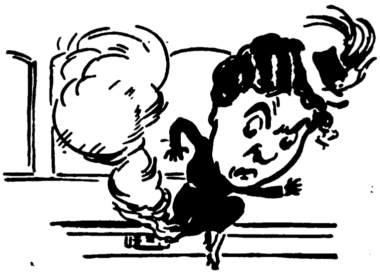
In connection with both of these points, however, two things must be borne in mind. The first and more important of these is that if the user does not understand the specification it will often be wiser for him not to use it at all but depend rather on the word and experience of some reputable manufacturer. It is self-evident that no specification, however carefully drawn, can supply a lack of experience or integrity on the part of the manufacturer. There are extant a number of specifications which are a "hodge podge" of extracts from various originals combined by inexpert hands into a heterogeneous mess. The various provisions of these are absolutely contradictory, and hence make them the laughing stock of reputable manufacturers and tend to make the latter "gun-shy" of any specification not prepared by themselves. Faulty specifications, and their incorrect use, therefore, do not tend to economy.

The second point has to do with inspection of materials. Here an attempt should be made to analyze requirements so as to determine fully just what materials are most vital to have properly inspected and tested, and what others can be purchased from ordinary merchantable stock, for the tendency in inspection, as in many other things, is to degenerate into red tape. Such inspection as can conveniently be made by the company's own employees should be so handled, and the balance should be turned over to reliable inspection bureaus.

Don't Hesitate to Conduct Tests and Inspections

Conditions vary considerably with the size of the property and its local situation, but the following would seem to be a reasonable procedure in connection with miscellaneous materials. Taking first the materials themselves, the chief supplies used for car equipment are gray iron and malleable iron castings, bar iron, steel shapes and plates, steel castings, copper cable, insulating materials, brass castings, bar copper and lumber.

Cast iron, being generally used in places where there is little tensile or bending stress, will usually be found satisfactory provided it is of good, soft, gray quality. This is easily ascertained by fracture. So with malleable iron, which is used in places where some degree of flexibility is necessary, the quality of the product can generally be determined by bending. When it comes to bar iron and steel, we enter the region wherein it may be well to resort to more elaborate tests. But here again the engineer need not sacrifice his judgment to the fetish that "everything must be tested."



Heater regulation will avoid this

If the material is for a piece the failure of which does not affect safety, and little trouble has been experienced with the part, ordinary stock material may be used at less cost than if rigid specification were required.

To insure reasonably good open-hearth steel, two simple tests can be made. In one the piece is bent cold around a 1-in. radius, and in the other a chemical determination of the percentage of phosphorus which it contains is made. The phosphorus content should not exceed 0.07 per cent. As the importance of the piece grows the specifications may be made more complete until the full tests required in the standard specifi-

Betterments Available in Car Equipment

Why and Where It Will Pay to Use the Newer Motors and Control, Large - Unit Lighting, Thermostatic Regulation, Car Checking Devices, Etc.

By C. W. Squier
Electrical Engineer.

THE spirit of the day is "economy" and "efficiency." Never before in our history have these two essentials been so impressed upon us. We have learned to retrench in fuel, food and all things connected with our daily needs as individuals, and we are learning to make what we have do twice the work we previously expected it would perform.

The cost of transportation is subject to the same rules as the cost of other commodities. Its cost of production must be restricted and reduced, and our car equipment so readjusted and operated that increased efficiency will result. In the past great strides have been made in rendering better service with lower costs of operation. Now any methods by which the capacities of our transportation system can be increased or their costs of operation reduced are of paramount importance.

Up to approximately five years ago safety and reliability in electric-car equipments were considered the first requisites. Heavy construction was considered necessary in order to meet the extremely trying operating conditions of railway service and to decrease the troubles of operation and the resulting maintenance costs. The life of all wearing parts was increased and operating engineers bent all their energies toward keeping maintenance costs as low as possible. As the limit in this direction was approached the fertile mind of railway engineers cast about for some other means of reducing costs of operation. Saving power appeared to offer the largest field for economy, as this constituted one of the largest operating cost items.

A demand for the reduction in weight of all car and equipment parts was the first that occupied attention. Articles were written by many engineers who figured the costs resulting from carrying around the dead weight of the car and its equipment. These figures varied from 3 to 10 cents per pound per year as the conditions and service varied. The results were, however, that all manufacturers of railway equipment were forced to redesign their apparatus. By the use of high-grade metals, pressed-steel shapes and better insulation, the weight was reduced and at the same time other vital characteristics received careful study to reduce power consumption wherever possible. The results that have been obtained are astonishing and the limit has not yet been reached.

Let us consider the various groups of apparatus comprising a car equipment and see what improvements have been made that are conducive to energy and labor saving.

Making Better and Lighter Motors

As the motors are used for propelling the cars we naturally expect to find the greatest saving in energy through improvement in their design.

The saving in power, the greater electrical efficiency produced and the decreases effected in maintenance costs have resulted primarily from the following improvements:

1. Better mechanical and electrical construction.
2. More efficient methods of lubrication.
3. Slotted commutators and high-grade brushes.
4. Interpole field windings.
5. Self and forced ventilation.
6. Reduction in weight.
7. Higher grade insulation.
8. Choice of correct gear ratio.
9. Lower armature speed.
10. Tapped field windings.

After the experimental and early development stages of railway motor construction had passed, there followed the period, already referred to, when the energies of railway engineers were directed toward reliability and increased life in operation. This resulted in the development of the magnificent motor equipments that are now found on our electric roads.

(*Concluded from page* 499)

cations are made. The above often holds also for steel castings, as in many cases a piece has only to withstand stresses which are but slightly in excess of these which could be met by the use of cast iron.

The copper parts and insulating materials are very generally put to use where safety and durability are prime features and hence should receive the maximum degree of care in selection that the user feels justified in applying. As the manufacturers are fitted to make the necessary tests at their own plants it is comparatively simple to have an inspector witness the necessary tests.

The requirements for lumber on the average car are not severe enough to necessitate elaborate tests, simple inspection being usually sufficient. Completely fabricated parts of special nature such as gearing, brushes, lamps, brakeshoes, buses, etc., can be effectively checked up as to their relative cost and efficiency by simple tests in the shops, and by recording the life and the mileage, at a cost the sum total of which is insignificant compared with the possible economy.

In all these matters it should be borne in mind that there are "acid tests" of the desirability of any specification or requirement. Will it make the article (1) safe, (2) more durable, (3) cheaper? The purchaser must be convinced that every requirement of the specification tends to one or more of these ends, and if he cannot be so convinced, it is often better to omit the requirement.

The first two groups of improvements enumerated above belong to this period and need not be described here, as they are a matter of history which has been fully treated in many articles in the ELECTRIC RAILWAY JOURNAL and elsewhere.

Present 1500-Volt Motors Less Troublesome Than Old 500-Volt Types

The development of the interpole or commutating-pole motors was brought about in an endeavor to reduce operating troubles and maintenance costs. This design was introduced and perfected during the period from 1907 to 1911. Previously one of the greatest troubles with direct-current motors was in commutation. The introduction of commutating poles, together with undercutting the mica of commutators and the use of high-grade carbon brushes which occurred about the same time, overcame this last serious objection.

The conductor has a lot to think about—Make his labors as light as possible

Those who have had experience with older types of motors, especially before these improvements were adopted, will remember the frequency with which the commutators ran black and developed flat spots. The lathes in the maintenance and overhauling shops were kept in constant use turning down and sandpapering commutators. As a result commutator wear was very rapid and it was necessary for manufacturers to make the segments very deep to provide for this wear. Now the wear of commutators is so slight that it can hardly be detected after a year of service, and the depth of segments is made only sufficient for proper insulation and mechanical strength. The wear of the brushes was also very rapid, due to the excessive sparking at the commutator, and it was necessary also to use a brush with high abrasive properties to cut the mica. With the slotting of commutators hard brushes were no longer necessary and brushes with greater conductivity came into general use.

Another great advantage that has resulted from these improvements is in the use of higher voltage circuits, which has increased reliability of service. Now motors are made to operate on 1500 volts and have less commutator trouble and operate better than did the old motors on 500 volts.

The principal saving that has resulted from these improvements is in the reduced maintenance and repair costs which have been given by some reliable authorities as from 50 to 75 per cent. These improvements have also made possible the carrying of heavy overloads on the motors, permitting higher rates of acceleration and therefore more economical operation. They have also made possible the use of field control with its resulting economy.

The first railway motor did not have an enclosing frame. All parts were exposed and consequently well ventilated. Vital parts were easily damaged, however, and due to the exposed location of the motors it was found necessary to inclose all parts by the frame. This added greatly to the reliability of the motor, but prevented proper ventilation.

As service conditions grew more severe it became evident that much could be gained by ventilating the interior parts and forcing air through the windings. The first step in this direction was to ventilate the armature and depend on its fan effect to keep the air circulating. This was a step in the right direction, but all heat had still to pass through the frame by conduction. By providing openings in the frame and additional ducts and channels in both frame and armature the present ventilated motor has been developed.

The various stages in the development in motor ventilation were shown very clearly by a series of diagrams in the ELECTRIC RAILWAY JOURNAL of May 15, 1915. On some locomotives air is forced through the motors by motor-driven blowers, but the construction most used provides a fan on the armature which draws air in and drives it through the armature and fields and by shields and ducts deflects it and again expels it to the outside of the motor. The effect that this has in reducing the temperature and increasing the capacity of the motors is simply tremendous, and it has resulted in increasing the continuous capacity of motors, which ordinarily is not more than 45 to 50 per cent of the one-hour rating, to 65 to 80 per cent of this rating.

The benefit that can be derived from self-ventilation depends upon the schedule speed that is to be maintained and the gear ratio used, since the amount of ventilation obtained is a function of the armature speed rather than the car speed. Thus in city service much of the operation is at low speed, with the fan practically inactive, and the benefit derived will be comparatively small. In high-speed interurban service, with long runs, great benefit is obtained. With a separate blower for circulating the air the ventilation is, of course, independent of the speed.

Motor Weight Reduction Alone Can Save $42 per Car per Annum

The weight of motors has been reduced by careful designing and proper proportioning of parts so as to eliminate all useless material. High-grade metals have been used to a greater degree, and many parts formerly made of cast iron are now made of malleable iron or steel. Great improvements have been accomplished in making these steel castings so as to permit the use of thinner sections than had been possible to cast theretofore. This has reduced the amount of useless material and resulted in a corresponding saving in weight.

Pressed-steel shapes have been used more extensively also, and heat treating of steel has been perfected to bring about other savings in weight. These improvements, together with the latest ventilating practice have resulted in a saving of from 15 to 40 per cent in weight, as compared with the old-style, totally-inclosed motor. The exact percentage depends upon the commercial sizes and speeds available.

To take a concrete example, suppose we consider a two-motor equipment with old motors weighing 2700 lb. each replaced by motors weighing 2000 lb. each. This gives a saving in weight of 1400 lb. per car. At an assumed operating cost of 3 cents per pound per year there would result an annual saving of $42 per car per year. Now consider a road that is in the market for 200 new equipments. The reduction in the weight of the motors which this road could now purchase will represent a saving of $8400 per year.

Better Insulation Is Equivalent to Increase of Motor Capacity

By employing a higher grade of insulation, with greater heat-resisting qualities, the capacity of motors has been increased through the raising of the safe temperature limit.

Soldering material with a higher melting point has also been used. This is important since heavy and sudden overloads of such short duration that they do not cause excessive heating of the armature coils, often last long enough to melt the soldered connections or to cause them to soften sufficiently to permit the solder to be thrown out by centrifugal action.

Better lubrication is a factor in conservation

This increase in the capacity of motors will enable a lighter motor to be used for a given service and also will permit a higher rate of acceleration in operation, thus reducing the average power consumed.

Re-Gearing Costs Less Than 5 to 10 per Cent Power Waste

The use of incorrect gear ratios for railway motor equipments has caused great losses to operating companies. Gearing that was suitable for operating conditions when the motor equipments were purchased will likely prove unsuitable as the service becomes more exacting. When we consider that in city and suburban service a majority of the work done by the motors is at speeds less than 10 m. p. h., we begin to realize how important it is to be able to accelerate rapidly.

In checking over the service conditions of a large railway system operating city and suburban service, I find that 37 per cent of the total mileage made is in congested sections where a schedule speed of 7 m. p. h. is as high as can be obtained. Thirty-eight per cent of the mileage is in sections where from 8 to 9 m. p. h. is the highest speed practicable, and only the remaining 25 per cent is in sections where the cars can maintain a schedule speed of more than 10 m. p. h. The maximum speed for such sections is less than 11 1-2 m. p. h. It is thus seen that the period during which cars can operate at maximum speed is very short, and a grave error is made by providing gearing for high speed when there is no opportunity to obtain it. A typical cycle for such service is rapid acceleration, short coasting period and rapid braking. Consequently the most efficient operation is with the lowest-speed gearing that will give the required schedule speed, with a reasonable margin for congested conditions and the making up of lost time.

Few outside of those who have made a special study of this question realize its importance and at the present time there are a great many motors operating in service which are so geared as to cause a continual loss to the operating company. Without doubt 5 to 10 per cent of all the power used for propelling electric cars and trains could be saved by the use of correct gearing.

In order that a motor may be economical in power consumption it must have a low armature speed, with as high a gear ratio as the service will permit. In comparing the power consumption of two motors, with the same gear ratio but different armature speeds, the one with the armature of lower speed will show a decreased power consumption in one of the following two ways, namely, it can produce the same rate of acceleration with less current, or with the same current it will give a higher rate of acceleration.

This saving will be found much more pronounced in a service with frequent stops. In comparing two equipments in a city service with nine stops per mile and a schedule speed of 9.2 m.p.h., it was found that the slow-speed motor used 0.46 kw.-hr. per car-mile less than the high-speed motor, or a saving of 10.9 per cent in its favor. This was due to the more rapid acceleration of the car with the slow-speed motor, so that the accelerating current did not continue so long, and with the same amount of coasting the brakes were applied at a lower speed. Part of this saving is, therefore, due to lower rheostatic losses and the remainder to the smaller amount of stored energy wasted in braking.

How Field Control Saves $100 per 35,000 Miles

The first designs of double-reduction motors provided for controlling their speed by varying the effective turns in the field winding. This was known as the "loop" system and was quite familiar on our first electric roads. This method of speed control proved a failure at that time, due principally to the difficulties encountered in commutation as the fields were weakened.

Improvements in motor design, together with the use of interpole field windings, slotted commutators and high-grade carbon brushes, so improved commutation that railway motor designers have again taken up this method of control, with surprising success. The first method of field control consisted of shunting portions of the field windings through a resistance. The latest method differs from this in that, instead of shunting the field, approximately 40 per cent of the full field winding is cut out. The advantages gained by this latter method are that the use of a non-inductive shunt around the field is avoided. This, with solid-frame motors, produced flashing.

Let us consider how a tapped-field motor saves power, and what saving can be expected by the use of tap-field control. This saving in power is the result of more efficient acceleration. By comparing the characteristic curves of the motors, one a slow-speed motor without field control and the other the corresponding motor with field control, we find that the speed of the field-control motor, when operating on normal or tupped field is about the same as that of the other motor, while the speed of the field control motor when operating with full field is much lower.

In accelerating the full field is used and the rheostatic losses will be less, as the grid resistors have less resistance and are not in circuit for as long as is necessary when using a motor without field control. The tapped field is used for running, so that the same speed is obtained as with the non-field-control motor and the braking losses remain the same. A further advantage is also obtained by use of the field-control motors when the same car is required to operate in service of different character. Thus for combined city and suburban service field control provides more economical operation over the slow-speed city sections in that it permits the use of a gear ratio most economical for this service, and with the same gear ratio provides the higher speed necessary for suburban service.

As an illustration of the saving that may be expected from the use of tapped-field motors consider a two-motor equipment where the tractive effort per motor necessary to produce the desired acceleration is 2000 lb. The relative values of current necessary to give this tractive effort are 83 amp. with the non-field-control motor as compared with 76 amp. with field control, and the corresponding rheostatic losses are 1.4 watt-hr. per ton as against 0.7 watt-hr. with field control. The tapped-field motor, then, saves 0.7 watt-hr. per ton every time the car starts. With a car weighing 30 tons and making eight stops per mile the saving in rheostatic losses alone will amount to 0.168 kw.-hr. per car-mile. The total saving from employing field-control motors in the service will amount to 0.38 kw.-hr. per car-mile. Considering that energy costs 3/4 cent per kilowatt-hour at the car, and assuming that the car makes 35,000 miles per year, this saving would amount to approximately $100 per car per year.

Concentrating Control Saves Weight, Wire and Conduit

At the same time that new motors were being developed, the old ones were receiving much attention from operating engineers and master mechanics with a view to cutting down maintenance costs. Wonders have been performed in this field, and now it is essential as never before to introduce still further economies if profits are to be made by the average road.

The design of railway control apparatus has kept pace with the improvements in motor construction and many operating economies have been made possible by the advance made in control equipments. The following are some of the improvements in control that have aided in producing high service efficiency and operating economies:

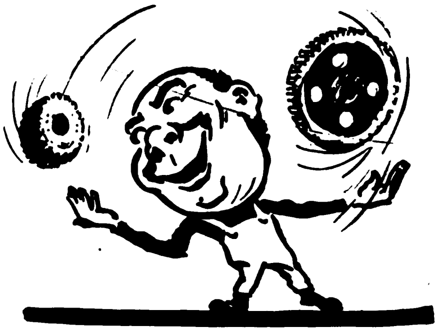
1. Simplicity of construction.
2. Greater reliability.
3. Consolidation of parts into single units.
4. Reduced weight.
5. Improved materials.
6. Automatic acceleration.
7. Selective acceleration.
8. More efficient use of resistance.
9. Arrangement for field control.

One of the most notable advances has been the tendency to seek simplicity and reliability and to combine various small pieces of apparatus into larger units. In the equipment for surface cars a return has been made to more general use of the shunting method of transition from series to parallel, instead of using the bridging feature, which required a greater number of contacts or switches. These changes are producing lower maintenance costs and reduced cost for replacement parts.

The combining of various pieces of control apparatus and assembling them in a single box, which applies particularly to switch-group control, simplifies the control connections, reduces the labor and time of inspection and provides a lighter equipment.

Switch Group of World's Biggest Rapid-Transit Car Weighs Only 900 lb.

The effort to reduce weight has not been confined to car bodies, trucks and motors, but has been extended to control equipment in a marked degree. The consolidation of various parts comprising an equipment into single units, just referred to, has produced astonishing results in weight reduction. In the control equipments used by the New York Municipal Railway on their new subway cars, the switch group which is designed to handle two 200 hp. motors weighs but 900 lb., scarcely more than half the weight of the former control outfit of similar capacity.


Skill in the selection of gearing conduces to economy

By combining all the main-circuit apparatus in a single box a further reduction in weight has resulted, due to the decrease in the amount of cable and conduit required and in the labor and consequent cost of installation.

Another marked saving in weight has been effected by a special design of grid resistor, whereby the weight of a set has been reduced approximately 40 per cent without loss in continuous capacity.

Not only has the weight of resistors for a given capacity been decreased by better ventilation and increased radiation, but control connections, also, have been rearranged so that the same section of resistance is used several times in increasing the voltage on the motors, by using it in series and again in parallel with other sections. Previously when a section was cut out it remained inactive during the remainder of the period of acceleration. This improvement gives a more efficient use of the resistors.

Smaller Control Accelerates Passenger Interchange

A large part of the equipments now being supplied are of the switch-group or multiple-unit type of control. Some of the many advantages possessed by this type of control are:

1. Better location of apparatus.
2. Less platform space occupied.
3. Less liability of accident.
4. Greater flexibility for operation.
5. Decreased maintenance.
6. Automatic acceleration.

The removal of the controller from the platform is important because the greater the space that can be used for boarding and alighting the less will be the resulting congestion and the shorter will be the stops. This produces a saving in time that is at once apparent in the increase that results in schedule speed, while the saving in platform wages and passenger time is well worth considering.

This effect of the length of stop on operating results and costs is very clearly illustrated in the article by J. F. Layng in the ELECTRIC RAILWAY JOURNAL for Jan. 5, 1918. This shows an increase of one-third in the cost of platform wages alone by increasing the duration of stop from five to fifteen seconds with nine stops per mile.

The removing of the main circuit apparatus from the car platform reduces the liability of accidents from controller explosions and burnouts, with consequent reduction in accident damage suits.

Automatic Acceleration Promotes Faster Schedules

Another great saving is possessed by switch-group control arranged for automatic acceleration in that it eliminates the energy waste in the first or accelerating part of the operating cycle by removing the personal element in operation.

Designing engineers make very careful calculations for the values of the various resistance steps in order to obtain smooth acceleration and prevent abnormal current peaks. They assume a certain definite rate of notching for cutting out these resistance steps. With hand-operated controllers this is seldom obtained.

The effect that the rate of notching has on current values and power consumption is very clearly shown by the curves given in my article on "Resistance Standards" in the issue of the ELECTRIC RAILWAY JOURNAL for May 11, 1912. A saving of from 5 to 7 per cent in the total power used could be obtained on most roads if the controllers were operated according to the methods assumed in the design of the apparatus. Automatic acceleration does away with the personal element and assures the engineer that the equipment will be operated as desired.

Another saving with automatic acceleration is in obtaining at all times the maximum rate of acceleration for which the equipment is designed. It is frequently found that where a line is operating under a fairly easy schedule the motorman will accelerate slowly and, no doubt, operate with the motors in series a large part of the time. A study of the energy required for different rates of acceleration is very interesting. With a specific equipment operating in city service the following results were obtained:

Rate of Acceleration M.p.h.p.s.	Watt-Hours per Ton Mile	Per Cent Saving from ¾ m.p.h.p.s.
¾	110	
1	90	18.2
1¼	83	24.5
1½	78	28.2
2	76	30.9

The difference in energy saving is considerably less between the high rates of acceleration than it is between the low rates. Thus the difference between accelerating at 1½ and 2 m.p.h.p.s. is only 2.7 per cent, while between ¾ and 1¼ m.p.h.p.s. it is 24.5 per cent.

Selective Acceleration Is Another Refinement

In order to obtain the same rate of acceleration for all loads between maximum and minimum, what has been termed selective acceleration has been developed. On the subway cars of the New York Municipal Railway this is accomplished by having two windings on the limit switch. One coil is in series with the main motor circuit, while the other is wound so as to oppose the first and is connected to a storage battery through a variable resistance. This resistance is cut out automatically as the load on the car increases, so that it will take more current through the series winding to counteract the current in the battery circuit and therefore to cause the "limit" to operate.

This feature not only produces economy at the car but permits trains to get away from stations faster and makes them respond more rapidly at signals, thereby increasing the capacity of the road.

Another great advantage accomplished by this improvement is in connection with field control. In changing from full to short field with tapped-field motors there is a sudden increase in current. This current swing mounts very rapidly as the lower current value, from which the change is made, is increased. Thus if the change from full to tapped field is made at 200 amp. the current will increase to 340 amp., and if it is made at 275 amp. it would swing to 450 amp. By the use of the double winding on the limit switch, just described, this change is always made at the lowest setting of the limit switch, which is 200 amp., and this current swing is constant and moderate.

Faster Braking Results in Energy Saving

Time saved while stopping a train is just as valuable as time saved during any other part of the operating cycle. Improvements in air brakes have made it possible to use a higher rate of retardation for stopping and also they have reduced the time necessary to apply the brakes so as materially to reduce the stopping distance and time necessary for bringing a train to rest.

Conditions remaining the same, any increase in the braking rate produces a decrease in power consumption, since the car or train can be allowed to coast longer and the brakes can be applied at a lower speed. Thus less of the stored energy of the car will be consumed during the braking period. This saving is shown directly in the decreased time that power must be used in order to maintain the required schedule speed.

Electro-Pneumatic Brakes Stop a Train in 330 ft. Instead of 580 ft.

By using electricity to actuate the air valves of the compressed air brake, the following advantages have been obtained:

1. The difference in time, at which brakes are applied on the front and rear cars of a train is eliminated.
2. The probability of rough handling is reduced.
3. The difference in time, between the movement

of the brake valve and the application of the brakes is reduced.

4. Brake-cylinder pressure and the resulting retarding force is developed more rapidly.

5. Higher rates of retardation can be employed.

6. The limits in the length of trains are removed.

The largest saving that has been accomplished by the use of electro-pneumatic brakes has been obtained by increasing the braking rate. Previously it was not possible to use a rate of retardation anywhere near approaching the holding power between the wheels and the rail. This was due to the fact that in applying the brakes pneumatically the application began first at the front end of the train, and this interval between brake application at the front and rear prevented using the maximum rate of retardation at the front end or shocks would occur so severe as to damage the car equipment and be injurious to passengers. By the use of the electro-pneumatic features a rate of initial retardation has been made possible at least ten times that formerly used without damage or inconvenience, since the brakes are applied on the rear of the train at nearly the same instant as at the front.

It is also practicable to use a maximum rate of retardation approaching very closely to the holding power of the rail. Compared on this basis, brakes applied electro-pneumatically will give 100 lb. brake cylinder pressure in two seconds, with a braking ratio of 150 per cent, and will stop a train from 40 m.p.h. in 330 ft., while when applied pneumatically they produced 60 lb. cylinder pressure in 6.6 seconds, a braking ratio of 120 per cent and at 40 m.p.h. required 580 ft. to stop the train. A saving in distance of 250 ft. is obtained in this instance by the use of electro-pneumatic brakes. This means a great deal on lines where it is necessary to operate to the full capacity of the tracks, as the length of the blocks used in signaling depends on the distance that is necessary to bring a train to a stop. With shorter blocks trains can follow each other more closely and so the capacity of the line is increased.

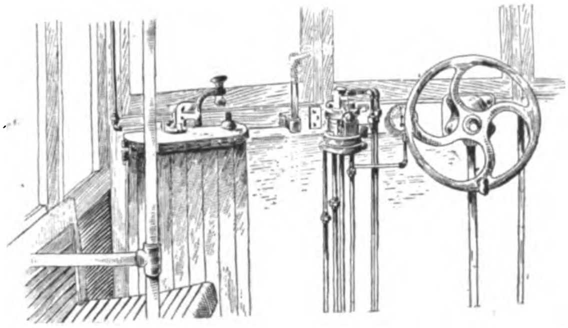
The stopping distance with the pneumatic brake will increase as the length of train is increased, while that with the electro-pneumatic brake is independent of train length. The length of train that can be operated is thus limited by the use of the pneumatic brake while with electro-pneumatic brakes any length trains are feasible as far as the brakes are concerned.

The value of increased braking rates on electric cars or trains makes itself manifest in a decreased power consumption if the same schedule speed is maintained or in an increase in schedule speed with the same power consumption. This follows since, with the same schedule speed, an increased rate of retardation will allow an additional amount of coasting and enable current to be cut off the motors sooner. The energy saved in average city service by increasing the rate of retardation from 1 to 1½ and 2 m.p.h.p.s. will average about 8 and 11 per cent respectively.

Since a high rate of retardation produces the greatest economy it is desirable to maintain the maximum rate with a loaded car or train as well as with a light one. A braking power sufficient for a light car is inadequate for one loaded, and if the braking power is designed so as to use the adhesion of the loaded car it would obviously produce sliding wheels when the car is empty. The variable-load brake, which has had its first installation in passenger service on the cars of the New York Municipal Railway, fulfills this requirement.

On these cars a full passenger load represents 45 per cent of the light weight of the car. The increase in train weight if the same braking pressure were used would mean practically a proportional increase in braking distance. It will be readily appreciated that the improvement prevents a serious waste of time and decreases the distance between trains at limiting points so as to increase the capacity of the lines.

Briefly, this automatically provides an increase in brake-cylinder pressure as the load increases, by increasing the volume of the auxiliary reservoir. This change in reservoir capacity is accomplished by the use of an additional reservoir divided into compartments of various sizes, and connected to the auxiliary and supplementary reservoirs through ports controlled by a slide valve. The movement and position of this slide valve is automatically adjusted by the variations in weight on the truck springs due to changes in passenger load. An accurate adjustment of braking power in ratio to load is thus obtained.


These are the tools that the motorman works with. Give him the best

In some tests made under operating conditions with a view to determining what saving was effected by the use of this improvement in stopping loaded trains, it was found, with the brake-cylinder pressure adjusted to give the maximum safe rate of retardation for a light train, that in making a stop with a fully loaded train from 40 m.p.h. an additional five seconds per stop and an average of 150 ft. in stopping distance was required over that obtained with the empty-and-load device supplying a brake cylinder pressure in proportion to the load. This means that with a brake adjustment and pressure for producing an average rate of retardation of 2 m.p.h.p.s. with a light train, there would be obtained but 1.6 m.p.h.p.s. with a fully loaded train. By the use of the empty-and-load brake device 2 m.p.h.p.s. could be obtained.

This device also improves operation in that a motorman can judge his stopping distance more accurately, for the stopping distance with the same reduction in train line pressure will be nearly constant while otherwise motormen frequently have to make a second reduction and sometimes an emergency application.

Slack Adjusters for Safe Saving—Automatic Couplers for Quick Train Make-Up

Slack adjusters also decrease power consumption. In making an application of the brakes, the first movement of the brake-cylinder piston takes up the slack in the brake rigging and brings the brake shoes in contact with the wheels. The more slack there is in the brake rigging the greater is the distance that the piston will have to travel before braking pressure is applied to the wheels, and the greater will be the volume of air used in applying the brakes. By taking up any excessive slack in the brake rigging the slack adjuster aids in giving more efficient braking. Slack adjusters also lengthen the period between brake adjustments.

The most important recent developments in coupler design include provision for automatically making the air and electrical connections between cars as well as providing the mechanical coupling of the cars. These improvements effect a great saving in time in adding and cutting off cars and they also do away with the extra men formerly necessary to assist the motorman in making these connections. Accidents are also reduced to a minimum. Automatic couplers also make it easy to add and cut off cars at points before the end of the line is reached, so that trains of maximum length can be operated through the congested service sections and then cars can be cut off and the remainder of the run made with just enough cars to take care of the service requirements.

Better braking results in energy saving

Pneumatic Door and Step Control—Better Lighting with Large Units

With power operation of doors and steps, many advantages have been made use of to reduce costs that were not considered at first. These include:

1. Reduced number of accidents.
2. Shorter duration of stops.
3. Better car heating.
4. The use of labor more suitable for personal contact with the traveling public.

When the rear platforms of earlier cars were open no door-operating mechanism was necessary, but with the introduction of closed vestibules on cars it became evident that the value of such cars would be greatly increased by a faster operation of door and step mechanisms. The earning power and attractiveness of a car are also greatly increased by the use of automatic equipment.

The hard service which manual door operation requires of a conductor can be appreciated from the fact that on some lines a round trip requires opening and closing the doors as many as 200 times. Is it any wonder then that with hand-operated doors the conductor slows up his operation after a few trips?

I have already discussed the advantage in power saving that is gained by keeping the stops as short as possible. There is an additional advantage obtained by closing the doors quickly in the saving of heat in cold weather. In addition to these savings in time and labor, power operation of doors and steps permits the use of a different class of platform labor and assists in obtaining it more readily, as the duties are made more attractive and desirable. Labor with greater mental capacity rather than physical agility can be used, and as the duties require close and continual contact with the traveling public better relations are fostered and complaints are reduced in number.

The changes and improvements that have been made in car lighting have resulted not only in better lighting but in cheaper lighting as well. The lamps in use on cars on nearly all the lines today are of the improved tungsten-filament type. Up to approximately five years ago the carbon-filament lamp was in general use. Due to the fact that nearly all roads using direct current arrange their lamps in circuits of five lamps in series, and as these circuits are subjected to a considerable fluctuation in voltage, the carbon lamps used were burned at low efficiency. Tungsten-filament lamps outclass carbon lamps in efficiency and in the color of the light produced and, with the improvements in manufacture that have been made, they now give as long life as the carbon lamps.

The first use of tungsten-filament lamps was in replacing carbon lamps and as most of these installations had been arranged for use of 16-candle power lamps these were replaced with 23-watt tungsten lamps to give approximately the same illumination. In rearranging lighting circuits for remodelled cars and installations of new equipment an endeavor has been made to use a lamp of larger candle power with fewer units per car, in order to get the durability of a larger filament. The results of some tests extending over a period of several years after carbon lamps had been replaced with tungsten-filament lamps show a net saving in the cost of energy after the additional cost of tungsten lamps reinstalled had been deducted of 25 cents per 1000 car-miles.

The advantages of the electric heater result from light weight, smaller fire risk, low maintenance, reliability, possibility of accurate regulation, cleanliness and small space required. The operating cost of electric heating is a serious one and this fact has been especially emphasized during the past winter.

Thermostatic Control Saves Money

The use of thermostatic control for regulating the electric heaters of cars has produced a large saving. Careful observations taken in actual service have shown that this saving amounts to 30 to 40 per cent of the total power used for heating in some cases. The heat from the passengers' bodies aids in heating the cars more than is usually supposed. A crowded car is many degrees warmer than an empty one consuming the same current.

During the rush hours cars traveling in one direction are usually crowded while those going in the opposite direction are comparatively empty. These varied conditions can be met successfully only by having an accurate automatic control of the heaters. The heating current load, occurring as it does during the winter months when both the lighting load and the power load are increased considerably, is worth more than its proportion of the total cost of power. The "top of the peak costs most" and any reduction in heating current decreases the peak load.

High-grade maintenance will assure savings expected from new equipment

Ventilated Motors During a Strenuous Winter

Neglected Commutator Covers of Old Motors Gave More Trouble Than Clogged Drain Holes of Ventilated Type—The Latter Motors Can Be Protected by Snow Shields, Better Insulation, Etc.

By R. E. Hellmund
Engineer Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

THE great amount of troubles and breakdowns experienced during the very severe winter season of this year, in connection with car equipments, naturally suggests the following questions with regard to the motors:

1. To what extent is the introduction of the ventilated type of railway motors responsible for breakdowns?
2. What can be done with regard to operation and maintenance to avoid a recurrence of the recent experiences in connection with the motors?
3. Is the ventilated motor a practical proposition and is it destined to survive?

To get an answer to the first of these questions, a number of the writer's associates visited a great many electric railway properties during, or soon after, the severe snow storms of this season and also while the exceptional water conditions existed when large amounts of snow were thawing within a few days. Unfortunately, a good deal of confusion existed in most places, due to the fact that the troubles to be taken care of were usually far in excess of the shop capacities for handling them. The records, therefore, were not fully kept, and this led often to confusing and contradictory information with regard to the number of failures, their location and their probable cause. Nevertheless, it was possible to reach the following conclusions with a fair degree of certainty:

Snow and Water Proved Even Worse for So-Called Closed Motors

A certain amount of damage is done every year to the motor equipment on account of the dampness within the motor caused by snow and water conditions. These troubles were more numerous than usual during this year's winter season, but, except on a few properties where special conditions prevail, they were hardly more numerous than should be expected if the greater severity and the more continued snow condition are taken into account. Actually the older so-called inclosed motors suffered more than the ventilated motors. This difference, however, can be accounted for by the difference in the age of the motors, and the quantity of the trouble which develops does not seem to be a question of the type.

(*Concluded from page* 506)

Another improvement that is worthy of consideration in these times of earnest effort to effect economies is the use of the heat from the resistors and main motors to help heat the cars. Several schemes for using this waste heat have been developed, but so far, I believe, have never been tried in actual service. On one particular installation of new equipment I recall that the registers were located so as to be available for such use, but an actual trial was never made.

On closed vestibule cars, one-man cars, and centre-entrance cars, the use of some type of trolley catcher or retriever has come to be considered as a necessity. On these cars when the trolley wheel leaves the wire the car must be brought to a stop before the pole can be pulled down and the wheel replaced on the wire. Much of the popularity of these modern cars is no doubt due to the effective service given by trolley retrievers.

This Is the Day of Car-Checking Devices

A large part of the electric car equipment in operation is not of the latest type and does not possess many of the improvements to which I have called attention. The attainment of the highest efficiencies possible with such equipment lies in its correct operation. Electric railway service contains many waste factors. To keep these at a minimum requires constant investigation and checking. Any automatic checking device intelligently used will pay for itself many times over. The mere installation of coasting recorders or power recording instruments on the cars of a company will not effect economies. They must be properly and intelligently used to insure the desired results.

Neither is it sufficient to instruct the men responsible for the operation of the cars as to how and why economies are produced. An incentive must be offered the men in order to get them to practice and put into effect the knowledge and instruction which is given them. They should be paid something for saving energy and time. Their work should be checked carefully and earnestness shown in preventing waste of power.

A great deal can be accomplished by personal follow-up work. The average motormen are bound to appreciate this man-to-man policy and, aside from the saving in time, power and wear of equipment parts, it will make thinking men of them. They will thus become better and more efficient in other ways.

There are many pieces of equipment on our modern cars, other than those specifically mentioned, that are being continually improved and their use is producing savings in labor, time and maintenance costs. Such are sanders, fenders, wheel guards, buzzers and other signals, headlights, signal-lights and markers, anti-climbers, storage-batteries, fuses, trolley parts, fare boxes and registers. It will be unnecessary to indicate here how these contribute to the desired end, but they should be kept in mind in any study of the subject of economy.

This fact seems at first somewhat surprising, but it is easily explained. Much of the damage in both ventilated and non-ventilated motors was caused by faulty conditions of the motor covers and drain holes. This was especially the case in parts of the country where severe snow and water conditions are not usually experienced. Thus, it was found that on certain northern railway systems, where the operators are accustomed to taking care of severe snow and water conditions, very little trouble was experienced, although an appreciable amount was reported from some systems farther south.

Melted Snow Refrozen and Drain Holes Clogged with Snow

Much of the snow which caused damage to the motors entered through the top commutator opening on account of missing or badly fitting commutator covers. On some properties the motors are purposely operated without commutator covers during the summer season in order to keep the motor temperature low, and these covers were not replaced at the beginning of the winter season, as would have been advisable. In other cases commutator covers were not properly tightened and were therefore lost during the summer. In still other cases the commutator covers had been adjusted, for convenience, so that they could be easily removed, and this caused bad fits and large spaces between the motor and the cover for snow to enter. It was observed that with such conditions snow was pushed into the motors in very large quantities when the cars bucked snow banks.

A good deal of trouble also was caused by snow blowing in through the top openings during a storm. In such cases, if the motors have been operated and are fairly warm and the car then stands still a considerable length of time, either while the service is intentionally suspended during the night or because the car is stalled in a snowdrift, it is especially bad to have the snow drift into the motor at the top. Such snow will naturally settle partly on top of the commutator and armature and partly on the brush holders. In the beginning these parts are warm and partly melt the snow. Later these parts cool off and get below the freezing point, so that the partly-melted snow refreezes into a solid mass of ice. It is easy to imagine the result when an attempt is subsequently made to start the motors. In quite a number of cases the brush holders were frozen stiff, making it impossible for the carbons to move up or down, while, at the same time, irregularities caused by ice on the commutator make such a movement very desirable. Whenever a motor starts at all under this condition, flashing and burnouts follow.

Another cause for many failures was found in the faulty conditions of the drain holes at the bottom of the motor. In many cases carelessness in oiling without gaging and consequent flooding of the bearings had caused the collection of oil inside of the motor near the drain holes, and this oil, with the dirt which collected in it, had blocked up the drain holes. In other cases it was found that the drain holes had been purposely blocked up to prevent water from entering the motor. In still other cases the drain holes were frozen shut either because the motors ran very cool or they became frozen while the car was standing still, and the motors were allowed to operate before the ice was removed from the drain holes. In all such cases the water from the melting snow or otherwise collected was retained long enough in the motor to soak the lower field coils thoroughly and cause them to break down.

Another fact which was brought out by the investigations is that motors on low-floor cars give more trouble than other motors, on account of the small clearance of these motors above the track. This is especially true where severe water conditions prevail. It is to be expected, also, because it is evident that water collects on the track in a good many cases high enough to enter a motor with 2-in. to 3-in. clearance but not high enough to enter motors with a considerably larger clearance.

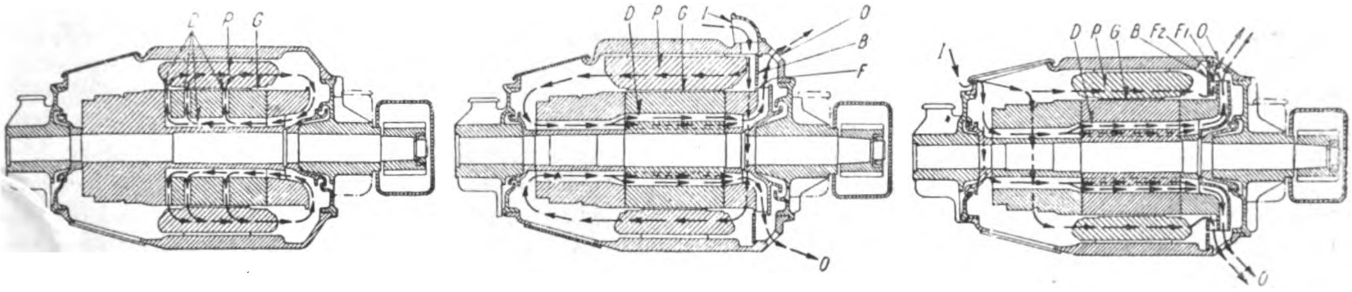
A study of the failures caused during the snow and water periods showed that a good many of them occurred in definite weak points in the motor and that these weaknesses were caused by a great many circumstances, such as defective workmanship brought about by the difficulty of securing skilled labor, severe overloads which had caused roasting some time in the past, etc. These weaknesses would have resulted in breakdowns at some time or other even without special conditions, but the severe snow and water conditions simply served to hasten the breakdown. This in itself would not be very serious if it had not been for the fact that all such breakdowns occurred at a time when the shops were already overtaxed.

Ventilated Motor Lighter, So Absorbs Less Heat

In this connection it is worth while to discuss one point in which the ventilated type of motors is liable to give slightly more trouble than the non-ventilated motor unless the motor is properly applied. Ventilated motors have for a given continuous rating considerably less weight than non-ventilated motors. Under ordinary operating conditions this is of little consequence, but under emergency conditions such as obtain while cars are bucking snowdrifts, pulling disabled cars home, etc., the ventilated motor, if applied to the limit of its continuous rating under normal operating conditions, is more liable to roast out than the old non-ventilated motors. The extra weight of the latter and the larger masses can temporarily absorb during heavy overloads of short duration a certain amount of heat and thereby prevent overheating. This has always been realized by the designing engineers, but the strong tendency of the last years towards reduction in weight has led to a number of rather close applications of the ventilated motors. In such cases the severe service conditions of the past season have roasted out a number of motors, causing poor insulation conditions. Snow and water which get inside of the motor in such cases constitute then only a contributory cause for trouble, in so far as they hasten the failure of roasted parts.

A number of failures of ventilated motors have also resulted from the opposite extreme of practice, namely, where cars have been over-motored. Particularly during the early days of the ventilated motors, a number of installations were made where ventilated motors of the same weight and size were applied in places where inclosed motors were previously used. This plan results in exceedingly cool running motors, but with not sufficient heat to dry out and evaporate whatever dampness gets into the ventilated motors, although the inclosed motors previously used were always warm enough properly to take care of this dampness. In such cases there have been a few more breakdowns with the ventilated motors than with the old inclosed motors.

It is evident from these facts that the great amount of trouble experienced this winter can hardly be blamed on the ventilated motors but is principally due to the more severe weather conditions, insufficient maintenance, rather close and too liberal applications, or the like. It is logical, therefore, to consider ways and means for remedying the real causes of the trouble; especially so in view of the fact that the expenses and losses caused this winter to many properties, both in the form of shop labor and lost revenues, exceed the $100,000 mark in many cases. This fact clearly indicates the wisdom of expending some money during the summer and fall seasons to prevent a recurrence of the recent winter troubles.



THREE TYPES OF MOTOR VENTILATION—FIG. 1—INCLOSED RADIAL-DUCT TYPE MOTOR; FIG. 2—SERIES VENTILATED FAN-TYPE MOTOR; FIG. 3—PARALLEL-VENTILATED FAN-TYPE MOTOR

While Fig. 3 shows the air intake on top, most recent motors of this type have them lower down, the advisability of which has been borne out by the experience of the last few months

Care of Commutator Covers and Drain Holes Is Essential

It is at once evident, from what has been said, that steps should be taken properly to maintain all motor covers, especially to replace all missing commutator top covers and properly tighten them if necessary, by applying felt linings before the winter season begins. Especially in interurban service, perfectly fitting covers are of great importance during snow storms. Furthermore, the drain holes of the motors should be kept open in all motors all the time. It is true enough that once in a while closed drain holes may keep water out of a motor and prevent a breakdown when the car runs through a deep pool of water over a considerable distance. Much more frequently, however, closed drain holes will hold water, which cannot be entirely prevented from entering the motor and remaining long enough around the bottom field coil to soak it completely and cause its certain breakdown. Even in an entirely inclosed motor there are always air openings to let water-saturated air enter the motor at times. If this air subsequently cools off while the car in standing idle during the night, for instance, the cooling air will deposit dampness either in the form of condensed water or, when it is very cold, in the form of frost on the motor parts. If such water, after running toward the bottom of the motor, is allowed to drain out promptly but little harm will be caused, but if it is kept within the motor it usually will cause damage. For this reason drain holes kept open all the time by proper inspection and maintenance are usually less of an evil than blocked drain holes. If, in case of flood conditions, it seems desirable temporarily to block the drain holes, great care should be taken that all other motor openings are closed also so tightly that no water can enter the motor. In such cases care should be taken to open the drain holes at regular intervals in order to drain whatever water may have collected in the motor before it does much damage. Only under this condition is it at all advisable to resort to the closing of drain holes.

Where the drain holes are not closed and the motor passes through pools, water will enter the motor casing and may cause some damage, but usually much less than that caused by water retained within the motor indefinitely. If drain holes show a tendency to freeze closed during exceptionally cold weather, they should be cleared of ice as often as practicable. This can easily be done in a few minutes by the pit man pushing a hot steel rod into the holes from the pit.

The proper procedure with regard to the ventilating openings of the ventilated type of motors has to be governed to a large extent by local conditions, and no general rule can be formulated. Our investigations have shown that if a small amount of snow gets into a ventilated motor through the opening, it does not cause any harm if the drain holes are properly maintained and if the motors run fairly warm. To know whether such conditions are fulfilled it is advisable for properties operating ventilating motors to take sufficient temperature readings under actual operating conditions to determine how the motors are loaded. If it is found that the motors run relatively cool, that is, if they have a temperature rise of not more than 40 to 50 deg. C. over the surrounding air under the most severe service conditions, it may be advisable to replace the ventilating covers partly or entirely by closed covers during the winter season; it may also be advisable, for similar reasons, to cover up some or all of the air outlet openings. But if the motors while fully ventilated run hotter than the temperature mentioned, it may be dangerous to reduce the amount of ventilation, and if from the experience of the past season an improvement is desirable besides that which can be accomplished by proper maintenance of covers and drain holes, other steps may be necessary.

Snow Shield Protection Possible for Ventilated Motors

In certain localities the use of shields in front of the motors, preventing large quantities of snow getting near the motor, has given very satisfactory results. Such shields should preferably be of substantial steel construction, since canvas covers which have been tried can hardly be maintained in proper condition more than a few days. In fact, it would seem advisable to provide, wherever possible, shields so substantial that they can serve at the same time as snowplows and so set that they will keep the snow level lower than the bottom of the motor and the gear cases. This would have the additional advantage of eliminating troubles caused when the motors and gear cases ride on the snow. In a great many localities, especially inside of towns, such a condition is not unusual in winter. The result is that considerable snow, mixed with sand and dirt, is scraped into the motors. Furthermore, gear cases have been worn through so that sand and snow have got into the gears. It is estimated that the damage thus done this winter to the gears and gear cases amounts to many thousands of dollars.

Fill Up the Cracks in the Insulation

While the previous suggestions for keeping snow and water out of the motors will undoubtedly give better results, some dampness will frequently get into the motors in spite of all possible precautions, as already explained in connection with condensation. This dampness will cause breakdowns wherever the insulation is not in perfect condition. It is, therefore, most desirable to keep up the quality of the insulation.

The best and cheapest way in which this can be accomplished with motors which have been in service is by the dipping and baking processes, applied to the armatures and field coils. Any insulation now known will when heated and cooled continuously and when subjected to the unavoidable vibrations of railway service develop certain cracks and small openings. This is particularly the case in motors which have been subjected to severe overloads and which have been roasted because of them. After the insulation has thus developed cracks, it is only a question of time when dampness entering such cracks will cause insulation breakdowns, and the only means for preventing such failure consists in the refilling of these cracks with insulating material before it is too late. This can be very easily accomplished if the armature and field coils are properly dried in a simple baking oven and dipped while hot in Sterling varnish or some equivalent insulating material, then dried in the oven. The varnish will fill up all little crevices and cracks, and, if the process is repeated from time to time, it will prolong the life of the insulation considerably. It is believed that the expense for the equipment and work necessary for this process could have been saved ten times over during the last season on a great many properties.

The Ventilated Motor Is Best but Requires Good Maintenance

Our third question as to whether the ventilated type of motor is destined to survive can now easily be answered with an emphatic "Yes." The evidence so far collected, under actual operating conditions, shows that if properly applied and handled, the ventilated motor will give no more trouble than an inclosed motor. This also follows from the following simple consideration.

It may be true that snow and dampness, at times, get into a ventilated motor in larger quantities than into a non-ventilated motor with well maintained covers. On the other hand, it must also be remembered that the constant air stream going through a ventilated motor will dry out damp insulation rather quickly, while even a small amount of dampness getting into the insulation of an inclosed motor will not dry out for considerable time. Since it takes some time for dampness completely to penetrate insulation, a small amount of dampness present for a long time is liable to do more harm than a larger amount for a shorter time. Even if it should prove necessary on some properties to change the type of covers twice a year and to adopt some improved methods of maintenance, the use of the ventilated motor is justified because the expense incurred is only a small percentage of the economies that can be accomplished with the ventilated motors.

It must be realized in this connection that the use of ventilated motors and attendant changes have reduced the weight of the motors alone on quadruple-equipment city cars between 2000 lb. and 5000 lb., not counting the reduction in the weight of the trucks made possible by the smaller motors. Assuming, therefore, the customary figure of three cents to five cents per pound extra weight in operating expenses, the introduction of the ventilating motor has made possible an annual saving of $75 to $300 per car. This being the case, it is good economy to spend a small percentage of this money in extra maintenance which may possibly be required with ventilated motors. The argument often advanced that it is impracticable to change covers a couple of times a year or properly maintain insulation must simply be discarded as long as a marked resulting economy with the ventilated motor is possible.

It should further be kept in mind that the ventilated motor is a rather new piece of apparatus and that not only its maintenance can be improved along lines suggested in this article but that it will also be possible to accomplish improvements with regard to its design and to its proper application. Recent experience has shown that such improvements are desirable even if they have to be accomplished by means of a slightly increased first cost of motors.

Streaking of Railway Motor Brushes

JOHN SWIFT DEAN, of the railway engineering department Westinghouse Electric & Manufacturing Company, has recently investigated the causes of the peculiar streaks or grooves which run along the front and back surfaces of brushes that have been in service for some time. Study of the streaking on a number of samples led to the hypothesis that it was due to particles of sand and dirt working their way down between the carbon and the carbon box. These, by constant vibration, movement of the carbon and the action of gravity, cut small grooves in the sides of the carbon.

This conclusion was confirmed by tests with and without current between brushes and boxes, the following test results being noted: (1) Pronounced streaking of carbon exists. (2) Streaking was produced when electric current was not present. (3) Considerable dust and dirt were in evidence. (4) When dust and dirt chutes were provided no streaking was produced. (5) When the dust and dirt were removed streaking was eliminated. (6) Sand particles were found lodged in groove.

From these results Mr. Dean was convinced that the grooving or streaking of railway motor carbons is due to the abrasive action of the grit, as he had surmised from his preliminary studies.

The Testing Organization of Electric Railways

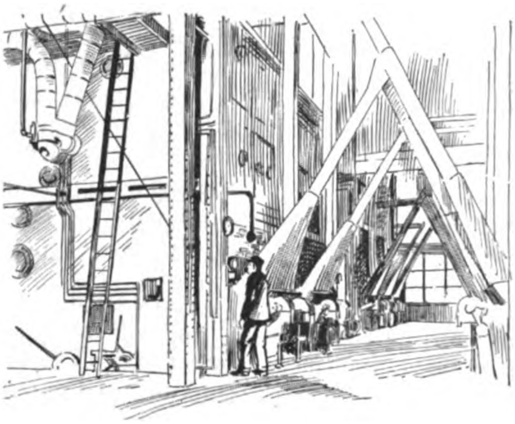
This Analysis Shows How Useful Such a Department Can Be and How Diversified Its Work Becomes in a Large Electric Railway Organization, Affecting All Phases of Construction and Operation

By Hartley LeH. Smith
Chief of Testing Bureau
Brooklyn Rapid Transit System.

IN CONSIDERING the work of a testing department the first question which merits discussion is whether or not such a department is worth while and economical. To justify itself it must result in the more systematic and efficient handling of certain things which are indubitably worth while.

The tendency of the times is to make tests. When it is decided that necessary or desirable tests shall be made with frequency, a testing department is created; until then, such tests as are made are handled by outside laboratories.

Electric railway tests, like all others, may be classified as those which are necessary and those which are desirable. Of necessary tests, practically all electric companies, railway or otherwise, are agreed that watt-hour-meter calibrations shall be so classed. The division line between necessary tests and desirable tests is an extremely elastic one.


Steam gages need calibration now and then

If a testing department exists the tests which are considered either necessary or desirable, and, being so considered, are made, depend really very intimately upon the relationship of the testing force to the departmental organization of the corporation. Tests might, for instance, be very closely associated with purchases. Where this was true the testing organization would be intimately connected with the purchasing organization. On the other hand, tests made on materials purchased are much more likely than not to be made on materials bought under technical specifications: *i.e.*, engineering specifications. Such specifications are naturally prepared by the engineering department or departments. Thus a natural link is at once found between the testing organization and the engineering organization.

Modern testing, of course, is an engineering matter. As a matter of fact, it is now fairly established as a branch of engineering. I need only point out that one of the great national engineering societies, the American Society for Testing Materials, is one devoted specifically to testing. So a testing organization is almost sure to be an engineering organization, manned by engineers. In an overwhelming majority of cases the testing organization of any corporation constitutes a part or branch of one or more of the engineering departments of the corporation. It might be thought that if there are more or less separated engineering departments in a large organization the testing force would in some way be equally associated with or related to them all. Such would, indeed, be the logical arrangement.

Tests may deal with materials or machines. The distinction is quite real. There is, for instance, the American Society for Testing Materials, cited above, but as yet there is no national society concerned particularly with the making of tests on machines, and perhaps there never will be. There are, instead, the codes of several national engineering societies dealing with the methods of making tests on some of the important classes of engineering apparatus. For instance, there are "the power-test code," adopted by the American Society of Mechanical Engineers, and the "standardization rules" of the American Institute of Electrical Engineers.

Among other broad divisions into which the work of a testing organization of an electric railway may be classed, so far as new material and apparatus are concerned, these three seem pertinent; first, continuous supplies; second, apparatus installed for extensions and betterments, purchased under guaranteed - performance specifications, and tested for acceptance; third, materials and apparatus on trial.

Of the first class a long list might be written, but some very common illustrations are coal, oil, condenser tubes, boiler tubes, incandescent lamps, trolley-line material, car wheels, axles, bolts, cement, paint, etc. In the second class a partial list including turbines, condensers, boilers, automatic stokers, centrifugal pumps, blowers, static transformers, rotary transformers, circuit breakers, high-tension cables, etc., might do. Of the third class, coals and oils other than those which have been customarily used, all sorts of steam specialties, lightning arresters, rail bonds, and many other things, might be mentioned as illustrative.

Deterioration Tests Another Function of the Testing Department

Another large field of work for the testing force is in inspecting material and apparatus during manufacture. In some of the most advanced organizations this work receives great prominence. As an important contribution along this line I would cite the paper entitled "Testing Is Not Inspection," by W. A. Aiken, read at the annual meeting of the A. S. T. M. in 1908.

Another class of work for the testing organization is in making tests to detect deterioration of the efficiency of apparatus which has seen considerable service. Such tests are of much aid in securing reasonable maintenance of the original efficiency of the apparatus throughout its life. Such tests, for instance, might show that the blade clearance of a turbine has increased and turbine castings become warped, both contributing to higher steam consumption; that pump impellers and casings have suffered erosion, with resulting falling off of efficiency; or that engines have developed valve and piston-ring leakage, clearly evident in indicator cards systematically taken and analyzed.

A still further field for the department is in tests made on apparatus for the detection of developing obsolescence. This is intimately related to the evolution of more highly efficient forms of apparatus designed for the same work. As illustration, the ageing of transformer iron may be cited, with its effect on substation efficiency, or as measured by uneconomical iron losses where potential is continuously maintained regardless of load. Still another illustration is in the detection of increasing current transformer errors due to aging of iron, with its effect on watt-hour-meter registration.

From foundation to chimney the testing department can find something to do

Tests Related to Improvement of Operating Conditions

Among the lines of work for the testing department which are of importance are those which deal with studies of operating methods. For instance, in power-station work there are tests made for the purpose of revealing those operating methods which will yield high efficiency under fundamentally controlling conditions of operation; that is load factor, extreme range between maximum and minimum loads, etc. Take, for example, the matter of banking boilers. This operation involves losses, but, depending upon the furnace equipment, some boilers will give astonishingly high over-all efficiency when steaming at low rates. These same boilers may show a falling off in efficiency to disappointingly low, but nevertheless legitimate, values in hours of heavy peak loads.

Merging closely with the above are studies which attempt to show the operating conditions and methods which will bring about the ultimate desideratum of power-plant economy; that is, such operation as will cause the summation of the fixed capital charges and the operating charges to be a minimum.

For instance, it does not at all follow that a turbine should be operated at its most economical water rate. Important papers on power-plant operation, based upon a realization of all these general principles, have been read before some of the national engineering societies, and certainly in the future this subject will receive a great deal more detailed attention than formerly.

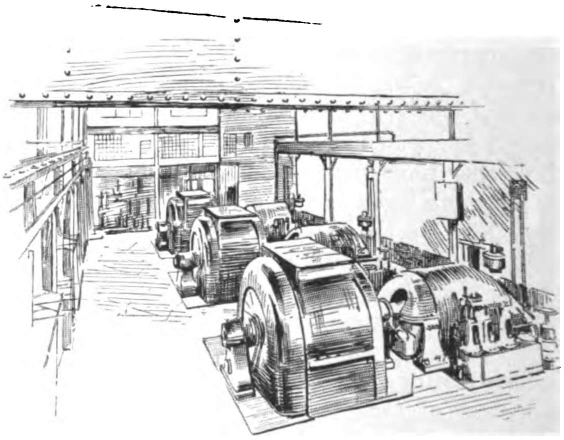
Another set of general tests includes those designed to give clear-cut information as to the methods of operation and maintenance which will favorably affect the heat balance of the station as a whole. For instance, there is the important problem of exhaust steam from auxiliaries; that is, as to the excess or deficiency of it, and the action taken regarding such excess or deficiency. In many stations to-day provision has been made for the connection of the auxiliary piping system, not only to the feed-water heaters but also to the low stages of one or more turbines, thus allowing considerable practical control of the heat balance.

Certain variations in operating procedure are dictated by seasonal variations throughout the year. Two sources of heat supply (when the heat balance is rigorously considered) fluctuate very greatly with respect to entrance temperature throughout the year, namely, the feed water as taken from the city mains, or other outside source, and the intake circulating water. The feed water, in so far as it comes from an outside source, is able to absorb a far greater quantity of exhaust steam in the winter than in the summer; and similarly the seasonal variation in intake circulating water is so great as to make large changes in the quantity of circulating water which are most economical in winter, on the one hand, and in summer on the other.

Routine Testing of Water and Other Power Plant Elements

Apart from tests and studies which have classifications such as outlined above, there are in the modern power station certain tests which do, or should, constitute essential parts of daily operating routine.

Foremost among these are tests which deal with water treatment. Where turbines are used, it is only under rather extreme circumstances that surface condensers are not used. The only justification for surface condensers is the use of the condensate as feed water. Where feed water has to be purchased from a municipality, the potential saving in the use of the condensate from surface condensers becomes enormous; so large that to forego it is prohibitive.



Here is a fertile field for the testing engineer

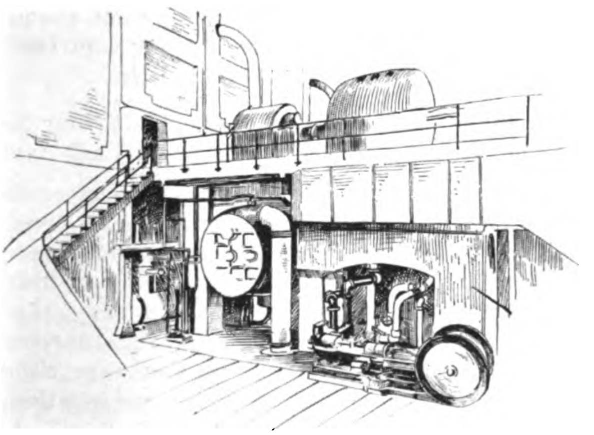
The use of condensate from surface condensers, however, involves many a problem. Except where the power station is so fortunately situated as to have unusually good condenser circulating water, I do not think it is possible to continue long the use of water from the hot wells of the condensers as feed water unless such use of it is controlled throughout by daily laboratory tests. Condenser tubes will develop leaks, and, as such leaks are the result of attack of the circulating water on the tubes, water so leaking becomes a contaminating influence in the feed water, and will cause trouble if not controlled.

Tests for Impurities in Condensate and of Conditions in Condenser

The sort of tests which in the aggregate constitute a system of adequate control is an extensive subject in itself. Certain fundamentals, however, can here be set down. When the tube leakage in any one condenser has become too great the entire hot-well water from that condenser must be thrown away until such time as the condenser can be shut down and repairs made. While it continues in operation with its water so contaminated by condenser-tube leakage as to prohibit its use as feed water an equivalent feed-water supply must be obtained from the alternative source, in general from a municipality, at a rather high cost per cubic foot.

The water from the mains of a municipality seldom constitutes an ideal boiler feed water; in other words, it compares unfavorably with the hot-well water from a condenser in which the leakage is slight, or even negligible. Therefore, it becomes a problem of correctly establishing the standard of allowable leakage through the condenser tubes into the hot well, after which the hot-well water will be temporarily thrown away.

Next in the order of these problems is that of scale prevention. The hot-well water will normally come to the feed-water heaters with certain amounts of condenser leakage water in it, as outlined above, and will consequently, in practically every case, be a scale-forming water. So also, in general, will be the water taken from the municipal mains or other outside source.



Tests of condensate are essential to safe operation

Prevention of objectionable scale is a necessity, and laboratory tests of some sort are essential to control the water treatment, whatever the treatment may be. After the water has been treated with reasonable satisfaction in this respect, it may, as a result, be of such nature as to induce priming. Hence, water tests for the specific purpose of avoiding priming difficulties become quite as essential as those which deal with the scale-prevention treatment.

Among the tests which are practically essential parts of daily operating routine are those connected with the maintenance work involved in maintaining first-class vacuum on large turbines. The last quarter-inch of vacuum obtainable in turbine practice is of the most urgent importance. The items which should have daily watching and control by tests are the adequacy of flow of circulating water, the air leakage, and the efficiency of air removal.

The adequacy of flow of circulating water is affected by the obstructing material which may have accumulated in the water boxes because it was not entirely caught at the intake screen. Daily tests should therefore be made to determine the temperature rise of the circulating water, which data in connection with simultaneous turbo-generator load data suffice for calculating closely enough for the purpose the quantity of water circulating. This will be found to undergo quite marked reduction between intervals of water-box cleaning or condenser-tube scraping. A fixed schedule for such work is not satisfactory because obstruction due to accumulating trash is itself irregular, due very largely to the effect of weather conditions on the source of condensing-water supply, usually a river.

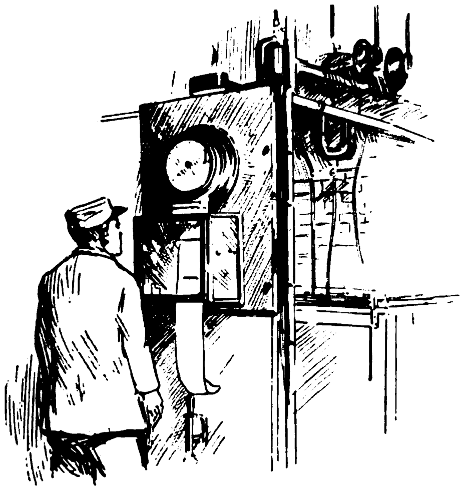
Where there is enough work for him an expert chemist should be a part of the testing organization

The air leakage into a condenser due to obscure causes is variable, and quantitative measurements are an aid in the general work of vacuum maintenance. Some years ago, in large power stations, the practice of using the following simple device became rather general. It embodies the principle of a gas holder or tank. The air, leaking into a condenser and withdrawn by a reciprocating dry-vacuum pump, is discharged into the device, causing its movable element to rise as the air accumulates in it above a water surface. The time of rise is measured with a stop-watch, and the quantity of air is calculated in cubic feet per minute, or other convenient unit. The power stations which have adopted this practice look upon it as well-nigh revolutionizing the problem of insuring that their condensers are free from objectionable air leakage. Such a device can be used immediately to render large air leakage evident.

There is, however, another aspect which perhaps has not had quite such general recognition, namely, the effectiveness or efficiency of air removal. All of the air which leaks into any condenser is removed by the air pump, otherwise there would be an accumulation of air in the condenser, and the unit would soon go to high pressure. To show what is involved in effective air removal it is only necessary to name the means used to measure it. To this end the valve in the air suction line between the air pump and the condenser is closed, and a reading is taken of the vacuum which the pump is able to "pull down" against the closed valve. If the pump is in proper operating condition it will naturally "pull down" a very high vacuum. Often enough, however, it will do nothing of the sort, and maintenance or repair work is accordingly at once indicated as urgently necessary on the pump parts themselves.

Some Factors in Maintaining High Vacuum

Some very interesting relationships exist, indeed, between the effectiveness of air removal, the quantity of air leaking into a condenser (and hence removed actually by the pump), the vacuum accordingly maintained in the condenser, and the type of air pump. There are on the market several kinds of air pumps embodying the ejector principle, and so constituting a radical departure from the old-line reciprocating pumps. Among these types great differences exist, as can be seen from curves plotted to show the vacuum possible to maintain in a condenser under given conditions of turbine load, circulating-water temperature and quantity of flow, in terms of the quantity of air leaking, and accordingly removed by the pumps.



Graphic meters are of great help in testing

Most reciprocating pump equipments in actual service are really of greater capacity than is ordinarily recognized. When such pumps are so maintained as to give effective air removal they will take out of a condenser the quantity of air leaking into it with such relative ease as to make the extent of air leakage of rather secondary importance. That is to say, if a reciprocating air pump is kept in fine mechanical condition one need not worry greatly over the quantity of air getting into the condenser.

With certain ejector pumps, however, the operating characteristics seem quite different. The vacuum which can be maintained in the condenser itself is not only a definite but one might say that it is a considerable function of the quantity of air leaking into a condenser. In such cases great care needs be taken to keep the condenser air leakage down to a low minimum if the pump has small capacity. If it has large air-removing capacity it is apt to make considerable power demand.

Attention may also properly be called to the fact that it is with just this sort of equipment that no effective device has as yet been developed which will permit of measurement of the air leakage in absolute terms. This, however, is not such a great disadvantage as might be supposed, because it is still possible to judge the condition of such an ejector pump by measuring its vacuum-pulling ability against a closed suction valve, and immediately afterward the vacuum which it can maintain when actually removing air from the condenser.

The rather steep line, previously referred to, connecting its vacuum-pulling ability with the quantity of air removed, suffices to determine whether the air leakage into the condenser is moderate or whether it is large, and thus needs work to bring it down again to moderate values.

Tests of Boiler Operation

An extremely simple matter which can be controlled by daily testing and which relates to one of the most fundamental and by no means negligible sources of loss of power station efficiency is the determination of the combustible matter in the ashes. Undoubtedly many power stations are following this matter up, as the relationships between true ash in the coal, combustible in the ashes as dumped, and resulting loss of potential heat are well understood.

Of great importance, also, although not so obviously connected with testing, is insuring the cleanliness of the heat-absorbing surfaces across which the gases from the furnace flow and through which the heat is transmitted to the boiler water. As, however, the fluctuations in gas temperatures leaving the boiler are given more attention than formerly, and very frequently are recorded automatically, it generally follows that a testing force becomes considerably involved in such studies.

In this connection it certainly would not do to omit some mention of the determination of the composition of flue gases. A few years ago the writing of papers on this subject amounted to nothing less than an epidemic. If we could gather statistics showing what young men in testing work in power stations really are doing probably the time spent analyzing flue gas or adjusting apparatus which itself automatically analyzes flue gas would appear high up on the list.

Calibration of the Watt-Hour Meter May Produce Large Cash Savings

Turning attention to the tests which may really be called essential for power station operation, we are confronted first by watt-hour-meter calibrations as mentioned earlier. In many cases, increasing in number, the corporations owning power stations are dependent for their fundamental income upon the accuracy of watt-hour-meter registration. In most electric railway power stations watt-hour-meter registration accuracy still affects only the accuracy of certain statistics, such as the economy figures of the power station itself, the energy consumption of the rolling-stock per ton-mile, figured from the power station switchboard, etc. But more and more every year the registration of watt-hour meters measuring energy supply for railway use is intimately related to cash payments, as the generating end bills the railway for energy as if it were a separate organization.

Probably accuracy of registration of railway watt-hour meters in service averages lower than in lighting or industrial power service because of the more violently swinging character of railway loads. Large railway power systems naturally suffer less from this handicap than small ones, but large systems are in general worked with substations, and the substation load is usually marked by severe fluctuation. Naturally this is true in a special degree where subway or elevated train loads are carried. The testing force of a railway power company therefore finds itself concerned with the problem of overcoming the handicap and attaining high accuracy in watt-hour-meter calibration. Quite special instrumental means and methods have accordingly resulted.

Insuring Accuracy of Switchboard Instrument Measurements

In a more general way the electric plant tests, which may be considered in the strictly necessary class in that they are either taken care of by an organized testing force or at less frequent intervals through the agency of outside testing organizations or departments of manufacturing companies, are those dealing with calibration and repairs of the switchboard indicating instruments. Where there is an organized testing force this work on a large system is apt to keep several men fairly busy. The work requires considerable skill if it is to be done efficiently, that is, at lower cost than that involved in having it done by the repair departments of the manufacturing companies.

The requisite skill of the men varies naturally with the type of instrumental equipment, some makers using much more delicate construction than do others. As a general proposition, however, on systems of ordinarily large size really high maintenance standards can be obtained far more cheaply if the instrumental repair work is done by a testing force. Such repair work is so closely connected with calibration, that is, work in which errors are detected and corrected without the necessity of repairing broken parts or replacing them with new parts, that the two kinds of work are generally done by the same men. The instruments requiring this sort of attention on an a.c.-d.c. system include ammeters, voltmeters, static voltmeters, synchroscopes, frequency meters, indicating wattmeters, etc.

Calibration of Ammeter and Other Shunts

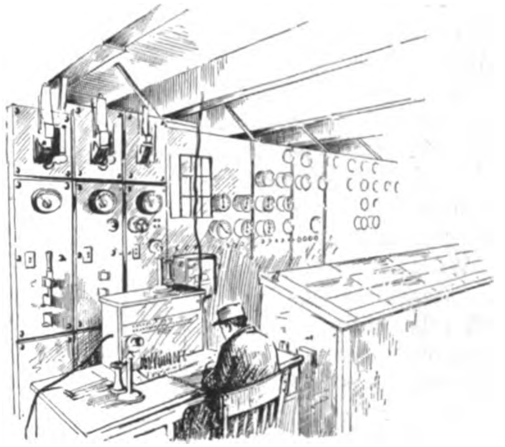
An organized testing force is apt to find itself pretty intimately concerned with the measurement of the ohmic resistance of meter shunts. Such shunts are subject to incidental deterioration. Now and again such a shunt will be overloaded and the avoidance of such overloading may temporarily be impossible. It may as a result suffer change in resistance.

More serious than this, however, because more likely to occur, is possible change in resistance due to handling during installation. Ammeters working on shunts are, of course, in reality milli-voltmeters, and the nominal potential for full scale deflection is generally on record expressed in terms of millivolts. Ammeter calibration itself therefore resolves into nothing more than the calibration of so many millivoltmeters. It is idle, however, to work upon this basis unless it is really known that the shunt resistances either actually have their nominal values or some other values which may be looked upon as substantially fixed for reasonable intervals.

I am speaking, of course, of those systems where effort is made to attain thorough-going accuracy founded upon a substantial basis. In this connection, however, it is worth while to point to the increasing use of the mercury type of watt-hour meters. If charges between one electric company and another or an electric power company and a railway company are to be based upon mercury-type watt-hour meters the resistances of the shunts ought to be measured *in situ.* This measurement of the resistances of shunts after installation is somewhat difficult and complicated. In large stations or substations it is a matter needing not only proper instrumental testing equipment but considerable skill.

There Is Work on Gages to Be Done Also

Turning to the steam plant, and considering tests which may be called necessary, the pressure gages naturally come in first for attention. There are indeed other ways for a manager to be assured that steam pressures are really what the station log indicates than to have a testing force to calibrate steam gages. But it is true that in a large station where there are many gages the average of accuracy is apt to be low unless an organized testing force is looking after them.



The heart of the power plant—the accuracy of every meter must be checked carefully

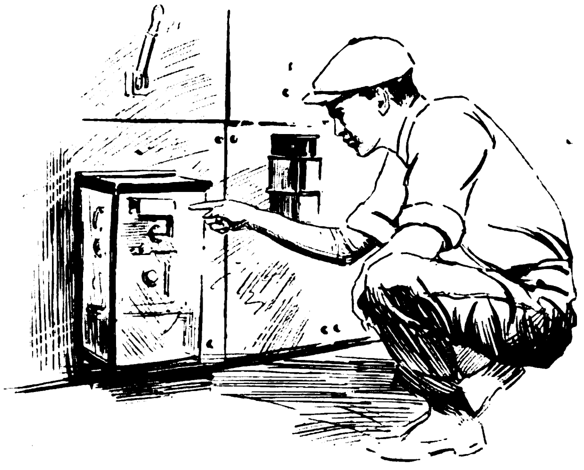
If such gage testing is done it is naturally done all along the line—water gages, air pressure and draft gages, vacuum gages, etc. In a large station with considerable instrumental equipment, maintenance and calibration of such instruments have just about the same status as in the case of electrical instruments. That is, to a considerable extent repairs are made by the testing force, and the general maintenance of instrumental accuracy where repairs are not necessary provide a considerable amount of work. To specify definite instruments may seem to be criticising certain of them, but broad experience will not lead to such a deduction. If there is a plentiful supply of steam-flow meters, recording pressure gages and thermometers, not to speak of CO_2 recorders, there is apt to be plenty of work.

Adjustment of Relays Naturally Falls to the Testing Department

A somewhat different viewpoint in considering the testing department from any of the above may be had by considering certain apparatus, and the adjustments and tests made upon it relating to automatic handling of emergency conditions. Going back to the electric plant, an extremely important case in point is that of relays operating oil switches of the high-tension system. The practice of different operating companies seems to vary very widely with respect to the underlying ideas upon which relay adjustments are made, and there is also much variation in the plans used to insure reliable operation. Companies differ also in the extent to which they have pushed experimental investigations along this line.

Where there is a testing force it naturally handles the matter of relay adjustments. The ease, accuracy, and reliability of such work have been increased in recent years by the development of a device which uses the cyclic variation of current of an alternating system as the quantity against which the operation of relays is checked, rather than against time measurements with a stop-watch. In using this plan it is only necessary to see that the frequency of the system at the time of making adjustments is substantially normal.

Adjustment of relays with a stop-watch is unsatisfactory because the only truly significant thing about relay action is how it acts when the actuating current is large. When it is large the relay action is quick and the time interval so short as to render stop-watch measurements unreliable. With a cycle counter accurate measurements of very quick relay action are at once attainable. Hence it becomes possible to adopt adjustment schemes which not only make provision on paper for properly selective action between relays on different parts of the power transmission circuits but which actually allow of the attainment of such selective action.



Here is the watt-hour meter. If its readings are inaccurate great loss of money may result

In practically all inverse-time relays in actual use at the present day, excluding only certain very old types, the relations between time and current are very definite. These characteristics are more flexible than are sometimes supposed. A well-designed system for the several relays at different parts of the power transmission circuits will show provision for selective action based upon a given margin of relay reliability at any currents within the limits of possible action. It will also include in its provisions the time required for the successive operation of oil switches as distinguished from relay operation. All this can be shown in a group of curves.

The testing force making relay adjustments will work with these curves so that, although the testing loads during successive calibrations may not for one reason or another always be identical, the adjustments given the relays will be such as will make them operate in a definitely known manner. The need for, and the great operating benefit derived from, accurately working selective relays on a complicated system is such that a testing force engaged in the work of adjustment is used also to keep track of the maintenance of adjustment in a systematic and routine manner.

To take an illustration from the field of matters more or less akin to the above discussions of electrical maintenance, let us consider the subject of safety valves. Safety valves, whatever else they are, are mechanisms of sufficiently complicated principles of design to give them in certain service characteristics not widely appreciated. Ordinarily one thinks of "popping pressure" and "blow-down" as about the whole safety-valve story, but a testing force can sometimes reveal unexpected limitations of types a bit antiquated, indicating the desirability of modernization.

The Organization of the Testing Department

With respect to organization of the testing force, its three divisions are manifested at once. Incidentally they follow rather inevitably the broad division lines which appear in the field of engineering education in so far as that field has direct relations to power plant service.

The young men engaged in testing work are, generally speaking, graduates of engineering schools. Probably no such testing force is, however, exclusively composed of such men. The schools turn out among others graduates in electrical engineering, in mechanical engineering and chemistry or chemical engineering. The testing work of such power plants naturally falls into these three classes. There is no small amount of interchangeability between the electrical and mechanical engineering graduates, since all electrical engineering courses teach much concerning mechanical engineering and mechanical engineers are taught a whole lot about electrical engineering. This interchangeability is such as to be able to bear considerable strain in actual service. Exigencies of organization building and the natural capabilities and adaptabilities of individual men, which after all always override any rigid educational demarcation lines, bring about now and then applications of this sort of strain. The writer once had simultaneously, for instance, an electrical engineering graduate in charge of steam testing and a mechanical engineering graduate in charge of electrical testing.

In the line of chemistry interchangeability hardly works. Electrical and mechanical engineers are taught chemistry but they are not chemists. In the testing work of a small or moderate size electric power plant a man not a specifically graduated chemist often does sufficiently well, but in the more highly specialized work of really large plants no great success could be expected. Much of the testing work of a mechanical nature around an electric power plant is fairly simple, but some is not. Where any approach to general quantitative analytical work is made a real chemist is required.

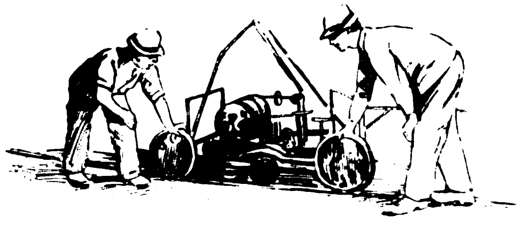
The writer ventures to predict that in the not distant future another branch of the engineering educational field will be tapped in manning the testing force of large electric railways, that of metallurgical engineering. The extension of the metallurgy of steels in re-

Labor-Saving Methods in the Way Department

The Author Analyzes the Possibility of Utilizing Effectively the Many Machines and Tools Which Are Now Available for Performing the Operations Involved in the Up-Keep of Track Work

By Roy C. Cram
Assistant Engineer Department of Way and Structure
Brooklyn Rapid Transit System.

THE labor conditions created by the entry of the United States into the war have had a strong influence in directing attention of way departments to the possibilities for saving labor through the extended use of machinery. The use of machinery, up to a comparatively short time ago, was gradually increasing, but there was still a tendency to hold back expenditures for equipment. This was largely due to the fear that too much money might be tied up in equipment, a great deal of which is limited in scope and liable to be idle for long periods, especially in the winter season.


Each class of rail grinder has its place

During the past two years, however, it has become evident that the main opportunity to overcome labor handicaps lay in the direction of labor-saving devices, and such machinery and tools now form a part of the way department equipment to an extent which would have excited wonder a few years ago. The way department yards have taken on an aspect resembling contractors' yards, and the general result has been that a much more businesslike procedure has taken its proper place in the scheme of things.

If there are any doubts as to the advisability of using labor-saving machinery to the fullest possible extent they should be dispelled by the results obtained from their use by the way department in track work in Elmira, N. Y., last summer, as described by F. H. Hill in the JOURNAL for June 30, 1917. Furthermore, John A. Beeler in his recent report on the Boston Elevated Railway, in commenting on the way department methods, says: "The methods employed are to be commended. Labor-saving devices have been introduced extensively and the amount of hand work has been reduced wherever possible. This has undoubtedly aided in keeping down maintenance costs. The use of such devices should be extended wherever possible, especially in view of the present shortage of labor."

With the advent of machinery, it has been necessary also to increase the supervision to some extent, because much of it requires a reasonable amount of attention and care if it is to be kept in a condition to give the best service, both in its application to the work and its performance as machinery.

General Tendency in Adoption of Equipment

The general trend of the interest in special tools and equipment has been toward the adoption of improved forms of work cars, such as crane cars and automatic dump cars; the increased use of the power shovel both for grading and for loading cars; the rapid adoption of pneumatic or electric tie-tamping tools; the broadened scope of the electric arc welders; the increased use of power drills in regular maintenance as well as construction work, and the general rearrangement of storage yards, including the installation of various forms of labor saving devices therein.

Arc Welders Assume Importance in Effecting Economies

It is somewhat difficult to indicate just where the greatest savings have been effected or to indicate any particular tool or device which has been so signally successful as to excite exceptional comment. Yet there can be but little doubt that the use of the several forms of arc welders now available has contributed a very large share in effecting many economies in men and materials. These devices had their origin in the use of the acetylene flame as first presented to the industry under the name of the "autogenous welding process." Since it involved the use of rather expensive gases, and its range of use was somewhat limited, the process soon gave way to the arc welder, using the very convenient

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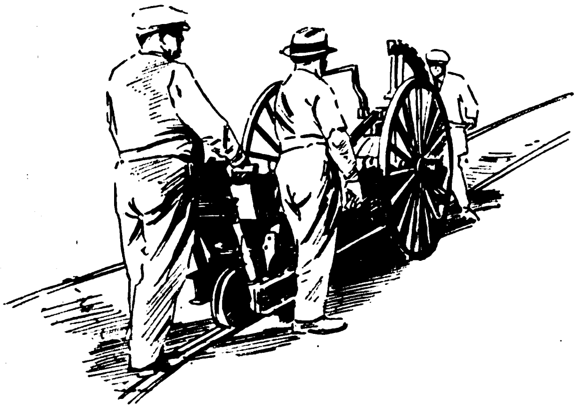
cent years, for example, has been very rapid. Likewise, special steels have been developed for special uses and complicated heat treatment is given to such steels during their manufacture and afterward. There is a growing recognition of the value of inspection during purchase of large orders, and a general extension of research in industry. The rapidly extending use of metallography in such work will demand the service of young graduates of the metallurgical schools.

It would also seem possible that the testing work of electric railways will find place for another branch of engineering, if such it may be really called, efficiency engineering. Of course all engineers think of themselves, let us hope rightfully, as in some degree efficiency engineers. Further, it is only too well known that many rather ill-advised activities of so-called efficiency engineers have been such as not to commend themselves to the practical minds of many very capable executives—and electric railway executives on the whole are mighty practical. Still there does seem hope that the wisest among efficiency engineers will overcome the the fairly justified prejudice with which a good many of the cult are now viewed, and we may find some young representatives of the class substantially established among the others in the prominent testing organizations in the electric railway field.

power from the overhead wire, until to-day there is no road of any size which is without some form of arc welding apparatus. With the use of the arc welder came a rapid development in the use in connection with the application of a simplified form of electrically-welded rail joint.

The early type of arc welder consisted of an arrangement of grid resistances which was effective but costly if the exorbitant use of power due to resistance losses was seriously considered. This has led to the development of dynamotor or motor-generator apparatus which has a greater range of use and is also highly efficient electrically, due principally to the absence of energy consuming resistance. With it all forms of joint welding, metallic electro welding, carbon arc metal cutting and electric bond welding may be done, using only 10 per cent of the current required by resistor types of apparatus.



The rail grinder should be used for new rail and incipient corrugation

It has been found that with the arc welder the repair of defective rail joints can be done more quickly, with little or no disturbance to traffic and for about 10 per cent of the cost as compared with the method of cutting out the defective joint, installing an insert with two joints, with the incidental destruction and restoration of pavement and bonding.

Grinding Equipment a Necessity Even on New Rail

In connection with arc welders it is to be noted that their effective use, in track work at least, is limited to a certain extent by the accompanying grinding apparatus. The grinding equipment must be proportionate to the welding equipment if the full value of the work of the former is to be secured. Incidentally the grinding equipment investment can be minimized and the amount of grinding work done can be greatly increased if arrangements are made for rapid transportation of grinding apparatus by autotruck, so that one grinding machine may follow up from two to three welding gangs which may be widely separated.

Rail-grinding equipment is now a necessity where it was once considered a toy, and, aside from the grinding equipment long in use by the Lorain Steel Company in its joint work, the need for grinding apparatus was not generally recognized until rail corrugation began to be troublesome. Another factor which ultimately created a field for grinders was the rather late and sudden recognition of the fact that all rail joints, no matter what their kind, must be ground. There was also a period of experimentation in connection with conflicting views over the relative merits of the rotary and reciprocating principles. All of this delayed the general adoption of grinding apparatus until it was finally found that, while each type has its peculiar field of usefulness, good results can be had by the use of both types.

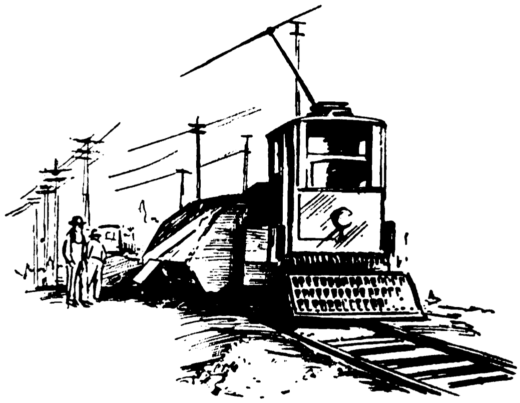
Types of Rail Grinders—Power Tampers No Longer an Experiment

Grinding apparatus may be classified into four general type groups, as follows: 1. Rail files (push files), hand operated, reciprocating. 2. Rotary grinders, flexible-shaft type. 3. Rotary grinders, machine-type, mounted on small trucks. 4. Reciprocating grinders, machine-type, mounted on small truck or special carriage.

The rail file, manually operated, served its purpose while labor was comparatively cheap and during the period of development of machines. Its chief use was for filing or grinding newly made joints. The flexible shaft rotary grinder came into use for the same purpose. It is now confined to grinding special track work where its peculiar construction has adapted it to this difficult field. It is a costly piece of apparatus to maintain, due to the abnormal failures of the shafting, and a new grinder has recently been developed for the same work which is far less expensive to maintain and less liable to cause injury to the workmen. This machine was illustrated in the ELECTRIC RAILWAY JOURNAL for May 26, 1917.

The larger machine types of rotary and reciprocating grinders and their uses are so generally familiar that they need not be described more fully. It suffices to say that both types are effective and efficient and that in general at least one machine of each type may be used advantageously on almost any property. In fact some classes of grinding work can be done best by the use of both, the one supplementing the other.

Incident to the use of grinding machines is the material composing the grinding wheels or blocks. All of this apparatus except the push files (which require a form of special steel bastard file) consume large stocks of abrasive material, and in consequence the selection of this stock needs careful attention, with the view to securing the most durable and effective material obtainable.



Specialized dump cars are playing an important part in modern track work

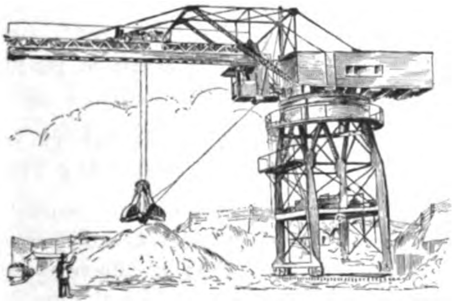
Tie tamping has been a bugbear with everyone who has had anything to do with track work. The time-honored custom of tamping by hand, with the tendency of the men to either "go to sleep" on each tie or else to skimp the work when pressed to wake up and cover ground, has at last given way to machinery. The mechanical tie-tamping devices now on the market came to the front just in time to be of great assistance at a time of extreme labor shortage. No longer an experiment, the pneumatic and electric tie tampers have become a part of the equipment of many way departments almost over night. The pneumatic type has had the greater development and is in more general use, but there are certain points in favor of the electric type which have great merit, principally the feature of availability of power, and if the electric machine can be made to overcome some present disadvantage it may ultimately supplant the pneumatic apparatus.

The pneumatic tampers have produced savings that are remarkable. Tamping can be done mechanically for half the cost of manual tamping. The proportionate saving in men, however, is even greater, and this is a particular advantage, as the much smaller force required is also of a higher grade. The number of men required for mechanical tamping is only 30 per cent of the number required for hand tamping. In addition the tamping itself is far superior to the best hand labor.

Power Drilling Machines Save 75 per Cent Over Hand Drilling

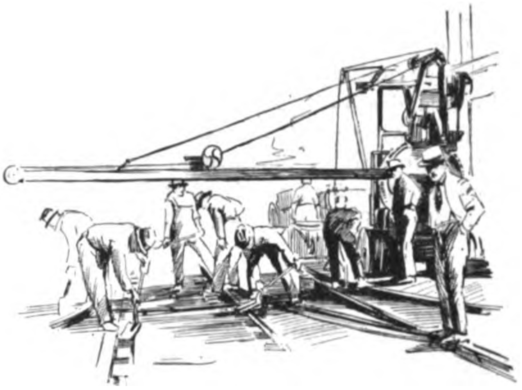
Rail drilling is another field where mechanical means have been resorted to with beneficial results in labor saving. That old-time standby, the ratchet drill, has been displaced almost entirely by the electric power drill, except for emergency use and for certain classes of repair work. It has been found that the power drill will cut the cost of track work in its sphere at least 75 per cent over hand methods. By cutting down the number engaged on drilling the power drill has also released a large number of men for other work. Incidentally there is a saving in drill bits and cost of sharpening due to the uniformity of working conditions created by the use of the power machine. In hand work with ratchets there is apt to be distortion in position of bits and other parts created by careless handling which lead to rapid breakage of bits.

In connection with power drilling it should be noted that there is a new type of power-operated ratchet drilling device which is available for use wherever pneumatic tools are used in track work. This device has the compactness of the hand-operated ratchet and is available for use in cramped space at joint repairs when the electric drilling devices cannot be used without destruction of a considerable area of pavement to make room in which the apparatus can work.



A great crane that literally "eats up" the work

Regardless of the nature of the drilling device, the drill bits receive very rough treatment, and the high carbon steel rails in general use are particularly difficult to drill even with the highest grade of special tool-steel drill bits. At this point the special tool-grinding machinery of the portable type comes into service. By means of special tool holders, any type of bit can be resharpened by the average laborer and the bits will do better work than if sharpened by the average machinist at a shop. There is no lost time waiting for fresh bits and a smaller stock can be carried, which is an item of moment when the present very high cost of drill bits is considered. Special tool-sharpening devices of this character are now considered indispensable on jobs where more than a few holes are to be drilled, and they should be in every gang tool box.



Track concreting à la mode

Power Shovels for 50 per Cent Economy

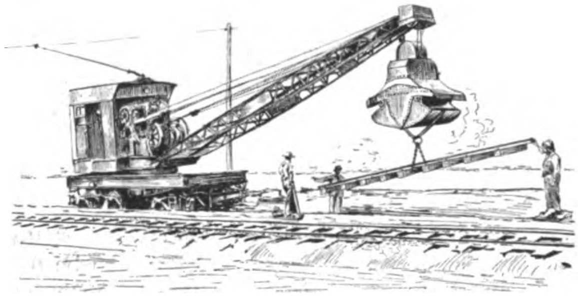
The electric shovel has also come into quite a general use as a labor-saving device, and consideration should be given to its use at every point where the controlling conditions will permit. It is invaluable when it can be employed for breaking up concrete, in excavating and grading on extension work, and in reconstruction work where the street widths will permit. In the latter situation it can best be used when there is room for the installation of a temporary third track. These shovels have been known to save their cost in doing two miles of track work. Under favorable circumstances they will reduce the cost of excavating by 66 2-3 per cent, and cut the cost of teams 50 per cent, which latter is a very great advantage at this time, when teams are not only high in cost but also difficult to get at any price.

The Pavement Plow As a Man Saver—Specialized Work Cars Beat Junk

Another labor and time-saving device is the pavement plow, the use of which has greatly extended in the past two years. As an aid in the removal of block pavements of all types and with all kinds of paving joint fillers it has proven its worth as a labor saver. This device will do as much work of the most difficult kind, in an hour or less, as five men can do in three nine-hour days and for less than 25 per cent of the manual labor cost. The need for men is so great that the saving in man-energy alone would make the device worth while even if the costs were the same.

An active interest has been created in the improvement of work cars for handling materials and the shortage of men has done more than anything else to direct attention toward the need for reduction in men used in this branch of the work. Until recently most bulky material, such as paving blocks, sand, gravel and crushed stone, were handled by men, who loaded the material onto ordinary flat cars at the yards and unloaded it again at the job. Sometimes the men were transported with the load, where there were none available at the point of unloading. From eight to ten men are usually required for this sort of work.

There was a time, not long ago, when any old collection of junk on wheels was considered good enough for a work car. In that day the way engineer who asked for specially designed work-car equipment was apt to be considered somewhat crazy. The development of the automatic side-dumping car has changed all this, much to the advantage of the companies. It is now possible to unload a 3-car train of automatic dump cars with one man, where six or eight were formerly required by such cars. The whole trainload can be dumped in from 3 to 5 min. where it formerly required about 20 to 30 minutes per car. Such equipment has further advantages in the saving of time of the equipment on the road, in lessening of tie-up of passenger car traffic while unloading between cars under regular service conditions, and in availability for use in general revenue freight service in hauling material for highway contractors as well as in the railway coal service.



The great thing about the crane car is its ubiquity—it's always there

It has been authoritatively stated that automatic dump-car equipment has saved as much as 30 cents per foot in the cost of track work in a large city in the Central West. The locomotive crane and the pillar crane, mounted upon cars, have taken an important place in the list of labor-saving equipment. When especially designed for electric railway work they are of particular value in handling special-work installations, in loading and unloading rails upon the street, and in the general work of handling materials. As an indication of the savings which may be accomplished through use of derrick cars the table below is reprinted from the ELECTRIC RAILWAY JOURNAL for Dec. 23, 1916:

SAVING EFFECTED IN FOUR YEARS BY USE OF 3-TON PILLAR CRANE CAR ON ELECTRIC RAILWAY SYSTEM

	Cost of Handling			
Number of Tons Handled	Without Crane	With Crane		Total Saving
4000 tons miscellaneous	$1.00	$0.25		$3,000.00
3324 tons load on cars	.75	.20		1,828.20
3324 tons to yard	1.00	.25		2,493.00
6340 tons unloaded	.50	.20		1,902.00
6340 tons to job	.75	.25		3,170.00
				$12,393.20
Cost of crane car, ready to run			$7,000	
Depreciation 5 per cent, four years			1,400	
Interest 5 per cent, four years			1,400	
Upkeep 2½ per cent, four years			700	
Net saving four years, one car				$3,500.00
				$8,893.20

In connection with the subject of dumping cars it may be well to call attention to a phase of the work of handling materials where there is room for the development of mechanical means which will save a great deal of labor. We have reference to the need for some form of power loading device which can be used in the confined areas of narrow city streets, alongside track trenches, for the purpose of placing the excavated materials upon the cars, thus lessening the amount of manual labor which is still employed for this purpose. Both grab buckets with cranes and electric shovels may be used to a limited extent in this way, but street conditions more often prevent this.

The subject is being studied in several quarters and there is no doubt that once the attention of manufacturers of several types of automatic loading devices now used extensively in coal yards for loading coal from the piles into wagons is called into active consideration of the field waiting for development we may expect to see a satisfactory solution of the problem.

Air Drills and Skull-Crackers for Concrete

In removing old track prior to reconstruction it is often necessary to remove a concrete paving base. Several methods have been adopted recently to do this work mechanically in order to replace the old method of digging jack holes, raising the track and breaking down the concrete with heavy mauls. This method is tedious, requires a great many men and is liable to cause serious disturbance to adjacent concrete under roadway pavement which is to be left in place. Such disturbances lead to excess cost of concrete for the new track because of the necessity for breaking out and replacing shattered concrete.

In this field there have been two developments, each of which is effective in saving of labor. One is the use of air drills in connection with compressor apparatus available for operation of tie tampers. With four air drills a gang of six men can remove as much of the hardest kind of track concrete in a day as a gang of fifteen men can accomplish manually, using heavy bull punches, jacks and mauls.

Another method is to utilize the so-called "skull cracker," which is a heavy casting weighing about a ton, attached to simple derrick, moving on the track and so rigged with a release trigger as to drop the casting from a height of about 12 ft. onto the concrete. It has been reported that this comparatively simple device has effected a saving of from 15 to 20 cents per foot of single track in labor cost of this work. The "skull cracker" is moderate in first cost and is available in many cases where there is no air equipment suitable for operating air drills.

Concrete Mixing Machinery Will Save Its Cost Many Times Over

There has been a rapid development in the application of machinery to mixing concrete and cement grout for track pavement work. This has been assisted, particularly in the case of mixers, by the change in opinion as to the practicability of machine mixing compared with hand mixing. There are at least two mechanical grout mixers now on the market which are acceptable to highway engineers. In fact, one of these had the advantage of being developed by its manufacturer under the direction of a board of experienced highway engineers with gratifying results. It is now possible with the mechanical mixer not only to save materials and secure a high uniformity of mixture, but also to save from 3 to 5 cents (42 to 70 per cent) per square yard in the labor cost of mixing. In addition a mechanical grout mixer will follow up and complete the grouting of all the pavement which can be laid in a track job in any one day under ordinary conditions. The advantages in completing the grouting so quickly are apparent.

In the concrete-mixing field the development has branched in three directions: (1) In the increasing use of the moderate-sized batch mixer; (2) in the adoption of very large-sized batch mixers with self-loading hoppers, mounted upon trucks and self-propelling, generally upon the track and sometimes on the roadway surface alongside, and (3) in the assembling of complete and rather complicated mixing plants upon a train of two or more cars.

Each of these methods has its field and has proved very successful. For all round use, particularly because of its mobility, the small batch mixer operated by a gasolene engine may be considered the most serviceable, especially in view of the fact that the cost of this machine is very moderate.

The larger, self-propelled mixers are more for use on very large jobs where a large volume of concrete must be produced rapidly. It has been observed that one, or at the most two, of these machines will serve very extensive reconstruction programs on systems of the greatest size, and the output of such machines by the mixer manufacturers for railway customers has so far been somewhat limited. To some extent this restriction may be due to the prevailing custom on many systems of letting the track-paving work out to contractors who usually have the paving work for the city. This is often being done in conjunction with the railroad track work.

The special concrete mixing plant mounted on trains of cars has been used in but few instances and interest in this type of plant has been revived by the action of the Denver Tramway Company in selecting it for that property, as described in the ELECTRIC RAILWAY JOURNAL for Oct. 6, 1917. The particular advantage claimed for this equipment is in the elimination of the storage of any concreting materials on the street. This does away with a large amount of labor required for handling, obviates complaints from property owners fronting the work and tends to preserve the cement from theft and from damage by the elements.

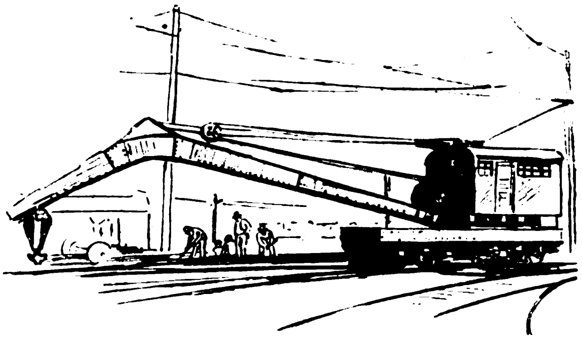
From the foregoing it will be observed that the railways are alive to the fact that concrete mixing machinery, when properly selected, will save its cost many times over, and there is no reason why every property should not take advantage of some one of the several types of apparatus which are available.

Kerosene Torches and Asphalt Surface Heaters

During the winter season there is a great amount of labor expended in keeping switches, switch-operating mechanisms and interlocking free of snow and ice. In this work the kerosene torch has come into use and it has been found that one man equipped with such a torch will displace from three to five men and do better work. These torches have other uses which make them serviceable the year round. They are indispensable in connection with the work of resetting hard-center plates in special track work.

Where there is a considerable amount of asphalt pavement in tracks the asphalt surface heater or burner is effecting large economies in men and materials. It consists of a set of five or more burners using kerosene and arranged on a carriage which also has a sheet-iron hood, about 4 or 5 ft. square, over the burners. The burners and hood are very close to the pavement surface, so that the heat is concentrated and the flames are protected from the wind. These heaters are used to soften the asphalt surface where it is desired to fill up worn areas which have not exposed the concrete. By their use the cutting out of much good surface material is avoided, as it is only necessary to add more material on top of the old material, after sufficient heating, and to finish the surface by rolling or tamping. Specially shaped hoods and heaters have been devised for use in repairing narrow ruts in asphalt along the rails, and by their use a saving of 50 cents per square yard of pavement surface has been effected.

These heaters have also been used to great advantage in heating cobble and block pavement in extreme cold weather preparatory to its removal for emergency track repairs, and have made possible the making of repairs in three or four hours' time which would have otherwise consumed a day.



In popularity the crane car heads the list (see pages 522 and 523)

Methods of Cutting Asphalt Surface

It is often necessary to remove sheet asphalt entire for new track construction or for reconstruction. There have been at least three recent improvements in methods of doing this work which have been described in these columns. Each of them does away with the onerous and expensive method of cutting manually with the asphalt mattox. One method involves the use of a special cutting tool designed to operate with the air-operated tie tamping machine, as described in the JOURNAL for June 30, 1917. Another utilizes an ingenious arrangement of a cutting wheel mounted in outrigger fashion upon a work car (see ELECTRIC RAILWAY JOURNAL for Jan. 20, 1916).

Still another plan involves the use of a tee-iron with a cutting edge laid upon the surface and made to cut by operating a small road roller over it. (See ELECTRIC RAILWAY JOURNAL for July 7, 1917.) Again, the work has been accomplished by mounting special cutting edges completely around the circumference of the rear roller of a small tandem road roller and running the roller over the area to be cut.

Each scheme has a good deal of merit, and any one of them will be found clearly in the labor-saving class. For instance, the air-operated cutting device is reported as having worked at the rate of 47 feet per hour. It would take one laborer several hours to do the same work manually.

The oxy-acetylene cutting flame or torch has proved to be effective as a time and labor-saving device. It is now used extensively in the work of removing old rails, replacing the chisel and sledge in cutting bolts at joints and replacing hack saws for cutting rails into short lengths prior to loading on cars. It is also of great service for cutting the ends of frog arms and other special work made of manganese steel, which is almost impossible to cut by any other method. There are many other uses to which this tool may be put, and these illustrations serve to call attention to a piece of apparatus which is almost indispensable as a part of the labor-saving equipment of the way department.

There has been a great deal of interest during the past year in connection with the possibilities for labor saving which are presented in the storage yard of the way department. Until a short time ago most yards consisted of a lot of nondescript tracks with partly worn-out rail and special work and a number of cheaply constructed gin poles or stiff-leg derricks scattered about largely at random, and with comparatively few installations of modern types of traveling cranes, derricks and other equipment of adequate design. This was perhaps the result of spasmodic growth from small beginnings, which prevented the consideration of the subject from an economical viewpoint. A great many yards have not been located to the best advantage with respect to the radius or center of distribution in combination with the sources of original supply.

The labor shortage has led to a renewed consideration of the whole subject, and a number of articles

[Supplement

How Way Engineers Rate Labor-Sa

In order to permit the compilation of the experience of way engineers on the subject of track tools and other appliances, the editors of the Electric Railway Journal asked a number of them to telegraph or write briefly their answers to the following questions:

1. What piece of special machinery or special tool has been the greatest labor saver on your property or properties in way department work?

2. What is the order of merit as labor savers of the following tools or devices: Arc welder, power drill, electric shovel, air tamper, concrete mixer, crane car, automatic dump car, pavement plow, concrete breaker, stone crusher, acetylene cutting flame?

Telegrams and letters were received from a number of companies and these are summarized as follows:

From J. M. Larned, *engineer maintenance of way, Pittsburgh (Pa.) Railways:*

In regard to the relative importance of different pieces of track equipment, I would arrange them as follows: Question 1—Crane car. Question 2—Arrange in this order: crane car, electric shovel, air tamper, concrete mixer, stone crusher, dump car, arc welder, rail grinder, ballast spreader, track drill, acetylene torch.

From A. E. Harvey, *engineer maintenance of way Kansas City (Mo.) Railways:*

All things considered I believe that our crane car has saved us more in labor than any other one piece of equipment, but I believe that there are several other kinds of equipment that are just as necessary to the accomplishment of the work in an economical manner. As to the second question I do not believe that a fair comparison can be made as to the relative economic value of the devices mentioned, as each is suited to its particular kind of work. Where such work predominates the machine that is fitted for it takes precedence in an economic sense over all other equipment. All of the devices mentioned are such great labor savers that where there is any considerable quantity of work to be done to which they are adapted they are just as essential to the proper handling and economical conduct of the work as are the most common hand tools. They should, therefore, not be considered as special tools but just as necessary a part of the outfit as a pick or shovel.

From W. R. Dunham, Jr., *engineer maintenance of way, Connecticut Company, New Haven, Conn.:*

The crane car has been the greatest labor saver on this property. In order of importance the devices listed in the second question might be arranged as follows: Crane car, arc welder, air tamper, power drill, electric shovel.

From H. M. Steward, *chief engineer Boston (Mass.) Elevated Railway:*

In answer to your request would state that the arc welding outfit to be the most useful apparatus. I should arrange in the following order the list given in question 2: Arc welder, crane car, power drill, air tamper, automatic dump car, electric shovel, concrete mixer, pavement plow, concrete breaker, acetylene cutting flame.

From J. P. Ripley, *railway engineer J. G. White Management Corporation:*

Taking all in all it is my opinion that the electric welding machine has been the greatest labor saver in the track department. It saves materials as well as labor. Instead of renewing a frog, for instance, the points can be rebuilt by welding. Your second question is difficult for us to answer because conditions vary on our different properties. We think the welding machine comes first and a concrete mixer is considered generally a necessity and might come second, and the same is true of the power drill.

We have not as yet given the pavement plow a trial and usually purchase stone already crushed for ballast. We have not tried the electric shovel or the air tamper but believe the latter at least has great possibilities.

From E. A. West, *chief engineer Denver (Col.) Tramway:*

Answering question 1, I should put arc welders first. I should arrange the equipment in question 2 in the following manner: Arc welder, acetylene cutting flame, air tamper, crane car, concrete mixer, portable stone crusher.

bearing on the matter were published in this paper in the early part of 1917 which brought out a good deal of information. Particular interest was developed in the description of the important yard improvements made at Cleveland and at Denver, where two quite distinct methods of handling materials and types of yard layouts were compared. The Cleveland installation was described in the JOURNAL for Feb. 24, 1917, while the Denver plant was the subject of an article in the issue for Oct. 27, 1917.

These two articles in particular served to emphasize the importance which the storage yard itself, its location and its handling problem have assumed. At the same time they presented definite facts which indicated the large saving in labor which must always result from a concerted effort to improve conditions in this quarter.

This is well illustrated by the statement made in the Denver article, in which it is stated that with the new yard layout three men can handle as much material as fifteen could handle in the old yard. At Cleveland one item of unloading a car of granite, for instance, showed a 25 per cent reduction in labor cost.

While it is quite clear that no one best way will be found to handle materials most economically on all properties there is no doubt but that the locomotive crane has been found to be one of the most useful pieces of apparatus for this sort of work, suitable alike to large and small yards and having other uses out on the road which make it a profitable investment.

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ticle by R. C. Cram]

g Appliances for Use in Track Work

From FORD, BACON & DAVIS, *New York City, for several properties operated:*

Ithaca (N. Y.) Traction Corporation—The rotary sweeper for removing snow has been the greatest labor saver.

Central New York Southern Railroad, Ithaca, N. Y.—The acetylene welding torch is the most useful device.

Lackawanna & Wyoming Valley Railroad—This company operates under steam road conditions and as the questions pertain almost exclusively to street work no answers of value can be given. The company understands, however, that the air-tamping devices are being used on steam roads with good results.

Empire State Railroad Corporation—The acetylene cutting flame is considered by this company to be the most efficient of all the labor-saving devices listed.

United Railroads of San Francisco—The crane car has been the greatest labor saver in our way department. We would arrange the list in question 2 as follows: Crane car, air tamper, automatic dump car, pavement plow, electric shovel, power drill, arc welder, concrete breaker, acetylene cutter, portable stone crusher. We are now ordering a concrete mixer which we hope to rank about fourth in the above list.

From C. G. KEEN, *engineer way and structure American Railways Company, Philadelphia, Pa.:*

As you know I am not in close enough touch with actual operating conditions to reply in respect to the labor-saving features of the tools mentioned. In respect to their values in maintenance work, however, I would place the arc welder in connection with the grinding machine easily first in importance.

From F. H. HILL, *general manager Elmira Water, Light & Railroad Company, Elmira, N. Y.:*

Replying to your inquiry I should place the pneumatic tie tamper at head of the list as the greatest labor saver in construction work. As to the list in your second question I should arrange the order as follows: The air tamper, arc welder and acetylene cutting flame are all indispensable. Power shovel and concrete mixer are necessities on construction work of any appreciable size. We do not have the other devices listed. A rail grinder in connection with a welder certainly prolongs life of track and equipment.

From CHARLES H. CLARK, *engineer maintenance of way, Cleveland (Ohio) Railway:*

On this property we are agreed that the pavement plow is the greatest labor-saving device that we have. It not only saves a large amount of labor but accelerates the work. To arrange the tools in your second question in order of merit is a rather hard proposition, for some tools are dependent upon others for their efficiency. However, this order may be suggestive: Pavement plow, crane, automatic dump car, concrete breaker, concrete mixer, acetylene cutting flame, electric shovel, power drill, air tamper, arc welder, stone crusher. An explanation is due in connection with this list. All of the devices are labor savers. A stone crusher is not necessarily a labor-saving device, it might more properly be called an economical machine. One might not need an acetylene torch but it will cut rails faster than twenty men can do. An electric shovel might be a poor adjunct unless there were sufficient work for it. We find use for two shovels. The arc welder is a necessity.

Summary

THE answers to question 1 indicate that, as far as this questionnaire is concerned, the crane car leads and the arc welding apparatus is a close second. The acetylene torch comes next, and there is honorable mention for the pavement plow and the pneumatic tamper.

A summary of the answers to question 2, weighting each in accordance with the number of votes, gives the following as the order of preference: 1—crane car; 2—air tamper; 3—arc welder; 4—automatic dump car; 5—concrete mixer; 6—pavement plow; 7—electric shovel; 8—power drill; 9—acetylene torch; 10—rail grinder; 11—stone crusher; 12—ballast spreader.

It would be unscientific to conclude that this list is at all conclusive—first, because only a few excellent devices were listed; second, because the canvass was only partial. The list, however, is suggestive, and will be useful in directing attention to the fact that way engineers appreciate the value of tools.

Better Car Maintenance an Urgent Necessity

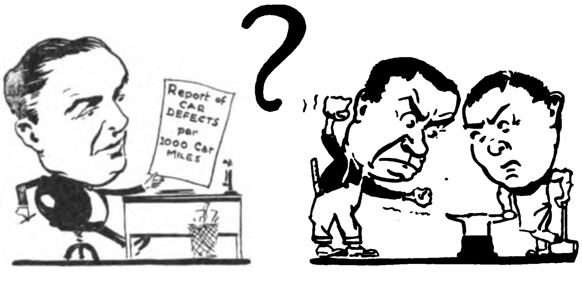
Electric Railways Should Have First-Class Talent in Charge of Shop Repairs and Should Spend More Money on Maintenance—The Equipment Department Should Be the Training School for Most Other Departments

By M. B. Lambert

Assistant Manager Railway Department, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

THE winter months which have just passed were the most severe on electric railway equipment that have been experienced in a number of years. About the middle of the winter many properties found themselves seriously crippled, with 35 to 40 per cent of their cars out of service, due to all kinds of equipment failures. Some of the larger properties had as many as 450 to 500 crippled cars at one time. Prompt repairs were impossible, due in part to a shortage of experienced armature winders and car equipment mechanics and in part to the difficulty of getting promptly the great amount of repair material that was necessary. Neither the railway companies nor the supply manufacturers were prepared for any such emergency.

The situation was a most trying one for the industry as a whole, and especially so where increased fares were being introduced. The people were agitated about the increased fare, and their demands for better service were more pronounced than ever. The severe weather made it impossible for the companies to provide anything like the usual service, and, incidentally, every passenger that had to suffer inconvenience became far more impatient and critical than usual. As a result, the public in many localities are more resentful than ever toward the public utility corporations. A solution for this trouble must be found and steps must be taken during the coming summer so as to prevent a repetition of this situation as far as possible.



Which kind of master mechanic is preferable?

The Maintenance Department the Last to Be Considered

One thing that appears quite evident is that more consideration must be given by operating executives to the maintenance of car equipments, since one of the biggest factors in securing the good-will of the public lies in providing reliable service. It is probably true that the average operating executive gives far less thought to his maintenance of equipment problem than he does to the numerous other perplexing questions with which he is obliged to contend throughout the year. When the great importance of having first-class talent in charge of shop repairs and maintenance, as well as providing adequate facilities, is mentioned to him, he will invariably assent, but will point out that, under existing conditions, his company is not in a position to pay such salaries and cannot afford to provide such facilities as the big companies do, etc.

Some of the fairly large companies do have first-class men in charge; but, as a rule, these men do not have the money to do all the things they know should be done. The result, in both cases, invariably shows up in the form of unreliable and interrupted service, causing far greater criticism from the public than curtailed but reliable service would cause. In other words, it would appear to be better to economize by less frequent service but to have the equipment that was in operation so well maintained that it would be as reliable as possible.

The Experience Last Winter Should Teach a Lesson

The general breakdown that occurred this winter will, without doubt, result in a change of attitude on the part of many operating executives regarding their equipment maintenance department. As a rule, one of the first departments they think of, when further reduction in expense must be had, is the shop maintenance, and orders are issued to reduce expenses there when it ought to be about the last resort. Perhaps the reason for this is that it is always possible for a company to cut down expenses there with less commotion or immediate effect than in some other departments. However, it would appear that greater discretion should be exercised in the future, especially during the fall months, when equipments are being put in shape to withstand the winter storms.

The average man will defer painting his house or his automobile and other similar things until he is financially able to do so, but he knows that if he neglects the plumbing or heating outfit, he will have serious trouble and that, in such maintenance, a stitch in time saves nine. The maintenance of the propulsion equipment on cars comes under the same category. That it has not, except in a few cases, received proper consideration is evident when an analysis is made of the whole country, and shows that a very large number of railway properties do not have adequate maintenance facilities nor adequate maintenance organizations. Moreover, the average master mechanic is underpaid and his job is not as attractive as it ought to be, largely because many operating executives have not, as previously mentioned, heretofore given to this phase of their problem its proper consideration.

Finally the fact that there are very few men available who are fully competent to handle the maintenance

A Kilowatt-Hour and the Coal Required to Produce It

Discussion at Manila, P. I., Brought Out Concretely the Losses Which Occur in Transforming the Energy in Coal Into Electrical Energy

AT A RECENT meeting of the electric railway company section of the Manila Electric Railroad & Light Corporation, B. H. Blaisdell, chief engineer of power plant, described graphically the ways in which losses occur as the stored energy in coal is transformed into electrical energy. To make his story tangible he exhibited a lump of coal from which he removed a portion as he discussed each individual loss. Some of the more striking passages in his talk follow.

Most people have a fair idea of what they will get when they ask a storekeeper for a meter of cloth or a kilo of potatoes, but there are few who have any conception of the nature and magnitude of a kilowatt-hour, other than that is 30 centavos' worth of electrical energy. This is because electrical energy cannot be seen.

Its value must be appreciated by observing what it can do. For instance, a 40-watt incandescent lamp can be burned from 6.30 to 10 o'clock each evening for a week with a consumption of 1 kw.-hr.

To produce this amount of energy requires, in the Manila plant, 3 lb. of coal, the cost of which is more than 75 per cent of the total cost of producing the energy.

Coal is, of course, simply compressed and mineralized vegetation. One of its earliest forms was peat, from which great pressure squeezed the moisture and high temperature drove off more or less of the volatile combustible constituents. Thus were formed lignite, bituminous coal and anthracite. The first named, lignite, still contains much moisture and volatile combustible matter, bituminous coal contains less of these, while anthracite is almost wholly fixed carbon.

A lump of coal has stored within itself sufficient energy to lift it a distance of 2000 miles, but of this energy only about 10 per cent is converted into the electrical form in the usual power plant. The remaining 90 per cent is lost in a number of ways as follows.

LOSSES IN THE POWER PLANT

In the first place, coal is rarely dry, but as the Manila company buys coal according to its heat value coal containing 10 per cent of moisture would cost 10 per cent less per ton than if it had been dried. However, a real loss due to moisture occurs in the furnace because some heat must be consumed in evaporating it. Except in the rainy season this amounts locally to about 1 per cent.

The second loss is from coal and coke falling through the grates. While this loss can be reduced by the use of minimum width of air spaces between grate bars and the elimination of unnecessary stirring of the fuel bed, the loss may be from 1 to 10 per cent. Locally it is about 1 per cent.

A third loss is from incomplete combustion, with production of smoke and carbon monoxide. This is mainly caused by poor draft, excessive thickness of fire, careless firing and faulty furnace design preventing proper intermingling of the fuel gases with air. It may be from 1 to 5 per cent, and in the Manila plant is about 1 per cent.

The fourth loss, the greatest of all occurring in the boiler plant, is that through the flue gases. In a natural-draft plant, like that at Manila, it is necessary to lose about 15 per cent of the heat to maintain the draft. Even with forced draft some energy would be used in driving the fans. There are also some unnecessary losses in the flue gases caused by the admission of excess air to the furnace (either through the grate bars or through infiltration through the boiler setting), scale and soot on the boiler tubes which permit heat to escape which should be absorbed by the water, deranged damper walls in the boiler which may allow the hot gases a short-cut to the flue, etc. In Manila these losses total about 5 per cent, making a total flue-gas loss of 20 per cent.

The fifth and last important heat loss in the boiler plant is from radiation from exposed boiler surfaces, piping and settings. While this may be reduced by proper lagging, it, with sundry minor ones, amounts to about 7 per cent.

Thus in the local plant about 30 per cent of the total heat in the coal is lost in the boiler room.

LOSSES IN THE TURBINE ROOM

Of the 70 per cent of the energy originally in the coal which comes to the turbine room, some must be used in driving pumps for circulating condensing water, removing air and condensate from condensers, feeding water to the boilers, cooling the oil, furnishing

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(*Concluded from page* 524)

of equipment shows again that this extremely important part of the industry has been more or less neglected. If the positions of master mechanics were more attractive on the majority of roads, there would be, without doubt, a tendency for men with more or less technical ability to endeavor to fit themselves for such positions, but they are not doing so now.

The Maintenance Department the Place to Develop Young Men

It is true that a few operating managers have interested themselves sufficiently in this subject to see that they had one or two promising men coming along in the organization who would be developing themselves for better and more responsible positions. But there are very few railway companies in this position. The majority of roads have one man they call master mechanic, and if he drops out for any reason whatever they are usually up against it until they find some other man who will, in some measure, fill the bill.

In the writer's opinion the equipment repair and maintenance department should be the training school for most other departments on the railway. Technically educated young men (preferably young men who are educating themselves) should be induced to work in the shops with the understanding that opportunities are open to them to advance into the traffic and transportation departments. This plan should bring about a condition whereby the men of promise, coming along in the organization, will have had a good mechanical training and will always appreciate the value of properly maintaining the rolling stock.

water to glands, etc. In Manila the auxiliary machinery takes approximately 16 per cent of the heat in the coal. Of this, however, more than a third (6 per cent) is returned to the feed water in the heaters, leaving 60 per cent of the original energy to be accounted for.

Next, heat is lost in radiation from the turbine casing, friction in bearings, internal losses in the electric generators and in excitation, and these amount in all to about 10 per cent of the total heat in the coal.

The last and greatest of all the losses occurring in this system of generating power is in the exhaust steam discharged from the turbine into the condenser, carrying with it 40 per cent of the total heat in the coal. This heat is absorbed by the condensing water and is carried away. The loss is necessary on account of the limited heat range through which steam can be worked. Increasing the initial pressure or the temperature of the steam in the boiler to begin with, and reducing the pressure or temperature in the condenser to end with, will increase the range of expansion of the steam so that more energy can be produced from it. However, there is a limit to the pressure or temperature at which it is safe to operate boilers, and there is a limit to which the pressure and temperature can be reduced in the condenser.

THESE FIGURES FURNISH NO CAUSE FOR DISCOURAGEMENT

Although, as Mr. Blaisdell pointed out, the local company pays for ten times the energy in the coal which is transformed into electricity, there is no reason to be alarmed but rather encouraged, because during the last two years the local power plant has reduced its coal consumption per unit of electrical energy by more than 15 per cent. A goodly part of this was brought about by the increased operating efficiency of power-plant employees. This point was emphasized, in the discussion of Mr. Blaisdell's paper, by J. P. Ripley, railway engineer J. G. White Management Corporation, who pointed out some of the lines in which further savings can be secured. He referred particularly to the use of higher boiler pressure and of powdered fuel. Another great possibility is in the production of by-product coke. Mr. Ripley had also a good word to say for the Diesel engine.

Comparing the local fuel consumption of 3 lb. of coal per kilowatt-hour with the 1.75 lb. of some plants, he said that the former figure was not by any means discreditable. The latter plants probably have larger generating units, use higher boiler pressure, are able to secure cooler condensing water, the auxiliary equipment may be of a more elaborate character and the fuel itself may be of a higher heating value.

New York Commission Issues Report

The Public Service Commission for the First District of New York has just issued Volume 1 of its report for the year ended Dec. 31, 1916. Besides the usual statistics, which were abstracted in this paper when the commission made its 1916 report to the Legislature, the volume contains an extensive résumé of the rapid transit construction program in New York City and the progress of the work. Many illustrations are used to show details of construction work under the various contracts.

AMERICAN ASSOCIATION NEWS

War Board Transacts Routine Business

A MEETING of the American Electric Railway War Board was held in Washington on March 8. Those in attendance were Messrs. McCarter, Budd, Brady and Gadsden. Charles L. Henry, Indianapolis, was also present by invitation. The appointments of E. C. Faber, manager, and W. V. Hill, assistant manager of the board, mentioned last week, were confirmed. Mr. Hill was also appointed electric railway representative on the fuel administration staff in place of Colonel Moore.

Announcement was made that the fuel-saving posters prepared by the Fuel Administration had been distributed to the electric railways. Altogether 280,000 of these posters have been sent out to electric roads, namely, 10,000 of the "firemen" poster, 20,000 of the "Uncle Sam" poster and 250,000 of the "Eagle" poster. The latter is the one put up in the car vestibules. All the expenses of issuing and distributing these posters were defrayed by the Fuel Administration.

Mr. Budd, the member of the board in charge of traffic matters, made a report to his associates of the progress on this work, and Mr. Faber made a detailed report. The next meeting of the board will be held in Washington on Friday, April 5.

Delegates to Chamber of Commerce Convention

PRESIDENT STANLEY has announced the appointment of ten delegates to the convention of the United States Chamber of Commerce in Chicago on April 10-12. P. H. Gadsden will be chairman of the delegation and representative of the association on the national council. The other delegates are: Thomas N. McCarter, H. H. Crowell, J. K. Choate, L. S. Storrs, Thomas Finigan, James H. McGraw, Britton I. Budd, A. W. Brady and Walter A. Draper.

Good Judgment More Important Than Strict Obedience to Rules

A SENTENCE found in the rule book of many railway companies reads as follows: "Use judgment and discretion in all matters pertaining to your duties."

The daily papers in a Middle West city commented favorably the other day on an incident brought about by a storm blockade there. One of the few electric railway cars which had been able to get through reached a point where the crew had been instructed to turn back. The order "All out, take the next car" was given by the conductor to his passengers. The usual remonstrances arose and the conductor saw for himself that there had been no car for some time and none was in sight behind. "All right, get aboard," he said, "I'm not going to let you people freeze—orders or no orders."

The railway president was asked by a reporter if he would discipline or commend this conductor. "I shall commend him," he said. "That was an exercise of judgment under unusual circumstances which I wish more employees would imitate. He acted correctly."

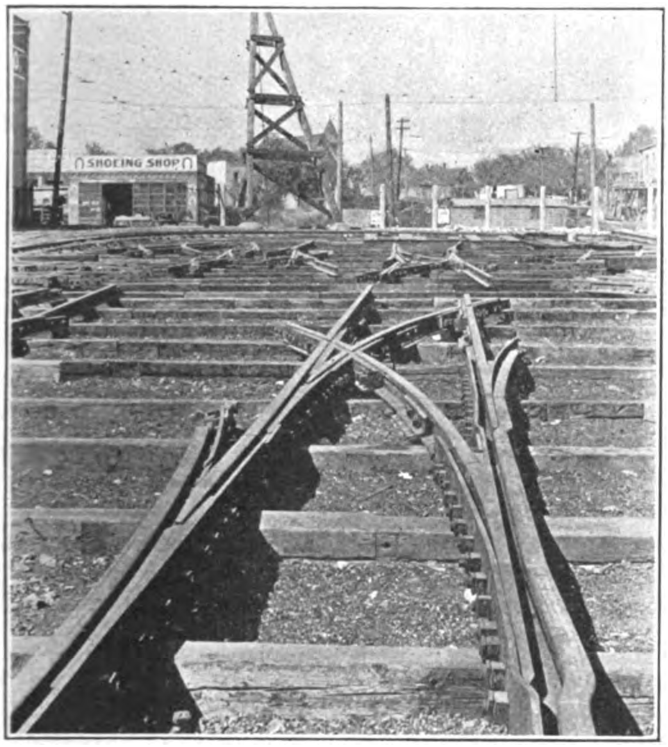
CONSTRUCTION, MAINTENANCE AND EQUIPMENT

SHORT WORTH-WHILE ARTICLES FOR THE ENGINEERING AND MECHANICAL DEPARTMENTS WHICH SHOULD PROVE HELPFUL IN DEVELOPING ECONOMICAL PRACTICES IN SHOP, TRACK, LINE AND POWER HOUSE

Special Work Designed to Give Longer Life

By W. L. Whitlock
Office Engineer the Denver (Col.) Tramway

A NEW type of special work which represents a radical departure from the standard construction of the Denver Tramway was recently installed at a downtown intersection in Denver. This layout, shown in the accompanying illustration, has been termed the "outside" switch. The construction is 100 lb. continuous joint A.S.C.E. rail, the casting being held by 1⅛-in. heat-treated bolts with lock nuts. The unusual feature of the "outside" switch is that main-line traffic does not operate over the switch tongue, the only time when this is actually under traffic being when a car takes the curve. The labor of maintenance and danger of derailment are reduced and the life of the switch is increased, as the stock rail rather than the switch tongue carries the wheel load.



NEW DESIGN IN SPECIAL WORK USED ON DENVER TRAMWAY

It will be noted that there is an offset in the stock rail to make provision for the switch point when open for the curve. This offers the one objectionable feature of the layout as the wheel flanges strike the offset when cars are leaving the switch. The trouble is due to the fact that it is impossible to put a guard on the mate to pull wheels away from this point. Wheels running out of the switch and striking this offset have gradually shaped the point off until it no longer offers an obstacle for wheels to strike. A few broken flanges resulted at first, but no trouble has been experienced since the point has worn down and future construction will eliminate this trouble entirely.

Convex Versus Concave Bonding Compressor Screw Terminals

The Author Concludes That Each Form of Screw Point Is Suited to Certain Kinds of Bond Terminal

By G. H. McKelway
Engineer of Distribution Brooklyn Rapid Transit System

ASK the average electrical or track engineer what kind of point is used on the screws of the bonding compressors operated on his road and, unless he will admit that he does not know, he will generally say "The ordinary kind," or something similar to that. Very few persons have noticed that there are two distinct and opposite types of these points. They can be most easily described by saying that one is convex and the other concave.

The compressors made by three large manufacturers of this equipment have convex ends to the screws, while those made by two other such companies have concave ends. The compressor of one of the latter companies has a point in the center of the cup for the purpose of helping properly to center the compressor on the bond terminal, while that of the other has no point, the center of the cup being flat. With the latter reliance is put upon the sides of the cup for bringing the compressor into the proper position.

The theory upon which the cone-pointed screws are designed is that the points of the compressor screws, where fitted with convex studs as in the case of those of the three manufacturers first referred to, will enter the bond hole slightly, forcing their way through the copper terminals of the bonds and spinning the copper outward so as to compress it tightly against the sides of the holes. Here it will come into the most intimate possible contact with the steel rails, thereby making the contact resistance very low. The copper is spun closely against the rim of the bond hole, sealing it and preventing the entrance of moisture, which would tend to oxidize the metals and cause the contact resistance to increase with age. Above the edge of the rail the copper which is pushed out by the pointed screw helps to form the button which is driven down closely on the rail by the shoulder of the stud.

The idea back of the cup-shaped stud, on the other hand, is to fill up the hole in the rail by forcing the copper in the terminal straight ahead into the hole. The sides of the cup and the collar around the end of the screw prevent the copper from spreading out too far at the sides and thus direct all of the surplus metal into the hole.

Which is the best type to use? There are good arguments in favor of both. It is probable that with the ordinary drop-forged terminal, when well made, a closer contact between the rail and the bond terminal can be made with the convex type. The reason for this is that the cup-shaped terminal tends to compress the copper in the end of the terminal and harden it so that the pressure inside the hole is not as strong in forcing the copper against the sides as when it is spun outward in the manner explained for the convex terminal.

On the other hand the spinning motion given to the terminal by the convex point will tend to crack a poorly made drop-forged terminal. This leaves long cracks extending from the circumference of the terminal nearly to the center, and moisture may work in and destroy the contact. The material from which some bonds are made is very susceptible to these cracks, although soft enough to be more easily and efficiently driven into the hole by the cup-shaped compressor than is the ordinary drop-forged terminal. It would therefore seem wisest to employ that form of compressor with this particular type of bond and the convex type with other bonds unless there is no question as to the softness of the metal in the terminals.

One other objection may be raised against the use of the cup-shaped point in that the edges of the cup, although carefully hardened by the makers, may become broken and in this condition will badly tear the bonds. This can and always should be remedied at once by turning up the end of the screw, but there is the difficulty that many shop men cannot properly harden the metal again. If the hardening is not properly done the same trouble will soon occur again, especially if the end of the screw is allowed to grind against the rail at the time when the bonds are being compressed.

The collar around the screw of the concave-end type is so heavy that it cannot be damaged in that way and is, for that reason, not exposed to the same trouble as the point.

A Cure for Surface-Bent Rails

Apparatus Quickly and Economically Removes Irregularities in Track Without Taking Up the Rails

By H. K. SULLIVAN

Roadmaster Springfield (Mass.) Street Railway

FOR about a year surface-bent rails on the Springfield Street Railway have been straightened effectively by the equipment illustrated. This device, which is quite simple and costs less than $40 to develop, was designed by the writer with the assistance of two of the track foremen associated with him. As shown in Fig. 1 it consists of a combination of I-beam, U-strap, keys and 15-ton Barrett jack by which pressure of about 60,000 lb. can be applied to the rail section.

A 12-in. I-beam 8 ft. long is provided with a welded fork at the right-hand end and designed to receive the working surface of the jack. This fork is made up of two 5½-in. x ⅞-in. x ⅞-in. pieces of steel welded to the top of the girder. At the opposite end a short transverse piece of 60-lb. A. S. C. E. T-rail is welded to the base of the I-beam and serves as a fulcrum, a second short piece of T-rail being welded to the base near the right-hand end to serve as a pedestal. Experience has also shown the desirability of reinforcing the center of the I-beam with two 10-in. x ⅜-in. x 5-in. steel plates welded diagonally to the web and top, as shown in Fig. 2. Four handles or elliptical rings of ⅝-in. wrought iron 5 in. x 2 in. in diameter are provided by means of which four men can easily lift the device from a work car and carry it to the job.

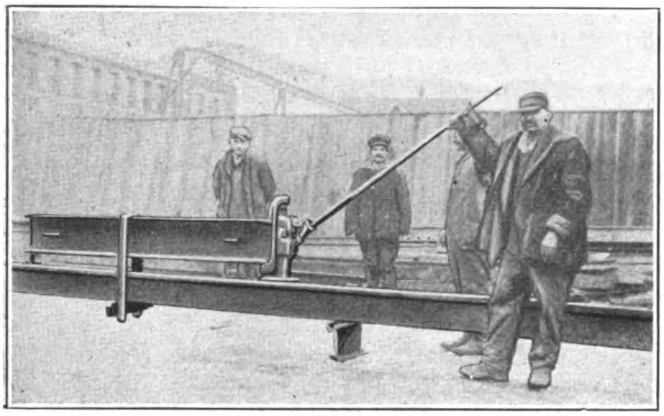


FIG. 1—SURFACE-BEND STRAIGHTENER PLACED AS IN SERVICE AT SPRINGFIELD

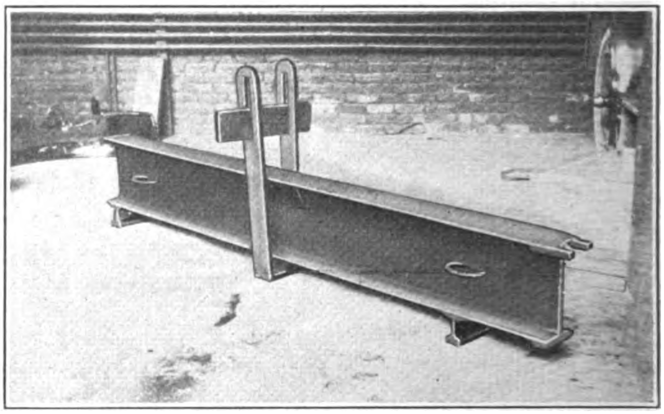


FIG. 2—DEVICE FOR REMOVING SURFACE BENDS IN ELECTRIC RAILWAY TRACK

The U-strap is about 32 in. high, 3 in. wide at the bottom (Fig. 2), and offset to a width of 4¼ in. at the upper part to provide for slotting and insertion of the wedges. The inside width of the U-strap is 7 in., the two sides being ⅞ in. thick each, and the keys taper from ⅞ in. at one end to 3⅜ in. at the other. The working slot for the wedges is 9 in. deep and about 1 in. wide, the keys being 15/16 in, thick. In Fig. 2 the U-strap is shown inverted as compared with Fig. 1. It can be used either way, but the adjustment below a piece of rail in service is made easier when the keys are driven in at the bottom, as indicated in Fig. 2.

In using the equipment, the ground is usually opened about 6 ft. on each side of the joint. The I-beam, straps and keys are put in place, and the rail is jacked up to

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about ¼ in. above the proper height. By applying upward pressure with the jack, with the U-strap in place around the I-beam and the rail section being straightened, the surface bend is taken out of the rail in an average time of about five minutes per joint, not including the time required for excavation or back filling. The jack is then slacked off to bring the rail to the exact surface, and the rail is tamped carefully, followed by withdrawal of the equipment. The speed with which surface bends can be removed, especially in connection with a general reconstruction job, is a most useful feature of the equipment which performs work hitherto imposing great difficulties upon the way department.

New York Railways Convert 439 Cars to Prepayment Type

Over $250,000 Saved by Revised Method of Construction—Folding Doors and Steps, Fare Boxes and Coasting Recorders Installed

THE New York (N. Y.) Railways Company is converting 439 box-type open-platform cars to the prepayment type with folding doors and steps, the control of which is interlocked with the motor circuit so that the cars cannot be started while the doors are open.

The old open-platform cars are of wooden construction throughout and weigh 28,850 lb. light. An end view of this car is shown in Fig. 1. The over-all width is 7 ft. 9 in. and the over-all length 37 ft., with a platform measuring 4 ft. 6 in. over the bumpers. The cars are double truck, equipped with two GE-57 motors, K-27 GE controllers and Westinghouse air brakes. All seats are arranged longitudinally, covered with carpet and the seating capacity is thirty-six. The successive steps from the ground to the car floor are 14 in. to the first step, 12⅜ in. to the platform and 8¼ in. to the car floor.

Some years ago a number of these box cars were converted to a pay-as-you-enter type, an end view of which is shown in Fig. 3. The method of construction used at that time was to remove the old platform and bonnet and rebuild the platforms, 6 ft. 6½ in. over the bumpers, giving a door opening of 57½ in. The conductor and the fare box were placed on the platform.

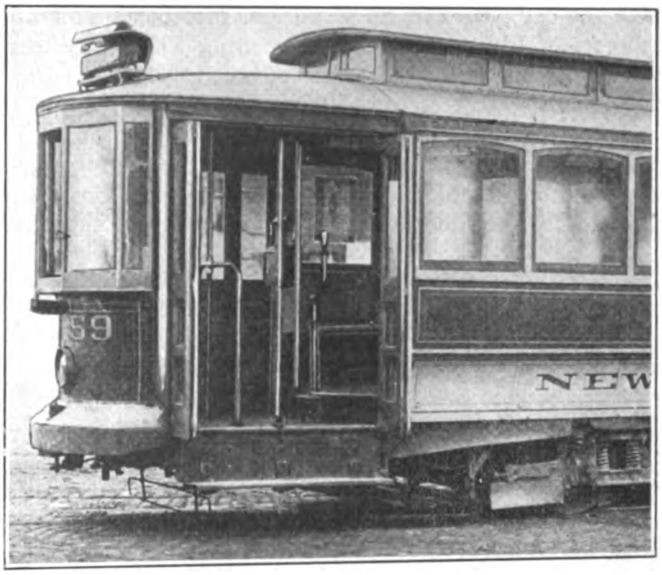


FIG. 3—FIRST CONVERSION INTO PAY-AS-YOU-ENTER TYPE

When it was recently proposed to convert the remainder of these cars to the prepayment type, a study of the matter showed that satisfactory door opening and platform arrangement could be made without demolishing the old platform and bonnet. This was accomplished by moving the vestibule corner post forward, cutting off the buffer angle at the step, moving the controller forward close up against the dashboard and substituting a drop-handle ratchet brake staff for the ordinary hand brake staff. All cars are equipped with air brakes and the hand brakes are used only occasionally. The bulkheads were removed and the longitudinal seats cut away at the corner, drop seats being provided in their place for use at the end not occupied by the conductor. The conductor is placed in-

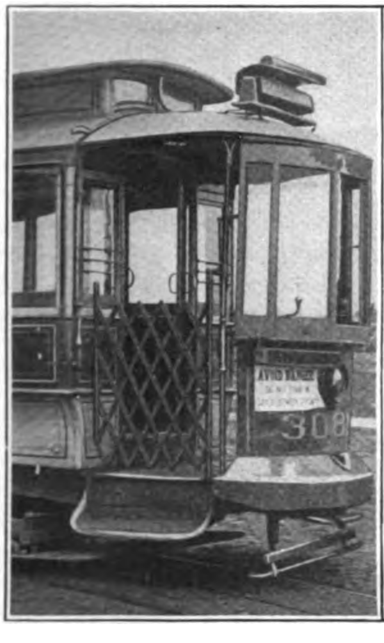


FIG. 1—OLD OPEN PLATFORM CAR

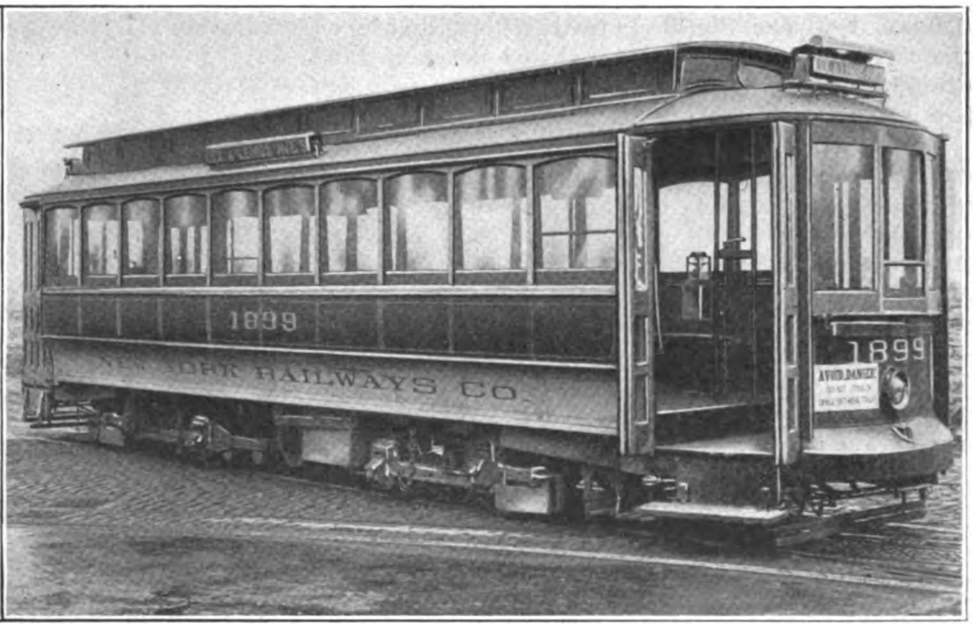


FIG. 2—NEW YORK RAILWAYS CAR REBUILT FOR PREPAYMENT OPERATION

side the car with control stand and fare box. This arrangement gives a 40-in. door opening which has been shown by numerous tests to be entirely satisfactory for handling two streams of passengers, one entering and one leaving. It is also possible to pick up on this platform, lined up before the fare box, as many people as could be handled on the older long-platform cars which were considerably obstructed by the conductor, fare boxes and prepayment railings. A plan of the new car is shown in Fig. 4 and a photograph in Fig. 2.

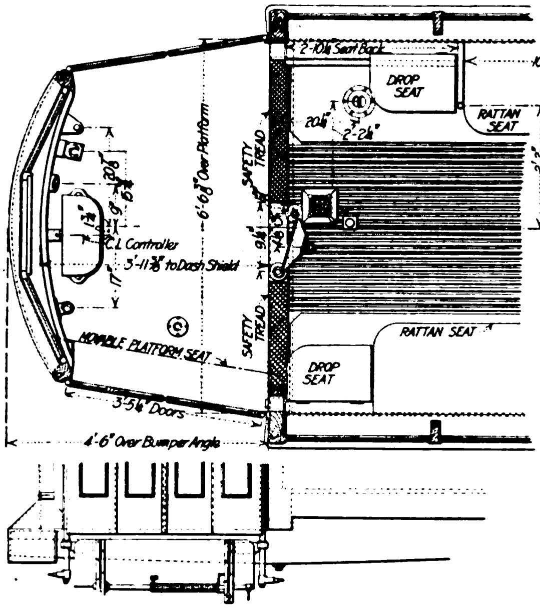


FIG. 4—DETAILS OF NEW YORK RAILWAYS CAR CONVERTED FOR PREPAYMENT

Manually operated, double folding doors and folding steps furnished by the National Pneumatic Company are being installed, all operating levers of which are located beneath the platform. The motorman operates the front door by means of a handle at the left of his controller and the conductor operates the rear or entrance doors by means of a handle very similar to a controller handle located beside the stanchion upon which his fare box hangs. The fare boxes are of the Johnson type and Sterling fare registers already on the cars are retained and are operated either by hand strap or by pedal mechanism. Rico coasting recorders are installed on all cars.

In rebuilding the cars the cutting off of the longitudinal seats and the substitution of drop seats provides a seating capacity of thirty-four in place of the original thirty-six. All seats are now being recovered in rattan, replacing the original carpet covering. With the folding step arrangement the successive heights from ground to car floor are now 13⅜ in. to the step, 13 in. to the platform floor and 8¼ in. to the car floor. The same motor and control equipment is retained, with the addition of the folding-door interlock arrangement. The lighting system is also unchanged. It consists of three five-light series clusters and one light at each end. The weight of the car has been increased to 29,686 lb. by the changes.

The cost of the work has proved to be $600 per car less than for the conversion first made in the original car by extending and entirely rebuilding the platforms and bonnets.

Shop Rearrangement in Rochester

Shifting of Tools and Installation of Materials—Handling Equipment Has Greatly Increased Capacity of General Repair Shop

THE St. Paul Street shops of the New York State Railways at Rochester are limited as to floor area, so that, with the increase in demand upon their facilities, it has become necessary to make the most of the available space. The general arrangement of the shop layout was explained in the issue of the STREET RAILWAY JOURNAL for April 11, 1903, page 548. A supplementary article appeared in the issue for Jan. 16, 1904, page 100. Recently a number of changes have been made for the purpose of increasing the amount of work which can be turned out with a limited shop force, largely by placing the tools where they can be served more readily while keeping the operators out of each other's way, and by introducing devices for handling heavy pieces. This rearrangement has been a factor in the large car remodeling job now going through the shops.

The principal changes in the shops have been in

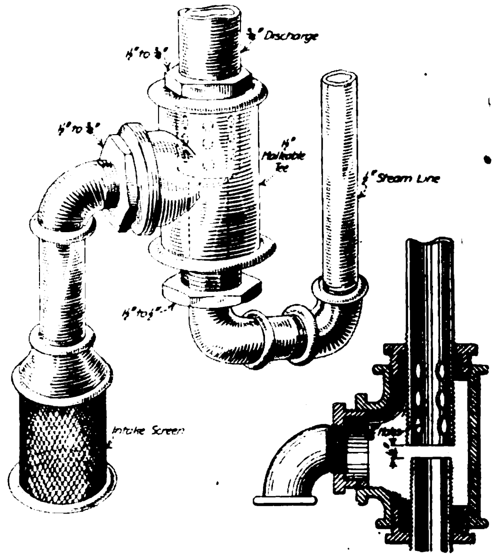
Inexpensive Water Ejector for Pit Use

BY J. E. HESTER

Union Traction Company of Indiana, Anderson, Ind.

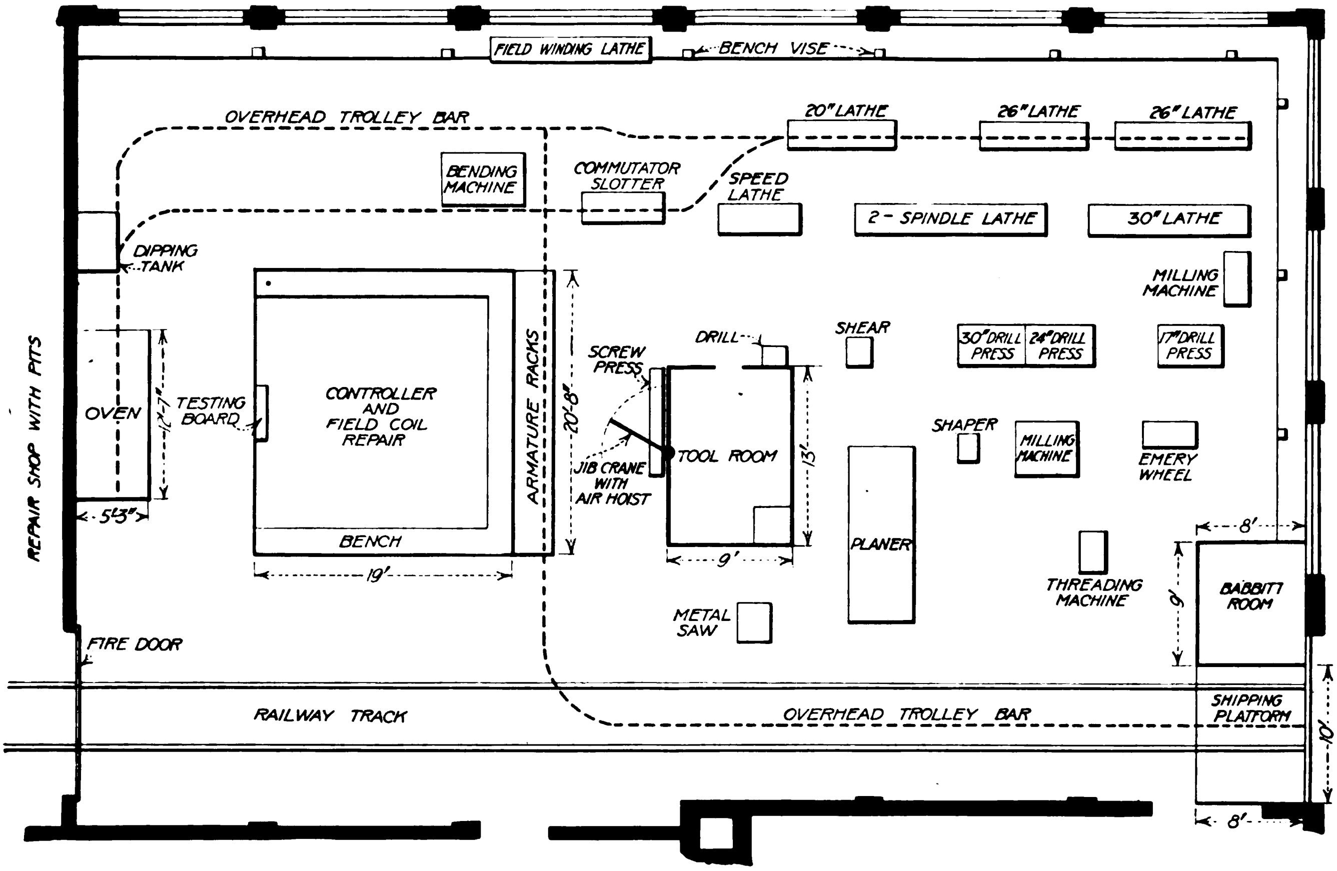
SOME years ago the writer took charge of a shop where the working pits became flooded with water whenever any considerable amount of rain fell. This had to be removed by hand-dipping, a very slow and expensive method.

There were no funds available with which to purchase a pump or other suitable device to remove the water, so the writer secured some pipe and fittings from the stockroom and constructed the ejector shown in the accompanying figure. The drawing is self-explanatory. The ejector can be made in a few minutes and has proved most effective in overcoming the trouble. Fittings of any size can be used, but naturally the larger the fittings the more rapid will be the displacement of water.



WATER EJECTOR CONSTRUCTED FROM ORDINARY PIPE AND FITTINGS the large room which accommodates a number of machine tools, the armature winding section and the controller repair department. The plan of this room is shown in the accompanying drawing. Near the center is the toolroom, within easy reach of all parts of the shop. One corner is taken up with the lathes, arranged in rows with excellent natural lighting from windows in two walls in addition to the skylight. Near them is a battery of drill presses compactly arranged. A planer, a metal-cutting saw, a grinder, a screw press, etc., are all placed to good advantage. A General Electric commutator slotter is the latest addition to the machine equipment in this shop.

The sections of the room assigned to the armature winding and controller repair work have not been materially changed. The former work is done in a bright corner, and for the latter a rectangular space is railed off, as shown. A trolley bar has been installed to serve all important machines and storage spaces. This is a home-made outfit consisting of a 1 in. x 3 in. flat steel bar suspended by means of hangers of the same, the hangers being given an offset at the bottom to clear the trolley wheels. The location of the trolley bar is indicated by a dash line on the drawing. Chain hoists are hung from the bar on simple trolleys.


FIELD WINDING LATHE
BENCH VISE
OVERHEAD TROLLEY BAR
20" LATHE
26" LATHE
26" LATHE
BENDING MACHINE
COMMUTATOR SLOTTER
SPEED LATHE
2 - SPINDLE LATHE
30" LATHE
DIPPING TANK
MILLING MACHINE
REPAIR SHOP WITH PITS
OVEN
TESTING BOARD
CONTROLLER AND FIELD COIL REPAIR
ARMATURE RACKS
SCREW PRESS
DRILL
SHEAR
30" DRILL PRESS
24" DRILL PRESS
17" DRILL PRESS
20'-8"
13'
JIB CRANE WITH AIR HOIST
TOOL ROOM
SHAPER
MILLING MACHINE
EMERY WHEEL
5'3"
BENCH
19'
9'
PLANER
8'
THREADING MACHINE
BABBITT ROOM
METAL SAW
FIRE DOOR
RAILWAY TRACK
OVERHEAD TROLLEY BAR
SHIPPING PLATFORM
10'
8'

LAYOUT OF GENERAL REPAIR SHOP NEW YORK STATE RAILWAYS, ROCHESTER, N. Y.

From the number and size of machines in this shop one would think that it would appear crowded when in full swing. This is not the case, however, and there is no confusion even when the full number of men are at work.

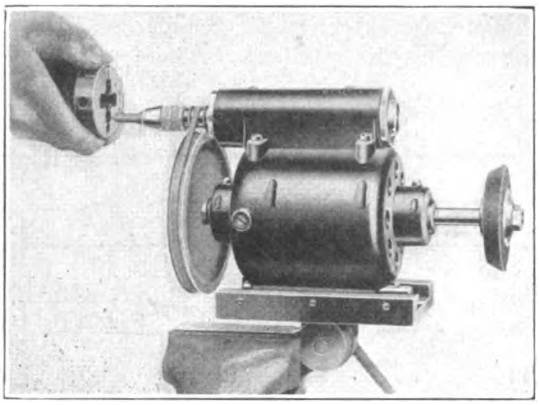
In the pit shop the main improvement has been the putting into commission of a number of previously purchased air hoists carried on trolley bars. In the wood shop the changes have been of minor character. Provision for heating glue has been made by the simple expedient of putting a sheet metal cover, with holes for the pots, over an ordinary kitchen sink. The water in the sink is kept hot by steam from a pipe, the end of which projects below the surface. A steam drying table, for giving pieces of trim a final heating before use, has also been put into this shop. It consists simply of a long, flat radiator made up of ordinary pipe and fittings. J. F. Uffert, master mechanic of the company, who is responsible for the changes mentioned, has also refitted the office section of the building, which is a two-story division at the St. Paul Street end of the building. The second floor has been divided into two small offices, the outer one for the clerks and the inner one for the master mechanic. These are simply but attractively finished and furnished. On the first floor are offices for the assistant master mechanic and timekeepers.

Like master mechanics generally, Mr. Uffert is enthusiastic regarding the possibilities of saving money by the use of gas and electric welding. Last spring he had on hand an accumulation of 532 broken motor cases. Of these all but fifty have already been reclaimed, the welders working on jobs of this kind when routine work is light. The local railway has been purchasing new motors of late in connection with large orders of front-entrance center-exit cars. These motors are the source of so few repairs that Mr. Uffert has been able to utilize the armature and field winding force for bringing the older equipment up to date, especially in respect to insulation, thus greatly reducing the number of pull-ins. At the same time the bearings are being rebored where necessary and the motors fixed up generally as a part of a large rehabilitation program.

Portable Electric Grinder with Speeds Up to 30,000 R. P. M.

A PORTABLE electric grinder with interchangeable equipment which permits the handling of a wide range of work is known as the "Dumore" and is adapted for work on dies, reamers, gages, deep internal grinding and "hard to get at" jobs.

It is claimed that the secret of the tool's success lies in the high cutting speed of 10,000 to 30,000 r.p.m. obtained on the various ball-bearing mounted spindles. Another important feature is that each armature is dynamically balanced and there is said to be no possibility of chatter marks in the work.


HIGH-SPEED PORTABLE ELECTRIC GRINDER

The grinder is equipped with a "Universal" motor which operates on either direct or alternating current and develops ¼ hp. The outfit complete includes a number of attachments, full equipment of wheels, cutter rest, etc., and the weight is only 17 lb. This grinder is manufactured by the Wisconsin Electric Company, Racine, Wis.

New Types of Joint Plates for Welded Joints

THE Atlantic Welding Company, New York, has completed arrangements with The Rail Joint Company whereby the latter company will roll a special type of joint plate for the Gailor welded rail joints exploited by the welding company.

The plates possess a cross section, as shown in Fig. 1. The design permits the Atlantic process welding under the head of the rail and brings the weld to the base in the most desirable place for all sections. These plates are adaptable to all types of girder, T and tram sections. Due to this arrangement plates for welding can be obtained at figures almost as favorable as ordinary mechanical plates.

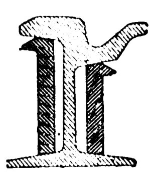


Fig. 1

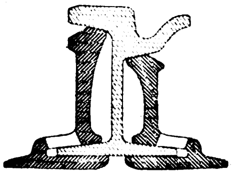
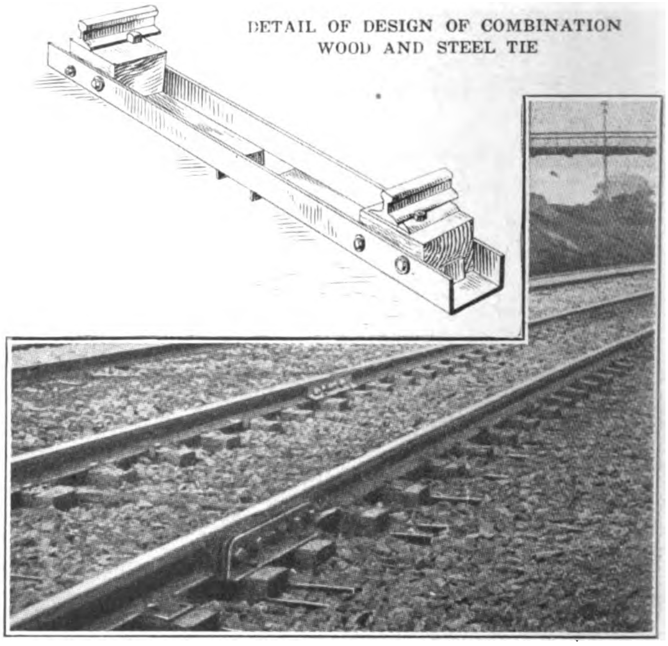


Fig. 2

A special type of a Continuous joint has been also developed adaptable to the welding company's methods. The plates of this joint are the plates of the usual mechanical Continuous joint, specially prepared with a bevel to allow welding the top of the plates to the underside head and groove, and have apertures in the base members of the plates for welding them to the top of the base. (See cross section, Fig. 2). This type of joint permits a short length plate to be used, making the cost very attractive. The first trial installation of these joints (see ELECTRIC RAILWAY JOURNAL, Sept. 1, 1917, p. 362), which have now been in service a year, are reported to have given perfect satisfaction to date.

New Steel Tie Retains Advantages of Wood

THE Dallas Railways Company has recently placed an order for a carload of a combination steel and wood tie which has been tried out satisfactorily by several railways in the last two years. This tie is made of a rolled channel section, placed in the ballast trough-side up, with wood bearing blocks to support the rails. The creosoted blocks, which are 18-in. long and about the same width and thickness as an ordinary tie, are firmly bolted into the channel and stand up nearly 2 in. above the side walls. The good features of a treated wood tie are thus retained and the objectionable features of solid steel or concrete are obviated.



COMBINATION WOOD AND STEEL TIE IN SERVICE

The rail is fastened to the block with any of the ordinary appliances, and, as there is no metal connection between the rail and the channel, perfect insulation is afforded. The blocks reinforce the tie under the rail, where the heaviest stresses have to be met, and thus give substantially the same strength as though the blocks extended the entire length of the channel. By overcoming the rigidity of steel on steel, a more resilient and quieter roadbed is secured. Holes punched in the bottom of the tie provide drainage and afford anchorage in the ballast.

The life of the tie is said to be limited only by the effect of corrosion, as there is no wear of the rail on the channel, and the wood blocks may be readily renewed. The designers of this combination tie, the Standard Steel Tie Company of Dallas, Tex., claim that the renewal of these blocks is offset by the value of the tie as scrap.

New Steam-Ejector Condenser Air Pump

A NEW FORM of condenser air pump operating on the steam ejector principle has been put on the market by the C. H. Wheeler Manufacturing Company, under the name "Radojet" air pump. While steam ejectors for removing air were used as early as 1868 it is believed that this is the first time that the device has been used to produce a high vacuum commercially.

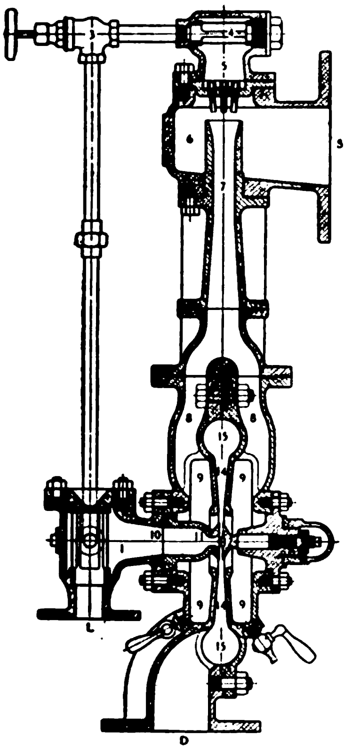


FIG. 1—CROSS-SECTION OF STEAM-EJECTOR CONDENSER AIR PUMP

The principle of operation is shown in the cross-section, Fig. 1. The air entrance from the condenser is at *S* and the ejector outlet is at *D*. The steam enters at *L*, dividing into two paths. One path is through the strainer 1, the vertical pipe, the steam valve 3, strainer 4, expansion nozzles 5 and across suction chamber 6 of the first ejector stage. The steam expands in the nozzles, leaving with a very high velocity, and while passing across suction chamber 6 entrains the air and vapors to be compressed. The mixture passes into the diffuser 7 from which it is discharged, at an absolute pressure higher than that of the air entering at S, into a double passage 8 communicating with the suction chambers 9 of the second stage. These two suction chambers are annular, giving the commingled fluid a large entrainment surface.

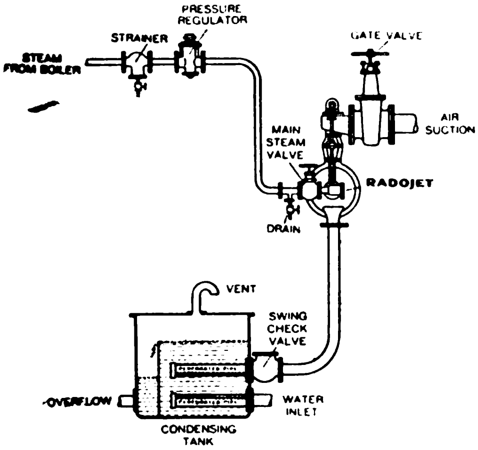


FIG. 2—DIAGRAM SHOWING APPLICATION OF STEAM-EJECTOR CONDENSER AIR PUMP

The second path of the steam is through strainer 1 into passage 10, which communicates with the annular expansion nozzle formed between two circular disks, 11 and 12. The distance between these disks is adjustable by means of the set screw 13. Thence the steam is delivered radially in the form of a sheet and, in passing across the suction chambers 9, entrains the air and steam coming from the first stage and carries them into the annular diffuser 14. The compressed mixture is discharged into casings 15 and to the exit *D*.

From the ejector the mixture of air and vapors can be delivered into a small tank supplied with fresh water for boiler feed as illustrated in Fig. 2.

The makers of the ejector air pump summarize as follows the advantages which accrue from the use of the steam ejector principles: (1) Low steam consumption. (2) Extreme simplicity. (3) No moving parts. (4) No lubrication. (5) Minimum space. (6) Minimum waste. (7) No foundation. (8) Noiseless operation. (9) No attention required during operation. (10) Quick starting. (11) Continuous service. (12) Safety in operation.

The weight of one of these pumps suitable for a 7500-kw. surface condenser is stated to be 450 lb. In a test of a surface condenser equipped with this pump, the following data were noted:

Cooling surface in condenser, sq. ft.	21,000
Load on turbine, kilowatts	11.200
Barometer reading in inches	30.01
Vacuum at turbine exhaust (mercury column)	28.15
Vacuum at air pump suction (mercury column)	28.25
Temperature of turbine exhaust, deg. Fahr.	98
Temperature of circulating water inlet, deg. Fahr.	75
Temperature of circulating water discharge, deg. Fahr.	90
Temperature of hot well, deg. Fahr.	94

About 1,000,000 kw. capacity of "Radojet" pumps has been contracted for, a large portion of which is in successful operation in the United States Navy and on United States Shipping Board vessels.

Checking Devices and Conservation

IN STUDYING the subject of devices for economical operation of electric railway cars L. E. Gould, president Economy Electric Devices Company, has listed a number of ways in which such devices assist in the saving of energy and materials. The most important of these are summarized below.

In the first place the motorman can save energy: (1) By not accelerating too slowly. Fifty per cent of the energy drawn from the line during the notching-up process is wasted in heat in the resistance grids. (2) By not accelerating too rapidly; that is, to the point of spinning the wheels. This wastes power, injures equipment and is uncomfortable for the passengers. (3) By not coasting up grade between stops. This calls for reacceleration and consequent losses. (4) By avoiding unnecessary slowdowns. (5) By not using the brakes and power simultaneously. (6) By not "fanning" the brakes.

Mr. Gould divides the possible savings in car operation into three groups, as follows:

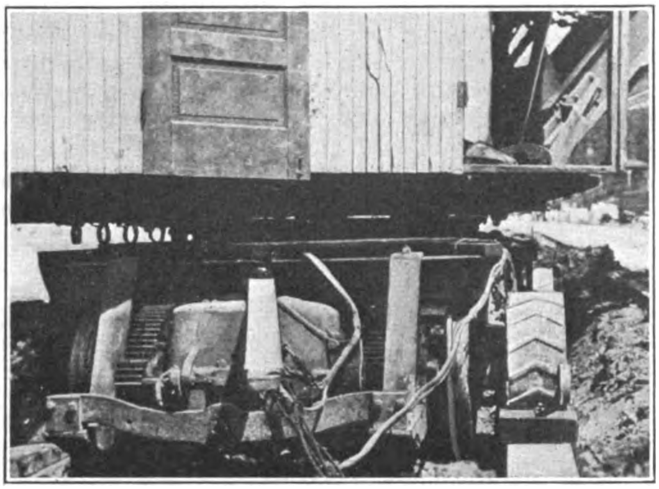
Power Savings.—Direct saving from improved handling of controller and brakes. Lower peaks. More efficient schedule speeds. Distribution system relieved of part of its load. Wider recognition of power waste.

Equipment Savings.—Constant inspection of condition of motors and brakes. Data show most efficient equipment for given service. Less wheel wear from spinning. Less brakeshoe wear. Less roasting of motor coils. Quick detection of short-circuited fields.

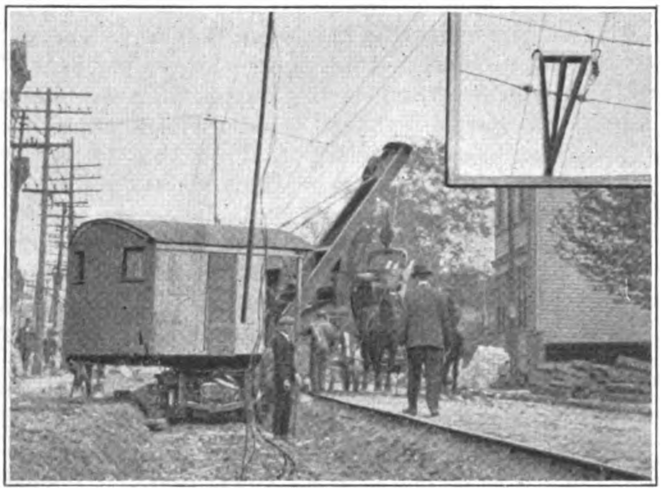
Accident Savings.—Crews are more watchful. Power is on for a shorter time. Maximum speeds are lower. More uniform braking is secured.

Electric Shovels Prove Their Value in Cincinnati

THE Cincinnati (Ohio) Traction Company has had in operation for some time two Thew shovels, electrically equipped, which have given excellent service. They are used primarily for excavating track trenches, but are found equally satisfactory for breaking out concrete. For unloading sheet steel from railway cars the dipper is removed and a lifting magnet is substituted. At other times a small clam-shell bucket is used to remove excavated material which has previously been placed alongside the track by the dipper when operating conditions were such as to prevent completing the operation in one movement. Another instance which shows the adaptability of this machine is when it is used with the clam shell to keep the stone side of a Foote continuous concrete mixer full and thus accomplish the work of eight laborers.



TRUCK WITH BULL WHEELS OPERATING ON PLANK TRACK



ELECTRIC SHOVEL IN OPERATION, CINCINNATI TRACTION COMPANY—INSET, CONTACT DEVICE

When operating on track the shovel is propelled on standard car wheels, but is mounted on bull wheels for traveling in the trenches. The truck axles are long enough for the bull wheels to be pressed into place outside the car wheels. The bull wheels are of smaller diameter than the car wheels, and when used are operated over a plank track made in short sections. The shovel is operated as a trailer when moving it to a new location on the system. The bull wheels are then keyed into position, and it is run into a short trench previously excavated.

Power is taken from the trolley by a flexible connector, which also completes the circuit as the company uses an overhead ground. The electric equipment consists of GE-800 motors for traction and 20-hp. Westinghouse motors for operating the bucket. Between 250 and 400 ft. of single-track trench can be made in ten hours, depending upon the class of materials, length of haul and street congestion.

Remote Control of Heavy Electric Current Switches

THE Texas Power & Light Company has recently purchased from the Union Switch & Signal Company interlocking material for operating from a central point a large number of oil switches located out of doors on pole construction. They are to be installed at the Payne switching station, Dallas, Tex. The ultimate switching system will comprise one one-lever, three two-lever, twenty-five three-lever and eleven four-lever Union dwarf machines, each completely equipped, making a total of 126 levers. For the present there will be one one-lever, three two-lever, eleven three-lever and six four-lever frames, with forty-four working levers. The levers will be arranged in three parallel banks, the mechanical leadout leaving the building in two directions. About one-third of the levers in each bank, located near the center, will be so interlocked that but one lever of certain groups can be reversed at a time. This is to prevent the closing of conflicting switches inadvertently. The above is a novel means of distant control of heavy current switches which heretofore have been solenoid or motor operated, involving considerably greater expense.

Street Car Seats in 1868

WASHINGTON had its street car troubles fifty years ago, as now, though not so serious. There was room for everybody on the car, but, according to the following in the *Star* of Jan. 7, 1868, the room was not always equitably apportioned.

"It is suggested that our street railway companies could save their conductors as well as passengers a good deal of needless annoyance by dividing the benches in their cars into single seats. Each person would then know just how much room he is entitled to and no two or three would be able, as they often do now, to compel others to stand by occupying more room than they need. A change of this sort would greatly promote the convenience of passengers in general and relieve conductors of a duty which is often as difficult as it is unpleasant."—Washington *Star*.

Towline Helps to Keep Tracks Clear

C. H. Clark, engineer maintenance of way of the Cleveland (Ohio) Railway, makes a practice of carrying a towline in his automobile as he travels around the city performing his duties. Recently he found a tie-up caused by an automobile stalling on the railway track, and with the aid of the towline soon had the tracks clear. At least six times during the past winter he has ended traffic tie-ups in this manner.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE · PERSONAL MENTION · CONSTRUCTION NEWS

Further Conferences in St. Louis

Present Emergency May Necessitate Important Changes in United Railways Franchise Terms

A proposal to repeal the mill tax and franchise taxes aggregating $480,000 a year, which are now imposed on the United Railways, St. Louis, Mo., was made by a committee of the Chamber of Commerce at a conference on the proposed franchise settlement in Mayor Kiel's office on March 5, attended also by street railway representatives. The Chamber of Commerce Committee proposed that the pending settlement bill be amended by striking out the proviso that the company pay 3 per cent of its gross earnings to the city, and that instead of paying the accrued mill tax of $2,300,000 in five annual installments with interest at 6 per cent, the company be permitted to pay the mill tax debt in ten annual installments without interest.

As a result of the meeting on March 5 the Mayor instructed President Kinsey of the Board of Public Service to invite representatives of the United Railways, a committee of the Chamber of Commerce and members of "such organizations as he sees fit" to confer on the proposed changes. No date has been set for this conference.

Proposed Amendments

Amendments, to which Mayor Kiel and other city officials have given their assent, would introduce into the pending bill these provisions.

Abolition of the mill tax and the franchise taxes, totaling $480,000 a year.

Extension of the time period allowed for the payment by the company of the accrued mill taxes, amounting, with interest, to $2,500,000.

Acceptance of the new franchise ordinance by the company practically at its own convenience.

Recognition of $60,000,000 as the valuation of the company's properties, which, President McCulloch announced, would be returned for assessment by the State Board of Equalization at that figure.

The bill now awaiting a report from the Board of Public Service, after having been finally amended by the Board of Aldermen, abolishes the mill tax and the franchise taxes, but imposes a tax of 3 per cent on the company's gross earnings and a supertax on its net revenues above 7 per cent on the $60,000,000 valuation established; requires the payment of the accrued mill tax within five years, with interest at 5 per cent, and allows nine months after the adoption of the ordinance for its acceptance by the company.

Thomas M. Pierce, general counsel for the company, is reported to have said that the company cannot formally accept the ordinance, if passed, and reorganize its finances until at least six months after the termination of the war.

Philadelphia Hearing March 27

The Public Service Commission of Pennsylvania has fixed March 27 in Philadelphia for the hearing on the proposed lease of the high-speed rapid transit lines by the city to the Philadelphia Rapid Transit Company. The agreement has already been approved by the company and the city.

Railway Men Donate Ambulance

A fully equipped automobile ambulance was accepted by the United States Army on March 9 as a gift from the Interborough Brotherhood, composed of employees of the Interborough Rapid Transit Company, New York, N. Y.

The presentation ceremony took place in the Twelfth Regiment Armory. Governor Whitman reviewed the regiment.

Theodore P. Shonts, president of the Interborough Rapid Transit Company, introduced John Phelan, president of the employees' association, praising the loyalty of the employees.

Mr. Phelan said the ambulance was given in honor of the 1800 employees of the company who are now serving in the army and navy. It was accepted by Governor Whitman, who paid a splendid tribute to the patriotism expressed by the Interborough men at home in behalf of the Interborough men abroad. Major Guthrie, in charge of the ambulance section of the Metropolitan Division at Yaphank, accepted the ambulance for the government.

Sticks to Electricity for Belt Line

Expert for Buffalo Thinks Fifteen-Mile Steam Line Could Be Electrified Quickly

It is practically assured now that the New York Central Railroad belt line around the city of Buffalo, N. Y., will be electrified by the International Railway providing money can be raised to finance the proposed improvement.

John C. Brackenridge, New York, retained by the city as an electric traction expert, has held a series of conferences with International Railway and New York Central Railroad officials and he says the work of electrifying the New York Central belt line, a distance of approximately 15 miles, can be accomplished very quickly and that the cost of the work would not be excessive. All that he says is necessary is the stringing of overhead wires and the bonding of the rails. Mr. Brackenridge suggests that the discarded cars of New York City's rapid transit lines be secured and rebuilt for use in Buffalo.

The proposed electrification was discussed at the meeting before the Public Service Commission at Albany on March 4, to which reference is made on page 537 of this issue. It was said that the plan proposed by Mr. Brackenridge would cost $1,200,000. General Manager Crowley of the New York Central said such a proposed electrification would be unwise for Buffalo. Relief for the transit situation should be undertaken in some other way. President Connette, of the International Railway, said there were so many details to be considered that he hesitated to express an opinion. He said he would consider the project and inform the commission.

AMBULANCE PRESENTED TO THE ARMY BY INTERBOROUGH EMPLOYEES

Municipalization Progress in San Francisco

Six Different Points of Agreement Reached in the Negotiations for the Purchase of the United Railroads by the City

William von Phul, vice-president and general manager of the United Railroads, San Francisco, Cal., and City Engineer M. M. O'Shaughnessy have been in consultation for several weeks in an effort to work out a plan agreeable to both parties and under which the city could purchase the entire United Railroads' system. The actual values involved have not as yet entered into the discussion. The chief subject of debate has been the method of valuation to be adopted.

A notable step in the progress toward common ground was the agreement that the cost of reproduction is to be based on an inventory of properties and unit prices representing an average of normal conditions for the five-year period, 1913 to 1917, inclusive. A difficult question will be that of the net earnings which the company may expect to receive from the system in case it were retained until the expiration of franchises. The points of agreement that have been established are as follows:

SIX POINTS OF AGREEMENT

1. The sale price of the properties of the United Railroads of San Francisco to the city and county of San Francisco shall be the agreed present physical value of the property plus an amount equivalent to the probable net earnings of the railroad properties during their remaining franchise life.

2. The present physical value shall be the cost to reproduce new as of Dec. 31, 1917, with allowance for betterments to date of consummation of sale, less depreciation, based on the actual physical condition at the date of the consummation of sale. The cost to reproduce new shall be based on a physical inventory of the property and unit prices representing the average of normal conditions for the five-year period 1913-1917, inclusive, and cognizance shall be taken of existing conditions at the time the present property was constructed. The general principles recognized by the Interstate Commerce Commission and the State Railroad Commission shall be followed in making the valuation. In the valuation of the physical property, abandoned trackage shall be taken at its value for old material, and allowance made for its removal and the restoration of the streets.

3. The probable net earnings—to be computed by the best agreed methods—of the properties during their remaining franchise life shall be the difference between the probable gross revenue and the probable gross operating expense for the properties for the period from the date of consummation of sale up to and including the year in which franchises, approximating 134 miles, have expired, plus an allowance for the additional net earnings of the remaining several and isolated lines, if operated independently, to the expiration of the several franchises. The net earnings shall be taken as the remainder of the gross receipts of the property after deducting operating expenses, taxes, depreciation sufficient to maintain the properties in their present condition under like future operating conditions, and interest on the agreed value of the physical property at the same rate which the city shall pay upon its deferred payments for the physical property.

4. Payments on the purchase price of property shall be made semi-annually from the operating receipts. Deferred payments on the physical value of the property shall bear interest at 4½ per cent per annum. Payments on that portion of the net earning value of the property shall bear no interest.

5. Nothing in the above basis of valuation shall be construed to prevent the establishment of a fair price for the purchase and sale of the properties as between a willing seller and a willing buyer.

6. In the event that the representatives of the United Railroads and of the city are unable to reach an agreement, then such matters as are in dispute shall be referred to an arbitrator, who shall be jointly selected by the city engineer and the representative of the United Railroads. Any expense incurred in arbitration shall be borne equally by the United Railroads and the city of San Francisco.

OPPOSED TO PIECEMEAL SALE

Jesse W. Lilienthal, president of the United Railroads, in answer to a request from the city engineer's office, has stated that the board of directors of the company has decided that it would be unwilling to sell the properties piecemeal and that therefore an offer for the purchase of the Parkside lines cannot be considered.

Columbus Publicity Continued

The refusal of the City Council to grant the Columbus Railway, Power & Light Company, Columbus, Ohio, an immediate increase in the rate of fare is only an incident in the company's campaign for relief from oppressive requirements of its 1901 contract. The action of the Council is only an expression of opinion, and eventually the question will be submitted to a vote of the electors. First, however, the company will put the truth before the people in the publicity campaign that has been started.

The request submitted to the Council involved two questions. One was an immediate increase in the rate of fare from eight tickets for 25 cents to seven tickets for 25 cents. The other was a service-at-cost proposition. An increase in the rate temporarily is needed by the company to maintain proper service, and the company feels that this should have been granted. The service-at-cost plan would have involved quite a period of time for consideration, but it seems to be uppermost in the minds of the officials. The present franchise has about nine years to run.

In its publicity campaign the company is endeavoring to adhere implicitly to the truth in every statement. It has invited criticism, favorable or unfavorable, in order that it may clearly set before the people every detail of the franchise situation.

Only 1 mile of track has been built in a number of years. That something must be done to enable the company to finance improvements and extensions is obvious. The city is growing and increasing in population and will shortly need increased facilities and additional trackage. It is the desire of the company that some arrangement be made that will enable it to carry out such construction work as is needed.

Transit Act Upheld

Court Passes Upon Bauer Act, Under Which Cincinnati Transit Program Will Be Put Through

In a decision handed down on March 5 the Ohio Supreme Court upheld the constitutionality of the Bauer act, under which the city of Cincinnati was authorized to name a rapid transit commission and construct a rapid transit road, and also approved the contract between the city and the Cincinnati Traction Company, except that portion wherein the city guarantees the obligations of the railway. This provision is held to be in violation of Article VIII, Section 6, of the Ohio constitution which forbids the passage of a law authorizing any county or city to become a stockholder in any joint stock company or loan its credit to or in the aid of any such company.

The contract between the city and the company provides for the distribution of the gross proceeds of the rapid transit line which is to be operated by the company, but specifies that certain obligations of the company and securities hereafter to be issued by it shall be paid before the payment to the city of the sums specified in the contract. The court held that this is a loan of the city's credit to the company for these payments.

All other portions of the contract were approved, as were the various steps taken by the Rapid Transit Commission in planning for the construction of the road. The court said the road is needed for the proper transportation of the people to and from the suburbs. The city has a right to enter into a contract with the company for the operation of the road and to provide by contract for the payment of all expenses of operation, depreciation and maintenance out of the gross proceeds received from all sources of operation under such terms and conditions as the city and its duly authorized officers and boards may deem for its best interests. The rental or compensation to be paid to the city must, however, be determined by some method which, while not necessarily a fixed sum, shall not leave the city's fair and just rent or portion of the earnings subject to hypothecation by the company or applicable to the company's independent obligations.

The opinion prevails that a new contract will have to be made with the company for the operation of the proposed rapid transit road and that it will be necessary to secure the approval of the voters, as was done before. Extreme care will have to be exercised in the formulation of the contract to prevent violation of any of the laws relating to public credit.

Cleveland will benefit by the experience of Cincinnati in this matter, as a rapid transit commission has already been appointed to work out a plan.

Grave Labor Situation

Contractors Engaged on New York's New Rapid Transit Lines Fear Financial Ruin

The Public Service Commission for the First District of New York has taken up with the Board of Estimate and Apportionment of New York City the question of whether it may not be necessary as well as advisable to secure legislation which will permit the completion of contracts for construction of some of the lines of the dual system of rapid transit in order to assure the beginning of operation of those lines at an early date. The progress of construction has been interfered with so seriously with embargoes on materials and by the labor situation due to the great amount of government war work going on that remedial legislation is deemed necessary to solve the problem.

A conference has already been held between members of the commission and Acting Mayor Alfred E. Smith, and it is probable that another conference will be held soon between representatives of the commission and the transit committee of the Board of Estimate and Apportionment to determine what legislation, if any, may be had.

The commission in a letter to the Acting Mayor pointed out that the situation was vital and directly affected the city. The letter states that contractors who entered into agreement before the United States declared war are now threatened with financial ruin from the unanticipated conditions which have arisen, while the commission finds itself confronted with the prospect of the abandonment of the work by contractors and consequent inability to get the work completed at a cost within reason.

In order to retain construction forces contractors have found that they must assume burdens which they state they are no longer in a financial position to meet. They are willing to complete their work on an actual cost, no-profit basis, but they do not feel able to advance wages further except on some basis which recognizes the unexpected character of war time exigencies. The commission states that unless this situation is met and legislation obtained which will permit an allowance to contractors sufficient to meet the increased labor cost, cessation of work on some of the new lines seems imminent.

Protest Against Proposed Buffalo Bills

International Railway Objects to New Legislation—Chamber of Commerce Has $30,000,000 Transit Program

Continual unjust criticism of the International Railway, Buffalo, N. Y., by the City Council, daily newspapers and the Municipal Street Railway Commission has so affected the securities of the company that it is even unable to dispose of its bonds at 88, according to a statement made before the Buffalo City Council by Henry W. Killeen, of Penney, Killeen & Nye, of counsel for the railway. Mr. Killeen said that unless the company received the support of the federal reserve bank in marketing bonds to finance approximately $2,000,000 of improvements planned for this year, the company "will be forced into bankruptcy with three-fourths of the other electric railway properties of the State."

LEGISLATION PROTESTED

When it was suggested that the city purchase some of the company's bonds, Mayor George S. Buck replied that the municipality would be willing to lay the new rails and make other improvements to the company's real property and then lease the equipment to the company. Mr. Killeen appeared before the Council to object to the three legislative measures pending before the Mayor and the Council for their approval. All of the measures affect the International Railway.

One provides that the city can own and operate automobile bus lines in competition with the railway; another provides that the city can license jitney lines operated by private companies, and another legislative measure would allow the city to own and operate electric railway properties.

In appearing before the Legislature at Albany to object to the enactment of these measures, Mr. Killeen branded them as unjust and discriminatory and urged the Legislature not to allow them to pass. Referring to traffic conditions in Buffalo, Mr. Killeen declared that the weather during the past winter was the most severe in the city's history; that the company suffered a loss by fire of almost fifty of its best cars; that a large Westside carhouse was burned and that floods crippled more than 100 cars. He said that this combination of circumstances crippled more than 50 per cent of the company's equipment and was wholly responsible for the alleged inadequate service about which the city complains.

$30,000,000 EXPENDITURE RECOMMENDED

The transportation committee of the Buffalo Chamber of Commerce, which has been studying local traffic conditions for almost a year, has submitted a comprehensive report embodying the expenditure of approximately $30,000,000 to improve the city transportation facilities. This plan of the Chamber of Commerce, includes the construction of a series of electric subway and elevated lines through the congested retail business section. A four-track subway in Main Street from Lafayette Square to East Ferry Street, a distance of approximately 3 miles, and another four-track subway on the east side between Lafayette Square and William Street and the West Shore Railroad tracks is recommended, together with a double-track elevated line connecting the end of the proposed east side subway with the seawall strip on the extreme south side of the city.

CONFERENCE WITH COMMISSION

Nothing is mentioned in the report of the Chamber of Commerce regarding an immediate relief of traffic conditions through rerouting of surface lines, but it is pointed out that there is a real demand for relief from the congested traffic in the retail business district and in the congested industrial centers.

Mayor Buck of Buffalo, General Manager Crowley of the New York Central Railroad; E. G. Connette, president of the International Railway, and the members of the Public Service Commission for the Second District, discussed Buffalo's transportation facilities on March 4. Chairman Hill presided and spoke of the conditions in the northern part of Buffalo, where about 37,000 persons are to be employed in industrial plants whose output is required by the government.

It was shown that surface cars can handle about 14,000 employees while the other employees must be transported by the steam roads. Mayor Buck explained the city's needs to relieve the situation and General Manager Crowley said his company would operate five trains of fourteen or fifteen cars in the morning and at night instead of two as at present. The additional service will require the installation of semaphores, telephones, etc., which will take two weeks to install.

Electrical Engineers Organize Regiment

A new regiment, composed largely of electrical engineers and known as the Thirty-seventh Engineers, is being recruited for early service in France. Positions still open to volunteers, including men in the draft age, are operators of steam, oil and gas engines and electrically driven pumps, machinists, blacksmiths, sheet metal workers, molders, pattern makers, pipe fitters, oxy-welders and electricians of all kinds, especially wiremen, linemen, armature winders, etc. A special recruiting office has been opened at the State Council of Defense Building, No. 120 West Adams Street, Chicago, Ill., in charge of Major A. B. Kratz, where all applications for this service should be made.

The regiment will be commanded by Col. T. A. Dillon, an officer of the Engineering Corps of the Regular Army, who has been relieved from duty as electrical engineer of the Panama Canal to command this regiment.

News Notes

Mayors Favor Municipal Ownership.—At the State conference of Mayors of New York on March 7, resolutions were adopted unanimously urging the Governor and the Legislature to a speedy enactment of a measure that would permit any municipality in the State to own public utility properties.

Increase in Wages in Sioux City.—An increase of 3 cents an hour will be made in the wages of conductors and motormen in the employ of the Sioux City (Iowa) Service Company. The request for shorter working days, the other important feature of the petition submitted by the employees, will be taken up with the men immediately.

Statement Regarding C. Loomis Allen.—At Syracuse, N. Y., on March 13 T. C. Cherry, business associate of C. Loomis Allen, former director of the Electric Railway War Board, issued a statement in regard to Mr. Allen as follows: "Mr. and Mrs. C. Loomis Allen are now at a quiet resort, the location of which is withheld at their request. Mr. Allen has not advised his friends of his future plans."

Utility Magazine Discontinues.—Owing to conditions growing out of the war the Utilities Bureau, Philadelphia, Pa., has decided to suspend the publication of the *Utilities Magazine*. The Utilities Bureau is the bureau of which Morris L. Cooke is acting director. Arrangements have been made so that if it becomes expedient at any time prior to the regular resumption to issue one or two special numbers of the magazine, it can be done.

Will Continue Park.—The lease of Wheeling Park by the West Virginia Traction & Electric Company, Wheeling, W. Va., to Griffiths & Crane has been canceled by mutual consent, but the park will be operated as usual this year. Arrangements are being made with J. A. Moore, Wheeling, to run it. In an item published in the ELECTRIC RAILWAY JOURNAL for Feb. 23, page 384, it was inadvertently made to appear that the operation of the park would be discontinued.

Flood of Municipal Ownership Bills.—There was a debate in the Senate of the State of New York on March 12 as to where a bill of Senator George F. Thompson, providing for a referendum on the subject of municipal ownership by all towns, villages and cities, should be referred. Senator Brown insisted that the bill should go to the public service committee this time. In the course of his talk he made the suggestion that there were so many municipal ownership bills coming in that it might be necessary to appoint a special committee that could take care of the subject.

One-Man Car Criticised.—The *Motorman and Conductor* for February, 1918, contains a signed article by W. D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees, critical of one-man car operation. Mr. Mahon says that his article is based on a report of the general executive board of the Amalgamated Association. The conclusions are, briefly, that the purpose of the designers and operators in introducing the cars is primarily profit, to save on platform expenses and with no thought for the safety and convenience of the public.

Plan to Revoke Franchise Put Over.—The City Council of Portland, Ore., following recommendation of City Attorney La Roche, recently laid on the table the ordinance introduced into the Council by Commissioner Bigelow, asking the revocation of the railway franchises of the Portland Railway, Light & Power Company on the ground that the company is violating the terms of the grant by charging a 6-cent fare. City Attorney La Roche stated that consideration of such an ordinance at this time might interfere with the suit which the city has brought in the courts to annul the 6-cent fare order of the Public Service Commission.

Frank Putnam States the Company's Case.—Frank Putnam, counselor of public relations to public utility companies, who is associated with the North American Company, which controls the United Railways, St. Louis, Mo., has written for the St. Louis *Globe-Democrat* a survey of the St. Louis electric railway situation, apropos pending negotiations between the company and its employees as to wages, and the company's plea to the Public Service Commission of Missouri for increase of revenue. During the last six months Mr. Putnam has also written a series of forty-five advertisements for the United Railways. Mr. Putnam was formerly on the editorial staff of the *Post-Dispatch* of St. Louis.

New Twin City Labor Finding.—The labor situation in the Twin Cities as it affects the Twin City Rapid Transit Company appears to be clearing up. Final action on the proposed settlement of the Federal Mediation Commission, which has been in session in Minneapolis more than two weeks, is up to the company officials. The basis is practically that recommended by the former commission several weeks ago, namely, that union men may return to the company's employ "as fast as vacancies occur." Present company employees, however, object to the provision that restores strikers to their seniority rights when they are reinstated. The union men on March 10 adopted the commission's recommendations, indorsed the commission and pledged loyalty to the government.

Bonus for Richmond Employees.—The Virginia Railway & Power Company, Richmond, Va., recently posted a notice on wages as follows: "Commencing March 1, 1918, and until further notice, the company will pay to all employees who are in the service of the company at the end of each calendar month in the several operating departments, including the shops, line department, power houses, substations, division offices, motormen and conductors and trackmen, a bonus of 3 cents an hour for men working by the hour, and $9 a month for men working by the month. This bonus is independent of regular wage scales, and is made to assist our employees in meeting the emergency confronting them during the war period in the high cost of living."

Programs of Meetings

Railway Signal Association

A meeting of the Railway Signal Association will be held at the Auditorium Hotel, Chicago, Ill., on March 18. The committee reports to be presented will be on: mechanical interlocking, power interlocking, standard designs, direct current relays, a.c. automatic block signaling, signaling practice, batteries and switchboards, electrical testing, harmonizing of specifications and regional committees. There will also be a memorial service for the late secretary, C. C. Rosenberg.

United States Chamber of Commerce

Business readjustment to war will be the dominant note of the sixth annual meeting of the United States Chamber of Commerce at the meeting in Chicago on April 10, 11 and 12. The four critical questions of the day—financing the war, railroads, centralized control of industry, and shipping—will be considered from the twofold point of view of filling the government's requirements, but with the minimum disturbance to private industry. More than 500,000 business men will be represented.

American Railway Engineering Association

The American Railway Engineering Association, through its president, John G. Sullivan, chief engineer of the Canadian Pacific, Western lines, has announced the nineteenth annual meeting to be held in Chicago on March 19, 20 and 21.

The program to be arranged will take cognizance of the changed conditions of the present time in the railway world, more particularly with reference to war emergency yard improvements to relieve the freight congestion; ways and means for overcoming or meeting the shortage of material and labor; devising new ways of labor saving in maintenance work; reclamation and utilization of scrap material; substitution of other materials for wood and steel; conservation of resources; and discovering, if possible, new sources of economy.

The National Railway Appliances Association has similarly seen the special field for its exhibit this year, and preparations have long been under way for a show that will best meet the needs of the railroads under the present circumstances. In all 158 firms have arranged for space.

Financial and Corporate

London Income Cut in Half

Another Canadian Company Is Hit by the Rising Cost of Electric Railway Operation

The gross earnings of the London (Ont.) Street Railway for the calendar year 1917 amount to $417,862 as compared to $426,314 the preceding year. The last year's earnings, therefore, represented a decrease of $8,452 or 1.98 per cent.

This was due in a measure to the large number of soldiers entraining in the city in 1916, thereby causing an abnormal increase in that year.

This decrease in earnings was greatly exceeded by the rise in operating expenses. These for the calendar year 1917 amounted to $331,094 as compared to $292,401 the preceding year, an increase of $38,693 or 13.23 per cent. Owing to the redemption of bonds, the deductions from income decreased $1,012. The net income for the year totaled $47,477 as compared to $93,610 in 1916, a decrease of $46,133 or 49.28 per cent.

The maintenance of equipment expenses in 1917 amounted to $46,713 as compared to $32,410 in 1916, an increase of $14,303. Included in the 1917 maintenance is an item of $10,267 for the rebuilding of cars, as compared to $1,978 in 1916. The operating expenses in 1917 showed a large increase in both materials and labor, the total being 79.24 per cent of the gross as compared with 68.6 per cent for 1916.

On March 8, 1915, the company began to redeem its bonds at the rate of $35,000 a year, the bonds redeemed to date totaling $105,000. While the company has improved its road and equipment on an average of $46,514 a year, it has not been able to increase correspondingly its bonds and capital stock. The result is, therefore, that on Dec. 31, 1917, there was invested in road and equipment $233,848 more than the total outstanding bonds and capital stock. With a surplus of only $194,542 available, the financial operation is said to have become difficult. The directors deemed it inadvisable to declare a dividend for the six months ended Dec. 31, 1917, on account of the large decrease in net income in 1917 and the other prevailing conditions.

Steam-Electric Deal Proposed

The Southern Pacific Railroad, the Southern Pacific Company, the Visalia Electric Railroad, the Minkler Southern Railway and the Atchison, Topeka & Santa Fé Railway have asked the California Railroad Commission to approve an agreement whereby the Visalia Electric Railroad proposes to sell its line of railway and property south from the city of Porterville, Tulare County, to the Minkler company. The purchasing company proposes to pay for the properties an amount equivalent to that actually expended by the Visalia Electric Railroad and reconstruct the line acquired so as to be suitable for steam and electric operation. It further proposes to extend the lines to Ducor to connect with the Southern Pacific lines.

The Minkler Southern Railway is controlled through stock ownership by the Santa Fé company, and through funds advanced by the parent company has been engaged in constructing a railway from Exeter to Porterville. It is now proposed to complete this line to Ducor, where connection will be made with the Southern Pacific lines.

Bay State Abandonment

Receiver Donham Authorized by the Court to Discontinue 125 Miles of Unprofitable Lines

The Bay State Street Railway, Boston, Mass., may abandon 125 miles of electric railway in sparsely settled districts. Permission to do this was granted to the company on March 11 by the United States Circuit Court. Discontinuance of the lines is not hedged about by alternatives. The order of the court carries with it no restrictions. The entire matter is left to the discretion of the receiver of the railway, Wallace B. Donham, who appealed to the court for the order.

Coincident with this request announcement was made that the communities thus threatened with loss or curtailment of service would be given reasonable notice of the intention of the company. The announcement was unsigned. It was contained, however, in an envelope bearing the return address of the Association of Owners of Massachusetts Street Railway Securities.

THE STATEMENT

The announcement was as follows:

"The Bay State Street Railway, through Receiver Donham, has just filed a petition with the United States Circuit Court for authority to discontinue operating approximately 125 miles of track. This, with the track already discontinued, and awaiting other proceedings, totals 141 miles.

"The receiver states that these lines in general are in the sparsely settled communities where the travel is insufficient to make them pay.

"Under present conditions, with abnormal operating costs on the whole property, and particularly with the high cost of coal, it is impossible to raise money for proper maintenance of these tracks.

"It is the intention of the receiver to give ample notice to the communities involved before service is discontinued, as it is realized that in many respects the decrease in values which would follow the giving up of these lines would be a serious problem to the communities affected.

"There are pending at the present time before the Legislature a number of bills, passage of which would authorize local communities to consider the question of whether they prefer to have the lines operated with some local assistance, or desire to have them given up, and it is the hope of the receiver that this legislation in some form will be passed, and before the actual taking out of the service that the wishes of the local communities may be thoroughly considered."

Financial News Notes

Mr. Dodge a United Director.—At the annual meeting of stockholders of the United Gas & Electric Corporation, New York, N. Y., the retiring board was re-elected with the exception of S. J. Dill, who was succeeded by Marshall Dodge.

Stock Increase Authorized.—The Ohio Public Utilities Commission has authorized the Cleveland (Ohio) Railway to increase its capital stock $2,700,000. The sum of $1,230,000 will be used to pay floating debt and the remainder will be spent for improvements to be made during the present year.

Southern Illinois Company Purchased.—The Public Utilities Commission of Illinois has authorized the Central Illinois Public Service Company, Mattoon, Ill., to purchase the entire outstanding capital stock of the Southern Illinois Railway & Power Company, Harrisburg, Ill., which operates 17 miles of line.

New Directors for Syracuse Suburban Lines.—C. Loomis Allen, Syracuse, N. Y., on March 12 was succeeded on the board of directors of the Syracuse & Northern Electric Railway, Inc., by W. J. Harvie, on the Rochester & Syracuse Railroad by W. K. Zinsmeister, and on the Auburn & Syracuse Electric Railroad by Frederick W. Barker.

Bond Issue Contemplated.—The directors of the Cities Service Company, New York, N. Y., are said to be considering the issue of between $2,000,000 and $5,000,000 of convertible 7 per cent debenture bonds, the proceeds to be used in chief part for the extension of operations in the organization's oil fields in Kansas.

Road Being Dismantled.—Thomas Flynn, Bluffton, Ind., has begun the dismantling of the property of the Bluffton, Geneva & Celina Traction Company, which he purchased at receiver's sale last November, and as a consequence the operation of the property has been discontinued. The affairs of the company were reviewed briefly in the ELECTRIC RAILWAY JOURNAL of March 9, page 475.

Receiver Appointed for St. Paul Southern.—The St. Paul (Minn.) Southern Railway has been placed in the hands of a receiver by Judge W. L. Converse of the District Court at Hastings. Application was made by the Northwestern Trust Company, St. Paul. A. R. Walbridge has been named trustee for the bondholders. A deficit of $51,934 has accumulated since the road was placed in operation late in 1914.

Reduction in Common Dividend by Twin City.—The Twin City Rapid Transit Company, Minneapolis, Minn., has declared a quarterly dividend of 1 per cent on the common stock payable on April 1 to holders of record of March 15. The common stock has been on a 6 per cent a year basis since 1910. It is understood that the reduction in the dividend was due largely to the increase in the cost of labor and supplies, the higher prices for coal being a prominent feature in this respect.

Two-Year Bonds Offered.—Harris, Forbes & Company, New York; Harris, Forbes & Company, Inc., Boston, Mass., and the Harris Trust & Savings Bank, Chicago, Ill., are offering for subscription $750,000 of first mortgage 7 per cent gold bonds of the Chicago & West Towns Railway, Chicago, Ill. The bonds are dated March 1, 1918, and are due Sept. 1, 1920. Interest is payable March 1 and Sept. 1 in Chicago. The bonds are in coupon form in the denominations of $1,000 and $500. They have been approved by the Illinois Public Utilities Commission.

Cape Electric Earnings.—During the year ended June 30, 1917, the Cape Electric Railway, Ltd., Cape Town, South Africa, carried 23,752,016 passengers and earned £231,105, as compared to 22,477,366 passengers earning £212,791 in the preceding fiscal year. The profit and loss account at the end of the year totaled £79,893. The difficulty of obtaining supplies, the high cost of materials and the increased war bonuses kept the cost of operation at a high level during the year. The expenditures were further increased by the additional taxation imposed by the government.

Louisville Net Falls Off.—At the recent annual meeting of the Louisville (Ky.) Railway it was reported that the gross earnings during the calendar year 1917 were $3,849,805 as compared to $3,365,376 in 1916, or an increase of $484,429. Operating expenses and all charges during the year were $3,214,474, an increase of $638,011. The net income at $635,330 showed a decline of $153,883. During the year the company built several miles of track to Camp Taylor, which are now bringing in good returns. The interurban lines had to meet heavy competition from passenger automobiles and from freight trucks. As a result business for the year was not satisfactory. A switch to handle interurban livestock was built into the Bourbon Stock Yards, but it was constructed too late in the season for any benefit in 1917.

Common Stock Dividend Policy Announced.—The stockholders and the directors of the Cities Service Company, New York, N. Y., have approved the following resolution: "Resolved, That until such time as there has been invested in the property of the Cities Service Company, or its subsidiaries, from the earnings of the company, a sum equal to the entire par value of the preferred stock then outstanding, there shall be no dividends paid in cash on the common stock in excess of 6 per cent per annum, unless the company shall, for a period of six months, have purchased and retired all preferred stock that can be purchased in the open market at 110 per cent of par or less."

Bay State Order Vacated.—With the consent of all parties concerned Federal Judge Dodge has vacated an order issued on Jan. 2, under which Wallace B. Donham, receiver for the Bay State Street Railway, was authorized to issue receivers' certificates to the amount of $379,000 to meet interest and tax obligations. This action was taken pending a decision by the Federal District Court on the claim of the State of Massachusetts for a franchise tax. Of the amount originally authorized $162,000 was for interest on bonds of the Boston & Northern Street Railway, $136,000 for similar payments to the bondholders of the Old Colony Street Railway, and the remainder to meet the State franchise tax.

Detroit United Bonds Offered.—The Guaranty Trust Company, New York, N. Y., is offering for subscription at 97 and interest, yielding about 7¾ per cent, $4,500,000 of Detroit United Railway five-year 7 per cent collateral trust gold notes due April 1, 1923. The notes are to be the direct obligation of the Detroit United Railway specifically secured by pledge with the trustee, the Central Trust Company, New York, N. Y., of $9,000,000 par value of bonds and dividend-paying stocks. The notes are to be issued to refund $3,500,000 of notes due on May 1 next; to reimburse the treasury for advances made to refund underlying bonds, and for capital expenditures. The issue of the notes has been passed upon by the capital issues committee of the Federal Reserve Board. The bonds are offered subject to the approval of the Michigan Railroad Commission.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$21,584	*$10,780	$10,804	$3,630	$7,174
1 " " '16	20,204	*7,084	13,120	3,555	9,565
12 " " '17	231,965	*119,414	112,551	42,736	69,815
12 " " '16	211,694	*100,858	110,836	42,003	68,833

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$8,910	*$10,038	†$1,128	$1,318	†$2,446
1 " " '16	8,788	*9,185	†397	1,121	†1,518
12 " " '17	124,316	*124,778	†462	14,755	†15,217
12 " " '16	122,614	*109,113	13,501	13,286	215

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$85,477	*$44,114	$41,363	$12,303	‡$32,041
1 " " '16	75,471	*39,710	35,761	9,625	26,136
12 " " '17	938,074	*516,993	421,081	137,120	‡303,779
12 " " '16	826,313	*444,422	381,891	107,698	274,193

EL PASO (TEX.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$108,471	*$71,215	$37,256	$6,508	$30,748
1 " " '16	117,342	*59,202	58,140	5,335	52,805
12 " " '17	1,283,525	*801,771	481,754	67,007	414,747
12 " " '16	1,110,717	*658,564	452,153	59,127	393,026

JACKSONVILLE (FLA.) TRACTION COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$69,590	*$44,919	$24,671	$15,866	$8,805
1 " " '16	62,300	*38,149	24,151	15,552	8,599
12 " " '17	698,123	*469,712	228,411	188,896	39,515
12 " " '16	627,193	*423,707	203,486	183,907	19,579

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$294,207	*$141,871	$146,336	$28,950	‡$126,969
1 " " '16	182,357	*101,221	81,136	28,597	52,539
12 " " '17	2,582,113	*1,445,663	1,136,450	348,744	‡816,455
12 " " '16	1,930,320	*1,157,078	773,242	346,929	426,313

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$29,302	*$21,177	$8,125	$7,990	$135
1 " " '16	28,281	*20,659	7,622	7,268	354
12 " " '17	304,682	*232,079	72,603	90,200	†17,597
12 " " '16	310,962	*213,600	97,362	86,676	10,686

PENSACOLA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$35,081	*$20,282	$14,799	$7,829	$6,970
1 " " '16	26,843	*14,657	12,186	7,664	4,522
12 " " '17	350,458	*203,680	146,778	93,668	53,110
12 " " '16	280,100	*157,336	122,764	92,675	30,089

SAVANNAH (GA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$92,611	*$58,317	$34,294	$24,832	$9,462
1 " " '16	80,096	*49,649	30,447	23,986	6,461
12 " " '17	968,173	*645,592	322,581	290,549	32,032
12 " " '16	826,093	*553,695	272,398	282,756	†10,358

TAMPA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$87,952	*$50,019	$37,933	$5,085	$32,848
1 " " '16	91,444	*45,504	45,940	4,368	41,572
12 " " '17	1,001,311	*563,540	437,771	56,118	381,653
12 " " '16	967,086	*527,719	439,367	52,414	386,953

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*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Flat Five-Cent Fare for Fort Wayne

Indiana Commission Sanctions Withdrawal of Reduced Rate Tickets During Period of War

The Fort Wayne & Northern Indiana Traction Company on March 4 was granted permission by the Public Service Commission of Indiana to charge a straight 5-cent fare and eliminate reduced-rate tickets during the period of the war. This change was noted briefly in the ELECTRIC RAILWAY JOURNAL of March 9, page 482.

The city opposed the petition for a straight 5-cent fare, and at a hearing given by the commission in Fort Wayne submitted argument to prove that the company was bound by its franchise contract. The commission found that the company made a franchise agreement under a general law of the State, and that under the recent Supreme Court decision in the Logansport telephone case the Public Service Commission had the power to change the terms of the contract. The Fort Wayne company surrendered its franchise and received an indeterminate permit from the commission last year.

COMMISSION HAS POWER TO CHANGE CONTRACT

The commission draws a distinction between the general law under which the Fort Wayne franchise contract was made and the specific law under which the Indianapolis Street Railway contract was made. In the former case, it is held, the Legislature did not surrender its power to regulate fares at any time, while in the latter case it did surrender its power for the period of the contract it authorizes.

At the hearing in Fort Wayne, over which Commissioner Edwards presided, eighty citizens filed a petition asking that the commission grant the company temporary relief.

The commission found the physical value of the company's property in the city $1,800,000, not counting intangibles. It further found that the company had an operating deficit in 1915 of $13,760; that the company's net earnings in 1916 were less than 1¼ per cent of the value of the physical property; and its net earnings in 1917 were about 1 1/3 per cent of the physical value of the property.

CHANGE EXPECTED TO INCREASE GROSS

The straight 5-cent fare may increase the gross earnings of the company $75,000 a year, but the commission says that this will depend upon a normal increase in traffic. The commission believes the company will be fortunate if the straight 5-cent fare enables it to realize from 5 to 5½ per cent on the physical value of the property. The increase in fares may reduce traffic somewhat so that the $75,000 estimated increase in gross earnings will not be realized.

The commission found that high prices of material and labor, owing to the war, had resulted in financial difficulties for the company, and it further found that 3500 automobiles in Fort Wayne have cut off a great deal of patronage the company formerly enjoyed.

More Than 100 Fare Increases

Big Gain Since Jan. 1, 1917, in Number of Companies Securing Financial Relief

Since about Jan. 1, 1917, electric railways numbering 119 have secured permission from regulatory bodies to increase fares or have increased them where such consent was unnecessary. This total includes two companies which secured higher fares late in 1916, and also one Canadian company. The information has been compiled by the information bureau of the American Electric Railway Association.

According to similar data previously collected by this bureau and published in the ELECTRIC RAILWAY JOURNAL of July 7, 1917, sixty-seven electric railways in the United States and the Dominion of Canada had secured increases in fare from the beginning of 1914 up to June 1, 1917. This total included six Canadian companies. The latest data, therefore, show a big increase in favorable fare awards during the last half of 1917 and the early part of 1918.

CITY AND SUBURBAN INCREASES SEPARATED

The 119 increases in the recent period to date are divided so as to show fifty increases for urban lines and sixty-nine increases for interurban lines. Higher fares for the urban lines were granted in twenty-three states, Pennsylvania leading the list with ten increases. New York came next with nine increases. Vermont, Massachusetts and Washington each reported three increases. There were interurban increases in seventeen states, Pennsylvania ranking first with thirteen, New York second with eleven, and Massachusetts third with ten. Ohio had six increases, Illinois five increases, and California, Connecticut and Indiana each three increases.

The information bureau also reports that at the present time sixty-one cases for higher fares are pending. These cases cover twenty-one states. Most of them are in New York, which has a total of seventeen. There are six cases pending in Illinois and five each in Ohio, Pennsylvania and Indiana.

The earlier data compiled by the information bureau were secured from reports of fare increases made by commissions and through the technical press. The later data, however, were secured by means of a questionnaire sent to member companies of the American Electric Railway Association. This explains the overlapping of the periods covered by the data.

Fare Rehearing Put Off

Up-State Commission of New York Puts Over Until March 21 Rehearing in Peekskill Cases

The Public Service Commission for the Second District of New York on March 7 postponed for two weeks action in the petition filed by the village of Peekskill for a rehearing of applications of the Peekskill Lighting & Railroad Company and the Putnam & Westchester Company for permission to increase fares.

The hearing resulted in an agreement between R. F. Barrett, corporation counsel, and M. S. Decker, former Public Service Commissioner, representing the companies, to inspect the company's books as to the allocation of certain charges, and if Mr. Barrett discovers anything to notify the commission and the rehearing will be considered. Otherwise the village's application will probably be denied.

The commission declined to take up a request for a rehearing of the 5-cent fare provision in the franchises given the company because the Appellate Division has upheld the commission.

APPLICATION FOR REHEARING UNSUPPORTED

Mr. Barrett complained against the provision of the commission's order under which transfers were canceled. He said the railroads were now charging a 7-cent fare, with no transfer privilege, but Mr. Decker said four tickets were sold for 25 cents.

Mr. Decker objected to a rehearing, saying no facts had been presented in support of the application that in any way tended to throw doubt on the accuracy or propriety of the decision of the commission in both cases. He said that it had been shown that in the first six months in 1917 expenses exceeded receipts by about $6,000, and that for the year the companies were $12,175 behind in operating expenses. He said allocations had been made in accordance with the requirements of the commission. At the commission's suggestion Mr. Decker agreed to permit Mr. Barrett to inspect the books of the corporations.

It was stated that the Putnam & Westchester Traction Company had lost more than 6500 fares because of people walking to their homes or to the other line. It was asserted that the company suffered most under the transfer system.

The reasons for the request for the rehearing were reviewed in the ELECTRIC RAILWAY JOURNAL for March 2, page 436.

Beeler Washington Report Considered

A Consolidated System and Increased Rate of Fare Suggested by Washington Railway & Electric Company

On March 10 the Public Utilities Commission of the District of Columbia submitted to the Senate a report on the local railway situation in answer to a resolution asking for this information. The commission also transmitted the comments of the companies on the Beeler reports.

The commission says that changes recommended by Mr. Beeler to reduce congestion in the vicinity of Fifteenth Street and New York Avenue have been put into force and have greatly relieved the situation. A second recommendation, to reduce the number of stops approximately one-third and have an average spacing of stops within the closely built sections of the district 8 per mile, and in the suburban districts 6 per mile, has been approved by the commission. The necessary stop signs have been ordered by the railway companies and as soon as they are received and erected the order will be made effective, probably about April 1.

Hearings on the proposed changes for the W. B. & A. cars will be begun on March 18. Reports on suggested rearrangement of stops on the most congested section of the Washington Railway & Electric Company's system and staggered working hours for the government departments, will be made public soon. Later the commission may ask for legislation to help the situation.

LABOR TURNOVER LARGE

In its letter to the commission the Capital Traction Company attributed the shortage of its rolling stock during the past winter largely to the unprecedented number of cars damaged through the weather conditions in the month of January, but twenty new cars have been ordered and will be available not later than Oct. 1. The labor turnover has also been large. During January, for instance, the company engaged 164 men or nearly 25 per cent of the total in the service at the beginning of the month and lost by resignation or otherwise 131. During the month an average of eighty men were absent from work on account of sickness. The company expressed its appreciation of the value of the Beeler survey and said that it desired to co-operate with the commission in an effort to overcome existing difficult conditions.

The Washington Railway & Electric Company said that it had experienced no lack of cars, but had suffered from lack of men to maintain and operate them. It attributed the shortage of men to war demands and war prices for labor. Severe weather conditions and shortage of coal also prevented many employees from reporting for work by reason of sickness. The company says that a proper development of public utility facilities to meet the inevitable growth of the city is dependent upon two things: First, upon authorization by Congress of a comprehensive and reasonable plan of financing "which is now lacking," and second, upon the consolidation of the two principal electric railway systems operating in the district. To the above should be added a higher rate of fare.

On March 5 the Public Utilities Commission of the District of Columbia, Chairman Brownlow presiding and Commissioner Gardiner present, held a hearing to consider the skip stops suggested in John A. Beeler's report of Feb. 7, abstracted in the ELECTRIC RAILWAY JOURNAL for Feb. 16.

Only two men representing the public attended the hearing. A. T. Gage, who spoke for himself and a number of other residents west of Connecticut Avenue in the Chevy Chase district, thought that the distance between stops would be too great inasmuch as many people resided a block back of Connecticut Avenue.

GENERAL IMPROVEMENT LIKELY

Chairman Brownlow pointed out that even if some citizens in this outlying section did not save much time, the universal use of a skip-stop system would produce a general improvement in the frequency of service and decrease congestion.

Walter Jackson, business manager of the ELECTRIC RAILWAY JOURNAL, testified that stops in European cities were much longer than in America, and that intervals like 800 ft. or more were considered necessary for good street railway service.

MR. BEELER ON THE SKIP STOP

In reply to Mr. Gage, John A. Beeler, consulting engineer to the commission, said that the stops had not been fixed arbitrarily, but had been laid out with the view of serving the greatest number of people, as established by his traffic checks. The average of 890 ft. was not as high as it seemed because of a 1500-ft. viaduct and other local conditions, which if eliminated from the calculations would result in adding only 100 ft. to the average walk. The average number of stops for Washington as a whole had been worked out as eight to the mile, the number eliminated being about 33 per cent. He added that both companies had already ordered the same style of "Car Stop" sign. This is a 12-in. diameter disk with yellow background and embossed black lettering.

Dr. H. W. O. Millington, representing three civic associations of the Brookland and adjacent districts, spoke very highly of the effort to establish better service through the medium of skip stops. He suggested some minor modifications which would be more helpful than certain others in serving a greater number of people.

W. F. Ham, vice-president and general manager of the Washington Railway & Electric Company, and G. E. Hamilton, president of the Capital Traction Company, also favored the Beeler skip-stop report and said they would be glad to consider individual changes.

After Commissioner Brownlow had stated that the matter would be taken under further advisement, the civic and railway representatives had an informal conference with Mr. Beeler for the adjustment of the few stops in dispute.

ORDER OF POSSIBLE NATIONAL BEARING

The absence of any serious objection to the skip-stop report is of particular interest, as the way the skip stop will work out in Washington may have considerable influence on the decision of Dr. Garfield to issue a nationwide order on the subject.

Joint Commission Action Likely

Request for Fare Increase by Kansas City Railways May Engage Attention of Two Commissions

An innovation in public service handling of electric railway matters when a street railway operates across state lines may be provided with reference to the affairs of the Kansas City Railways. The Public Service Commission of Missouri, considering the matter of fares at Kansas City, suggested that the joint meeting of the Missouri with the Kansas Commission would probably be arranged to hear the argument. The commissions would have to hold separate meetings for their decision, though the obvious advantages of a joint meeting to receive evidence and testimony are thoroughly appreciated.

This announcement of the Missouri commission was the result of the argument of city officials at Kansas City, Mo., against any interference by the Missouri commission with the 5-cent fare and universal transfers provided by the franchise of the Kansas City Railways in Kansas City, Mo. The franchise provides in a general way that 5-cent fares and universal transfers shall prevail on all the city lines of the Kansas City Railways, including the lines in Kansas City, Kan., and in adjacent small towns, which form a metropolitan district.

APPLICATION IN KANSAS SOON

Officials of Kansas City, Mo., maintain that the city has the only authority over fares and that if inter-city fares are to be considered, the matter would be one for the Interstate Commerce Commission.

The Kansas City Railways will soon file its application before the Utilities Commission of Kansas for increased compensation for its service. Its petition to the commission in Missouri asks only that its revenues be increased to meet increased expenses. The petition in Kansas must be more definite and the company will therefore state whether it desires more than a 5-cent fare or merely a charge for transfers.

Another meeting of the Missouri commission will be held probably in April, at which time the city will file its brief setting forth its claims to exclusive jurisdiction in the matter of rerouting, fares, etc.

Brooklyn Company Protests

Objects to Public Service Commission Order Requiring Time-table Data in Cars

The Brooklyn Rapid Transit Company, through President T. S. Williams, has issued a statement protesting against the provisions of the order of the Public Service Commission of March 5 in which the company was directed to carry certain time-table data in its surface cars. This order was reviewed briefly in the ELECTRIC RAILWAY JOURNAL of March 9, page 481. The statement made by the company to the press follows:

"The company will co-operate with the commission in any effective way to procure sufficient and regular car service under existing conditions. The order proposed, however, like any attempt to prescribe in detail precise operations covering seventy-five different lines of surface cars and 541 miles of track, leads to complications, absurdities and impossibilities which would probably, if efforts were made to carry it out in detail, impair service as much as it would help it. All electric railway operation in a big city must be elastic in order to be effective. With fluctuations of travel so great as they are in this community, varying not only from day to day but from hour to hour, and by reason of weather conditions or other influences being subject to constant changes, car service cannot be bound by iron rules.

"This applies equally to all congested territories in Greater New York, and we assume that whatever general rule the commission thinks good for Brooklyn will be equally applied to other parts of the city.

"We have had no chance to point out to the commission some of the clearly objectionable features of its order, and as soon as the commission has considered these we assume it will hesitate to compel the enforcement of the order without material modification."

Cleveland Fare Threatened

The operating report of the Cleveland (Ohio) Railway shows that the interest fund reached the low point of $170,260 in January because of a deficit of $55,776 for the month. This indicates another increase in the rate of fare by April 1 or May 1.

On May 1 it will probably be necessary to make an increase in the wage scale of motormen and conductors and after that it is predicted that the income from the maximum rate of fare allowed in the Tayler grant under which the company operates will not be sufficient for operation at a profit. The maximum fare under the franchise is 4 cents cash and seven tickets for 25 cents.

Portland Court Case Closed

Argument Completed in Action Growing Out of Fare Increase in Which Life of Commission Is Threatened

The hearing in the case of the Portland Railway, Light & Power Company, Portland, Ore., versus the city of Portland, before a tribunal of six circuit judges of Multnomah County, in regard to the matter of increased fare in Portland granted by the Oregon Public Service Commission, came to a close on March 4. Decision of the six circuit judges who sat en banc throughout the case will be the next step. No definite date for announcement of this decision has been set. The case will probably be appealed to the Supreme Court, regardless of the decision handed down.

THE COMPANY'S SIDE

The case closed with arguments by three attorneys. Franklin T. Griffith, president of the company, spoke during the last session, arguing that the act creating the Public Service Commission vested in that body the power to regulate all rates, whether or not the rates were in existence before or after the commission came into being. Mr. Griffith further contended that the city's charter did not give the city the right to make the railway grant inviolable.

The hearing concluded with an appeal from Attorney General George M. Brown on behalf of the Public Service Commission. Without placing any particular emphasis on the justice or injustice of the increased rate, Attorney Brown defended the act of the commission. He maintained that the commission has the right to fix rates on all public utilities, and asserted that to find the act of the commission invalid would destroy its usefulness.

R. A. Leiter, for the company, contended that the commission had a right to alter the rates, because the franchise ordinance under which the 5-cent fare was established was never included in the commission government charter passed by the people at the special election in 1913. This occasioned surprise, as it had been generally believed that the commission government charter was voted by the people of Portland under either the initiative or referendum rights. Attorney Leiter pointed out that the commission government charter had been framed by a committee of nine men, but that the people had never petitioned for the passage of the charter, as is required under the initiative and referendum rights under the "Oregon System." Attorney Leiter conceded that the city had every right to regulate railways and other public utilities, but "not one jot or tittle of power with reference to the regulation of rates." He said that power was solely and exclusively vested in the Public Service Commission.

Attorney Martin L. Pipes, for the city of Portland, stated that because the referendum act which gave existence to the Public Service Commission was not retroactive in its scope, that body had no authority to readjust rates which had been fixed before the commission came into existence. He contended that the commission's power lay only in the right to readjust rates which had previously been fixed by the utility itself. This right did not include the fixing of rates which had been established by a municipality. Mr. Pipes endeavored to show that the powers and rights delegated in both the city charter and the act creating the commission were parallel, and pointed out that it would be impossible to have such co-existing authority. He asserted that either the city charter or the Public Service Commission must bow to the other.

Wilson T. Hume, representing the city, asserted that a legislative enactment passed in 1901 definitely fixing fares at 5 cents and no more was on the statute books, and in full force and effect. In answer to the contention of the defense that the sovereign power lay with the lawmaking bodies, Mr. Hume argued that this power lay only with the people themselves.

City Attorney La Roche attacked the constitutionality of the referendum measure creating the commission. He discussed the history of the Malarkey bill creating the commission and pointed out that the people of Oregon, who are supposed to retain the sovereign power, have no method of holding a referendum on any act or order of the commission. He asserted that this was sufficient to invalidate any act or order increasing or regulating fares. He further contended that the franchise contract by which the company was permitted and directed to charge a 5-cent fare was an inviolable contract. His third important point was with reference to the retroactive feature involved in the legal controversy. His argument on this line was similar to that of Attorney Pipes.

New Jersey Fare Case Postponed

The State Board of Public Utility Commissioners of New Jersey on March 14 granted an adjournment of twelve days in the hearing on the application of the Public Service Railway for permission to charge a 7-cent fare and 2 cents for a transfer, with an additional cent for a transfer on a transfer. The board also directed the company to amend its petition to show that the proposed increase would be an emergency measure and not permanent.

Thomas N. McCarter, president of the company, said that new construction work which would cost $6,600,000 was necessary to sustain the burdens placed on the corporation by the war and that the only way in which this expense could be met was by increasing fares. The corporation would welcome a rate inquiry and co-operate with it, but its needs were so urgent that Mr. McCarter thought the petition should be granted without waiting for the result of an inquiry.

St. Louis Fare Case Started

President McCulloch the Principal Witness for the Company—Another Hearing to Be Held on March 20

Hearings were begun on March 5 before the Public Service Commission of Missouri with respect to the application of the United Railways, St. Louis, for permission to increase its fares. Richard McCulloch, president of the company, occupied the stand as a witness for six hours. He reviewed various operations of the company, particularly those relating to finance. Many exhibits were introduced, among them a statement of the value of the properties of the United Railways as of Dec. 31, 1917. This statement, reproduced from unofficial sources, follows:

Estimates of physical property July 1, 1911	$35,666,359
Less property sold or scrapped before 1917	$34,412,505
Plus 20 per cent increase in construction costs	6,163,983
Plus additions to 1917	4,364,473
	$44,940,962
Plus construction overheads—	
Engineering ...... 5 per cent	
Legal expenses ... 2 per cent	
Contingencies ....10 per cent	
Interest ....10 per cent	
Taxes and insurance 3 per cent	
Constructor's profit.10 per cent	17,976,385
	$62,917,347
Plus superseded property	2,740,000
	$65,657,347
Plus organization and bond discount	6,565,734
	$72,223,081
Plus working assets, Dec. 31, 1917	3,053,280
	$75,276,371
Securities held in treasury	1,155,000
Grand total	$76,431,371

ZONE SYSTEM FAIREST

Mr. McCulloch was of the opinion that a zone system of fares would be the fairest way of increasing revenues, but that it might be difficult to put such a system into effect successfully in St. Louis because of the delay the plan would be likely to cause in traffic during the rush hours. He thought that the zone system would tend to repopulate the so-called "deserted" districts and prevent unwise spreading of the city's area, but that it would not result in forcing congestion.

Mr. McCulloch estimated the total operating expenses of the company for 1918 at $11,153,177, an increase of $2,674,188 over the costs of 1917. He said that the labor costs would be increased this year 35.6 per cent, and the cost for materials more than 15 per cent. An outlay of $3,074,152 would be required for transportation alone. He estimated the total income of the company for 1918 at $12,569,035. After paying $11,153,177 as before related for operating expenses $1,415,858 would be left for depreciation and fixed charges. After allowing 10 per cent depreciation and a mill tax reserve of 2 per cent a deficit of $92,426 would result. Adding the $2,523,230 necessary for fixed charges the company would face a total deficit of $2,615,656.

Mr. McCulloch said that since 1910, when dividends were suspended, the company had spent $13,199,714 in maintenance and $6,779,784 in replacements, and that $901,931 represented property retired from use. New construction paid for out of earnings cost $1,988,907. The sum of $2,463,000 had been expended in retiring bonds.

ANOTHER HEARING MARCH 20

Chairman Busby of the commission announced that the commission would proceed with deliberation in the case, paying no attention to insinuations of possible strikes. He fixed March 20 as the day of the next hearing, and Counsellor Daues of the city, after consultation with C. E. Smith, the city's railway expert, announced that the city would be ready at that time to cross-examine Mr. McCulloch.

The Board of Public Service has retained James E. Allison of James E. Allison & Company, St. Louis, consulting engineers, to serve as technical advisor of the city in its opposition to the application of the railway before the commission for permission to increase fares.

Talk on Collecting Fares

General Superintendent of Columbus Company Addresses Men on Matter Affecting Them and the Company

The Columbus Railway, Power & Light Company, Columbus, Ohio, issued under date of Feb. 15, over the signature of Harold W. Clapp, general superintendent, an eight-page booklet entitled "Collecting Fares." In it the company said frankly that it does not receive fares for all rides, used an example to show what large proportions the non-collection of fares might assume, and urged all conductors to "get all the fares." It followed this with the rules for collecting fares with the aid of fare boxes. In its introduction the company said:

MEN AND MANAGEMENT MUST WORK TOGETHER

"Whatever success this company may enjoy is just as important to conductors and motormen as it is to the management. If that success is dependent upon the amount of revenue received and there is a leak anywhere tending to lessen revenue, it is most certainly of vital importance to conductors and motormen for that leak to be stopped.

"Co-operation between men and management in stopping the leak cannot be had unless we all understand each other thoroughly. In reaching that understanding perfect frankness must prevail in the discussion of problems of mutual interest.

"In talking about the collection of fares we have one unpleasant truth to face, but why turn our backs on a big problem because it is disagreeable in some ways? Why fool ourselves by any such action? Why not talk it over as man to man? That is the true spirit of co-operation, so let us be frank about it."

Emergency Fare Bill in New York

Railways to Seek by Legislative Enactment a Six-Cent Fare for Period of War

Theodore P. Shonts, president of the Interborough Rapid Transit Company, Col. T. S. Williams, president of the Brooklyn Rapid Transit Company, and officers of other electric railways, at a hearing before Governor Whitman on March 14, submitted for his approval a proposed bill which will be introduced in the Legislature, fixing a 6-cent fare on the electric railways throughout the State, beginning April 1 and continuing in effect until six months after the war.

The bill would give to the Public Service Commission the power of review of such new fares after they were fixed. Governor Whitman is reported to have told the railway men that the bill as it was presented appeared to oust the Public Service Commissioners from their power to fix fares. He suggested an amendment to the bill permitting the increase in fares with the approval of the Public Service Commissions. The bill declares 6 cents "a just and reasonable rate of fare."

Others at the hearing in addition to Messrs. Shonts and Williams representing the railways included S. W. Huff, president of the Third Avenue Railway; L. S. Storrs, president of the New York & Stamford Railway; James F. Hamilton, vice-president of the New York State Railways; W. O. Wood, president of the New York & Queens County Railway, and Horace E. Andrews, president of the New York State Railways.

Answer in Binghamton Fare Case

The Binghamton (N. Y.) Railway has filed with the Public Service Commission of the Second District its answer to the complaint of residents of Binghamton and Johnson City against the proposed stopping of sale of ticket books between Binghamton and Endicott and between Johnson City and Endicott.

The operation of the company's new tariff has been suspended until April 30. The company alleges that the rate under the dollar book, used between Binghamton and Endicott, is less than half a cent a mile and that the cost to the company is considerably more than the return on both the dollar book and the 60-cent book, used between Johnson City and Endicott. It is alleged that the ticket-book business is entirely one way and it is necessary to operate extra cars to maintain the service.

The rates in force were established about thirteen years ago when Endicott was "a mere hamlet" to aid its industrial development. At that time the cost of operation was much less than now. The answer cites the service given between the places by the Erie

Railroad and it is claimed these trains carry from 850 to 1000 passengers. The case was referred to in the ELECTRIC RAILWAY JOURNAL of March 9, page 482.

Kansas City Traffic Changes

Engineer of Commission to Assist City in Working Out Operating Details

The Public Service Commission of Missouri at a meeting in Kansas City on Feb. 28 took up many matters of operation of the Kansas City Railways and instructed its engineer, A. L. Harrup, to return to Kansas City to assist in working out new details. With respect to nearly every subject there were objections from city officials that they were matters properly to be handled by the city. In nearly every instance, however, the commission intimated that it could take care of such matters.

The company's request for permission to install a skip-stop system of approximately eight stops to a mile met with favor before the commission. The company was asked to go ahead with its plans for skip-stop operation on one line at a time. Cars will probably stop on all lines at odd numbered streets going out and at those with even numbers coming in.

The company's request as to rerouting cars was not taken up in detail. The commission expressed itself as favorable to shorter loops and turn-backs —an important element of economy in operation being worked out by the company especially on certain long lines on which traffic at the other third is comparatively light.

"We Walk!" the Cry

A walkers' club has been started at Harrisburg, Pa. Every member pledges himself or herself to walk to and from work, if the distance is less than 2 miles. This pledge is to be kept in all sorts of weather. The movement is another manifestation of the queer turn which the thrift idea has received. The appeal on which the campaign is based is stated as follows:

"In these days when the people generally are being urged to conserve all natural resources, it is our opinion that by walking instead of riding on the electric railway cars we will not only save time for ourselves and others and much of the coal necessary for the production of electricity needed to operate cars, but we will put ourselves in good shape physically—thus obviating the necessity of burning so much coal to keep our houses warm; and we will be effecting a saving in actual money which will not only enable us better to meet the high cost of living, but purchase additional Liberty Bonds and Thrift Stamps, as well as make contributions to worthy causes."

"Running a street railway nowadays is like setting a hen on china eggs— nothing in it."—*The Buzzer* of the British Columbia Electric Railway.

Commission Ordered Not to Change Fares

Rhode Island Legislature So Directs and Creates Special Legislative Committee to Report by March 26

The Legislature of Rhode Island has prevented the Public Utilities Commission from carrying into effect the new fare rates established as just and equitable for the Rhode Island Company by a special commission created a year ago for that particular purpose. That commission ordered the adoption of a system with 5-cent central areas and recommended taxation and franchise reforms. Its findings were reviewed briefly in the ELECTRIC RAILWAY JOURNAL for March 9, page 480.

Two measures have been passed. One of these orders the Public Utilities Commission not to make any change in the rate of fare charged by the Rhode Island Company. The other created a special legislative committee of seven members to make a report before March 26 on the electric railway situation.

MEASURES ORIGINATE IN HOUSE

Both measures originated in the House the day after the report of the special commission was presented and a day after the Public Utilities Commission had, in accordance with the law passed a year ago, ordered the Rhode Island Company to put into force before April 1 the new rates set forth in the report.

The House provided for a special committee of five, two Senators and three Representatives, to consider the report of the investigating commission, but in the Senate the membership was increased to three Senators and four Representatives, one of each to be a Democrat.

Representative Jennings of Cranston, Republican majority leader of the House, declared in his speeches that the report was "absolutely unjust" and should never be allowed to go into force. He was supported by many of the House members. In the Senate both of the measures were unanimously passed, not one voice being raised in defense of the report.

The trustees of the Rhode Island Company, who are in control of the railway property under the decree of the Federal Court for the dissolution of the New Haven Railroad, have sent to each member of the Legislature the following statement:

TRUSTEES HAD CONFIDENCE IN REPORT

"The Chairman of the Board of Tax Commissioners, the chairman of the Public Utilities Commission, and the Banking Commissioner, constituting the special commission to investigate the affairs of the company, have now made a report, which has put into effect a system of fares worked out by the commission itself and its advisors as to the adequacy of which to meet the needs of the company the trustees can now form no positive judgment. They have, however, confidence in the commission and in the report of the commission's experts, upon which the action of the commission is largely based, all of whom believe that, if the relief from excessive taxation which the commission recommends is granted by the Legislature, the new rates of fare will probably enable the company to continue in operation, and the trustees are willing to try the experiment.

COMPANY CANNOT CONTINUE

"In view of the action now proposed nullifying the results of the investigation by the official commission, the trustees of the Rhode Island Company feel it their duty to say that it is certain that the company cannot continue to operate until the next session of the Legislature of the State, unless action is taken by the Public Utilities Commission or by the Legislature which will result in a substantial increase of revenue.

"Obviously this increased revenue must come, if at all, from the riding public of the cities and towns in which the company operates. If the representatives in the General Assembly of the various cities and towns take the position that, whatever happens, their constituents must not be made to bear any part of the burden, the attempt to obtain increased revenue for the company must fail.

SYSTEM MAY FALL APART

"What will then happen. It is impossible with certainty to foresee, but it is not improbable that the traction system will fall apart into the separate companies which at the present time lease their properties to the Rhode Island Company."

Advocates Fare Change

Labor at London, Ont., Favors Fare Increases for London Street Railway

The Trades and Labor Council at London, Ont., on March 6 unanimously adopted a resolution advocating the granting of the appeal of the London (Ont.) Street Railway for higher fares on the ground that the best interests of the men in the employ of the company would thereby be served.

The labor men held the view that the company was not in a position to grant wage increases, as war-time conditions had imposed extreme financial burdens upon it. They therefore advocated favorable action by the Council on the fare application and requested that the Trades and Labor Council be granted representation upon the committee of the Council which it is proposed to name to inquire into the company's financial condition. The railway is bound by a fare agreement made in 1895. This year the company passed its dividend.

The company has for some time carried on an effective publicity campaign under the direction of Glenn Marston, New York.

Transportation News Notes

Fare Schedule Protested.—A complaint has been filed by the city of Coatesville, Pa., against the new schedule of fares filed by the West Chester Railway. It is claimed the increase will be a violation of the franchise.

Reduced Rate Tickets Withdrawn.—The Hot Springs (Ark.) Street Railway has discontinued the sale of six tickets for 25 cents and books of twenty-five tickets for $1, in effect for several years, and is now charging a straight 5-cent cash fare.

Skip Stop in Oakland.—Several City Councils have passed skip-stop measures which will permit cars of the San Francisco-Oakland Terminal Railways (Key Route) to cut down stops outside the congested districts. The plan has not yet been put into effect.

Fare Increase Notices Filed.—Notices of increases in fares have been filed with the Public Service Commission of Pennsylvania, by the Bangor & Portland Traction Company, Bangor, Pa., and the Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.

Lend-a-Hand Appeal in Harrisburg.—Cards asking the traveling public to co-operate with the Harrisburg (Pa.) Railways are being placed in all cars of the company. One of these reads: "Other persons say Harrisburg has better street car service than most cities of its size. Help us to make it still better."

More Men Secured in Kansas City.—The increase in the number of trainmen secured by the Kansas City (Mo.) Railways through advertising and other means has made it unnecessary to employ women on the trains. Several women who had been put in training to run cars are now employed in the general offices. They will be put on the cars only if an emergency arises.

Skip Stops in Indianapolis.—The Indianapolis Traction & Terminal Company, Indianapolis, Ind., will try out the skip-stop plan on the East Washington and North Illinois Street lines beginning March 17. The company has painted signs on telephone poles indicating where cars will stop under the new plan. On at least one of the lines the stops will be staggered.

Proposed Portland Tariff Suspended.—The Public Utilities Commission of Maine has suspended until June 7 the revised rates for the railway lines of the Cumberland County Power & Light Company, Portland, Me., included in the system of the Portland Railroad. The new rates were filed to become effective March 11. This suspension is to allow protestants to examine the company's evidence and perhaps to employ experts.

New Albany Fare Hearing on March 20.—The city of New Albany, Ind., has filed with the Public Service Commission of Indiana its answer to the petition of the Louisville & Southern Indiana Traction Company for permission to put into effect a new schedule of passenger rates and to discontinue the service on the Elkin Avenue line. The hearing on the petition will be held in New Albany on March 20.

Fare Increase Asked in Durham.—R. L. Lindsey, vice-president and general manager of the Durham (N. C.) Traction Company, has asked the Board of Aldermen of Durham for permission to increase the fare from 5 cents to 6 cents. The request has been referred to a special committee. It has been suggested that if statistical information is desired the books of the company will be open for the inspection of the city officials at any time.

Seven-Cent Unit On Pennsylvania Roads.—The Lykens Valley Railway, Williamstown, Pa., has filed a schedule of new rates effective on April 1, with the Public Service Commission of Pennsylvania. The rate per zone is increased from 6 cents to 7 cents. The fare from Lykens to Williamstown will be 14 cents; to Sheridan, 21 cents; to Tower City and Reinerton, 28 cents. Rates for chartered cars and cars making special runs are to be increased about 20 per cent.

Transfer Changes Suggested.—H. F. Dicke, general manager of the Utah Light & Traction Company, Salt Lake City, Utah, has presented to the Public Utilities Commission of Utah a proposal for a change in the rules regarding the issuance of transfers. In the proposed new forms the name of the line issuing the transfer would be printed, and the conductor would punch the transfer for the direction indicated by the passenger. The transfers would be good only at the 'junction of the two lines used.

Citizen Pleads for Company.—W. H. Fern, Scranton, Pa., has filed an unusual complaint with the Public Service Commission of Pennsylvania protesting against the complainants who are opposing the increase in fare by the Scranton Railway from 5 cents to 6 cents. Mr. Fern states he is a private individual with no interest in the company, but that he realizes the difficulties a corporation must have to meet because of war conditions. He thinks the increase will not hurt anyone and will be an aid to the company in giving good service.

Skip Stop for Dallas.—The skip-stop system is to be tried out by the Dallas (Tex.) Railway. The plan will be put in operation at once on the Ervay line and on several other lines in the downtown district. On the Ervay line the plan will cover the entire route. Careful check will be kept on the time of operation, and definite figures will thus be made available showing just how much time can be saved. If the plan proves successful on this line, which is one of the longest and most generally patronized of any in the city, it will be extended to other lines. The staggered system will be used.

Further Discussion of Uniform Operating Rules.—At a hearing on Feb. 26 before the Connecticut Public Utility Commission, the uniform system of operating rules for all the electric railways in Connecticut was discussed. The matter of uniform rules has been under consideration for some time. An all-day conference was held with the commission at Hartford, on Oct. 25, as noted in the ELECTRIC RAILWAY JOURNAL for Nov. 3, page 840, and it was decided at the time that representatives of all the companies receive a copy of the rules and regulations of the commission and report back to the commission in regard to changes proposed by them.

Increase in Fare on Kansas Line.—The Public Utilities Commission of Kansas has authorized the Joplin & Pittsburg Railway, Pittsburg, Kan., to raise the fares on its Kansas lines to 2 cents a mile. The company asked an increase to 2½ cents a mile. The commission declined to allow any freight rate increase. It is estimated that the increased passenger rate, when put into effect by the company, will result in a considerable increase in the annual receipts. The increase represents an advance, on an average, of one-fourth to one-half cent a mile. The application of the company for a rate increase in Missouri has not been acted upon by the Public Utilities Commission of that State.

Passenger-May-Elect Decision Protest.—The Indiana Union Traction Company, Indianapolis, Ind., has filed with the Public Service Commission a petition for a rehearing in the case in which the commission granted persons traveling between Indianapolis and Carmel permission to pay 24 cents or 30 cents fare at their own option. In its petition the company states that the law provides that only one set fare may be charged between two points and that the commission had not power to permit the charging of two different rates. The decision of the commission in this case was reviewed briefly in the item, "Passenger May Elect," in the ELECTRIC RAILWAY JOURNAL of March 9, page 481.

Donation Bus Bill Vetoed.—Mayor Hiram C. Gill, Seattle, Wash., has vetoed the so-called free or donation jitney bus ordinance, passed recently by the City Council by a vote of seven to one. Under the terms of the measure the city defined a free or donation bus as "any motor-propelled vehicle engaged in the business of carrying passengers without compensation or charge therefor, provided, however, that any voluntary donation or contribution by any person so carried shall not be construed as compensation for such carriage." The bill carried an emergency, requiring the votes of seven members of the Council and the approval of the Mayor. The disapproval of the Mayor nullifies the bill, placing it in the same position as a bill vetoed by the Mayor and the veto upheld by the Council.

Personal Mention

E. T. Smith has been appointed master mechanic of the Tampa (Fla.) Electric Company to succeed George Hudson.

F. E. Fletcher has recently been appointed purchasing agent of the Tampa (Fla.) Electric Company to succeed C. A. Leonard.

J. C. Freelund has been elected secretary and treasurer of the Washington (D. C.) Utilities Company, to succeed W. W. Spaid.

F. J. Gwynn has recently been appointed assistant treasurer of the Tampa (Fla.) Electric Company to succeed E. J. Seaborn.

J. W. Gould has recently been appointed master mechanic of the Wilmington & Philadelphia Traction Company, Wilmington, Del., to succeed W. O. Demoss.

Emmet McClung has recently been appointed engineer of overhead construction of the St. Petersburg & Gulf Railway, St. Petersburg, Fla., to succeed C. N. James.

R. M. Marlowe has recently been appointed claim agent of the Connecticut Company at Hartford, Conn., to succeed John A. Crilly, who has been made special adjuster for Hartford.

A. T. Throop has recently been appointed superintendent of the light and power department of the Wilmington & Philadelphia Traction Company, Wilmington, Del., to succeed C. M. Cooper.

Norman Grey, president of the Washington (D. C.) Utilities Company, has been elected president of the Washington-Virginia Railway, Washington, D. C., to succeed Frederick H. Treat, deceased.

Chester Smith, for two years assistant to the president at the Kansas City (Mo.) Railways, has resigned. He is now in service in the transportation department of the government in Washington.

Thomas E. McCarthy, for the last four years chief clerk to the chief engineer of the Montreal (Que.) Tramways, has been commissioned lieutenant United States Reserves, stationed at Camp Sherman, Chillicothe, Ohio.

O. J. Richmond, formerly chief engineer of the power station of the Danbury & Bethel Street Railway, Danbury, Conn., has been appointed superintendent of power for the United Illuminating Company, Bridgeport, Conn.

C. F. Hayden has been appointed traffic agent of the Washington-Virginia Railway, Washington, D. C., to succeed C. L. Evans, who resigned from the company to take charge of his souvenir and lunch room business at Mount Vernon, Va.

Harry Reid, Louisville, Ky., has been elected president of the Interstate Public Service Company, Indianapolis, Ind., to succeed Chester P. Wilson. The Interstate Public Service Company is a subsidiary of the Middle West Utilities Company.

Norman Litchfield has resigned as engineer of car equipment of the Interborough Rapid Transit Company and New York Railways, New York City, to become mechanical engineer of the American Car & Foundry Company, with headquarters in the same city. In his new position he will be associated with A. E. Ostrander, recently appointed general mechanical engineer of the last-named company. Mr. Litchfield was graduated from the Stevens Institute of Technology in 1901 with the degree of mechanical engineer. He served his apprenticeship in electric railroading in the shops of the Brooklyn Rapid Transit Company. Later he was employed under L. B. Stillwell in the preparation of plans for the equipment of the New York subways and in the supervision of the experimental cars. When operation of the subway began, Mr. Litchfield joined the engineering staff of the Interborough Rapid Transit Company, with which he has since been continuously connected. He has been actively interested in the work of the American Electric Railway Engineering Association, and served as its secretary for a number of years. He was also a member of the executive and the standards committees of the association. He has contributed a number of articles on technical subjects to the ELECTRIC RAILWAY JOURNAL, and is now engaged on a series on the fundamentals of car-body and truck construction, one of which appears elsewhere in this issue.

NORMAN LITCHFIELD

S. T. Dow has been appointed acting general manager of the Atlantic Shore Railway, Sanford, Me., to succeed L. H. McCray, who has resigned to enter government service. Mr. Dow has long been connected with the company as assistant treasurer.

H. J. Cosgrove has been appointed master mechanic of the Rock Island Southern Railway, with headquarters at Rock Island, Ill. Mr. Cosgrove was formerly with the Great Northern Railway at St. Paul, Minn. He has served for twenty-five years with the railroads in the West and the South.

Lloyd Harris, secretary-treasurer of the Lake Erie & Northern Railway, Galt, Ont., has been appointed chairman of the Canadian War Mission to the United States, with offices in Washington, D. C. Mr. Harris has been associated with the British War Mission in Washington on behalf of the Canadian government for several months.

Lord Beaverbrook, a director of the British Columbia Electric Railway, Vancouver, B. C., has been appointed Chancellor of the Duchy of Lancaster, under the British government, and is undertaking general propaganda work relating to the allied nations' position regarding the war. In accordance with the general custom, he will have to resign from the railway.

H. G. Lawrence has resigned as superintendent of the railway lines of the Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., effective on April 1. Mr. Lawrence has acquired an interest in the newly organized Clemons Auto Supply Company, Eau Claire, dealers in automobile supplies and accessories, and will devote his full time to that business after April 1. Mr. Lawrence went to Eau Claire from Winona twenty-three years ago and started in electric railway work as a motorman. He was successively made conductor, carhouse foreman, assistant superintendent and superintendent, serving in the latter capacity for the last seventeen years.

L. H. McCray, for the last eight years general manager of the Atlantic Shore Railway, Sanford, Me., has resigned to accept a position with the Emergency Fleet Corporation, Boston. Mr. McCray's early railway experience was acquired in the Central West. He was assistant to the master of transportation of the Winnebago Traction Company of Wisconsin from 1904 to 1907, which position he resigned to become superintendent of the Sterling, Dixon & Eastern Electric Railway, Dixon, Ill. In 1908 he was appointed assistant general manager of the Atlantic Shore Railway, and was made manager in 1910. Shortly before Mr. McCray's departure from Kennebunk the employees of the Atlantic Shore Railway presented him with a watch and chain, as a token of their esteem.

R. H. Parsons, formerly general foreman of electrical repairs of the mechanical department of the Third Avenue Railway, New York, N. Y., has been made general foreman of the Sixty-fifth Street shop, in place of G. R. Jenkins, who has been assigned to other duties. Mr. Parsons was born in Syracuse, N. Y. He received his early training with the New York Central Railroad, advancing to a position of engine house foreman with that company. He became connected with the electrical department of the New York Central Railroad when that road electrified its New York City terminal and in 1907 entered the employ of the Interborough Rapid Transit Company, from which company he resigned in May, 1908, to become connected with the Third Avenue Railway. In 1909 he was appointed to the position from which he is now advanced. Mr. Parsons has been a frequent contributor to the ELECTRIC RAILWAY JOURNAL.

C. A. **Babcock**, comptroller of the Rhode Island Company, Providence, R. I., recently completed forty years of service with the company. Associates of Mr. Babcock in the company arranged a dinner in celebration of the event which was attended by the following officers of the company: A. E. Potter, president; R. R. Anderson, superintendent of transportation; A. E. Paddock, general freight agent; Clifford Whipple, general counsel; G. Frederick Frost, attorney; H. B. Shaftoe, assistant to the comptroller; W. C. Slade, superintendent of power and lines; and H. W. Sanborn, chief engineer. Mr. Babcock entered railway work in Providence on Feb. 28, 1878, as clerk in the office of the Union Railroad. At that time the entire force consisted of 282 employees and officers. At present the force numbers nearly 3400. By the time the company moved its quarters to the Union Trust Building, Mr. Babcock had been promoted until he was treasurer of the company. As other companies were taken over from time to time he was elected treasurer and secretary of each. When the Rhode Island Company was formed in 1902 Mr. Babcock was made assistant treasurer and remainded in that position until 1908, when he was placed in charge of the comptroller's office. As comptroller, Mr. Babcock has under his direction the following offices: auditor of disbursements, auditor of passenger receipts, auditor of freight receipts, receiving department, general accounting department, treasurer's office, paymaster's office. Since entering the employ of the company he has served under seven presidents.

Obituary

John M. Bowers, chosen by President Wilson to act on the Legal Advisory Board in connection with the draft in New York City, died on March 7 in Lakewood, N. J., where he had gone to recuperate from strain due to his war work. Mr. Bowers was in his sixty-ninth year. He had been a member of the New York Bar for nearly fifty years. Mr. Bowers' career was closely bound up with corporation law cases in New York. As counsel for the reorganization committee of the Third Avenue Railway, New York, N. Y., in 1912, Mr. Bowers had much to do with the rehabilitation of the property.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Chickasaw Utilities Company, Birmingham, Ala.**—Incorporated as a subsidiary of the Tennessee Coal, Iron & Railroad Company to construct and operate an electric railway to the new Chickasaw shipbuilding plant. Officers: George G. Crawford, president; H. C. Ryding, vice-president, and L. T. Beecher, secretary and treasurer.

Franchises

New Albany, Ind.—The Louisville & Southern Indiana Traction Company has asked the Public Service Commission of Indiana for permission to abandon its Ekin Avenue line from Vincennes Street westward to East Fourth and Spring Streets and also certain track in the city of Jeffersonville.

Baltimore, Md.—An ordinance has been passed by the City Council of Baltimore and approved by the Mayor authorizing the Washington, Baltimore & Annapolis Electric Railway to construct additional connecting tracks required for the operation of an extension to its freight terminal facilities in the city.

Kansas City, Mo.—The Kansas City Railways has received a franchise from the City Council of Kansas City for the construction of a double-track extension on Twenty-seventh Street from Prospect Avenue to Main Street.

Tulsa, Okla.—The Oklahoma Union Railway has received a franchise from the City Council to construct a new line in Tulsa. It is proposed to construct a line to Guthrie via Coffeyville.

Fort Worth, Tex.—The Northern Texas Traction Company has asked the City Council for permission to construct new tracks on First Street from Houston Street to Throckmorton Street and to build a curve joining the Throckmorton Street line with the Weatherford Street line in order to relieve the congestion on Houston Street.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company has petitioned the City Council of Seattle for a franchise to operate an electric railway from the intersection of West Spokane Street and Avalon Way, along Avalon Way and Thirty-sixth Avenue Southwest to the intersection of the latter street and West Snoqualmie Street. With the request the company submitted a proposed franchise ordinance, which provides for the completion of the line within twelve months of the granting of the franchise. The proposed line will materially shorten the distance to the end of the Fauntleroy Park line, and eliminate long delays now occasioned by a single-track section of that line that will be abandoned by operation over the Avalon Way route, and will open up a large residential district within a short distance of the shipbuilding and other industrial plants in the Harbor Island and Riverside districts.

Track and Roadway

Alabama Interurban Corporation, Birmingham, Ala.—It is reported that the contract for the construction of the proposed line of the Alabama Interurban Corporation from Birmingham to the Warrior River, about 20 miles, has been awarded to A. T. Newell & Brothers. Thomas L. Cannon, Birmingham, president. [Feb. 23, '18.]

Pacific Electric Railway, Los Angeles, Cal.—A survey has been made by the Pacific Electric Railway for an extension from Redlands to Yucaipa City.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—W. R. Alberger, general manager of the San Francisco-Oakland Terminal Railways, recently informed the City Council of Oakland that the board of directors of the company would consider the proposition of a railway line on Adeline Street from First to Sixteenth Streets.

Municipal Railway, San Francisco, Cal.—The Board of Public Works of San Francisco has awarded a contract to Eaton & Smith, San Francisco, for the construction of the "D" line extension of the Municipal Railway on Greenwich Street between Scott and Baker Streets, at $28,600.

New Orleans Railway & Light Company, New Orleans, La.—An offer to put up money to help defray the expenses of laying tracks and other costs has been made to the New Orleans Railway & Light Company by Paul H. Maloney, representing property holders and residents of that section of the city bounded by Napoleon Avenue, Louisiana Avenue, Rampart and Magnolia Streets. Mr. Mahoney asked that Franklin and Howard Streets be used for the extension. It is proposed that the cars go up one of these streets and down the other.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—In order to protect the heavy traffic between Baltimore and Washington and to Camp Meade, near Admiral, the Washington, Baltimore & Annapolis Electric Railroad has contracted with the Union Switch & Signal Company, Swissvale, Pa., for the material and installation of automatic block signals on its main line from Scott Street, Baltimore, where private right-of-way is entered, to Naval Academy Junction, where trains branch off for Camp Meade.

St. Louis & Illinois Railway, St. Louis, Mo.—The St. Louis & Illinois Railway, through its attorneys, Bishop & Cobbs, has notified Director of Public Utilities Hooke that it will accept the terms of a permit to operate street cars on the free bridge at St. Louis, give a bond of $25,000 to extend its lines on the East Side and to use the municipal loop in St. Louis when it is completed.

Southwest Missouri Electric Railway, Webb City, Mo.—Operation has been begun by the Southwest Missouri Electric Railway on its extension from Galena to Baxter Springs. Work is now under way on the line from Baxter Springs to Picher.

International Railway, Buffalo, N. Y.—Within the next few months the International Railway plans to spend approximately $2,000,000 for repairs and improvements to its surface lines in the city of Buffalo. Of this amount, the largest items include the cost of laying new track in a number of east side streets and for repaving the streets between the rails. The company is also trying to secure some new equipment.

New York & Queens County Railway, New York, N. Y.—Application has been made by the New York & Queens County Railway to Borough President Connolly for permission to operate a single-track extension over a loop beginning at Kingsland Avenue, Corona, and extending through Alburtis Avenue to the terminal of the elevated route, thence along Roosevelt Avenue to Grand Avenue and through Grand Avenue back to Kingsland Avenue, where the cars of the Corona trolley line are now operated. Should this arrangement be granted, it is the intention of the company to operate College Point, Flushing and Jamaica cars to the Corona elevated terminal instead of taking them to the Fifty-ninth Street side of the Queensboro Bridge, as is now the case with the Flushing and College Point cars. The Jamaica cars now stop at Flushing Bridge.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Plans are being considered by the Mahoning & Shenango Railway & Light Company for the reconstruction of its line between Sharon and the Wheatland Borough limits, at a cost of about $150,000.

***Collinsville, Okla.**—It is reported that D. H. Siggins, Coffeyville, Kan., is interested in the construction of an electric railway from Collinsville to Nowata, Coffeyville and other points.

Oklahoma Union Railway, Tulsa, Okla.—A report from the Oklahoma Union Railway states that it plans to construct 2 miles of double track.

Bridgeburg, Ont.—The decision of the Ontario government on March 5 to vote $3,000,000 for Niagara system extensions is believed to indicate that the trolley line from Welland to Port Colborne to Bridgeburg will be started in a few months. This line was contracted for by the Ontario Hydro-Radial Commission, through Sir Adam Beck, two years ago when he made agreements with the municipalities en route to construct the line as soon as the necessary funds could be obtained, the Ontario government to undertake the expense and the municipalities benefiting thereby to bond themselves for the share of each involved.

Johnstown (Pa.) Traction Company.—Operation of street cars over the new Walnut Street bridge will be begun about April 1. The concrete work on the big structure is being finished rapidly and the Johnstown Traction Company will begin track work in a week or two.

Reading Transit & Light Company, Reading, Pa.—Preparations are being made by the Reading Transit & Light Company for the reconstruction of its tracks on Lehman Street, Lebanon.

Three Rivers (Que.) Traction Company.—This company contemplates a 2-mile extension of its line toward the western limits of the city.

San Angelo Water, Light & Power Company, San Angelo, Tex.—A communication from the San Angelo Water, Light & Power Company, which recently purchased the property of the San Angelo Power & Street Railway Company, states that it will not extend and place the system in operation until conditions are more nearly normal. The company expects to begin operation of the line as soon as material and rolling stock can be purchased to advantage.

Virginia Railway & Power Company, Richmond, Va.—The Virginia Railway & Power Company has been authorized to change the gage of the tracks on its Atlantic Terminal line from Twenty-third Street to Ninety-ninth Street.

Wheeling (W. Va.) Traction Company.—The Wheeling Traction Company has taken over the Wellsburg, Weirton & Steubenville Traction Company's line under lease and extensive improvements will be made to the road.

Shops and Buildings

Northern Electric Railway, Chico, Cal.—It is reported that the Northern Electric Railway will soon begin the construction of a string of grain warehouses along its lines in California.

Oklahoma Union Railway, Tulsa, Okla.—This company reports that it expects to construct a new carhouse.

Toronto (Ont.) Suburban Railway.—A small carhouse has been built by the Toronto Suburban Railway at the intersection of Bay and Dundas Streets, Guelph, to hold one radial car. The building is 20 ft. x 15 ft. and contains a passenger waiting room and a freight platform. It is necessary to house a car overnight and for certain hours during the day at Guelph.

Power Houses and Substations

British Columbia Electric Railway, Vancouver, B. C.—Work has been begun by the British Columbia Electric Railway on the extension and reconstruction of its Point Grey substation at King Edward Avenue, which will increase the equipment for feeding the railway lines in Kitsilano, Fairview and Point Grey. The new building will be 100 ft. x 60 ft., of reinforced concrete construction.

Shore Line Electric Railway, Norwich, Conn.—The Public Utilities Commission of Connecticut has granted permission to the Shore Line Electric Railway to furnish electricity to the Groton Iron Works, a large shipbuilding plant, for manufacturing purposes.

Woodstock Electric Railway, Light & Power Company, Woodstock, N. B.—This company is contemplating improvements to its plant this summer, including the installation of a Hercules turbine, type D of the Holyoke Manufacturing Company, developing 137½ hp. at 13 ft. head, belt-connected to a Westinghouse generator in synchronism with two other generators.

Oklahoma Union Railway, Tulsa, Okla.—This company reports that it will construct a new substation.

Harrisburg (Pa.) Railways.—Automatic stokers are being installed under the boilers at the power plant of the Harrisburg Railways so that river coal can be used entirely for firing. At present river coal is mixed with bituminous coal, but with the new equipment the entire fuel supply can be obtained in the city. Contracts have already been let to owners of coal fleets operating in the Susquehanna River at this point.

Reading Transit & Light Company, Reading, Pa.—This company has received a large shipment of insulators to be used on its high-tension line from Lebanon to Reading.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.—A report from this company states that it has awarded a contract to A. R. Warner, Waynesboro, for the erection of a brick and concrete substation.

Virginia Railway & Power Company, Richmond, Va.—Plans are being made by the Virginia Railway & Power Company to erect an electric transmission line from Petersburg to Norfolk to supply electricity in Petersburg and Norfolk and to the towns between the two cities. The cost of the work is estimated at about $750,000. Contracts, it is understood, will soon be awarded for the proposed work. The proposed line will provide connections with the three power plants in the cities of Richmond, Norfolk and Petersburg. In case of any accidents to any of the plants service can be supplied by the two other stations.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Maintenance and Replacements Chief Concern

Situation Reflected in the Purchase by Railway Companies of Repair Equipment and Material

Probably for the whole of the past year or longer, and surely for the last nine months, the major part of equipment purchased by electric railways has been for maintenance or replacements. Conditions have been such that, with few exceptions, traction companies for many reasons, were compelled to husband their available working capital by economizing in every possible direction. A glance over the files of the ELECTRIC RAILWAY JOURNAL for 1917 to date will reveal the fact that the orders for new rolling stock were few and, as compared with former periods, far between, or, as an accessory manufacturer phrased it, more cars were bought and equipped in two months in normal times than are now ordered in a year. This, perhaps, may savor slightly of exaggeration, as an expression of the seller's personal experience.

Recently, however, for special reasons, a quantity of new cars has been purchased and are now on delivery. For a while it appeared as if the car builders were in no position to accept business for early, let alone prompt, delivery, on account of being engaged on government work. The situation has, however, greatly improved.

Diligent inquiry among all classes of railway equipment, supplies and accessory manufacturers and sales agents, from time to time, proves the statement that for a year or more the bulk of the buying has been confined almost exclusively to auxiliary machinery, apparatus, appliance, tools, etc., required to maintain the power house, substation, transmission lines, rails and roadbed in a proper state of efficiency. A careful survey of the situation, fortified by first-hand information, compelled the conclusion that manufacturers and sellers of track welders and welding apparatus of every description were doing quite a brisk business for at least a year past. Ordinarily sales of this class of machinery—of substantial, rugged build, fitting the work for which they were adapted, and therefore almost as long-lived as an ordinary safe—are slow but steady. In fact, a road possessing a welder of the most approved type would frequently be in a position to lease its apparatus or perform the work under contract for other railways, in addition to keeping its own track in condition. A number of improved, simplified welding machines, which expedite and lower the cost of the work, have also appeared in the market. This, in a measure, stimulated the demand.

Other items for repairing and rehabilitating the general equipment commanded attention, such as rail grinders and supplies, soldering and brazing apparatus, measuring, testing and recording instruments, rail joints, rail bonds and rail bonding outfits, junction boxes, line material, machine and hand tools, splicers, track drills, guy anchors, brackets and crossarms, poles, axle straighteners, car-wheel boring tools, rail-bending and straightening machines, bond testers, brakes, brake systems and brake parts, bell, trolley and register cord, cutting machines, trolley wires, cables, wheel-truing shoes, track scrapers, spikes, bolts, nuts, rivets, tieplates, angle bars, relaying rails, car trimmings, repair shop appliances and many other minor but necessary articles.

In not a few instances second-hand equipment has been eagerly sought, as it represented a lighter investment. This is especially true of motors, converters, controllers and other important parts, not to mention cars, for which the entire country was scoured. If reliable reports may be depended upon, there are few, if any, second-hand passenger cars—motor or trailer—out of service anywhere that have not been purchased by some traction road unable either financially or otherwise to acquire new rolling stock.

The character of the present market is well known to every manufacturer and sales agency of rolling stock, equipment and supplies. Their comments on the situation at times have been more forcible than elegant; for the dearth of regular railway trade has been at so low a state that some of the well-known houses have been seeking business in other fields, with more or less success. It is therefore almost superfluous to add they would welcome the day when the traction railways should again be in position to operate and maintain their respective properties on a high plane, in keeping with their public usefulness and importance.

Not a few roads have been so hard pushed for money that they have been forced to let their property and equipment deteriorate to a considerable extent. Rehabilitation will soon be necessary. Those roads that operate in places where government employees or shipyard workers must be transported will probably be the first to be in a position to make long-needed repairs. Certain it is, however, that there is a large maintenance and replacement market awaiting proper financial conditions.

Car Window Glass Discounts Again Shrink

Orders Filled 100 Per Cent—Factories on Half Time—Deliveries Depend on Restrictions

Another slight advance was made in car window glass on Feb. 11 and is now the ruling figure. The previous increase of 15 per cent, effective as of Feb. 7, was announced in the ELECTRIC RAILWAY JOURNAL of Feb. 23. Shortly afterward the Fuel Administrator had a survey made of the glass industry, which showed that production during the year probably would far outstrip the demand. To conserve fuel the manufacturers were ordered to curtail their production 50 per cent, and the factories are operating on that basis.

As a rule car window glass is sold through the jobber, who for some time had been expecting higher prices. They therefore advised purchasing agents to cover their immediate requirements and estimated wants for next season as soon as possible. Following this discounts shrunk, varying with point of shipment, quotations being f.o.b. plant. Car windows are nearly all of the grade known as double strength AA, on which the manufacturer's discounts are now 71 per cent off list for first quality and 80 per cent on second quality. Orders are filled 100 per cent, but deliveries are subject to embargoes and the necessary priority certificate for shipments coming through the consignee.

Railway Costs Higher in the Far West

Pacific Roads Unable to Take Advantage of Market Conditions—Freight Situation Burdensome

While it is well known that prices have advanced to an extent never before experienced, that deliveries have never been known to be worse, these conditions apparently are not the same throughout the country. The situation in these respects on the Pacific Coast are particularly severe, according to advices from the San Francisco representative of the ELECTRIC RAILWAY JOURNAL.

Electric railways of the Pacific Coast have to meet several costs which do not appear in the operating expenses of systems in Eastern cities. One of the most serious of these is the disadvantage when purchasing material and equipment of being unable to take advantage of market conditions. The Eastern road, through close touch with manufacturing conditions, can usually buy to advantage by getting its orders in when prices are low. Western roads have always been under a disadvantage in this regard because of the necessity for placing orders at long range, but now with terms of delivery much longer than before, the disadvantage is increased.

Another item is the difference in terms. Bills are usually rendered with cash discounts for ten or thirty days from date of invoice. If the shipment is to a road in the Far West it may now be anywhere from one to four months before the consignment is received. Thus, in order to take advantage of the discounts, payment must be made long before the equipment arrives.

The higher freight rate on l.c.l. shipments makes it desirable to get together carload lots to secure the lower rates whenever possible. This tendency has been an additional reason for carrying a comparatively large stock of extras where such long delays are experienced in getting deliveries from the East. When this is necessary to insure dependability of service the capital tied up thereby of course must be charged to operating expenses.

Such points as these, considered collectively, constitute a considerable financial burden, and are looked upon by western roads as more than offsetting the climatic advantage which they have over eastern roads in the matter of operating conditions.

Varnish and Paint Prices Advance

Increases Due to Rising Cost of Raw Material—Railway Enamel Is Growing in Favor

Varnish and paint manufacturers who specialize in railway paints and varnishes declare the field to be one in which specialization is necessary. Nevertheless, they are enthusiasts, even to the chemists, compounders and experts, on the proposition. As one of the many well-known manufacturers says, "No field of endeavor has greater need for specialization than the manufacture and use of railway and electric railway paints and varnishes. In no branch of the business does the chemist and his testing experts meet with more variable and exacting conditions. Every conceivable kind of surface must be protected or beautified, or both. Furthermore, this endless variety of surfaces must be prepared to withstand the gruelling of severe travel and exposure."

Late winter, early spring and the fall are the usual buying seasons, because it is the time of the year when more cars are re-shopped than any other. Some advance orders for the needs of several important electric railway properties have already been booked. Manufacturers and sales agencies anticipate a greater year than in 1917, which was the best on record in volume and values. Prices have increased from Jan. 1 to Feb. 1 from 10 to 25 per cent. In a year to a year and a half prices of paints and varnishes have advanced over 100 per cent. The basic materials, such as white lead, linseed oil, potash, etc., have been on the upward trend for a long time, and are still tending in that direction.

In addition to the regular list of varnishes and paints called for from the priming to the finishing coats, a new compound has come into use within the last three or four years. This is known as a railway enamel, and is made and sold under different names by all the leading manufacturers. As one firm explains, "railway enamel is the crowning achievement of the combined efforts of expert painters to produce a finishing enamel." It is known as a full-oil enamel. No gums enter into its construction. This insures it against eventually becoming brittle and then cracking.

This railway enamel, now coming into more general use, is admitted by car builders, managers of railway repair departments and practical car painters, not to mention paint manufacturers of repute, as wearing longer than other finishing varnishes. Besides, its employment reduces the cost of material to a minimum. Still more important, in the matter of time in applying the various coats, including rubbing and finishing varnishes, a saving of 50 per cent is effected. The quality, the makers assert, is as good if not better than the average high-grade car varnish. As an evidence of its popularity one manufacturer may be cited as having sixteen standard car body colors, and, it is presumed, others are equally well provided. Some are known as traction orange and green, interurban green, etc. At any rate, reports bear out the assertion that many electric road superintendents of rolling stock consider this enamel one of the best finishing products in point of appearance, service and wear, under all weather conditions, that has been introduced in years. The leading railway lines in the New York district are heavy buyers of the specialty.

Managers of the car-painting departments of several of the larger companies are in the habit of buying colors and making up their own finishing enamels. This has its advantages, but the great majority of the companies purchase their supplies ready mixed. Some of the important properties buy in bulk; that is, in barrel lots. One manufacturer with wide experience stated, however, that it was a peculiarity of the traction companies to provide for their requirements in five-gallon can lots. The ultimate quantity was about the same as if buying by the barrel, simply the can package seemed to appeal to this class of buyers.

Quotations were not being made very far ahead. On clear varnish one company has accepted a few orders at six months' delivery. Colors, customarily taken on contract for six months or a year, are now greatly restricted for the immediate future. The market situation is constantly fluctuating and is described as too uncertain. Raw material, while in fair supply, is none too ample. Potash, an essential ingredient from several points of view, is a bothering proposition, as almost the entire world's supply came from Germany, which is now completely cut off. A domestic substitute is being developed, but as yet the quantity is comparatively small and, to quote an authority, not altogether to be depended upon. Eventually this will no doubt be remedied. Potash is therefore on a high price level. Linseed oil, another important base, is appreciating in cost continually. Transportation and other prime contributing conditions are playing havoc with this line. Labor scarcity has resulted in factory production being curtailed somewhat. Under these circumstances manufacturers advise that traction companies anticipate their wants as far as possible in order to avoid the predicted inevitability of still higher prices.

Deliveries, with embargoes yet in force, are mentioned with reservations. Shipping dates, providing cars can be obtained, may be arranged; but the arrival of goods at destination, even with more favorable weather, cannot be guaranteed, and doubtless a priority order may be a requisite in addition, excepting to nearby points of factory. Besides, a great many paints are not carried in stock, because they deteriorate by the very nature of their composition, and therefore time must be allowed for manufacturing. On deliveries one manufacturer said he had had three cars of paints coming into New York from the Middle West since Jan. 14, and they were still in transit; also a shipment from Philadelphia that took three weeks to arrive. Local trucks that normally cost $8 a day now command $12. It is therefore declared that these items must necessarily figure in the ultimate cost of the merchandise.

Rolling Stock

Aberdeen (S. D.) Railroad recently obtained a new snowplow.

Aurora, Elgin & Chicago Railway, Aurora, Ill., recently purchased six cars from the Cincinnati Car Company, to be used for city and short interurban system runs.

Columbus Railway, Power & Light Company, Columbus, Ga., through Howard W. Clapp, general superintendent, advises that it "is not purchasing any new car equipment at this time." The report referred to appeared in the ELECTRIC RAILWAY JOURNAL of Feb. 23.

Cleveland (Ohio) Railway has been supplied with twenty-five trail cars, mounted on Brill 67-F trucks, built by the G. C. Kuhlman Company, Cleveland. Total passenger capacity, standing and seated, 130.

State Belt Electric Street Railway, Pen Argyl, Pa., which finished 15 miles of trackage from the Wind Gap to Stroudsburg, Pa., during 1917, had four interurban cars recently shipped from the J. G. Brill Company, Philadelphia. The cars have Brill 27-M, C.B.2-x trucks, 6-ft. wheelbase and 33-in. wheels, and are constructed with all-steel framing and sheathing. Mahogany is used for the interior finish, including all doors, sashes and moldings. Seating capacity, forty-six.

Philadelphia (Pa.) Rapid Transit Company, which recently ordered 100 new cars from the J. G. Brill Company, as referred to in the ELECTRIC RAILWAY JOURNAL of March 9 and previously, furnishes the appended specifications. The order was assumed as coming through the Emergency Fleet Corporation.

Number of cars	100
Name of road	Philadelphia R. C. Co.
Date order was placed	Feb. 1, 1918
Date of delivery	Commencing 90 days
Builder of car body	The J. G. Brill Co.
Type of car	Closed passenger
Seating capacity	48
Weight (total)	44,000 lb.
Bolster centers, length	21 ft. 0 in.
Length over bumpers	45 ft. 6 in.
Length over vestibule	44 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 8 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	Nevasplit
Roof	Arch
Air brakes	General Electric
Axles	Valley steel heat treated
Bumpers	Brill channel iron
Car trimmings	Brass (Brill)
Conduits and junction boxes	General Elec.
Control, type	G. E. P. C.
Couplers	Tomlinson air and electric
Curtain fixtures	Forsyth No. 88 and Rex rollers
Curtain material	Pantasote
Designation signs	Hunter illuminated
Door operating mechanism	National-Pneumatic
Fenders or wheelguards	H-B Life Guards
Gears and pinions	Tool Steel Gear Co.
Hand brakes	National Staffless
Heaters	Peter Smith Electric
Headlights	Ohio Brass Co.
Journal boxes	Brill
Lightning arresters	General Electric
Motors	4 General Electric 247-C
Motors	Inside
Paint	Brill Standard
Registers	International R-7
Sanders	Air—Ohio Brass Co.
Sash fixtures	Edwards
Seats, style	Longitudinal
Seating material	Cherry
Springs	Brill
Step treads	Universal
Trolley retrievers	Ohio Brass Co.
Trolley base	Wasson
Trucks, type	Brill 77E1
Ventilators	Garland C-2 Honeycomb
Wheels	33-in. rolled steel
Tail lights	Nicholas-Lintern
Slack adjusters	Anderson
Side bearings	Perry
Outer plates	Brill oil retaining

Capital Traction Company, Washington, D. C., mentioned in the ELECTRIC RAILWAY JOURNAL of March 2 as being in the market for rolling stock, on March 12 placed an order with the J. G. Brill Company for twenty 44-ft. closed passenger cars.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb., has had recent shipments of new cars from the American Car Company, St. Louis, Mo. The cars are of the pay-within type, mounted on Brill double-motor 7-E-1 trucks, equipped with 24-in. wheels with a seating capacity of forty. The framing is of composite steel and wood.

Cumberland County Power & Light Company, Portland, Me., has been furnished eight double-truck, center-entrance trail cars by the Wason Manufacturing Company, Springfield, Mass. The trucks are of the Brill 53-F type, with a wheelbase of 5 ft., and 22-in. wheels. The bodies are framed and sheathed in steel and are of the stepless type.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill., having completed its 8-mile line between Murphysboro and Carbondale, commenced operation with an initial equipment of handsome cars built by the American Car Company, St. Louis, Mo. The rolling stock is double-end operated, steel-frame cars for straight passenger service, with a seating capacity of fifty. The cars are mounted on Brill 27-M. C.B. high-speed trucks, and have a toilet and motorman's cab at one end in diagonally opposite corners. The wheelbase of the trucks is 6 ft., with 33-in, wheels.

Wheeling (W. Va.) Traction Company has taken over the Steubenville, Wellsburg & Weirton Railway Company, Wellsburg, W. Va., and has placed orders for fifty-two new all steel pay-as-you-enter cars, to cost $200,000. The new cars will replace the rolling stock recently destroyed when the Bay Island carhouses were burned. Twenty-nine of these cars will replace those lost in the fire. Fourteen will arrive within the next thirty days and the remainder in at least four months. Contracts for construction and delivery of the rolling stock have been awarded to the Jewett (Ohio) Car Company and the Cincinnati (Ohio) Car Company. Twenty-three cars will be added to the present number owned and operated by the company. Their seating capacity will vary from fifty-two to seventy and the cost per car from $12,000 to $14,000.

Trade Notes

Third Avenue Railway, New York, N. Y., has placed an order with the Gurney Ball Bearing Company, Jamestown, N. Y., for 150 radio-thrust bearings which are to be used on the journal boxes of the storage battery and low level cars.

Electric Railway Improvement Company, Cleveland, Ohio, is planning to give practical demonstrations of efficient rail bonding and arc welding with its portable welder and portable rheostat at the National Railway Appliances Association exhibit, to be held at the Coliseum, Chicago, March 18-21.

Drew Electric & Manufacturing Company, Indianapolis, Ind., has appointed the Northern Electric Company, Ltd., exclusive agents for Drew electric railway, light, power, gas and mine haulage material and specialties in Canada and Newfoundland. The Northern Electric Company will carry a complete stock of the Drew line in Canada for the benefit of its electric railway customers. The head office of the Northern Electric Company is at Montreal; branch houses are maintained in Montreal, Halifax, Ottawa, Toronto, Winnipeg, Regina, Calgary and Vancouver.

Interborough Rapid Transit Company, New York, N. Y., is making inquiries for 10,000 tons of rails for 1919 shipment. David W. Ross, vice-president in charge of contracts and supplies, informed the ELECTRIC RAILWAY JOURNAL that the company had an ample supply of rails for 1919 requirements, but it was the practice to keep its stock up to an established standard of quantity, and the inquiry was sent out to ascertain whether deliveries could be guaranteed for next year. The negotiations only covered the needs of the subway and elevated systems, and did not include those of the New York Railways Company, the surface lines which the company controls and operates.

RAILWAY MATERIALS

	March 6	March 13
Rubber-covered wire base, New York, cents per lb.	30	27-30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb	$5.00	$5.06
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.85	$4.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl	$2.25	$2.25
Cement (carload lots), Chicago, per bbl	$2.31	$2.31
Cement (carload lots), Seattle, per bbl	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.43	$1.53
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.44	$1.54
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	45½	44½

NEW YORK METAL MARKET PRICES

	March 6	March 13
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	*27	26.25 to 26.75
Lead, cents per lb	7¼	7¼
Nickel, cents per lb	50	50
Spelter, cents per lb	7.875	7.75
Tin, Straits, cents per lb	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb	†32	†32

OLD METAL PRICES—NEW YORK

	March 6	March 13
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$42.41	$42.41
Old car wheels, Chicago, per gross ton	$42.41	$42.41
Steel rails (scrap), Chicago, per gross ton	$30.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$35.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

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*Nominal. †Governmental price in 50-ton lots, f.o.b. plant.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, March 23, 1918 *Number* 12

True Thrift in Fuel Conservation

THE dominant factors in electric railway management at the present time are the need for an increased fare, the adoption of operating economies, labor shortage and fuel conservation. Fuel conservation is too often considered purely from the viewpoint of the balance between the money-saving from any proposed method of reducing power consumption and the financial outlay necessary to accomplish the desired result. In the last analysis such a policy is short sighted because it leads to the depletion of our national resources for an immediate profit although these resources ultimately would have a greatly enhanced value. A policy which would conserve fuel and other natural riches can be designated as one of real, far-sighted thrift.

That we have been a nation of spendthrifts with regard to our natural resources has become a truism, and the time has now come when thrift, in its truest sense, is being forced upon us. We should recognize this fact and prepare for it even though it requires us to better matters from a different standpoint from that to which we have become accustomed by long experience and association.

The conservation of fuel is vital to our national welfare, not only in these war times but constantly. The reason for this is that even if the interest rate of the return on the investment for additional or improved apparatus is not sufficient in itself to make the venture attractive from a purely financial standpoint the necessity for true thrift still remains. That it is not possible to overturn well-established investment principles is of course obvious. On the other hand, it is well to recognize that thrift of the nation as a whole has become a factor of such importance as to affect individual choice.

A Good Time to Disarm All Criticism

THE electric railways of the country are seeking popular support these days for many of their requests. This is as it should be, and there are evidences on all sides that the people from the President of the United States down are in sympathy with their contentions. Appreciation of these conditions must be shown while the public is in this mood, and if there are localities where the people are still hostile because of lack of information on company policy, steps should be taken to educate them.

The complaint department of a company is a good place to gage the public temper. True, the people who take the trouble to make a complaint or suggestion may be a small proportion of the patrons of the line. At the same time they may be the very people to approach with conciliatory replies. It might also be a good idea to adopt the plan of a certain large Eastern company and send with each acknowledgment a copy of any literature which may be available setting forth the policy and aims of the management. When answers are made by mail the potentialities of a well-written letter should be kept in mind. The complainant should not be antagonized even if it is necessary to tell him that he is wrong. Experience of a Middle West property of considerable size has shown that 98 per cent of the complainants have been put in a more friendly attitude through correspondence and have frequently become outspoken advocates on the side of the management. The possibilities of making friends through this channel must not be overlooked. Patrons who sympathize with the attitude of the company are valuable at all times, and it is undoubtedly true that direct correspondence of the character indicated appeals to the public.

Labor Conditions Largely Control Selection of Shop and Way Tools

THE munitions works, shipbuilding yards and other necessary war industries are requiring thousands of men trained in the mechanical and electrical trades. In addition to these demands of a civilian nature, the government is needing several hundred thousand more such men to take care of the intricate machinery which forms such an important part of the equipment of a modern army. As far as the labor problem is concerned, the old law of supply and demand is giving way to the equally aged one of military necessity. And labor conditions will become even more tense as the war continues. The present needs, great though they now seem, are but a mere bagatelle to those that will exist before the war is over.

There is only one source of supply of trained men, namely, the technical industries. Electric railways belong to this class, and they with others are beginning to feel the pinch in the labor situation. The shortage is particularly noticeable in the shop and way departments. The work of the railways will have to be done with fewer employees. Both necessity and good patriotism will require it to be so.

But in order that it may maintain its going status, a railway must lay a certain number of ties, place a certain number of bonds, set a certain number of poles, repair a certain number of car equipments, etc., each year. Under the circumstances tools must take the place of men. Obviously, skill and care should be used in the selection of these tools. Ordinarily we would say that, other things being equal, that tool is best which for a given annual output has the lowest annual charges. The old economic law involved in this idea takes into proper account the cost of labor. Unfortunately, however, it does not take into account the non-existence of a labor supply. It may well be, therefore, that under existing conditions economy and even quality of output may become subordinate to the labor factor. At any rate, the matter of available labor, present and future, should receive much weight in decisions relative to the selection of new shop and way tools.

Electrical Night at the New York Railroad Club

AMONG the significant technical gatherings held during the course of a year the annual electrical meeting of the New York Railroad Club occupies a unique place. The club is primarily a railroad organization quite distinct from electric railway associations, and its attitude toward electrification is therefore conservative although entirely friendly. Under the auspices of its electrical committee, always composed of men prominently identified with electrification matters, the club has been able to secure each year the authoritative presentation of the very latest information on heavy electric traction. The meeting furnishes an unusually good occasion for the electrical men who know what is what in this field to get their data and their ideas forcibly before their brethren of the steam persuasion.

At the 1918 "Electrical Night" meeting attention centered on four distinctive locomotive designs. These were the latest New York Central bi-polar, direct-current, low-voltage machine, the enlarged New Haven alternating-current type for use on the New York Connecting Railroad, and the two direct-current, high-voltage types of locomotives, of each of which a number are under construction for the St. Paul Railway. Among thse types there are sufficient variety and enough elements of novelty to give a decided technical news value to papers describing them. Hence we print elsewhere a rather extended abstract of the proceedings of "Electrical Night." Much of the information given has not heretofore appeared in print.

On the mechanical side these four locomotives divide themselves into two groups; two having bi-polar motors with gearless drive, the others twin multipolar motors with quill and gear drive. Simplicity is the prime desideratum in the first group, flexibility of support and high center of gravity are conspicuous in the second. One group happens to be the product of one manufacturer, the other of a second. As far as the St. Paul road is concerned the engineers are obviously convinced that both will be satisfactory in their respective fields on this property. The New York Central is well satisfied with the gearless and the New Haven with the geared quill drive (although its first locomotives were gearless).

Electrically the four machines differ widely in principle and in detail and again divide into two groups of two locomotives each, although the grouping is not the same as along mechanical lines. The two machines in one of these groups have regenerative control because they are to operate on heavy grades where regenerative braking is conducive to economy and safety. The others are non-regenerative, because the profile of the track in each case does not make regeneration necessary; one also, if another reason is desired, because not inherently adapted to it. In the St. Paul locomotives the large number of motors is utilized in providing a speed and accelerating control involving small rheostatic losses. On the other hand, in the New York Central locomotive and in the New Haven locomotive, when operating on direct current, there is not as great an opportunity for energy saving. Numerous other electrical distinctions will suggest themselves and should be borne in mind when these machines are compared.

The questions that naturally arise perennially as the progress of electrification is viewed on these "Electrical Nights" are: Why doesn't the electric locomotive show some tendency toward standardization? and which of these existing types is the best all-round one? By way of answer it is possible at this time only to say that each new problem put up to the electric locomotive designers seems to involve new requirements which many times dominate. Again the development stage of any art is marked by change, but when closely examined the electric locomotive will be seen to be following certain rather definite and logical lines of evolution. After all, the electric locomotive is only emulating its steam predecessor's example in passing through these mutations, for the number of steam locomotive types which have appeared is legion.

Knowledge of Advantages of Spreading Peak Becoming General

FOR several years past various committees of the American Electric Railway Association have been trying to impress on member companies an appreciation of the acuteness of the rush-hour problems. The committee on standards for car loading and the bureau of fare research gave much time to the subject, and the committee on cost of rush-hour service continued the investigation and made a report on the subject at the 1916 convention. "The fact that rush-hour service is not necessarily profitable because a substantial proportion of the receipts are taken during that period is not generally known," the report said. Agitation for "daylight saving" and "spread of closing hours" was recommended. This week the daylight saving plan becomes law and the month of April should witness the effect of its operation in lowering and widening the peaks. Manufacturers, merchants and others, also, are showing some evidence of an appreciation of what they can do to help.

War conditions have served to influence the public on such matters so that now, through publicity given by the War Board and other agencies, the question of "lowering the peak" has become one of real importance. Various public service commissions also have learned to appreciate what the "peak" means. The Oregon commission in its order of Jan. 5 expressed this thought happily in the following statement: "Hitherto we have thought only of accommodating the service to the public, but it is possible also to vary the movements of the public to suit the service. Considerable progress has been made in the spreading of peak loads by changes in the hours of beginning and quitting work in large industrial establishments, but much remains to be done. Office employees and professional men may also vary their hours in some degree so as to avoid traveling at times when the cars are crowded with those in other occupations." The passage of the "daylight saving" bill will also help to "spread the peak" as it will separate the lighting from the transportation loads on power houses. This burden will be still further lightened if the plan for staggering the opening and closing hours is more generally adopted. If all factories and stores merely move forward one hour their opening and closing hours the great mass of riders will continue to use the cars at the same time.

Employers can serve the comfort of their workers as well as make for improved service generally if they will fix their working schedules so as to fit more nearly into slack periods of transportation. Professional men, shoppers and others who have the choice of their hours of travel also would do well to bear this situation in mind. It behooves the wide-awake railway manager to give due publicity to these facts. He can serve the interests of his company as well as his patrons by doing so. Undoubtedly civic associations and employers generally will join in any such movement for increased efficiency of service.

Boston Turbine Accident Not Necessarily Discouraging

THAT great steam turbine in the Boston Elevated power plant will have wrecked itself in vain unless some valuable lessons are learned to compensate for a direct loss of possibly $200,000 with incidental losses difficult even to estimate. There is no doubt in our minds, however, that both designers and operators will gain from the accident such technical information as will enable them to reduce if not entirely to eliminate all future risk.

From the investigations of our contemporary *Power* it is evident that the Boston accident was not the result of faulty design or of the use of defective materials. It was due apparently in the first place to the deflection of one of the cast-iron diaphragms, a circumstance which could hardly have been foreseen. It will not in the least influence confidence in the durability or reliability of the steam turbine in general or of the single-cylinder, high-capacity turbine in particular. It will, however, be a guide to designers in the future as to the materials and dimensions of parts to use in the construction of these machines.

Engineers and power plant owners generally have approved of the steam turbine as a worthy successor to the reciprocating engine. They accept it with its comparative complication because it is economical of steam, of floor space, of materials. Essentially its wheels, diaphragms, buckets, etc., must be thin and light, and the peripheral speeds, particularly in the low-pressure stages, must be enormous. At the same time the temperature and pressure ranges in the cylinder must be wide, clearances between buckets must be small, etc. The wonder of it all is that designers have made the turbine the marvellously successful machine that it is.

Aside from what the accident will teach the specialist the plainest lesson to power plant men generally is that they must understand their turbines perfectly, they must be alert to cut the machines out of service promptly if signs or sounds point to internal trouble, and they must enforce such inspection procedure as will insure the detection of incipient irregularities.

Local Rate-Making Is Contrary to Public Policy

COMMISSIONS as well as men differ in common sense. When the Public Service Commission for the First District of New York recently refused the application of the New York & North Shore Traction Company for higher fares, we criticized the commission for placing technical and legal subtleties ahead of justice. This board, it will be recalled, admitted the need of increased revenues, but asserted that the company was bound by its franchise to a 5-cent fare. The basic contention was that the New York State Constitution, in requiring municipal consent to electric railway operation, gave the city power to impose fare and other conditions for the consent.

It so happened that the New York commission in this case placed great dependence upon a "luminous" opinion interpreting the similar constitutional consent provision in Pennsylvania. The commission proceeded to argue that a city cannot be restricted in imposing conditions of consent. Of course, it said, a regulatory body can withhold approval of a new franchise, if "the city insists upon a term or condition which defeats the public convenience and necessity," but if these are served, "it cannot modify the terms of the city's consent." Hence, the New York board contended, if a commission could not modify a fare clause before approving a franchise, how could the law permit the ridiculous practice of the same body changing the fare after approving the franchise?

But is it so absurd to think that a commission can refuse to approve a franchise because of an improper fare clause? By no means. Since the New York First District Commission appreciates the luminosity of Pennsylvania thought, suppose we mention the latest decision of the Public Service Commission of that State on this point. The case is that of the Northwestern Electric Service Company, which applied for certificates of public convenience, evidencing the approval by the commission of franchises secured from several localities. Each contract contained a provision by which the company agreed that its rates for house lighting should not exceed the maxima mentioned.

Did the Pennsylvania commission think it proper to approve such provisions? Read its finding:

> The Legislature has established this commission for the purpose of regulating the rates to be charged by public service companies and has delegated to the commission the exclusive power to determine what are the just and reasonable rates for service rendered by such companies at a particular time.
>
> It is clear that it was the intention of the Legislature to place these matters exclusively within the power of the commission, and, therefore, action by local authorities which attempts to establish rates to be charged by public service companies is contrary to the public policy of the Commonwealth.
>
> The difficulty incident to the establishment of rates in a municipal ordinance has been brought forcibly to the attention of the commission in numerous cases recently. The contracts in question fix rates for service to the public, and we are of the opinion that for this reason they are not for the best interests of the municipalities, the company or the public. The applications are, therefore, refused.

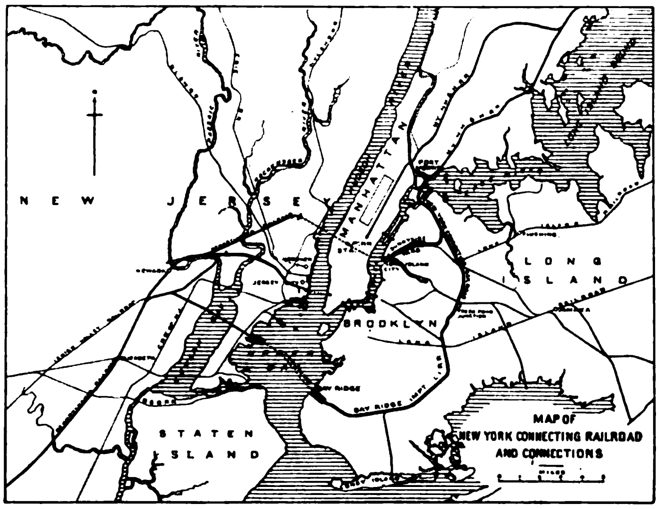
Here is a broad-minded opinion, based upon the principles of modern utility operation. There is much more common sense exhibited in this decision than in the New York one. The so-called constitutional restriction is the same in both States, but the Pennsylvania commission interprets it reasonably.

The Latest Commercial Electric Locomotives

On Its Annual "Electrical Night" the New York Railroad Club Discussed the Newest Electric Locomotives Under Construction or in Operation on the St. Paul, New Haven and New York Central Lines

THE New York Railroad Club held its fourteenth "electrical night" on March 15, with a very large attendance. After opening the meeting C. E. Chambers, superintendent of motive power Central Railroad of New Jersey, president of the club, turned it over to E. B. Katté, chief engineer of electric traction, New York Central Railroad, chairman of the electrical committee.

Illustrated papers were presented by E. R. Hill, of Gibbs & Hill, consulting engineers, New York City; F. H. Shepard, director of heavy traction, Westinghouse Electric & Manufacturing Company, New York City; A. H. Armstrong, chairman electrification committee General Electric Company, Schenectady, N. Y., and Mr. Katté. An abstract of the papers is given below and on the following pages.



ROUTE OF THE NEW YORK CONNECTING RAILROAD AND CONNECTIONS WITH PENNSYLVANIA AND NEW HAVEN SYSTEMS

New 180-Ton Locomotives for the New Haven Railroad

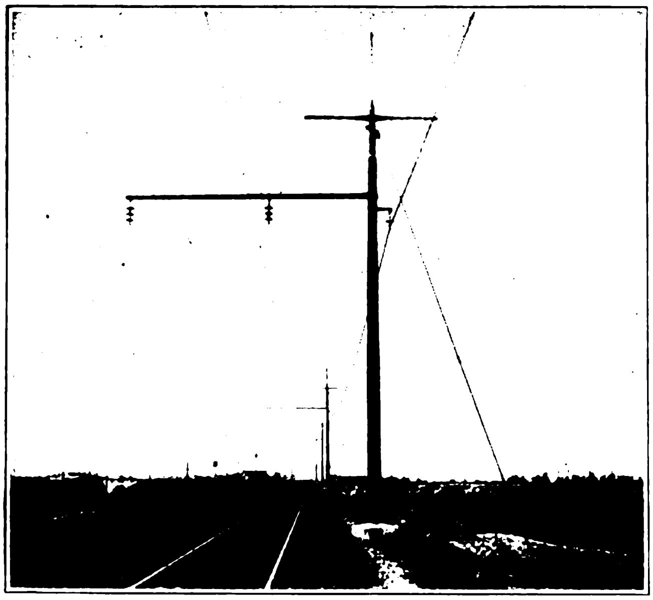
BY E. R. HILL

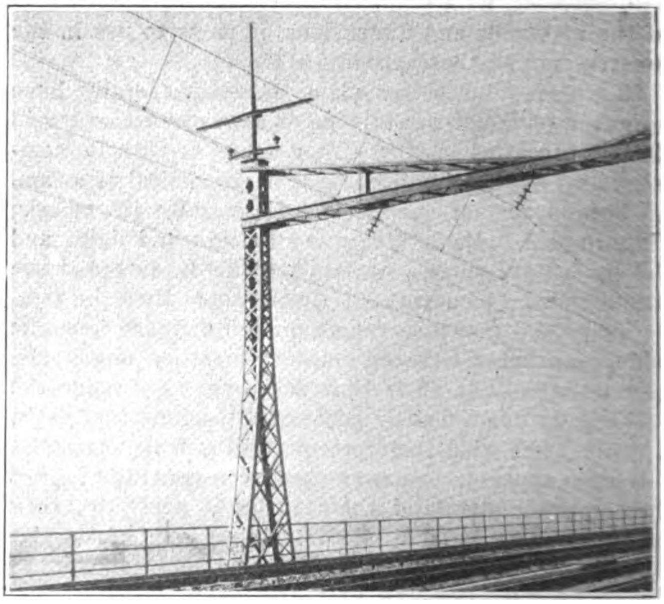
THE New York, New Haven & Hartford Railroad, as pioneer in heavy alternating-current railroad operation, opened the initial electric service to Stamford in 1907, the Harlem River branch in 1912 and the extension through to New Haven in 1914.

The extension to New Haven did not include sufficient locomotive equipment for 100 per cent electric operation of the division. For this purpose about twenty additional passenger engines, twelve freight engines and twenty-seven switchers are still required. The five new engines recently ordered and now under construction are part of the additional passenger requirements. They are of the Baldwin-Westinghouse type, similar in many respects to the present locomotives, all of which were furnished by the Westinghouse Electric & Manufacturing Company.

There have been no recent additions to electrified track, but the completion of the New York Connecting Railroad over Hell Gate, the electrification of this line for passenger service via Sunnyside Yard into Pennsylvania Station, and the possibility of electrification later for freight service over this line and the Long Island Railroad to Bay Ridge have introduced some new problems.

The present New Haven electrified lines are nearly level, the maximum gradient being 0.4 per cent.

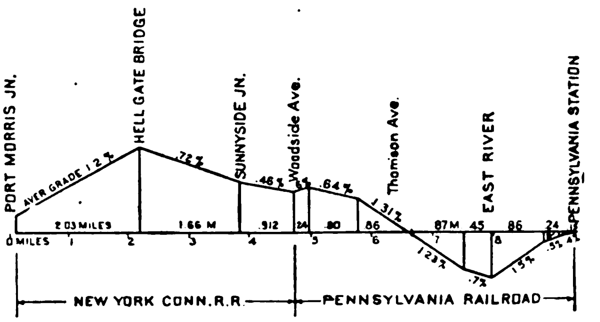




STANDARD BRACKET SUSPENSION ON NEW YORK CONNECTING RAILROAD—OVERHEAD CONSTRUCTION AT EXPANSION JOINT, LITTLE HELL GATE BRIDGE

Data on the New York Connecting Railroad are as follows.

Length of two-track passenger line—Port Morris to Sunnyside Yard	5 miles
Length of two-track freight line—Port Morris to Bay Ridge	20 miles
Maximum grade, westbound, approaching Hell Gate Bridge, 2 miles	1.2 per cent.
Maximum grade, eastbound passenger tracks, approaching Hell Gate Bridge, 1.7 miles	0.72 per cent.
Grade in Pennsylvania tunnels	1.5 per cent.
Length of four-track passenger and freight section—Port Morris to Sunnyside Junction	3.8 miles
Length of Hell Gate Bridge:	
Between abutments	977 ft.
Outside of towers	1,150 ft.
Clear height above mean high water	135 ft.
Cost of bridge	$4,000,000
Cost of entire New York Connecting Railroad	$30,000,000
Total cost of line, including Bay Ridge improvements of Long Island Railroad	$40,000,000

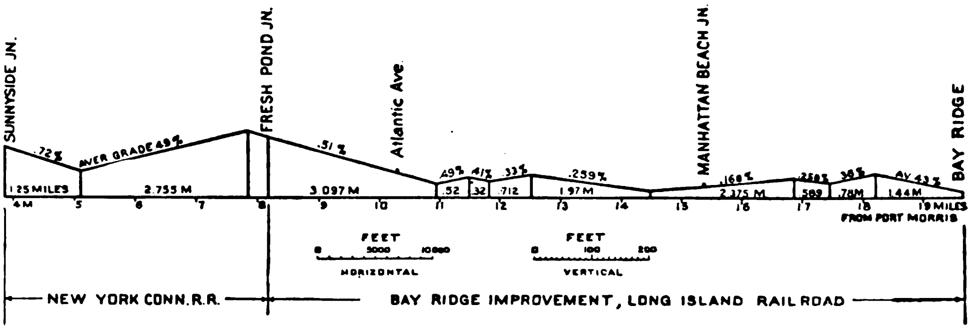


PROFILE OF NEW YORK CONNECTING RAILROAD SHOWING HEAVY GRADES AT HELL GATE BRIDGE AND UNDER EAST RIVER

The 0.72 and 1.2 per cent grades on the single-phase New York Connecting section and the 1.5 per cent grade on the direct-current Pennsylvania tunnel section introduced new conditions affecting the operation of New Haven electric locomotives.

Express trains operated between Grand Central Station and New Haven average eleven steel cars and weigh about 770 tons. Maximum trains of this character are of twelve steel Pullman cars and weigh from 850 to 900 tons.

These same trains must be operated between New Haven and Pennsylvania Station over the heavier grades of the New York Connecting Railroad. To meet these operating requirements it is necessary to provide heavier locomotives than now in use on the line or double-head the present locomotives, as is frequently done on the heavier trains.



PROFILE OF PROPOSED FREIGHT EXTENSION OF NEW YORK CONNECTING RAILROAD TO BAY RIDGE

Another condition limiting the New Haven's operation is the restriction imposed by the New York Central as to total weight and axle loadings of locomotives using drawbridge and viaducts on their line into Grand Central Station. The New York Central's conditions limit loads on four driving axle locomotives to 47,500 lb. per axle, and on locomotives with six driving axles to 41,000 lb. per axle. There are limitations also as to the total weight of locomotive and to the extent to which double-heading is permitted.

The five 180-ton engines now on order represent the maximum in weight and capacity of the a. c.-d. c. type that will not exceed the New York Central structure limitations. This, however, does not quite meet the maximum desired performance for through express trains on the New York Connecting Railroad grades.

The new engine will handle twelve-car trains on the Pennsylvania direct-current terminal grades and eastbound on the 0.72 per cent grade of the New York Connecting Railroad, but it will handle only eleven-car trains on the westbound 1.2 per cent New York Connecting Railroad grade. This latter grade is 2 miles long and it is proposed to employ electric pushers for assisting westbound trains of more than eleven cars up this grade. An alternative to this is to double-head these engines with one of the old gearless-type locomotives.

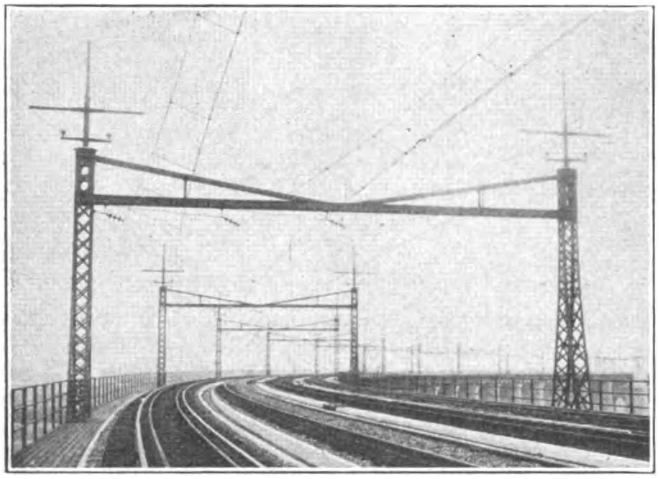
PRINCIPAL SERVICE DATA, NEW HAVEN ELECTRIC LOCOMOTIVES

Maximum safe speed, m.p.h.	70
Balanced speed with 770-ton average train, in miles per hour:	
On level	60
On 0.4 per cent New Haven grade	42
On 0.72 per cent Connecting Railroad grade	35
On 1.2 per cent Connecting Railroad grade	26
Schedule speed of express trains, New York-New Haven, in miles per hour:	
Without stops	43.7
With four intermediate stops	37.6
Train Weights:	
Grand Central Station service east and west:	
Maximum local train	420 tons, 6 cars
Maximum local train double-headed with gearless engine	620 tons, 9 cars
Maximum express train	900 tons, 12-13 cars
Pennsylvania Station service:	
Maximum eastbound express train	850 tons, 12 cars
Maximum westbound express train	770 tons, 11 cars

Prior to the installation of the new locomotives the latest and largest type of locomotive on the New Haven road was the 2-4-4-2 engine of the 073-075 series, having four driving axles and two pony axles in two trucks, each driving axle being equipped with a pair of single reduction geared motors with quill drive.

PRINCIPAL DESIGN DATA, NEW HAVEN ELECTRIC LOCOMOTIVES

	New 180-Ton	Present 120-Ton	Present 109-Ton
Series number	....	073–075	01–041
Classification	2-6-2+2-6-2	2-4+4-2	2-4+4-2
Weights:			
Mechanical parts, lbs.	187,500	123,900	105,600
Electrical and air-brake parts, pounds	161,700	115,100	112,000
Steam-heating equipment and miscellaneous, pounds	12,800	....	....
Total pounds	362,000	239,000	217,600
On each driving axle, pounds	41,000	45,500	41,900
On each pony axle, pounds	29,000	28,500	25,000
Rigid wheelbase	14 ft. 3 in.	8 ft. 0 in.	8 ft. 0 in.
Total wheelbase	59 ft. 6 in.	40 ft. 6 in.	30 ft. 9 in.
Length over all	69 ft. 0 in.	50 ft. 0 in.	37 ft. 7½ in.
Diameter of driving wheels	63 in.	63 in.	62 in.
Diameter of driving axles	8 in.	8 in.	8 in.
Size of main journals	7 in. x 13 in.	7 in. x 13 in.	7¼ in. x 10 in.
Size of truck wheels	36 in.	36 in.	33 in.
Size of truck journals	6 in. x 12 in.	6 in. x 12 in.	5½ in. x 10 in.
Type of drive	Quill-geared	Quill-geared	Quill-gearless
Number of motors	12	8	4
Horsepower:			
One-hour	2,550	1,700	1,120
Continuous	2,025	1,350	1,125
Maximum safe speed—m.p.h.	70	55	85
Tractive Effort:			
One-hour, pounds	21,000	17,700	9,700
Continuous, pounds	14,500	12,200	6,400
Momentary maximum pounds	47,500	....	....
Gear ratio	27:87	....	....



SPECIAL OVERHEAD COSTRUCTION ON VIADUCT, NEW YORK CONNECTING RAILROAD

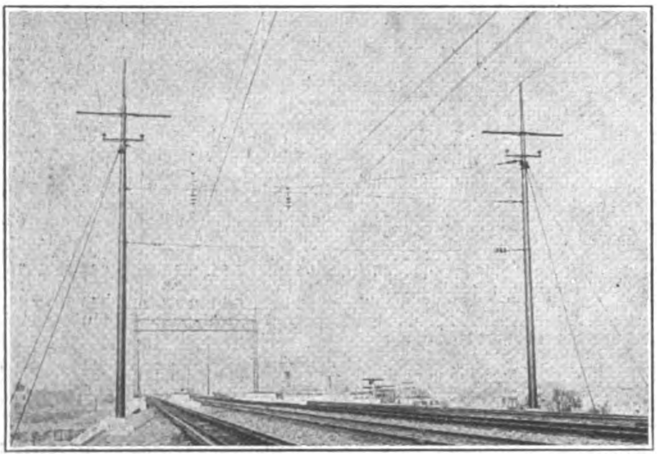
The new engines are duplicates of these present engines in all essential respects, the main differences being that there are three pairs of drivers on each truck instead of two, and pony axles are used at both ends of each truck instead of the outer ends only. In all principal respects also the details of the locomotive are identical with the thirty-four freight and heavy passenger straight single phase locomotives built in 1911 for use in freight service.

The principal data regarding the three types of passenger locomotives of the road are given in the tables at the bottom of page 557.

The motors are connected in groups of three permanently in series, and the speed characteristics are substantially the same as those of the original gearless locomotives. The control is to be arranged for multiple-unit double-heading of locomotives of these two types. They are geared for a higher speed than the present geared-type locomotives and cannot be operated in multiple unit with them.

QUILL DRIVE INSURES FLEXIBILITY

The motors are grouped in pairs and connected by means of bearings and single-reduction gearing to a quill, which surrounds the axle, with ample radial and end clearance to prevent it coming in contact with the axle when in normal running condition. The motors, gearing and quill are supported from the truck frame independent of the axle and wheels, the motors being directly above the center line of the axle. With this arrangement the weight of the motors, gearing and quill is carried on springs and the only dead weight coming directly on the track is that of the driving wheels and axle. The center of gravity is high, and good riding qualities and tracking conditions are secured.



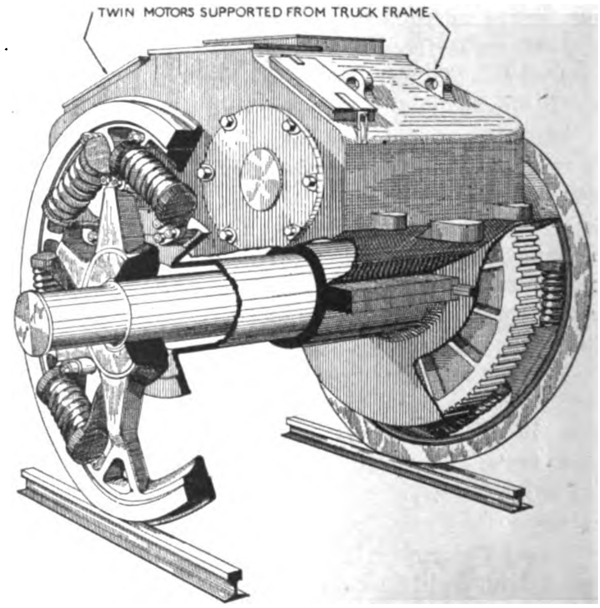
STANDARD SPAN CONSTRUCTION, NEW YORK CONNECTING RAILROAD

The only connection between the motors and the driving wheels is through a group of six helical springs in each driving-wheel center, connected at one end to the spokes of the wheel and at the other end to the disk at the end of the quill. This arrangement is in use on all of the geared passenger, freight and switching locomotives of the New Haven road and has given excellent satisfaction. The motors are also identical with those used on certain of the passenger locomotives and on all of the geared freight locomotives, the total number of such motors being more than 400. By adopting this same type of motor suspension and drive, duplication and uniformity of parts is secured and saving in shop maintenance and operation is thereby effected.

The truck center pin is located between the first and second driving axles, thus making the truck unsymmetrical fore and aft of the center pin. This will tend to prevent oscillation or nosing of the trucks.

STEEL TRUCK FRAME CAST IN ONE PIECE

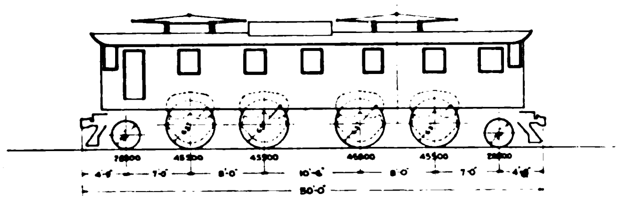
The drawbar pull between trucks is transmitted through a radial bar coupling and not through the cab. The weight of the cab is borne on each truck by six spring-mounted pads. The truck frames are of the integral cast-steel type, the entire frame and cross-ties being cast in one piece. The saving in weight by the use of this type of truck frame is estimated to be 3200 lb. per locomotive. This feature is important not only because it is desirable to minimize the dead weight of the locomotives in general, but also because of the weight limitations of the bridge structures over which these engines are to operate and the guarantee which the manufacturers were required to give was that the total weight should not exceed 181 tons.



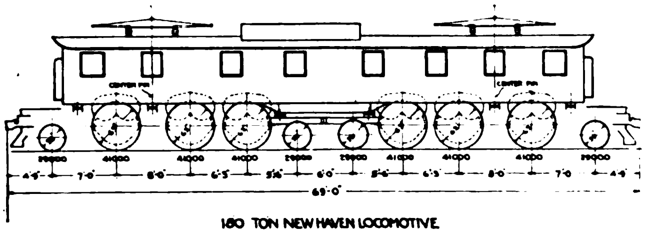
SKETCH TO SHOW THE CONSTRUCTION OF THE QUILL DRIVE

The motors and transformers are forced-ventilated by means of two motor-driven blowers mounted in the cab. For train heating purposes the locomotives will be equipped with flash-type, kerosene-fired boilers capable of evaporating 4200 lb. of water per hour. Tanks having a capacity for 1440 gal. of water and 370 gal. of oil will be provided as part of the heating equipment of each locomotive.

These locomotives illustrate in a general way the adaptability of electric traction in meeting the constantly increasing requirements of railroad service. In this case, without modifying the general type or any of the mechanical or electrical details and without exceeding existing weight limitations on bridge structures, a locomotive 50 per cent larger than the present one has been produced simply by the addition of a driving axle and a pair of motors to each truck with adaptation of mechanical and electrical details for the mounting and control of the additional parts.



120 TON NEW HAVEN LOCOMOTIVE



180 TON NEW HAVEN LOCOMOTIVE

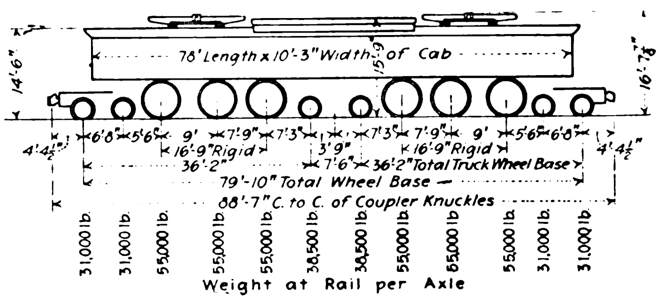
ELEVATIONS OF PRESENT 120-TON AND FUTURE 180-TON NEW HAVEN LOCOMOTIVES

266-Ton Locomotive for the St. Paul

BY F. H. SHEPARD

THERE are under construction for the Chicago, Milwaukee & St. Paul Railway ten Baldwin-Westinghouse locomotives similar to that shown in an accompanying illustration. These will weigh 266 tons each, of which weight 121 tons will be in the electrical equipment, 118 tons in the mechanical equipment and 27 tons in the heating equipment, including water. A diagram is reproduced to show the weight distribution and wheel spacing.

The locomotive comprises two running gears, with the Pacific-type wheel arrangement. These are coupled back to back, supporting a single cab, which contains the auxiliaries and heating apparatus. The driving wheels are 68 in. in diameter, the driving wheelbase is 16 ft. 9 in., the wheelbase for each truck is 36 ft. 2 in., the total wheelbase is 79 ft. 10 in., and the total length between knuckles is 88 ft. 7 in.



WEIGHT DISTRIBUTION IN QUILL-DRIVE LOCOMOTIVES FOR THE ST. PAUL

HEATING EQUIPMENT OCCUPIES LARGE SPACE IN CAB

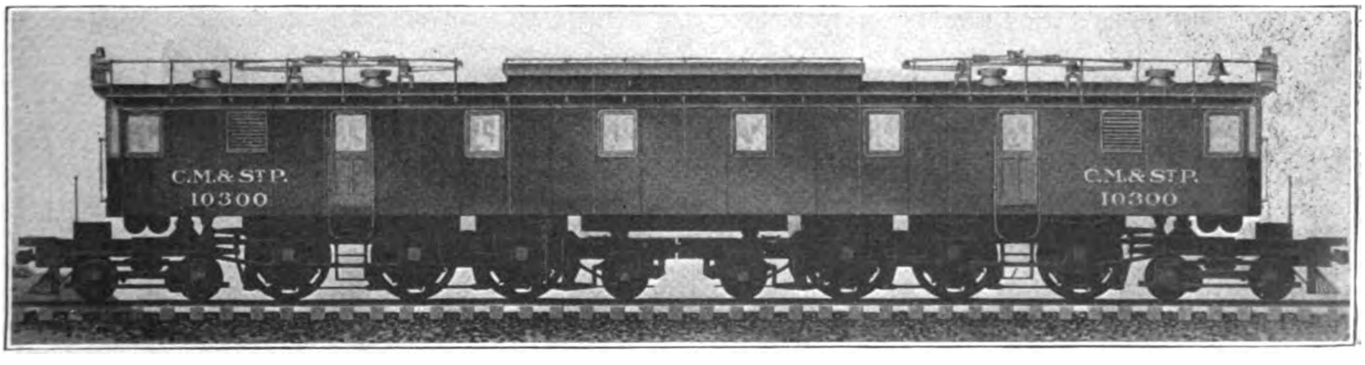
The layout of the apparatus in the cab is shown in the elevation and plan on page 560. In these it will be noted that a large part of the cab is occupied by the heating equipment. This includes boiler, water tanks and oil tanks. The rheostats are arranged above and near their controlling switches. The engine is, of course, made for double-end operation, each end having its complement of meters, air-brake valve, master controller, sanders, etc.

SCHEME FOR MINIMIZING RHEOSTATIC LOSSES

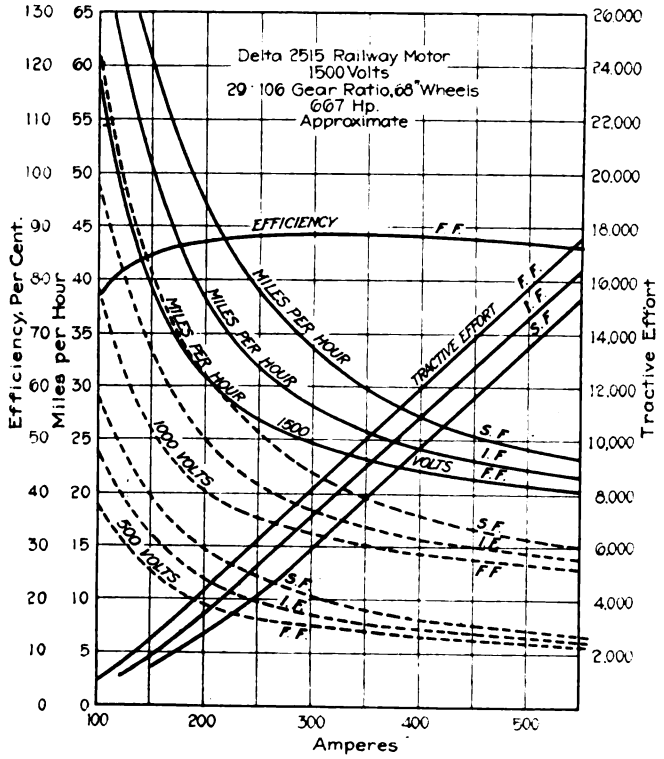
In one of the figures is a set of speed curves, showing operation on the nine running positions corresponding to one-third, two-thirds and full-speed positions, with two field-control positions on each. This provides economical operation over a wide range of speed. Regeneration from maximum speed down to 10 m.p.h. is provided for the purpose of holding trains on grades or making slowdowns. In another diagram the rheostatic losses during acceleration on a 2.2 per cent grade with a 950-ton train are indicated by shading.

The continuous capacity of the locomotive is 3200 hp., corresponding to a tractive effort of 49,000 lb. at 24.5 m.p.h. The maximum starting effort is 110,000 lb.

The motive equipment consists of six twin motors with quill drive, these being mounted above each driving axle. Each armature carries a single pinion and the two, driving a single solid gear mounted upon the quill shaft, are held in position by quill bearings. Thus a movement of the axle within the quill shaft of



NEW LOCOMOTIVE FOR THE ST. PAUL RAILWAY, WITH TWIN MOTORS, QUILL DRIVE AND SIDE RODS



CHARACTERISTIC CURVES OF MOTORS FOR ST. PAUL QUILL-DRIVE LOCOMOTIVE

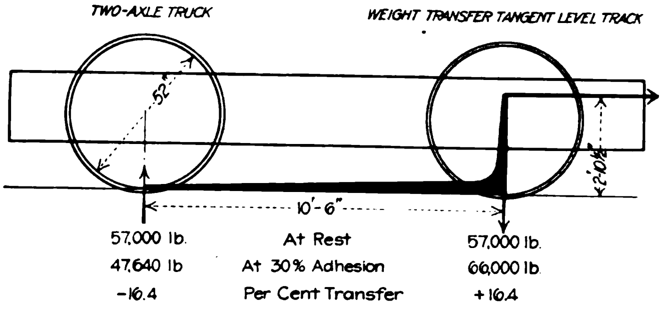
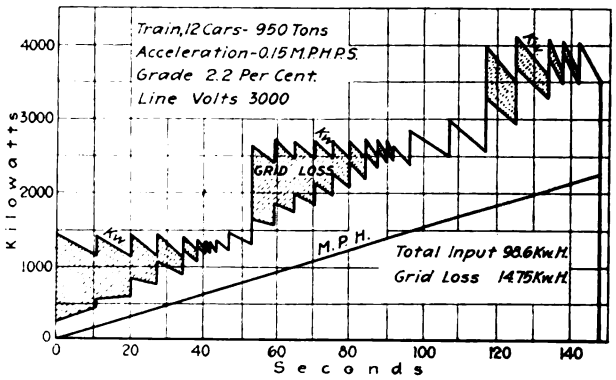

TWO-AXLE TRUCK
WEIGHT TRANSFER TANGENT LEVEL TRACK
52"
2'-10½"
10'-6"
57,000 lb.
47,640 lb
-16.4
At Rest
At 30% Adhesion
Per Cent Transfer
57,000 lb.
66,000 lb.
+16.4

DIAGRAM SHOWING HOW WEIGHT ON AXLES IS TRANSFERRED BY DRAWBAR PULL



TYPICAL STARTING CURRENT GRAPH, ST. PAUL QUILL-DRIVE LOCOMOTIVE

1¾ in. from normal position is secured, providing freedom of movement of the driving axles.

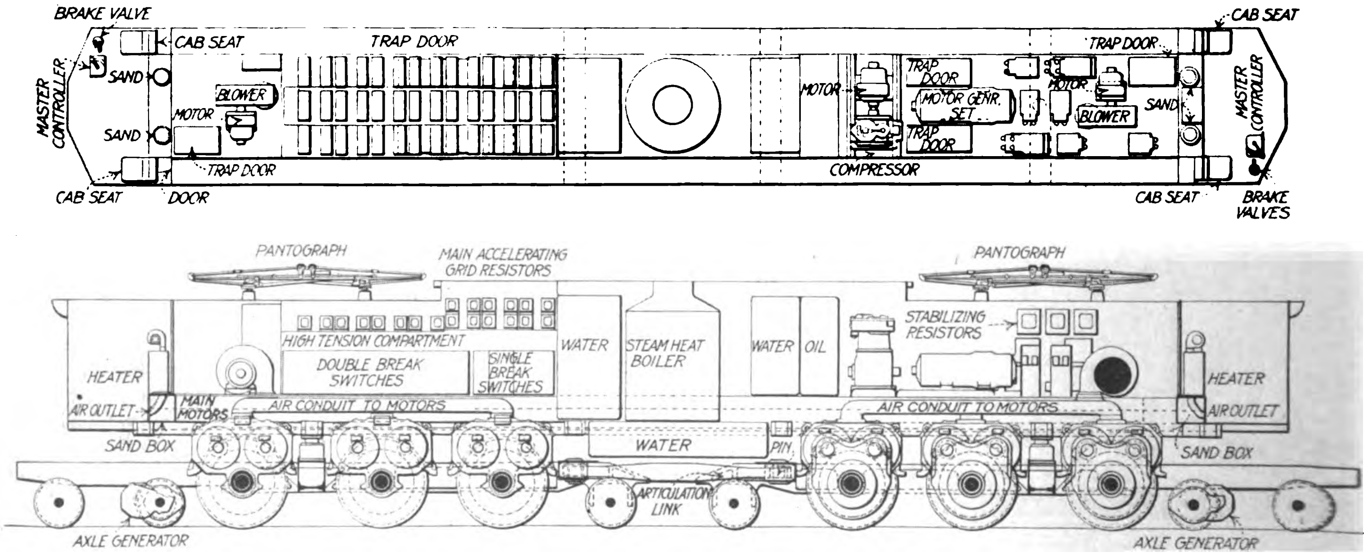
This locomotive is, of course, provided with the well-known electro-pneumatic control.

THREE SOURCES OF POWER SUPPLY FOR THE AUXILIARIES

Power for the auxiliaries is obtained from the 3000-volt contact line through a motor-generator set delivering current at approximately 80 volts. From this the train lighting is supplied, and to it a storage battery is connected. The blowers, air compressor, lights and control are all operated at 80 volts and their operation, due to the presence of the battery, is independent of line power. In addition to the motor-generator set and battery, there is a third source of low-voltage supply, which is utilized for the operation of the auxiliaries and for the excitation of the fields of the main motors for regeneration whenever the train has acquired requisite speed. This is a pair of axle-driven exciters, each being mounted on the inside axle of the four-wheel truck. These axle-driven generators are about the size of an ordinary street car motor, and furnish current, at low voltage, for the excitation of the main motor fields when regenerating, and at other times for the operation of the blowers and air compressors, independent of the battery. Thus the locomotive is at all times independent of line power for the supply of air for the brakes.

CONSIDERATIONS FAVORING THE TWIN-MOTOR, QUILL DRIVE WITH SIDE RODS

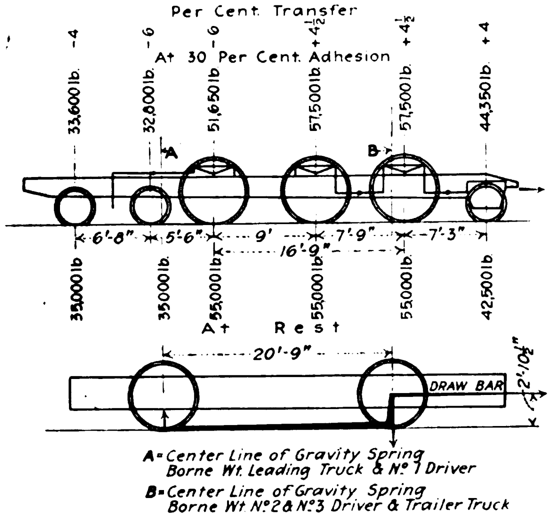
A question naturally arises as to the considerations which led to the selection of this type of locomotive, possessing as it does certain mechanical complications as compared with certain other types. In the absence


BRAKE VALVE
CAB SEAT
TRAP DOOR
MASTER CONTROLLER
SAND
BLOWER
MOTOR
TRAP DOOR
CAB SEAT
DOOR
MOTOR
TRAP DOOR
MOTOR GENR. SET
MOTOR
BLOWER
COMPRESSOR
TRAP DOOR
SAND
CAB SEAT
BRAKE VALVES
PANTOGRAPH
MAIN ACCELERATING GRID RESISTORS
HIGH TENSION COMPARTMENT
DOUBLE BREAK SWITCHES
SINGLE BREAK SWITCHES
WATER
STEAM HEAT BOILER
WATER
OIL
STABILIZING RESISTORS
HEATER
AIR OUTLET
MAIN MOTORS
AIR CONDUIT TO MOTORS
SAND BOX
WATER
PIN
ARTICULATION LINK
AXLE GENERATOR

ELEVATION AND PLAN OF QUILL-DRIVE ST. PAUL LOCOMOTIVE SHOWING ARRANGEMENT OF EQUIPMENT of service data which may be directly comparable the reasons may be classed as somewhat theoretical. In the first place it was understood that the weight on driving axles, both as to amount and disposition, in the present engines would not be accepted for additional engines for passenger service. A departure from the design of the locomotive at present in passenger service was therefore necessary. This could have been accomplished by the use of more driving wheels with smaller and lighter motors, or of very large motors with side rods. The service conditions require a minimum of six driving axles, with a weight of 55,000 lb. on each. This requirement can be very reasonably and economically met by twin motors with quill drive.

Among the advantages of this type of construction the following may be noted:

1. The limitation of voltage across any commutator to 750 volts, thereby obtaining especially stable commutation for both motoring and regenerating.



WEIGHT DISTRIBUTION AT REST AND AS MODIFIED BY DRAWBAR PULL, ON ST. PAUL QUILL-DRIVE LOCOMOTIVES

2. The greater accessibility, lesser restriction in design, and greater freedom from injury to motors, due to their position above the axle remote from the roadbed.

3. The mounting of the motors rigidly upon the locomotive frames, thereby securing great flexibility between the roadbed and the motor mass.

4. The height of center of gravity of the running parts, which is 43½ in. above the rail.

5. The use of a minimum number of gears and the removal of the necessity for spring gears.

6. The very desirable wheel arrangement, weight distribution and equalization.

The utilization of the weight of the locomotives for adhesion is not of the same importance in passenger locomotives as in those designed for freight service. However, the relative value of wheel arrangement is affected by weight transfer, due to the tractive effort being applied at the height of the drawbar, as shown in the accompanying diagrams. Thus with 30 per cent adhesion the weight transfer of this wheel arrangement is no more than 6 per cent, while if the wheelbase were as short as 10 ft. 6 in. the weight transfer under the same condition would be 16.4 per cent. Thus for drag or heavy freight service the use of side rods has a distinct advantage, since all of the drive wheels on the truck are coupled.

The American railroad track is a cushioned, yielding structure, but unfortunately the yield of the rail due to wheel loads varies greatly, depending upon the track joints, special work, condition of ballast and sub-grade. This general condition is exaggerated, of course, by the extreme weather conditions experienced in this country.

A great deal of importance has been attached to such matters as center of gravity, wheel arrangement, size of wheels and equalization on steam locomotives, especially for passenger service. The steam locomotive, of necessity, consists of a large mass, including boiler and cylinders, carried on the locomotive frame, the driving wheels being loosely and flexibly connected thereto. Space limitations also require a relatively high center of gravity. It is a coincidence that this limitation in the design of steam locomotives automatically secures a reaction upon the roadbed which is inherently easy upon the latter. In view of the flexibility of the heavy parts of the locomotive, the individual axles are relatively free from restraint imposed by directly imposed weight. In the electric engine described these advantageous features are all retained. In the use of side rods on electric locomotives the action differs from that of steam locomotives in the entire absence of dynamic augment produced by the lack of counterbalance of reciprocating parts of the steam locomotive for all speeds. The electric locomotive with side rods is perfectly counterbalanced for all speeds, since the motion of the rods is of pure rotation only.

3000-Volt Gearless Locomotive for the St. Paul

By A. H. ARMSTRONG

THE excellent operating results obtained during the past ten years with gearless motor locomotives on the New York Central tracks have attracted increasing attention to this form of construction. The extreme simplicity in design offered by mounting the armature directly upon the driving axle, thus eliminating all gears, quills, jack-shafts, side-rods, etc., has been reflected in great reliability and low cost of maintenance. It is, therefore, an achievement of much importance to announce the entry of the gearless locomotive in mountain grade haulage, as it can be reasonably expected that this type of construction holds promise of equally good operation in this heaviest class of railroad service.

The gearless locomotive now under construction in the General Electric shops for the Chicago, Milwaukee & St. Paul extension to Seattle is equipped with fourteen axles, twelve of which are drivers and two guiding axles. The armature is mounted directly upon the axle and, with the wheels, constitutes the only dead or non-springborne weight of the locomotive. This weight is approximately 9,500 lb. as compared with 17,000 lb. dead weight on the driving axles of the present geared locomotives now in operation on this road. The two fields are carried upon the truck springs with full freedom for vertical plan of the armature between them.

The construction of the motors throughout is practically identical with that employed upon the New York Central gearless locomotives, but the capacity of the locomotive is much increased and the wheel arrangement somewhat different. The following table gives the general physical characteristics of the locomotives now under construction:

DIMENSIONS AND WEIGHTS—C., M. & ST. P. 3000-VOLT D.C. GEARLESS LOCOMOTIVE

Length inside knuckles	76 ft. 0 in.
Length over cab	68 ft. 0 in.
Total wheel base	67 ft. 0 in.
Rigid wheel base	13 ft. 11 in.
Diameter driving wheels	44 in.
Diameter guiding wheels	36 in.
Approximate height center of gravity	57 in.
Weight of electrical equipment, pounds	235,000
Weight of mechanical equipment, pounds	295,000
Weight of complete locomotive, pounds	530,000
Weight on drivers, pounds	4[illegible]8,000
Weight on guiding axle, pounds	36,000
Weight on each driving axle, pounds	[illegible]
Dead or non-springborne weight per axle, pounds	9,500

With twelve motors per locomotive available for different control combinations, there is a possibility of securing a wide range of speeds to meet the varying conditions of passenger train operation. Motors are connected three in series, giving 1000 volts per commutator for full-speed operation, but the control also permits a connection of four, six and twelve motors in series for fractional speed operation. Further provision for variable speed is made by shunting the motor fields in all combinations of motors, but it is probable that the greatest value of field shunt will be obtained with the full-speed connection of three motors in series. The following table illustrates the speed possibilities of this locomotive:

SPEED CHARACTERISTICS—C., M. & ST. P. 3000-VOLT GEARLESS LOCOMOTIVES, 960 TONS TRAILING LOAD

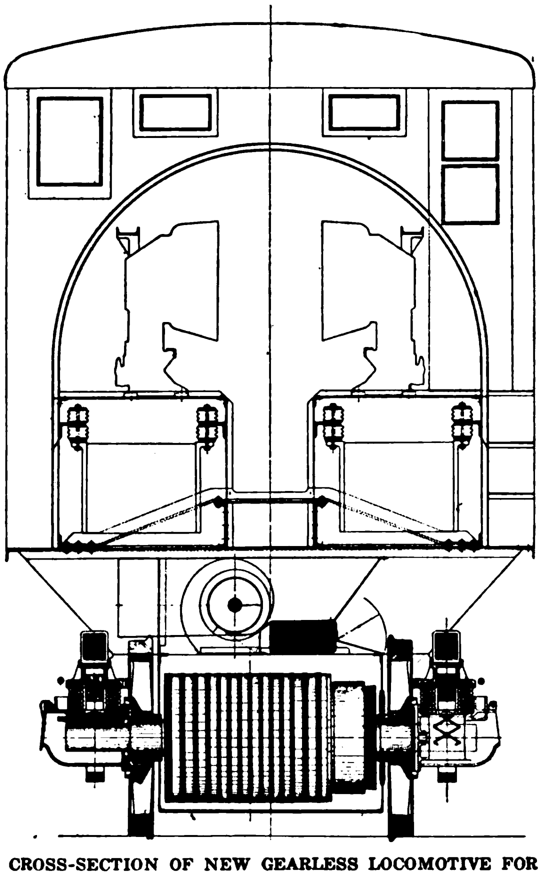
	Speed in m.p.h.			
	On Level	On ½ per Cent Grade	On 1 per Cent Grade	On 2 per Cent Grade
Three-motor shunt field	63.0	47.2	38.5	30.5
Three-motor full field	49.5	36.0	30.0	25.0
Four-motor full field	40.5	27.0	22.0	18.0
Six-motor full field	29.0	17.8	14.2	11.0
Twelve-motor full field	15.0	8.0	6.0	4.0

It is especially desirable that a passenger locomotive shall have sufficient weight on the drivers and reserve motor power to haul additional train weight on occasion, and in this respect the gearless locomotive under construction presents some attractive possibilities. The manufacturer's guarantees cover the operation of a twelve-car train weighing 960 tons against an adverse grade of two per cent at a speed of twenty-five m. p. h. Under these conditions there is a demand for 55,200 lb. tractive effort at the rim of the drivers and equivalent to twelve per cent coefficient of adhesion of the weight upon the drivers. There is, therefore, ample margin both in weight upon drivers and capacity of the motors to haul not only twelve cars but on occasion thirteen or fourteen cars, with practically no sacrifice in schedule speed and without overloading the motors or exceeding known and conservative practice as regards loading of driving wheels. For example, the gearless locomotive being built will permit the starting of a twelve-car train on a two per cent grade with a coefficient of adhesion of only twenty per cent and accelerate the train at 0.3 m. p. h. per second. The above general statements are tabulated below:

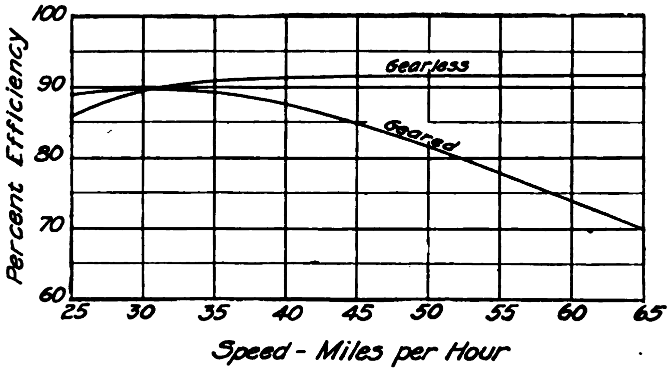
HAULING CAPACITY—C., M. & ST. P. 3000-VOLT D.C. GEARLESS LOCOMOTIVE

Number of motors	12
One-hour rating, horse-power	3240
Continuous rating, horse-power	2760
Tractive effort, one-hour rating, pounds	46,000
Tractive effort, continuous rating, pounds	42,000
Tractive effort, 2 per cent ruling grade with 960-ton train, pounds	55,200
Coefficient of adhesion ruling grade, per cent	12
Starting tractive effort, 20 per cent coefficient of adhesion, pounds	91,600
Rate of acceleration, starting, 2 per cent ruling grade, miles per hour per second	0.3

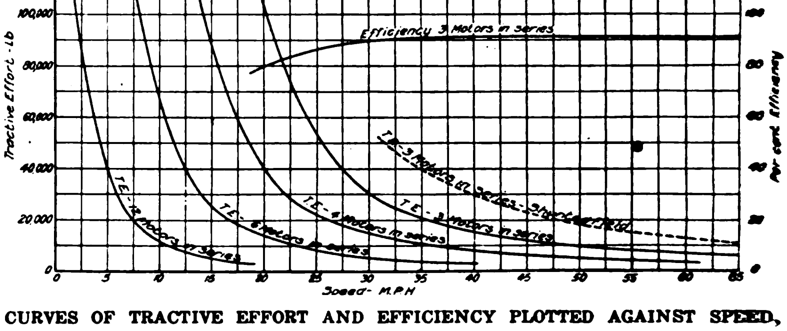
While the manufacturing guarantees are limited to 42,000 lb. tractive effort as a continuous output of this locomotive, preliminary tests upon a sample motor built



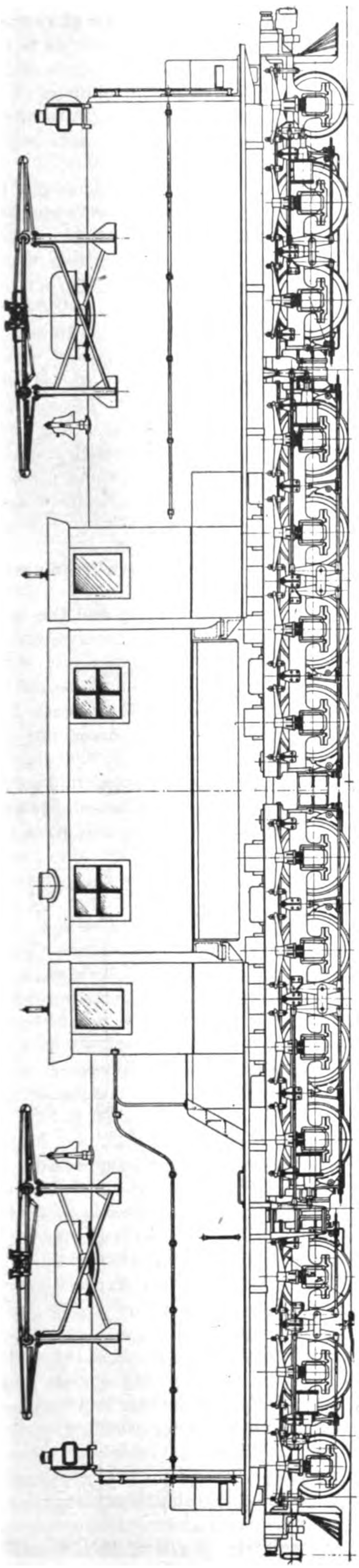
CROSS-SECTION OF NEW GEARLESS LOCOMOTIVE FOR THE ST. PAUL



EFFICIENCY CURVES OF PRESENT GEARED AND FUTURE GEARLESS ST. PAUL LOCOMOTIVES



CURVES OF TRACTIVE EFFORT AND EFFICIENCY PLOTTED AGAINST SPEED, ST. PAUL GEARLESS LOCOMOTIVES



ELEVATION OF GEARLESS LOCOMOTIVE FOR THE CHICAGO, MILWAUKEE & ST. PAUL RAILWAY

indicate that this rating is conservative and that the final tests upon a complete locomotive when finished may show values materially higher than the guarantees made. This fact is of the greatest importance and holds out wide visions of radical changes in the operation of trans-continental trains, both passenger and freight.

The total weight upon drivers of 458,000 lb. is practically the same as the driver weight of the freight locomotive now in operation on the Chicago, Milwaukee & St. Paul. If, therefore, the completed locomotive meets the expectations of the builder, it offers the possibility of using the same locomotive interchangeably for both passenger and freight service.

The considerable speed variation permitted with four motor combinations insures a means of operating the locomotive at any speed demanded by the character of service to which it is assigned. Furthermore, when operating a freight train at lower speeds it can reasonably be expected that the tractive effort rating of the locomotive will be increased, due to the lower core loss at the lower armature speeds. While not primarily designed as an interchangeable locomotive, nevertheless it is quite possible that the flexibility of this new Chicago, Milwaukee & St. Paul gearless locomotive will become increasingly apparent when it is put into operation and its fitness for freight service will be fully recognized. It is needless to forecast the operating benefits that would result from having only one class of locomotive assigned to the road movement of either passenger or freight trains. Just as the Chicago, Milwaukee & St. Paul Railway was the pioneer road in long distance electrification, utilized for the first time 3000-volt direct current and employed regenerative electric braking on down grades, so also this road may introduce radical changes in the road movement of passenger and freight trains, by reason of the great flexibility offered in the gearless motor locomotive, which will be put into operation within the year.

MOTOR-GENERATORS WILL NOT BE USED FOR EXCITATION IN REGENERATION

The control of the gearless locomotive will in many respects be a duplicate of that now in successful operation on the geared motor locomotive previously installed. Provision will be made for regenerative electric braking on down grades as the success and operating value of this method of holding trains on down grades has been fully established during the past two years of electrical operation on the Chicago, Milwaukee & St. Paul Railway. The geared locomotives now operating utilize a motor-generator set for the purpose of motor field excitation while regenerating, and the results with this combination have been excellent. Careful experiments made during the past two years have demonstrated that motor-generator field excitation is not essential and, taking advantage of the advance of the art, the control for the new gearless locomotive will dispense with this feature. This simplification of the control and reduction in weight and cost constitutes a marked improvement.

It is estimated that approximately twenty-five per cent of the 550,000,000 tons of coal mined in the United States during 1917 was consumed under the boilers of steam engines hauling our railway tonnage. One of the greatest arguments for electrification is the saving of fuel effected and therefore it is very essential that the efficiency of electric locomotives be raised as high as possible, in order to fulfill one of the claims for their introduction. In this respect the gearless locomotive under construction offers a marked improvement as compared with the geared-motor locomotive.

GEARLESS DRIVE IS MOST EFFICIENT AT HIGH SPEED

The original installation of the Chicago, Milwaukee & St. Paul was undertaken with a single type of road locomotive for both passenger and freight service, the locomotives differing only in the ratio of the gearing between the motors and drivers. The locomotives were therefore interchangeable, except as to gears, with consequent simplification of shop repair practice. The geared locomotive operates at a high efficiency in heavy freight service where pushers are used on up grades, but accumulative gear losses result in a low all-day efficiency of a geared locomotive in passenger service, when the profile is broken and contains long stretches of practically level track. On the other hand the gearless motor operates at highest efficiency on level track or lesser grades and it is this class of service that constitutes the bulk of the all-day duty of a passenger locomotive.

A comparison of the efficiencies of the present geared locomotive of the St. Paul road and the gearless locomotive under construction is presented in the curves shown on page 562 which are plotted with speed as abscissae, instead of the usual method of plotting efficiency to ampere input. A comparison of the two curves is most instructive. The average operating speed at about 50 m.p.h. shows a gain of 10 per cent in efficiency of the gearless locomotive as compared with the geared type and in fact throughout the entire range of speed from 30 m.p.h. up the gearless locomotive will operate at over 90 per cent efficiency, as compared with drooping characteristic of the geared-motor locomotive.

Electrical apparatus is inherently so efficient in its conversion of electrical into mechanical power that there is usually little gain in going from one type of motor to the other. It is therefore proper to note that the considerable gain in efficiency resulting from the adoption of the gearless motor is due almost entirely to the elimination of the mechanical losses inherent with geared motor drive. The exclusion of mechanical parts, such as gears, quills, jack-shafts, side rods, etc., utilized to transmit the power from the motors to the drivers with some forms of locomotive construction not only results in a marked improvement in the all-day efficiency of the locomotive, but is followed by an equally attractive increase in reliability and a marked reduction in maintenance expense. It is felt, therefore, that the introduction of the gearless locomotive upon the Chicago, Milwaukee & St. Paul marks a distinct advance in electric railroading and that this type of construction now for the first time made possible for mountain service will result in a marked improvement in the method of handling both passenger and freight trains in this most difficult class of railroad service.

New York Central Well Satisfied with Its Bi-polar Motor Locomotives

By E. B. Katté

During the past year we have received on the New York Central Railroad nine new electric passenger locomotives of the type known as Class T-2B. The tenth locomotive will be delivered next month. These locomotives are very similar to the earlier Class T locomotives, in fact, when we asked the men in the operating department if they desired to suggest any changes, their representative held up his hands and exclaimed, "For goodness sake, don't make any changes, you will spoil them." As a matter of fact, thirty or forty minor modifications and improvements were made.

These locomotives are driven by eight motors of the bi-polar type, one on each axle. The total weight of the locomotive is 134 tons, and the drawbar pull at 25 per cent adhesion is 66,000 lb. The load is about equally divided on all the wheels. The motors are known as GE-91-A and have a one-hour blown rating of 325 h. p., or a total of 2600 h. p. for the locomotive.

The capacity of the locomotive is the hauling of a 1200-ton train at 60 miles per hour. The maximum speed of the locomotive with lighter trains is 75 miles per hour.

As typical of regular service a Class T locomotive hauls Train No. 71, weighing 1035 tons, between the Grand Central Terminal and Harmon, a distance of 32 miles, making one stop, in 54 minutes running time. The average maximum speed is 57 m.p.h. and the current consumption has been shown to be equivalent to 21.9 watt-hours per ton-mile.

CLASS T GEARLESS LOCOMOTIVE OF NEW YORK CENTRAL LINES

The cost of inspecting, maintaining and repairing our electric locomotive has averaged 3½ cents per mile during the past year. The locomotives are inspected after traversing an average of 3000 miles, which is equivalent to 33 days between inspections. As a measure of reliability I can say that Class T locomotives average 32,000 miles per locomotive detention.

Some Details of the Boston Elevated Turbine Failure

On Feb. 14 a 35,000-kw. steam turbine in the O Street power station of the Boston Elevated Railway was wrecked, the direct loss due to breakage being estimated at as much as $200,000. This is a horizontal, 20-stage impulse turbine, representing the most advanced practice in single-cylinder machines of large capacity.

The details of the accident were reported briefly in the issue of the Electric Railway Journal for March 2, page 406. Since this was published the editors of *Power* have completed an investigation of the causes of the turbine failure. They conclude that a distorted cast-iron diaphragm in the eighteenth stage probably fouled the eighteenth wheel, breaking off the buckets. The buckets and diaphragms from this stage on to the last or twentieth, and the entire turbine casing, were destroyed.

The accident occurred just before 6 p. m., when the evening peak was coming on. Rubbing sounds from within the casing were heard and the machine was seen to vibrate. Within six minutes after the first indication of trouble the destruction was complete. Fortunately steam was promptly cut off by the tripping of the automatic throttle valve, presumably through the vibration of the turbine. Some comment upon the accident appears in the editorial pages of this issue.

Track Engineers Meet

A Digest Is Presented of Reports of Electric Railway Interest Submitted at Meeting in Chicago This Week of American Railway Engineering Association

THE nineteenth annual convention of the American Railway Engineering Association was being held at the Congress Hotel, Chicago, as this paper went to press. The annual exhibit of the National Railway Appliances Association was being held at the same time in the Coliseum. Abstracts of the reports of especial interest to electric railway men follow.

BALLAST

The report recommends three different sections of ballast for 24-in. depth under the tie. These sections apply to single track on tangent, double track on tangent and single track on curve. Each shows 12 in. of sub-ballast and 12 in. of top ballast. The committee feels that Class A track should have 24 in. of ballast under the tie, but is not ready to make general recommendations as to the proper depth of ballast of various kinds to insure uniform distribution of loads on the roadway.

Other recommendations for the Manual include seven new definitions, and matter relating to physical tests of ballast. Considerable data are presented on methods and cost of applying ballast, account being taken of organization, use and limitation of tools and ballasting by contract. Diagrams for the disposition of forces, as secured from a few roads, are shown, but the committee has thus far had meager responses to its inquiries along the line of organization. The committee interprets the consensus of opinion as being strongly against ballasting by contract in normal times, especially on an operated track.

The committee has brought up to date a general bibliography on ballast and ballasting made in 1906 in the library of the American Society of Civil Engineers. It also presents as a matter of interest the specifications for stone ballast of the Pennsylvania lines west of Pittsburgh.

ECONOMICS OF RAILWAY LABOR

This report begins with an indexed tabulation of publications on the economics of labor. A second part is on "methods of securing labor." It says that there has been a decline in late years of the classes of men engaged through labor agents or padrones and that a large part of the better class of unskilled foreign labor that formerly went directly to the railways now goes to the mills and factories. There has also been a decline in all classes of common labor available for railway work. The railways have met this condition in an unorganized and desultory fashion, adhering to their existing methods of employment and endeavoring to obtain additional labor by various practices, such as maintaining a low hourly rate, but adding for extra hours not actually worked, so that the daily wage may be increased; also by a lessening of supervisory effort on the part of the foreman. These methods are reprehensible but continue. The committee suggests that free transportation to labor might be curtailed so that men who desire transportation would not accept work to get it and then quit; also that more attention be paid to housing facilities. A third section of the report relates to feeding and housing maintenance of way employees and includes a digest of the laws in the various states covering this subject.

ECONOMICS OF RAILWAY OPERATION

The report of this committee was accompanied by an extended bibliography, including such subjects as train resistance, car weights as affecting operating costs, economic length of train divisions, standards of maintenance of way, etc. The committee, which is a new one this year, was asked to report on the possible scope of a committee with such a title. It suggests a number of topics for future consideration, including economical speed of trains, additional main tracks and economic length of operating districts.

TIES

The report of this committee was largely on methods in use for controlling tie renewals and its usual report on trials of substitute ties. As regards the former, reports were received from 100 railways with an aggregate mileage of 223,000, showing that a majority of the roads placed the principal responsibility on the section foreman, while a considerable number placed the responsibility primarily upon an inspector working independently of the section foreman. The information on trials of steel, concrete and other substitute ties includes all installations on steam roads in America reporting to the association.

ELECTRICITY

This report recommends adoption in the Manual of a number of electrical definitions. Of these eleven are entirely new, others have been suggested by some association. The second part of the report brings up to date the company's statistics on third-rail and overhead clearances. The third section relates to "Electrolysis and Insulation." The subject considered is not electrolysis from railway return currents but the corrosion of concrete under the action of salt wâter. Under water power the committee calls attention to the increased cost of coal as being a factor in making hydroelectric developments attractive.

A section is also included on the proposed National Electrical Safety Code. In discussing the legal aspects of the code, the committee expresses doubt whether Part IV can be made valid law as a statute or as an administrative order. It is probable that the provisions of the code are in general reasonable, but valid objection to Part IV may be based upon the inflexible nature of the language and its intereference with the private management of business to an extent not justified in the interest of safety. Specific objection is made to a number of the requirements, generally because they are not strict enough. In general the conclusion is that the principles of the code are acceptable as tending to establish uniform electrical rules in the several states, but that the code is cumbersome, that certain of its requirements should be revised upward and its legality should be established by the opinion of an authority high in the federal government.

RAILS

The first section of this report recommends that the specifications for quenched carbon and quenched alloy steel joint bars, track bolts and nuts and for medium carbon steel track bolts and nuts, which have been held over for revision for the last two years, be adopted by the association in place of those now appearing in the Manual. The second section deals with rail failure statistics, a very comprehensive report on which appeared in the September, 1917, bulletin of the association. Failures are divided into head, web, base and fulcrum, and the number of failures compared on a basis of five year-service has been materially reduced.

The subject of special investigations is covered in the third section of the report and includes a series of papers on mill inspections, influence of gage length and elongation in drop tests, tests of manganese steel rails, inhibited or delayed transformation in rail heads, intensity of pressure on rails and rail failure statistics for 1916 covered in the previous section. The fourth section dealing with track bolts and nut locks recommends that the specifications submitted in 1916 be adopted, with some changes, by the association. Under mill practice dealt with in the fifth section the general results of mill inspection of rails manufactured in 1915 and 1916 are covered and there is a discussion of the specifications on which the rails were bought.

Progress is reported on sections six and seven dealing respectively with the study of joint bars from the standpoint of design and material and the relative value of various heat treatments. Subject eight on the intensity of pressure of rail resistance covers extensive field and laboratory tests dealing with the crushing effect on rail metal of various wheel loads. Methods of inspection covered in section nine state that it is believed that inspection of rails by the hydraulic bender could be carried on much quicker than by the drop test. On subject ten, commission rulings, the committee reports progress.

ROADWAY

The committee on roadway reports on the six subjects assigned to it, namely (1) recommendation for changes in the subject matter of the Manual; (2) methods of determining extent, character and effect of subsidence under embankments; (3) methods of estimating the shrinkage of embankments; (4) prevention and cure of water pockets in roadbeds; (5) a study of the unit pressures allowable on roadbeds of different materials; (6) the best method for draining roadway through stations and yards. The last is the only topic to which it has been possible to give full consideration. The substance of the report on this subject is that the drainage of roadway through stations and yards should be treated in accordance with local conditions, but that the surface water should be carried off as quickly as possible. The proper method for doing this depends upon the soil, contour of ground, etc. Methods of procedure are given for different types of sub-grade and for the proper type construction in yards.

SIGNS, FENCES AND CROSSINGS

The work of this committee included a study of the subject of flangeways in crossings of steam and electric tracks. The report contains a number of tables of dimensions showing widths and depths of flangeway on straight and curved track for different weights of rail for both electric railway and steam railroad. The committee says that after careful consideration of these tables it recommends the following dimensions for flangeways on straight track:

	Steam Railways	Electric Railways
Depth of flange......	M. C. B. standard..	⅞ in., 1 in., 1⅛ in.
Width of flangeway..	1¾ in.	1⅝ in., 1⅝ in., 1¾ in.
Depth of flangeway..	1⅞ in.	1⅛ in., 1¼ in., 1⅜ in.

For flangeways in curved tracks of steam railroads the report recommends an increase in width of 1/16 in. for every 2 deg. of curvature over 2 deg. For flangeways in curved tracks of electric railways no special increase is recommended, as the dimensions given above cover ordinary operating conditions. On some roads the width of flangeway is increased as the gage is increased, so as to keep the distance between the gage line and wearing surface of the opposite guard rail uniformly 4 ft. 6¾ in., which is good practice and recommended for excessive curvature.

For flangeways of steam railroad tracks located in paved streets, the reports show widths generally ranging from 1½ in. to 2½ in., with one case each of 3 in. and 4 in. These flangeways are, as previously reported, formed by rails laid on side rails placed upright with separators, planks and other paving materials, and special guard rails. For flangeways of electric railway tracks located in paved streets, the width generally ranged between 1½ and 2 in., although one case reported a width of 3 in., another 3½ in. The depth of flangeways of steam railroad tracks varies generally from 1¼ to 2 in., with two cases of 3 in., while the depth of flangeways of electric railway tracks varies generally from ⅞ in. to 1¾ in.

The committee also continued its study in regard to fences and concrete fence posts and repeats its conclusion of 1914 that "concrete fence posts are practical, economical and a suitable substitute for wood."

TRACK

The report recommends various minor changes in the Manual and then passes on to detailed plans for turn-outs, cross-overs, slip switches, double cross-overs and other details of track construction. It is intended that the committee shall permit further plans on these construction details at the next convention. A report is made on the reduction of taper of tread of wheel to 1 in 38 and on canting the rail inward. The summary of this section is that the best results will be obtained from both wheel and rail wear if the rail is installed and maintained so as to provide a uniform bearing and wear on the head of the rail. A section on specifications for relayer rails for various uses classifies used rails suitable for relaying into those suitable for main track,

Power Production in War Times*

How the Cost of Coal Has Gone Up and Its Quality Has Gone Down—Problems of Coal Delivery and Station Operation Which the Power Superintendent Has to Face—Possible Economies Suggested

BY WALTER C. SLADE
Superintendent Power and Lines, Rhode Island Company, Providence

THE problem of producing steam generated power in war times is one which is beset with difficulties and with trials. The question of the cost of production, although always of prime importance, has at times been obscured at least temporarily by the more important question whether for certain periods power could be produced at all, irrespective of the cost. In Rhode Island we have felt the shortage of bituminous coal keenly. The two power producing utilities at Providence have been operating of late with inadequate coal reserves, and the Rhode Island Company in particular has recently been forced to operate its main power station for three or four days with borrowed coal entirely.

The coal requirement for our railway power plants at Providence and Rockland for the year ending June 30, 1916, was about 73,100 gross tons. In the calendar year 1917 it amounted to as much as 90,500 gross tons, although the power generated had increased above the value applying to the former period by less than 5 per cent. The increased consumption, the cause of which is explained later, met with ever decreasing ability on the part of coal mining companies and transportation companies to fulfill requirements.

The Rhode Island Company, as is the case with possibly 50 per cent of the railway companies in the country, operates its own power stations exclusively for a traction load. The diversity factor resulting from different classes of service which the average central station enjoys does not exist. The maximum demands for power, though relatively brief, are high as compared with the average load, and, characteristic of the railway load, the load factor is relatively poor. As the small engine plant at Rockland, which generated 1,423,217 kw.-hr., and the large turbine plant at Providence, which generated 73,492,300 kw.-hr. in 1917, represent widely different types and capacities of stations, they are further typical of many plants of the same kind now operating.

COST PER TON OF COAL CONSTANTLY INCREASING

The prices which we have been forced to pay for coal in cargo lots alongside the Providence plant have varied, but they seem to be constantly increasing. For the fiscal year 1915-1916 we were fortunate in obtaining coal at a practically uniform price of $3.32 alongside. We could then get discharging done at 8½ cents per ton. In the spring of 1917 we paid as high as $11 and $12 a ton for some coal and bought considerable coal at prices between $6 and $9 a gross ton. Later developments proved that this action was justified. Since the government fixed the price of coal and has established transportation rates and other rulings concerning the mining and shipping of coal, we have had to pay not less than $7.72 a gross ton alongside for Southern coal, and one cargo has cost us as much as $10.35 alongside. The average price is now running to more than $8.35 alongside, provided there are no demurrage charges. Due to government regulation, the consumer absorbs not only demurrage charges, whether they occur on cars or on the boat at loading end or at discharging end, but also other charges, such as war taxes, insurance, etc. To date we have received nearly $6,000 in demurrage bills on the last eleven boats, on which about two-thirds was incurred at the loading end. Finally, from 8½ cents per ton our discharging costs have advanced to 15 cents to 23 cents per ton. This is due to the fact that we are obliged to discharge boats on overtime work to avoid the high demurrage charges, and to-day coal passers along the water front are demanding 50 cents per hour straight time, 65 cents per hour overtime and 75 cents per hour for work on Sundays and holidays. They are able to get the money. The majority of these men are unable to read or write or to speak or understand English.

Early in the year 1917 we realized from the experience of the previous winter the necessity of providing at an early date a supply of coal to carry us through the winter of 1917-1918. We planned to accumulate a

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*Abstract of address before the New England Street Railway Club, Boston, Feb. 28, 1918.

(*Concluded from page* 566)

those which may be made suitable for main track by resawing and those suitable for side tracks. A fourth class includes those suitable for scrap purposes. A further section of the report is devoted to the design of cut track spikes. The design submitted by the committee is the same as that recommended by the committee in March, 1916, with the exception that there is a reduction in the amount of reinforcing under the head for the spike.

The effect of fast trains on the cost of maintenance of way and equipment is the subject of one section of the report and is illustrated by many plates and by one important and comprehensive chart which divides the factors influencing the cost of maintenance of way and structures into three elements, namely, weather stress, density of traffic and character of traffic, differentiating between passenger and freight traffic. It is stated that a fourth factor, *i. e.*, the ability of the management to regulate the expenditures in strict accordance with the demand of the traffic may enter into consideration. The last section of the report devoted to the subject of widening of flanger of wheels considers it to be unnecessary to make any difference in the width of flangeway of frogs and crossings or change the present method of track construction.

supply that would carry the station for perhaps three months, and between early May and July we increased our tonnage from approximately 6000 to 26,000 gross. In August we discovered that we were going to have trouble with fires in part of the stored coal before the winter was over, due to the rapid heating property of some of the coal which was of poor quality, though it had been purchased at high prices. We had our fire trouble even earlier than anticipated. Besides this, about Sept. 1 coal shipments became less frequent, so that we were forced to draw upon our storage supply, and in December it was reduced to about 7500 gross tons. In early February we consumed what coal we had left and were finally forced to operate on coal borrowed through the aid of the local Fuel Administrator. There was delay in loading coal and in transporting it by water. The longest delays have been in elapsed time between the completion of loading and the arrival of the boat at point of discharge. Formerly boats used to come through in a week or less, but the time required during last winter was from one week to five and a half weeks, with an average of possibly two and a half weeks. This delay was doubtless due to the deficiency in towing capacity in the coastwise trade. During all this period we had exerted all possible pressure to have suitable deliveries kept up to prevent the depletion of the supply.

QUALITY OF COAL KEPT GETTING WORSE

Prior to the time when the coal mining conditions became abnormal and transportation facilities became demoralized, we had made a practice of burning New River coal or Pocahontas, the average analysis of which used to run about 14,900 B.t.u. Even the same grade of coal, due evidently to poorer preparation at the mines, and at a later time due possibly to the pooling of the coal supplies by the government, gave noticeably lower average B.t.u. value on analysis. The spot cargoes which were purchased outside, consisting mainly of Pennsylvania coals, but which were expected to be of average quality, in some instances were of extremely poor quality. Of the coal placed in yard storage, 35 per cent showed a heat value under 14,500 B.t.u. and 46 per cent under 14,750 B.t.u. In fact, 21 per cent was under 14,000 B.t.u., some of it containing 15 per cent ash. Due to the deterioration of this coal in storage before it was consumed under the boilers, the average B.t.u. value of the coal as fired was not over 14,300 B.t.u. The effect of the quality of the coal was reflected directly in the cost of operation, in addition to the effect of the higher cost of the coal alongside. It resulted also in increased boiler-room maintenance. The net result was to raise the unit cost of power for the year 1917 by 104 per cent, as compared with the twelve months ended June 30, 1916.

The coal factors for both power stations have been growing worse since the fairly satisfactory showing for the year ended on June 30, 1916. This year was the last fiscal year that was not affected materially by advancing costs of fuel, material and labor.

	Manchester Street Station		Rockland Station	
	Lbs. Coal per Kw.-Hr.	Per Cent Increase	Lbs. Coal per Kw.-Hr.	Per Cent Increase
12 months ended June 30, 1916.	2.28	...	3.49	...
6 months ended Dec. 31, 1916..	2.38	4.4	3.78	8.3
12 months ended Dec. 31, 1917..	2.69	18.0	3.99	14.3

The unusually high factor for the turbine plant in 1917 was due to a combination of operating conditions requiring a large number of banked hours on standby boilers not used in 1916, together with the necessity of burning a considerable amount of inferior coal, as well as coal damaged by spontaneous combustion. The performance will not be repeated in 1918. In fact, under favorable conditions the plant was operating for a part of January at 2.13 lb. The decrease in economy at both turbine and engine plants, as shown above, has been of the same relative order.

COST PER KILOWATT-HOUR MORE THAN DOUBLED AT MAIN PLANT

As regards the increased cost of busbar power, some comparisons may be made with the costs which apply to the year ended June 30, 1916. Comparing the last six months of 1916 and the year 1917 with this period, we find that the cost per kilowatt-hour at the busbar increased for the six months 23.4 per cent and for the following twelve months 104 per cent at the Manchester Street plant. At the small Rockland plant the busbar cost of power for the same periods increased respectively 31.8 per cent and 73.5 per cent. The cause of these remarkable increases in the unit cost of power, as stated above, is due primarily to the abnormally high price of coal, but also to the character of the coal that was burned. Some of the coal was of such poor quality that it raised our stoker and furnace maintenance to an undesirable point. The increase in the cost of fuel, as fired, was 132 per cent, and raised the fuel charge in 1917 to as much as 83 per cent of the total maintenance and operating costs. Referring to operating charges in the same year, while fuel cost advanced 132 per cent over the 1916 cost, wages advanced 30 per cent and all other operating charge 25 per cent. The average of the above percentage increases is 106 per cent. The kilowatt-hour delivered increased only 4.9 per cent and the pounds of coal per kilowatt-hour 18 per cent.

WHAT SHALL WE DO WITH OUR RAILWAY STATIONS?

Before concluding, I will dwell briefly upon a few possible economies, first in power production and second in power utilization. The great majority of the existing railway power plants were built at a time when 25 cycles was the only commercial frequency that was considered suitable for traction purposes. These 25-cycle plants as a rule enjoyed no diversity factor in their load. Only the power stations of the larger capacities can compete with the large central stations of to-day in the cost of manufactured power. So much capital is invested in these large railway plants that even though they are able to generate less economically than adjacent central stations, it is difficult to consider anything but a continuance of the operation with added improvements in the interest of economy of these stations. Between the average large 60-cycle central station and the average large 25-cycle railway station there can be no interchange of power except through frequency changers, a method which is sufficiently uneconomical to make this exchange feasible only for emergency purposes. Such an arrangement for emergency operation is, however, feasible. It is also equally practicable in certain cases, it would seem, when new equipment is added to existing 25-cycle power plants to install the equipment for 60-cycle operation, so that in the future more railway plants would be able to take advantage of central station power which in normal times is steadily being produced at decreasing cost, as well also of hydroelectric 60-cycle developments that will, doubtless, be made throughout the country. In short, the big 25-cycle power plant must continue in operation as an individual unit, operating either independently or to varying degree in conjunction with other power stations to obtain both a desirable diversity factor and to reduce capital investment that would otherwise be necessary for new equipment.

But what of the small engine-driven railway plant that is struggling along trying to produce power cheaply even in normal times? Many of these plants could and should be shut down as soon as arrangements can be made for equipment suitable for operating from central station or hydroelectric service. With increasing cost of coal, the balance is all in favor of the big station, and it is questionable if the price of coal in future years reaches a minimum that is $1 to $1.50 a ton above the prices that prevailed before the war.

BOILER ROOM ECONOMIES ESPECIALLY NECESSARY WITH HIGHER FUEL COST

As regards increasing economies in our power stations I am going to speak principally of the boiler room. In ordinary times the fuel item will represent from 70 per cent to 75 per cent of the total cost of generated power. I recently stated that our own experience had seen the fuel cost reach a point equal to 83 per cent of the total cost, in fact, at least 90 per cent of the total cost was expended in the boiler room for fuel, water, wages, supplies and materials required for maintenance. We should indeed consider spending money in such a field where such a large proportion of the expense of production lies.

The best solution, perhaps, is to follow the practice, already observed I believe in a few cases, to put under the chief engineer a technically trained man or at least a man who understands the theory of combustion sufficiently well, who can keep constant check of operating conditions in the boiler room, working in constant touch with the chief engineer. This type of man has been termed "combustion engineer." Even plants of moderate capacity could well afford to maintain such a man on the payroll. Working with the assistance of the necessary weighing, measuring and metering devices with which he should be provided, he could put the true spirit of industrial control into boiler room practice. To aid the "combustion engineer," so called, in effecting the desired economies, it would be well to consider the advisability of making the operation of all equipment as nearly automatic as possible. Man power may be at a premium for some time to come, and at all times undue dependence on the human element is undesirable.

WILL INSTALL AUTOMATIC SUBSTATIONS

Transmission, conversion and distribution of power are but a step beyond its production. In this field there has been developed an idea which makes additional economies possible for all. I mean the automatic railway substation. We have built and are preparing within a short time to start two small automatic substations. We hope to build more at a later date if these prove successful. With these stations we will eliminate power losses and labor, which more than offset the additional fixed charges required for the automatic equipment or any possible increased cost of maintenance that we can contemplate.

SAVINGS POSSIBLE ON THE CAR

As regards the utilization of power, let us consider how power is being wasted at the present time on the car through unskillful operation of equipment, unnecessary application of brakes, wasteful use of heaters and lights. Without doubt there is not a railway company operating which is not able to reduce its power consumption by at least 10 per cent through a proper and persistent instruction of its motormen regarding economical methods of operation and to install some type of automatic checking device on its cars to maintain a record of performance after once established. I believe that in some cases power bills can be reduced without trouble and in a short time as much as 15 or even 20 per cent. At present, with the possibility of effecting savings as great as they are at the trolley car, opposition on the part of employees would indicate not only a great lack of co-operative spirit but a lack of patriotic feeling.

The effect of reducing the stops per mile has recently been discussed at length in the technical journals. If through the co-operation on the part of the people that we serve unnecessary stops can be eliminated and car mileage reduced, the effect will be immediately noticeable. Thermostatic control of car heating is an important consideration, because of the beneficial effect that it has in reducing the peak demand, as much as the effect in conserving power. Safety cars are, of course, of great interest to many of us at present and are surely capable of being used on at least a part of every railway system.

Other opportunities for establishing economies could readily be suggested. Some of these have been put into effect in Rochester, as described in a recent issue of the ELECTRIC RAILWAY JOURNAL. Another interesting example of co-operation in a small way between a railway company and an industry is the arrangement between the Pittsburgh Railways and the Westinghouse Electric & Manufacturing Company, at East Pittsburgh, where the latter company supplies cars to the railway line through a rotary converter in its factory. In this way a good voltage is maintained on the lines, and the rapid handling of the traffic to and from the works is assured. The load handled by the converter is removed from the railway power station at a time when it is most undesirable, and is put onto the power station at the factory at a time when there is a much lessened demand because of partial shutdown.

I. C. C. Report for 1916

The report of the Interstate Commerce Commission for the year ending June 30, 1916, just published, shows that on that date the total mileage of interstate railroad companies was 394,944, being an increase of 3802 miles as compared with the corresponding period in the preceding year. Of this increase, 1641 miles were single track and 1959 miles were in yard track and sidings. At the same time, there were 65,314 locomotives of all kinds, 2,342,217 freight cars, 54,774 passenger cars, and 98,190 service cars.

Zone System Best for Rhode Island

Special Commission Finds Conditions Require Central Five-Cent Areas and Two-Cent Intermediate Zones — Recommends Abolition of Municipal Franchise Taxes and of City Regulation

A MODIFIED zone system, with certain tax, franchise and other reforms, constitutes the relief needed by the Rhode Island Company, Providence, R. I. Such is the tenor of the recent report by the special commission appointed by the Legislature early in 1917 to investigate the affairs of this railway. The commission consisted of the chairman of the State Board of Tax Commissioners, the chairman of the Public Utilities Commission and the bank commissioner.

Since the report was submitted to the General Assembly on March 7, as noted in the ELECTRIC RAILWAY JOURNAL of March 9, the legislators have created a peculiar situation. In April, 1917, they approved a bill authorizing the special commission to certify any necessary fare changes to the Public Utilities Commission and directing the latter body to order such changes to be made. Now, however, as stated in the issue of March 16, the General Assembly by special order has prohibited a change in the rate of fare and created a committee of legislators to report before March 26 upon the electric railway situation. The new zone system was to go into effect on or before April 1.

Although the matter of adopting a zone system for the Rhode Island Company has thus not been finally settled, the report of the special commission is of value because of the system outlined for handling the fares on the company's 354.07 miles of electric railway track, and also because of the recommendations to the Legislature on other matters. These facts justify the publication at this time of further material from the special commission's report, which is now available in full.

FINDINGS AND RECOMMENDATIONS

The findings of the special commission may be summarized as follows:

1. That the Rhode Island Company is furnishing to the people of the State transportation facilities which compare favorably with those furnished in other cities of approximately the same size, and that reasonable provision is made for the demands of the traffic.
2. That the Rhode Island Company does not receive a fair and equitable return upon the property owned and controlled by it and devoted to the public service, and for several years the property has been operated at a heavy loss.
3. That the fair value of property owned and controlled by the Rhode Island Company and devoted to the public service upon which the company is entitled to a fair and equitable return is $29,000,000.
4. That 6 per cent is a fair and equitable return upon the property owned and controlled by the Rhode Island Company and devoted to the public service.
5. That a modification of the present system of fares and transfers is necessary to provide in part for a fair and equitable return upon the fair value of the property owned and controlled by the Rhode Island Company and devoted to the public service.

Upon the basis of these findings the commission recommended:

1. That primary regulation of the utility be by the Public Utilities Commission.
2. That municipal franchise taxes be abolished.
3. That the Rhode Island Company be relieved from its paving obligations as they now exist and be required to maintain only that part of the highway actually worn out by it, and to repair all damage done.
4. That routing of cars be changed to conform to the plan recommended by the commission's engineers.
5. That changes in equipment recommended by the commission's engineers be made as soon as practicable.
6. That the company provide some definite and adequate system for collecting and compiling statistical information relative to traffic costs, passenger movements, service furnished, and a record of the reasons deemed sufficient to warrant changes in routing or service furnished.

TAXATION IS EXCESSIVE

In discussing taxation, the commission states that in Rhode Island the company pays taxes to forty-two subordinate taxing jurisdictions as well as to the State itself, and in twelve of these subordinate jurisdictions it pays two kinds of taxes. These various taxes, paid to the State and its subordinate jurisdictions, amount to $498,186, or 8.44 per cent of operating revenue, and if the taxes paid to the United States ($34,468) and the State of Connecticut ($1966) be added, the tax imposed amounts to 9.04 per cent. If the calculation includes the payments made by the Rhode Island Company for paving and is based on revenue received from passengers only, the percentage reaches 10.73 per cent.

Such a rate of taxation, the commission feels, cannot be justified. Even if it were a fact that the receipts enabled the payment to be made without interfering with a fair and equitable return on the capital properly invested, the commission considers it unjust to exact in taxes 0.5 cent out of each 5 cents paid by a passenger. The company is one of the heaviest-taxed properties of its kind in the United States.

Exclusive of the taxes on real estate and tangible property, the company pays franchise taxes of $147,860 in twelve cities and towns, and it pays the State 3 per cent ($166,915 in 1917) of its gross earnings. The commission believes that the municipal franchise taxes are not justified under present conditions. If the system were a strictly urban one, there would be considerable force to the argument that there should be no franchise tax by the State or that it should be a small amount. Under conditions as they exist, however, the State appears to be the natural and proper recipient of such franchise taxes as should be imposed.

STATE SHOULD REGULATE

The Rhode Island Company operates in twenty-six cities and towns and in each is subject to regulation by municipal authority. Under the existing system the company may at the same time be compelled to observe regulations emanating from State or local authority by any of the three following methods:

1. Regulatory power directly exercised by a town or city.
2. Regulatory power directly exercised by the Public

Utilities Commission in the performance of its functions.

3. Regulatory power indirectly exercised by the Public Utilities Commission where the action of a town or city is made the subject of review by the commission.

It is the opinion of the investigating commission that a direct and unified control by State authority will be in the public interest and will result in better and more uniform regulations. The regulating authorities will have a broader and more comprehensive view of the situation than under present conditions and will, therefore, be better able to judge as to the advisability or necessity of changes desired by either the public or the company. The business and social life of the whole State is more or less directly concerned in and affected by the operation and management of this utility, and its regulation should be positive and direct by State, not municipal, authority.

FAIR VALUE IS $29,000,000

The commission reports the following figures for purposes of comparison on the basis of reproduction new:

Commission's engineers	$28,966,755
Ford, Bacon & Davis	33,275,184
1910 Validation Commission's report corrected and brought to June 30, 1917	29,565,193
Approximate cash invested	28,802,590

The cost of reproduction new was found by the commission's engineers, Sloan, Huddle, Feustel & Freeman, to be $28,966,755 and by the company's engineers, Ford, Bacon & Davis, $33,275,184. The cost of reproduction new less depreciation was $22,345,913 and $26,067,466 respectively. The difference in the totals arrived at, on the basis of cost of reproduction new, by the two independent investigations, amounting to $4,308,429, is accounted for by $979,951 for payments covering current liabilities of leased companies, which were held to have been improperly included; a difference in overhead percentages, resulting in a discrepancy of $1,513,270; differences in quantities and prices of paving and grading, amounting to $940,558, and certain other minor differences in unit prices used. With the first two items excluded, the difference amounts to but $1,815,208, or approximately 6 per cent of the total cost of reproduction new as found by the commission's engineers.

The special commission decides that the fair value of the property owned and controlled and devoted to the public service is $29,000,000. The preliminary report of the commission's engineers, which forms a part of the present report, was abstracted in the ELECTRIC RAILWAY JOURNAL of Nov. 3, 1917, page 815.

The commission states that apparently it would not have been possible for any of the companies involved to have accumulated a depreciation fund. It was not customary, and public opinion sustained the owners of public utilities in the belief that all revenue in excess of that required to pay ordinary operating expenses belonged to the stockholders. The courts were in many instances opposed to the accumulation of funds to provide amounts considered necessary for future accrued depreciation.

It, therefore, does not seem just or equitable in the present instance to deduct an amount estimated to be equal to the accrued depreciation from the cost of reproduction new to arrive at the fair value of the property involved. It appears reasonable and just to the commission, however, to allow, in determining the fair and equitable return, an amount sufficient to enable the company to maintain its property in condition to render properly and efficiently the service required without impairing the net returns.

In regard to the rate of return, the commission says that present conditions are so abnormal that it does not appear wise or expedient to attempt an adjustment of rates according to them, or to determine what would be fair and equitable merely for the present. It seems more reasonable to adjust rates on a normal basis, and then, if necessary, make special provisions to take care of the very unusual conditions which now prevail, as occasion may require.

Under normal conditions a net return of 6 per cent on the fair value would be enough to maintain an issue of stock for a like amount at par, or somewhat over, and also to attract capital in sufficient amounts to meet all the legitimate requirements of the business. It is not expected that the carrying into effect of the recommendations of the commission and the modification of the system of fares and transfers will immediately result in the earning of 6 per cent net on the rate-base. It is assumed, however, that the company will have sufficient revenue for efficient operation, and that at present some net return will be earned. Upon restoration of normal conditions, the commission says, the company should, after compensating for bad judgment, be able to earn 6 per cent net on the rate-base and in addition a fair profit for conducting a large and complicated business.

After an allowance of adequate provision for renewals and replacements, the property as a whole in the year ended June 30, 1917, fell approximately $200,000 short of earning 4 per cent. If the calendar year 1917 were used, not one of the properties would show earnings of 4 per cent. The properties fell short to the extent of $776,092 for the fiscal year ended June 30, 1917, of earning 6 per cent. This financial showing, the commission states, indicates clearly the necessity of immediate relief, if the service is to be maintained, whether the system is operated as a unit by the Rhode Island Company or as a number of independent roads by several companies.

ZONE SYSTEM SEEMS BEST FOR RHODE ISLAND

In adopting a zone system of fares as one of the means of relief for the Rhode Island Company, the commission summarizes the fare problem as follows:

a. Flat increase in existing fare:

Advantages: Ease of collection of fare, both passenger and conductor readily understanding the principle involved. All passengers are treated alike. No change is made in the method of identifying passengers. Existing fare limits are not disturbed. No tendency exists to restrict the spread of population to outlying districts and to encourage congestion.

Disadvantages: Increased fare of all riders alike. Exaggerated discrimination against short-haul passengers. Tendency to decrease short riding with consequent loss of the most profitable business. Tendency to increase jitney competition. Advance over present rate could not be less than 20 per cent. Tendency to discourage extension and expansion by the utility. Required making of change for all passengers or a ticket system.

b. Transfer charge:

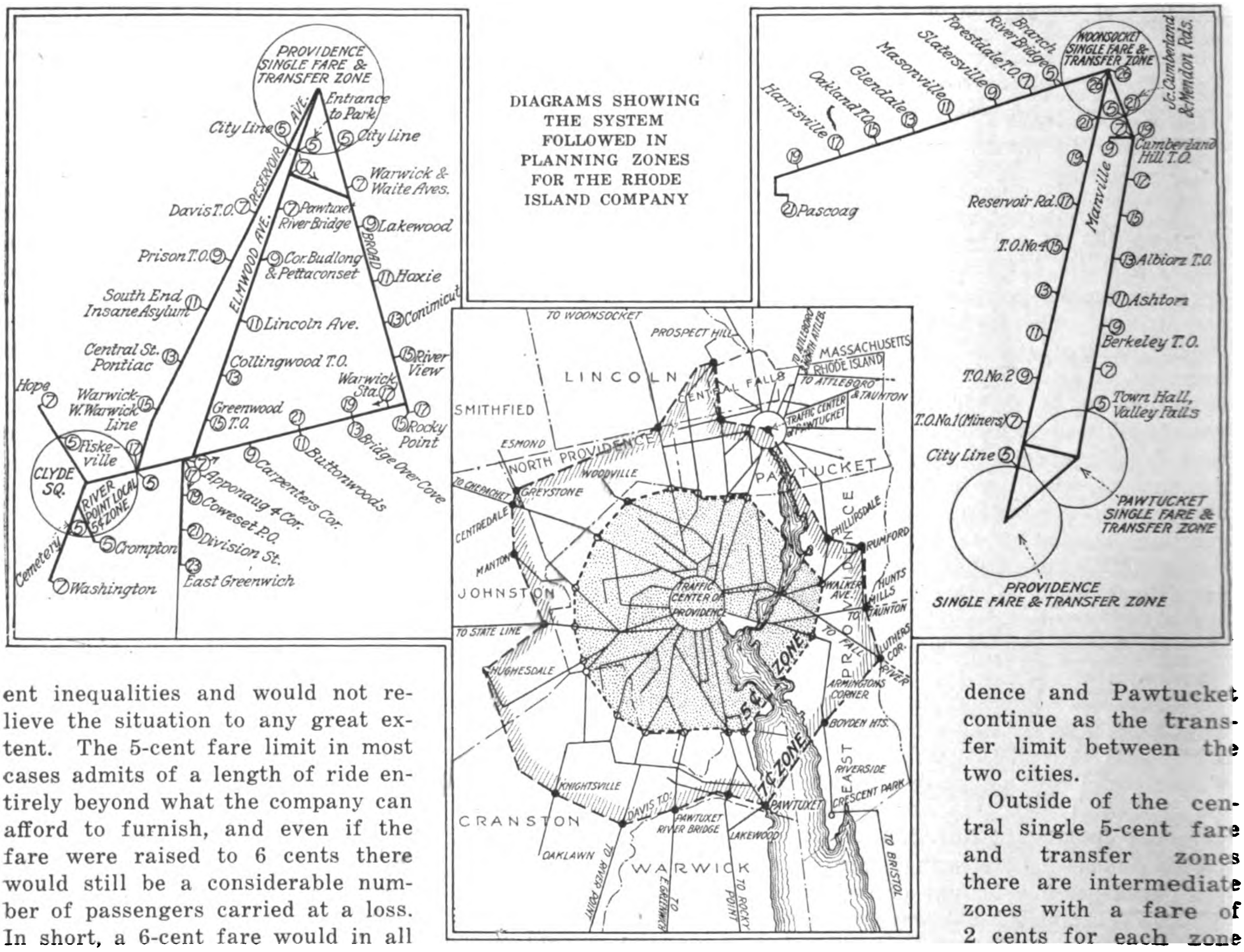
Some claim that the free transfer unduly extends the length of ride for the original fare, and also that even if the ride is comparatively short an extra stop and start are required as well as twice the equipment used by a passenger in a continuous ride. On the other hand, if a charge is made for transfers, there is immediately a demand for through service which may be perfectly just, but which, if granted, would seriously interfere with economical or convenient routing. A free transfer tends to equalize the charge between different sections within the transfer limits, encourages the spreading out of the population and does not encourage congestion. There is no general rule which may be applied to all cases; each transfer question must be determined according to the peculiar circumstances relating to it.

c. Modified zone system:

Advantages: The charge approximates service received. Reduced discrimination against short rides. Considerable flexibility. Reduced number of passengers carried at a loss. Only a part of the passengers affected. No tendency to reduce the number of short rides.

Disadvantages: Difficulty of identification of passengers and in the collection of fares. Tendency to prevent spreading of population beyond 5-cent fare limit and consequent congestion. Inconvenience to passengers required to pay several fares. An entirely new system of fares and fare collection with which both the public and the conductors are not familiar.

It is the opinion of the commission that a flat increase in the present fares would exaggerate the present inequalities and would not relieve the situation to any great extent. The 5-cent fare limit in most cases admits of a length of ride entirely beyond what the company can afford to furnish, and even if the fare were raised to 6 cents there would still be a considerable number of passengers carried at a loss. In short, a 6-cent fare would in all probability cause inconvenience and dissatisfaction altogether out of proportion to whatever advantage was gained, and there seems to be very little, if anything, to recommend a flat increase so far as the case under consideration is concerned.


PROVIDENCE SINGLE FARE & TRANSFER ZONE
Entrance to Park
City Line ⑤
⑤ City Line
RESERVOIR AVE.
ELMWOOD AVE.
BROAD
Warwick & Waite Aves.
Davis T.O. ⑦
⑦ Pawtuxet River Bridge
⑨ Lakewood
Prison T.O. ⑨
⑨ Cor. Budlong & Pettaconset
⑪ Haxie
South End Insane Asylum ⑪
⑪ Lincoln Ave.
⑬ Conimicut
Central St. Pontiac ⑬
Collingwood T.O. ⑬
⑮ River View
Warwick Sta. ⑰
Hope ⑦
Warwick-W. Warwick Line ⑮
Greenwood ⑮ T.O.
⑰
⑮ Rocky Point
⑤ Fiskeville
CLYDE SQ.
RIVER POINT LOCAL 5¢ ZONE
⑨ Carpenters Cor.
⑪ Buttonwoods
⑬ Bridge Over Cove
⑰ Apponaug 4 Cor.
⑲ Coweset P.O.
㉑ Division St.
㉓ East Greenwich
Cemetery
⑤ Crompton
⑦ Washington
Branch River Bridge ⑤
Forestdale T.O. ⑦
Slatersville ⑨
Masonville ⑪
Glendale ⑬
Oakland T.O. ⑮
Harrisville ⑰
⑲
㉑ Pascoag
WOONSOCKET SINGLE FARE & TRANSFER ZONE
Jc. Cumberland & Mendon Rds.
Cumberland Hill T.O.
Manville
Reservoir Rd. ⑰
T.O. No. 4 ⑮
⑬ Albion T.O.
⑪ Ashton
⑨ Berkeley T.O.
T.O. No. 2 ⑨
⑤ Town Hall, Valley Falls
T.O. No. 1 (Miners) ⑦
City Line ⑤
PAWTUCKET SINGLE FARE & TRANSFER ZONE
PROVIDENCE SINGLE FARE & TRANSFER ZONE
TO WOONSOCKET
PROSPECT HILL
TO ATTLEBORO & NORTH ATTLEB.
MASSACHUSETTS
RHODE ISLAND
LINCOLN
CENTRAL FALLS
TO ATTLEBORO & TAUNTON
TRAFFIC CENTER OF PAWTUCKET
SMITHFIED
ESMOND
NORTH PROVIDENCE
WOODVILLE
TO CHEPACHET
GREYSTONE
PAWTUCKET
CENTREDALE
PHILLIPSDALE
RUMFORD
MANTON
JOHNSTON
TRAFFIC CENTER OF PROVIDENCE
WALKER AVE.
HUNTS MILLS
TO TAUNTON
TO STATE LINE
TO FALL RIVER
LUTHERS COR.
HUGHESDALE
5¢ ZONE
EAST PROVIDENCE
ARMINGTONS CORNER
BOYDEN HTS.
7¢ ZONE
RIVERSIDE
CRESCENT PARK
KNIGHTSVILLE
DAVIS T.O.
PAWTUXET
CRANSTON
PAWTUXET RIVER BRIDGE
LAKEWOOD
OAKLAWN
TO RIVER POINT
WARWICK
TO E. GREENWICH
TO ROCKY POINT
TO BRISTOL

DIAGRAMS SHOWING THE SYSTEM FOLLOWED IN PLANNING ZONES FOR THE RHODE ISLAND COMPANY

It is the opinion of the commission that a modified zone system with 5-cent central areas will produce the best results and operate more justly to all concerned than either of the systems without modification. No bad sociological effects will follow the application of the proposed system; inconvenience due to the change will be reduced to a minimum and the charge for transportation will be as nearly proportionate to the cost of the service rendered as is practicable. The increase in transfer privileges will be of substantial benefit to the public without unduly reducing the gross earnings of the company.

The accompanying diagrams and table indicate the system followed in planning the zone system. Single 5-cent fare and transfer zones as established are identical. Four transfer zones are provided for the following centers, viz.: Providence, Pawtucket, Woonsocket and Clyde Square at River Point. Limited local 5-cent fare and transfer zones are provided for Cranston and East Providence. A local 5-cent fare zone is provided from Olneyville Square, Providence. The Providence single 5-cent fare and transfer zone includes the area within a radius of approximately 2½ miles from Exchange Place as a center, excepting in the direction of Pawtucket, where the city limits of Providence and Pawtucket continue as the transfer limit between the two cities.

Outside of the central single 5-cent fare and transfer zones there are intermediate zones with a fare of 2 cents for each zone and a minimum fare of 5 cents for travel through two zones. Upon the Danielson, Sea View, Pawtucket-Cumberland Hill and Chepachet lines, which present similar low earnings, the average length of such zones reflects a rate of approximately 2½ cents per mile. Upon these lines a minimum fare of 5 cents entitles a passenger to travel through three of such zones. Upon the other interurban or suburban lines

Struggling with Poor Coal*

"Black Asbestos" Was the Name Given by One Engineer to the Material Which the Connecticut Company Tried to Burn Under Its Boilers Last Winter—To Difficulties in Combustion Was Added Injury to Mechanical Stokers Caused by Impurities, as Well as Other Troubles

BY GEORGE E. WOOD
Mechanical Engineer The Connecticut Company

THE Connecticut Company has six generating plants ranging in capacity from 16,500 kw. to 350 kw., which supply the entire system with energy, with the exception of the New Britain, Waterbury, Norwalk and Stamford divisions, the latter sections being supplied with purchased power. The total installed capacity is 40,000 kw., of which 12,000 kw. is held in reserve. The Bridgeport, Hartford and New Haven plants supply 85 per cent of the total output.

Since the latter part of 1916 the quality of the coal has been gradually getting poorer, and at present it is a continual struggle to keep the plants operating, to say nothing of trying to improve the efficiency. If good coal could have been obtained last year a 10 per cent increase in efficiency over 1915 would have been attained in fuel consumption, due to new and reconstructed plants. However, as the quality of fuel which could be procured was below standard, the actual tonnage consumed increased 24 per cent over that required in 1915 and 31 per cent over what would have been required in 1917 with standard quality coal. It appears that with good quality coal 7 per cent fewer cars would be required on the railroads compared with the rolling stock needed to handle what one of the company's engineers termed "black asbestos."

Soon after the first lot of poor coal was received the tonnage consumption began to rise. The company engaged the services of a competent combustion engineer, who instructed the various boiler-room engineers in the vagaries of combustion under the conditions attending the constantly changing grades of coal. Without his aid the tonnage consumed would have been considerably greater.

It is possible economically to consume low-grade fuels of uniform quality and corresponding low price, where the furnaces are designed to suit the fuel, with ash removal machinery capable of meeting the heavier demands, and, of course, suitable unloading facilities. When, however, a plant is designed for a high-grade coal and the fuel actually used is worse than a uniform low-grade product, there is no doubt as to what the results will be. Thus, one consignment of fuel received would pack down upon the tuyeres so solidly that the combined capacity of all the blowers in the plant could not force sufficient air through to allow it to burn. To attain any semblance of combustion, it was necessary to apply slice bars through the observation doors, and even then interruptions of varying duration could not be avoided.

About the time this coal had been "run through the furnaces" and the firemen were able to attain better results, the next shipment would be received. As this new coal followed the last of the previous shipment through the bunkers, the firemen would find that with the usual plenum in the wind boxes, the coal would be blown over onto the dump plates and pile up in a red-hot mass to a depth of 3 to 4 ft. Often the entire dump plate and shaft twisted out of shape so badly that they had to be entirely renewed. Within a few days some coal was received that would burn nicely for about an hour, after which it could be seen gradually to shut off the air supply. The shaking grates

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*Abstract of address before New England Street Railway Club, Boston, Feb. 28, 1918.

(*Concluded from page* 572)

the average length of such zones varies from 1.18 to 2.08 miles and the average rate from 0.96 cent to 1.69 cents per mile. In the case of these lines, the commission determined a properly advanced through rate, having in mind the existing rate, the nature and density of traffic, and the probable effect of the increased rate.

LENGTHS OF ZONES AND RATES OF FARE UNDER SYSTEM PROPOSED FOR RHODE ISLAND COMPANY

Interurban and Suburban Lines

	Track Mileage			Intermediate Zones			Total Fare	
	Local	Intermediate	Local	Number	Length	Cts. per Mile	New	Old
Providence-Woonsocket	2.84	9.74	2.21	8	1.22	1.64	.26	.20
Providence-Rocky Point	3.40	7.60	....	6	1.27	1.58	.17	.10
Providence-Buttonwoods	3.40	9.97	....	8	1.25	1.61	.21	.15
Providence-East Greenwich	3.45	10.66	....	9	1.18	1.69	.23	.20
Providence-River Point	3.11	7.15	2.44	6	1.19	1.68	.22	.15
Providence-Washington	3.11	8.31	4.82	7	1.19	1.68	.24	.20*
Providence-Riverside	2.43	3.43	....	2	1.71	1.17	.09	.10
Providence-Crescent Park	2.43	4.40	....	3	1.47	1.36	.11	.10
Woonsocket-Pascoag	2.14	12.93	....	8	1.62	1.24	.21	.15
River Point-Rocky Point	2.05	7.60	....	5	1.52	1.32	.15	.10
Pawtucket-Crescent Park	1.64	7.83	....	4	1.96	.98	.13	.10
Providence-Esmond	2.96	4.17	....	2	2.08	.96	.09	.10
Providence-Oaklawn	3.23	4.08	....	2	2.04	.98	.09	.05
Woonsocket-Manville	3.25	2.73	....	2	1.36	1.47	.09	.05
Providence-Prospect Hill	2.76	3.96	....	2	1.98	1.00	.09	.10
Interurban and Suburban Lines, With Low Earnings								
Pawtucket-Cumberland Hill	2.52	5.86	....	7	.84	2.39	.19	.10
Providence-Chepachet	2.96	12.26	....	15	.82	2.5	.35	.30
Providence-Danielson (State line)	2.62	24.57	....	30	.80	2.5	.65	.55
Sea View Railroad	....	19.14	....	24	.80	2.5	.48	.50
Barrington, Warren and Bristol (Crescent Park to Bristol)	....	10.57	....	10	1.00	2.	.20	.15

*Special book tickets, ten trips for 50 cents, have been issued to residents of East Providence, entitling passenger to ride between East Providence-Barrington town line and Post Office, Providence, without Providence transfer privilege, for 5 cents.

The existing 5-cent fare limits were adopted as the new 7-cent limits about Providence, thus making a uniform increase of fare of 2 cents to all persons living in the area included between the old and the new 5-cent fare limits, riding to and from Providence, but entitling such passengers therefore to a transfer within the Providence transfer limits.

could not be moved more than ½ in., and a slice bar thrust in along the grates would lift nearly half the fire up from the grate. Steam jets in the ash pits were of little assistance in preventing this "India rubber" like clinker, and after a short time the plant was shut down for two hours. Section breakers and feeder switches were relocated to relieve the load on the plant, and the arrival of more coal made it possible to resume operation under these conditions. It also gave the operators a chance to take the boiler out of service and clean the heating surfaces, which were covered with soot and slag.

This boiler had been in service continuously for three weeks and as a result of the cleaning five barrows of stalactites were taken out, in spite of the fact that the boiler was dusted daily. If the boiler had not been taken out of line at the time, a deposit would have formed which practically would have closed the gas passage.

An investigation of the records of fuel analysis shows samples containing 24 per cent of volatile hydro-carbons, 45 per cent fixed carbon, 29.8 per cent ash and 3 per cent sulphur, with a calorific value of 10,300 B.t.u. per pound. One particular cargo "passed through the furnace" with the ash running close to 37 per cent by weight. The average for all coal received in 1917 was but little better than the case cited, for, although it may have had a greater heat content, the nature of the ash was such as to make it impossible to burn the coal with any degree of economy.

POOR COAL INCREASED MAINTENANCE

In addition to serious interruptions, which caused the public to criticise the company in spite of the fact that it was doing all that was humanly possible, great trouble has been experienced from stoker failures. These occur at some plants at the rate of two a day, and on this account it is impossible to repair them in a first-class manner. It is a case of patching up to keep going. This is not to be wondered at when one stops to think of the foreign substances found in the coal, such as trap rock, short bolts, coupler pins, slate, slag, brickbats and even pig iron. The smaller pieces pass through the crushers and into the furnaces, in spite of the vigilant eye of the weigh-hopper man, and then there is a cracked bearing cap, broken bracket or sprung crankshaft. Stoker repairs are tripled, and the stock of repair parts so seriously depleted that it has been necessary to make up temporary repair parts in the company's shops, to send a representative to the factory to look up delayed orders, and bring the parts to New Haven or Hartford by motor truck.

The poor quality of coal has added to the difficulties of the labor situation. It has been particularly difficult to retain the ashmen and firemen. For every carload of ashes taken out of the ash hoppers during 1915. three carloads are taken out at present. This means that the ash hoppers must at times be emptied upon the floor to make room to dump the stokers. It is often necessary to call in a local contractor to assist in this work in order to keep men on the job. On account of this condition a good laborer will not consider the proposition, and the result is that only mediocre men can be obtained.

An inspection of the operating records shows that the total unit cost of production for 1917 was 1.48 cents, or double the cost for 1915. Of this, 82.5 per cent is due to fuel cost. Comparing the total amounts for the fiscal years 1915, 1916 and 1917, the total cost of production for 1915 was $630,000; for 1916, $745,000 (an increase of 18 per cent for 8 per cent increase in production), and in 1917, $1,187,500, an increase in production of 11 per cent and a cost increase of 90 per cent. In 1915 the total amount paid for fuel for the six plants was $425,000, or 67 per cent of the total production cost. In 1916 it was $520,000 or 70 per cent, and in 1917 it was $976,900, or 83 per cent, which is more than twice that paid under normal conditions. Labor shows an increase of $33,000 and maintenance an increase of $70,000. It is not unreasonable to state that fully 90 per cent in the company's increased cost of power is due solely to the fact that the road is paying for, but not getting, coal.

COMPANY PLANS ADDITIONAL EQUIPMENT

Several plans are afoot to relieve conditions in the near future. The most important is the installation of additional ash-handling facilities and coal-handling equipment and storage space. In the last case it is proposed to discharge sufficient coal at each plant between the dates of April 1 and Nov. 1, 1918, to take care of the needs during this period and have stored at the latter date sufficient coal to carry the plants through until the spring of 1919. To do this it will be necessary to receive in 214 days 150,000 gross tons of coal, which is equivalent to unloading 692 tons per day. To attain this result the Connecticut Company will have to expend between $200,000 and $300,000. For the New Haven power plant it will have to furnish additional storage space. In the Hartford plant the same thing pertains, and in the Bridgeport plant another dock will have to be built, with facilities for reclaiming the coal and getting it into the bunkers. To put in this coal and get it into storage about $500,000 will have to be expended. A quotation received in this connection for an eight-wheel locomotive crane with 50-ft. boom and a 1½-cu.yd. bucket was $18,458, compared with $7,650 in 1915. This plan will relieve much anxiety as to coal shortage next year and will relieve traffic congestion.

The Connecticut Company has exerted every effort to reduce fuel consumption to a minimum. Strict attention has been paid to turning off all unnecessary lights and electric heaters; the skip-stop system of operation has been inaugurated; a vigorous campaign in power saving has been instituted with good results, and in all heating systems drips are trapped to avoid waste, all unnecessary coils are shut off, etc. In closing, the author quoted the ten suggestions for fuel economy published on page 1121 of the ELECTRIC RAILWAY JOURNAL for Dec. 22, 1917.

London Trams on Raid Nights

It was stated at a meeting of the London County Council that the running of tramcars on raid nights was subject to the general officer commanding the London district. When guns were heard the cars stopped, and restarted when firing ceased. So far as extraordinary circumstances were concerned, arrangements were made to enable passengers to complete their journeys without additional payment by rejoining cars with tickets issued before the stopping.

Boston's Future Considered

Service-at-Cost Plan and Public Control as Available Methods of Relief for Boston Elevated Railway Discussed at Legislative Hearing by Chairman Macleod of Commission and President Brush of Company

THE respective merits of the public control and service-at-cost plans for relief of the Boston Elevated Railway were discussed at recent hearings before the joint legislative committee on street railways and metropolitan affairs by Hon. F. J. Macleod, chairman of the Massachusetts Public Service Commission, and Matthew C. Brush, president of the company. Hon. Joseph B. Eastman of the commission also spoke at length upon the board's plan, and explained its details. A summary of the remarks of the two first mentioned follow:

MR. MACLEOD DESCRIBES PUBLIC CONTROL PLAN

Mr. Macleod explained to the committee the difficulties of the company in rendering service under the severe winter conditions, and also because of labor shortage, high prices and long deliveries, combined with the need of additional net revenue. Passenger revenues in November, December and January fell off materially as compared with a year ago. Mr. Macleod then described the commission's plan of relief, involving public control of the property by a board of public trustees and a guaranteed dividend to the stockholders. Under the proposed plan the trustees would direct the general policies of the road, leaving the direct management in the hands of the operating officials as at present. The commission feels that the public would be more disposed to accept rate increases if established through public trustees with the excess above 5 cents applied to service betterment than by private directors. Mr. Macleod said that he could see no reason why under proper public control the car riders and the public at large would not meet a justified fare increase in the same spirit that the postage increase from 2 to 3 cents was met a few months ago. The chairman outlined the advantages of being able to raise money through public credit, as in Cleveland.

Some part of the cost of rehabilitation, the speaker thought, should be placed upon the community at large, in view of the peculiar position of the company with reference to existing rapid transit lines. At present it would cost the company about $7,000,000 a year to meet its rentals, taxes and fixed charges and to pay a 6 per cent dividend. This would mean that out of every nickel only about 3.25 cents would be available for operation. "The rapid transit lines are breaking the back of the system," said the speaker, "and they will break the back of any system that tries to carry them, out of the receipts from the car riders. It never has been done and never can be done. In this case the problem will never be properly solved till the taxpayers assume their proper share of the burden. We hear a great deal about the car rider paying his way, and paying for what he gets. I agree to that, but you should go a step farther and say that the taxpayer should also pay for what he gets. Men who do not ride in the cars at all get more benefit in many cases from the operation of these rapid transit lines than the car riders themselves. These lines in effect represent a duplication of existing street facilities." Mr. Macleod held that the possible contribution from the taxpayers should not exceed one-half the present cost of subway rentals.

Under public control, the speaker said, men of the type of the present management might properly continue in charge of the road. The commission has confidence in the ability of the present management, and considering the tools and facilities it has to work with, it has done about as well as could be expected under the conditions. In the last analysis a return on the investment of the stockholder is as necessary to keep the property running as the payment of wages to the conductors and motormen.

The commission itself, the chairman said, is too busy to take over the general direction of the company's policies. Its plan provides that if the trustees are unsatisfactory a new set can be appointed. Mr. Macleod said he approved of the general principle of the service-at-cost plan, and that there should be a direct relationship between what the passenger gets and what he pays for. This is provided under the commission's plan so far as the fare in excess of 5 cents is concerned, and the same principle might properly be applied to the basic 5-cent fare, at least to the extent of fixing a limit beyond which increases in the current costs of operation would be paid for by the car riders. Gov. McCall's plan, the chairman said, of authorizing the commission to grant temporary rate increases during the war would not be likely to give the company the credit necessary to obtain new money. Mr. Macleod said that he did not think the subway development in Boston had been in excess of public needs, but that subways are luxuries and that any community which desires them must be prepared to pay for them. The Boston Elevated company yielded to popular pressure in taking over such heavy subway burdens, but the action has proved very ill-advised from the standpoint of the company's interests.

The speaker commended the general principles of service at cost, but said that he did not believe that it would result in a spirit of co-operation between the public and the Boston company to anything like the extent of the plan proposed by the commission. The chairman thought the falling off in traffic would be less relatively in Boston in the event of a fare increase than on other roads, on account of the large amount of long-haul business handled.

MR. BRUSH EXPLAINS ELEVATED POSITION

Mr. Brush reviewed at length the recommendations of the Beeler report to the Public Service Commission for possible economies on the Boston property. He agreed with Mr. Beeler that it is impossible to build subways for street cars and make them pay. Train operation eventually must come in the Boylston Street subway.

The company has petitioned for a third track in Commonwealth Avenue to increase the capacity of the Boylston Street tube and is considering four-car train operation with multiple-unit equipment. Express service would be rendered over this third track inward mornings and outward afternoons. Mr. Brush said that he would never dead-end a rapid transit line if loop construction were possible.

Mr. Brush disagreed with some of Mr. Beeler's suggestions, such as that to abandon the Park Street subway station in Boston and establish a single downtown terminal at Washington and Summer Streets. Others required considerable capital expediture. He considered Mr. Beeler's report as thorough and intelligent and that it demonstrates that the necessary increase in net revenue can be obtained only through an increase in the present rate of fare.

The consolidation of divisions and carhouses, as recommended in the report, is economically desirable and has already begun. A substantial saving can be made by a keener, more co-operative spirit on the part of motormen in car operation. The company is doing everything possible by mechanical devices and others to encourage and compel a lower power consumption and a reduction in track and equipment maintenance by increased coasting. To equip all surface cars with coasting clocks would require about $150,000. The savings secured by these on the rapid transit lines are good, though not as large as were estimated. There is a further saving possible on the surface lines by this means, but success depends on the sincere co-operation of the motormen.

Mr. Brush created a mild sensation by displaying to the committee a small truck-load of exhibits composed of investigations and reports made on the Boston Elevated property during the past few years. He reviewed the finances and investigation history of the road along lines previously printed in this journal. Some new figures as to the rental per subway mile which the company is required to pay annually were then presented. Mr. Brush then described the subway policies in New York and Philadelphia relative to the sharing of cost by the city. He maintained that subway rentals should not be borne by the car riders.

Mr. Brush vigorously resented intimations that the management had been lacking in initiative and cited numerous examples of advanced practice in the road's development. Among these is the installation of a 35,000-kw. turbo-generator set two years after units of 15,000-kw. rating had been installed to gain 20 per cent in efficiency, the use of motor-driven fare boxes (his company was the first in the world to provide these), establishment of prepayment areas, provision of signals on all rapid transit and the latest subway lines, remodeling of the power system from "straight d.c." to an a.c. and d.c. combined system, improvement in rolling stock designs, such as the building of articulated cars, provision of center-entrance motor and trailer cars, etc.

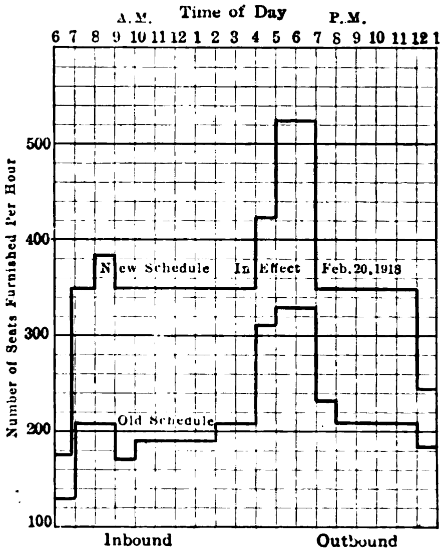
The investment carried by the company is now $116,000,000 and in the immediate future will be $130,000,000. The earnings in 1897 were $8,000,000 and now are $19,000,000. Since 1897 the earnings have increased 137 per cent, the investment 364 per cent and the population 49 per cent. In Cleveland the average ride per passenger is 2.19 miles, compared with an estimated 4.4 miles at Boston.

Mr. Brush said that the so-called service-at-cost scheme as applied in Cleveland, Dallas and elsewhere, if properly developed and drawn would probably work for the Boston company. This plan creates a reciprocal relationship between the car riders and the public, a sliding scale of rates adjustable to yield a fair return, and only that, to the investor. By a fair return is meant one which will invite capital.

"Under no circumstances would an investor accept the public control bill as drawn by the Public Service Commission and now before the legislative committee," said Mr. Brush, in part. "You could not justify a banker or investor investing his money in an enterprise and then turning it over to five trustees at whose pleasure the property might be returned." It is estimated that a 6-cent fare in Boston would produce about $3,500,000 additional revenue per year. To make higher fares successful, the public must be convinced that no matter what the service is, the people are getting what they are paying for under the circumstances. No group of four or five trustees can actually manage a property except through a competent chief executive. The speaker believes that the service-at-cost scheme will eventually restore public confidence in the property.

More Service with Fewer Cars

On Feb. 20, 1918, the Puget Sound Traction, Light & Power Co. substituted a one-man car service on its Summit Line for a two-man car service. The two-man cars formerly used were equipped with longitudinal seats, and each car had a capacity of twenty-six passengers. The new one-man car has a capacity, with cross seats, for thirty-five passengers. A somewhat higher schedule speed was put into effect so that ten of the one-man cars now are used during the rush period instead of eleven of the old style two-man cars, yet the seats per hour are forty-six per cent greater than under the old schedule. The accompanying diagram shows the new and old schedules.



NEW SCHEDULE WITH ONE-MAN CARS REQUIRES LESS ROLLING-STOCK

LETTERS TO THE EDITOR

Heating Does Not Account for All the Winter Increase

ALBANY, N. Y., March 20, 1918.

To the Editor:

Suggested methods of reducing coal consumption on electric railways during the winter which has just passed have included programs for less heat on the cars, particularly during the peak hours. Considerable saving can undoubtedly be made in this way, but I wish to point out that exaggerated ideas of the amount of conservation thus to be effected are obtained when the consumption per car-mile or per ton-mile of energy in the summer and winter months is compared and the assumption is then made that the electric heaters are responsible for the difference. This assumption makes no allowance for the facts that it takes more energy to propel a car over a snow-covered track than over a clean one; that the wind resistance of a car closed is greater than when the sashes are down; that the number of stops and slow-downs, and therefore the energy consumption, is greatly increased when snow-cleared track is blocked by other vehicles; that frozen lubricant increases journal friction and that the car-lighting periods are much longer. That such allowances should be made is borne out by the records of companies which use devices for checking the motorman's use of energy for propulsion. These records usually show a rise in energy consumption following severe weather. Any company operating with coal stoves knows perfectly well that its energy per car-mile or ton-mile tends to rise as the temperature drops.

Another point which should be remembered in any analysis of the energy taken by electric heaters is that with a little care and oversight no heat need be wasted. Generally speaking, the average energy use of electric heaters during the winter months should be within one-half of their rated capacity, even in long continued periods of cold. Where this is not the case, the responsible officials are not doing their duty in enforcing the "1-2-3" car heating order scheme. The difficulty of doing this has led to the more extended use of the thermostat as an energy saver, for it is not only automatic, but is also most sensitive to changes in car temperature.

From the foregoing it is fair to conclude that due allowance for other energy-using factors and the wiser use of the equipment will make the electric car heater much less of a fuel-eating bugaboo than it now appears to be.

W. S. HAMMOND.

Transportation Engineers Needed

BOSTON, MASS., March 19, 1918.

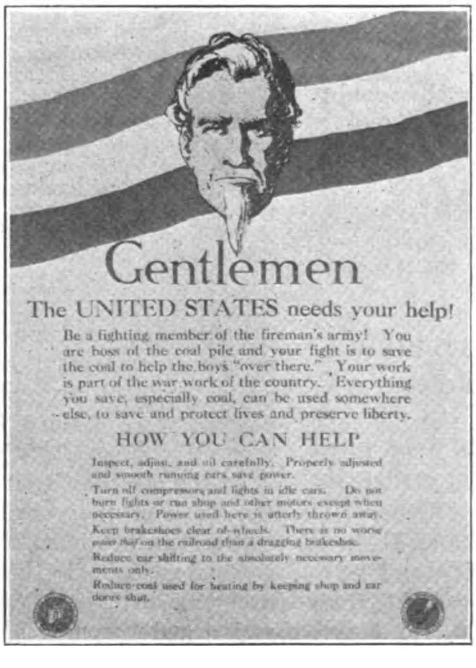
To the Editor:

A great deal has been written about the increasing outgo and decreasing income of electric railways, particularly of the city railway with its 5-cent fare, diluted by transfers. I do not propose to discuss the political and economic reasons for this condition, but to consider what can be done by the operator along engineering and transportation lines to improve conditions.

It is almost inconceivable that until recently the number of transportation departments which carried on any traffic analysis could be counted on the fingers of one hand. In fact, one transportation superintendent who lost his job could not understand the reason given by the engineer-manager, namely: That he would not have in his employ a transportation man who would not learn how to read a traffic curve. Nevertheless, important as it is for the transportation man to know how to analyze traffic, he will fulfill only half of his functions unless he makes an endeavor to fit his equipment to the service needs which his traffic analyses disclose. The following are some considerations in traffic selection often overlooked:

Schedule speed is determined not so much by maximum speed as by such factors as height of floor and

UNCLE SAM wants the help of the men who run the cars and feed the boilers to save fuel. To aid in this campaign the Fuel Administration has sent to electric railway companies 20,000 *of the poster shown at the left and* 10,000 *of the "extra shovelful" poster, shown at the right. The design and distribution of these posters were carried out with the co-operation of the War Board of the American Electric Railway Association.*


Gentlemen
The UNITED STATES needs your help!
HOW YOU CAN HELP

Be a fighting member of the fireman's army! You are boss of the coal pile and your fight is to save the coal to help the boys "over there." Your work is part of the war work of the country. Everything you save, especially coal, can be used somewhere else, to save and protect lives and preserve liberty.

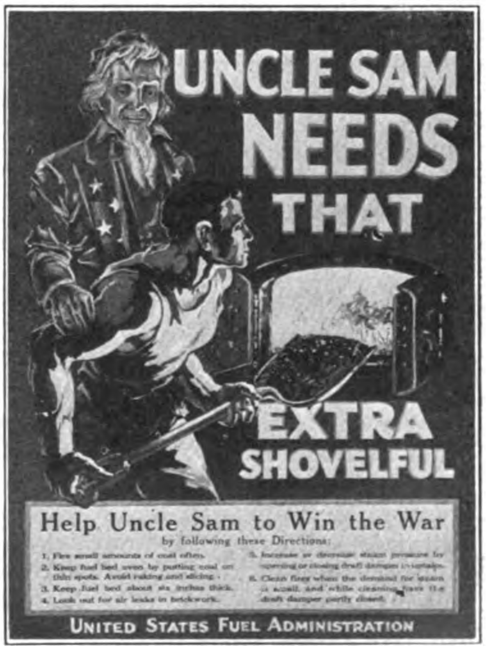
Inspect, adjust, and oil carefully. Properly adjusted and smooth running cars save power.

Turn off compressors and lights in idle cars. Do not burn lights or run shop and other motors except when necessary. Power used here is utterly thrown away.

Keep brakeshoes clear of wheels. There is no worse power thief on the railroad than a dragging brakeshoe.

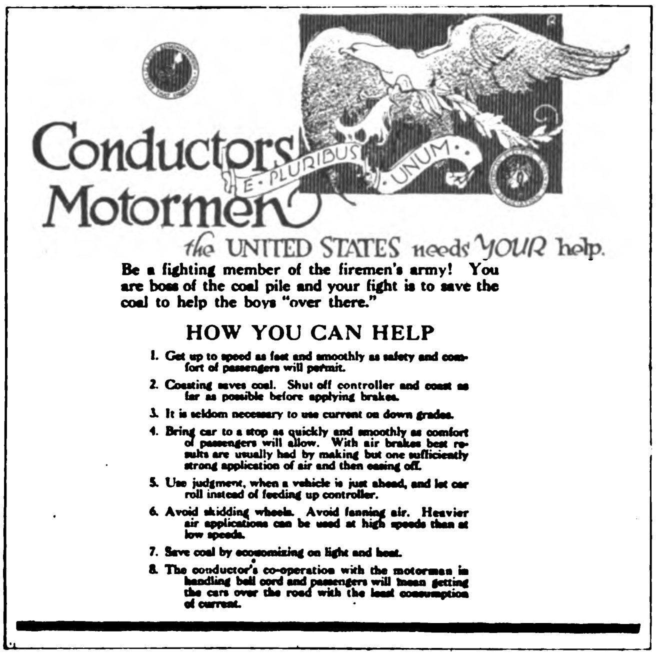
Reduce car shifting to the absolutely necessary movements only.

Reduce coal used for heating by keeping shop and car doors shut.


UNCLE SAM
NEEDS
THAT
EXTRA
SHOVELFUL
Help Uncle Sam to Win the War
UNITED STATES FUEL ADMINISTRATION

by following these Directions:

1. Fire small amounts of coal often.
2. Keep fuel bed even by putting coal on thin spots. Avoid raking and slicing.
3. Keep fuel bed about six inches thick.
4. Look out for air leaks in brickwork.
5. Increase or decrease steam pressure by opening or closing draft dampers in uptake.
6. Clean fires when the demand for steam is small, and while cleaning have the draft damper partly closed.



Be a fighting member of the firemen's army! You are boss of the coal pile and your fight is to save the coal to help the boys "over there."

HOW YOU CAN HELP

1. Get up to speed as fast and smoothly as safety and comfort of passengers will permit.
2. Coasting saves coal. Shut off controller and coast as far as possible before applying brakes.
3. It is seldom necessary to use current on down grades.
4. Bring car to a stop as quickly and smoothly as comfort of passengers will allow. With air brakes best results are usually had by making but one sufficiently strong application of air and then easing off.
5. Use judgment, when a vehicle is just ahead, and let car roll instead of feeding up controller.
6. Avoid skidding wheels. Avoid fanning air. Heavier air applications can be used at high speeds than at low speeds.
7. Save coal by economizing on light and heat.
8. The conductor's co-operation with the motorman in handling bell cord and passengers will mean getting the cars over the road with the least consumption of current.

THIS IS A REPRODUCTION OF THE POSTER WHICH THE FUEL ADMINISTRATION IS DISTRIBUTING FOR POSTING IN CAR CABS

steps, the width of platforms and aisles, the character of operation for doors and steps, employment of fare-collection devices that give quick, accurate collection, and so on. In short, schedule speed is determined not only by the propelling equipment, but by the equipment that hinders or hastens interchange of passengers at stops.

Second, a car should be of the type that will get the maximum travel during twenty-four hours. In the past we have scanned too closely the item of platform expenses. Cars have often been so large that operators have not run them on sufficiently short headway to get all the business. Whether the jitney stays or not, many people will walk a mile rather than stand ten to fifteen minutes waiting for a car.

Third, the equipment should be adequate to meet future needs. Only lack of credit justifies the purchase of equipment which makes no allowance for expansion. It is true that 40-hp. motors are cheaper than 50-hp. motors, but if the territory is growing, larger motors will be needed within four or five years because of the increased stops, so that the first cost of the large motor will often be justified purely on the grounds of higher rate of acceleration with lower maintenance cost.

E. W. HOLST.

"Pull-Together" Order Distributed to Pennsylvania Railroad Employees

Every one of the 250,000 employees of the Pennsylvania Railroad System, both east and west of Pittsburgh, will receive an individual copy of Order No. 8, issued by William G. McAdoo, Director General of Railroads, calling upon the working forces of all lines to "pull together" in the National service and work unitedly to win the war. For this purpose the order has been reprinted, in small leaflet form, for distribution.

AMERICAN ASSOCIATION NEWS

Rhode Island Company to Organize Section No. 12

EMPLOYEES of the Rhode Island Company, Providence, R. I., plan to organize a company section in that city on April 9. Representatives of the American Association will attend in order to advise the employees as to the method of procedure which has been found satisfactory elsewhere.

More Medals and Cash Prizes Awarded at Manila

AT THE thirty-sixth monthly meeting of joint company section No. 5, held at Manila on Jan. 15, medals were awarded for merit in papers presented before the section as follows: Gold medal to Francisco Santiago, chief meter inspector, for his paper on "Economic Influence of Electric Light and Power on the Industrial Philippines"; silver medal to Nicolas Tranfaglia, assistant superintendent track department, for his paper on "Co-operation", and bronze medal to F. P. Santiago, assistant claim agent, for his paper on "Accident Prevention." Cash prizes were also awarded as outlined in the following letter to each recipient, dated Jan. 15, 1918:

CONDUCTORS' AND MOTORMEN'S CASH PRIZE AWARD FOR PERFORMANCE OF DUTIES ACCORDING TO COMPANY'S STANDARDS OF SERVICE, YEAR ENDED DEC. 31, 1917.

In accordance with bulletin to employees dated July 20, 1917, providing that all conductors and motormen earning the distinction of "Excellent Service Employee" at the close of each calendar year, Dec. 31, be given cash prizes (Class A 30 pesos or $15, Class B 20 pesos, Class C 10 pesos), as awards, based on the performance of their duties according to the company's standards of service, it affords the company great pleasure and satisfaction that you have been awarded a cash prize and to present you with a check in accordance with said award.

The award was made by a committee of nine, consisting of the superintendent of transportation, the assistant superintendent of transportation, a division superintendent, two inspectors, two conductors and two motormen, after a thorough investigation of their records for the year 1917 and a careful consideration of all of the circumstances in connection therewith.

On behalf of the company officially, as well as myself personally, I desire to congratulate you upon the award of the cash prize given you and to assure you that the company is proud of having in its service as faithful and loyal an employee as you have proved yourself to be and who has so well performed his duties according to the company's standards of service.

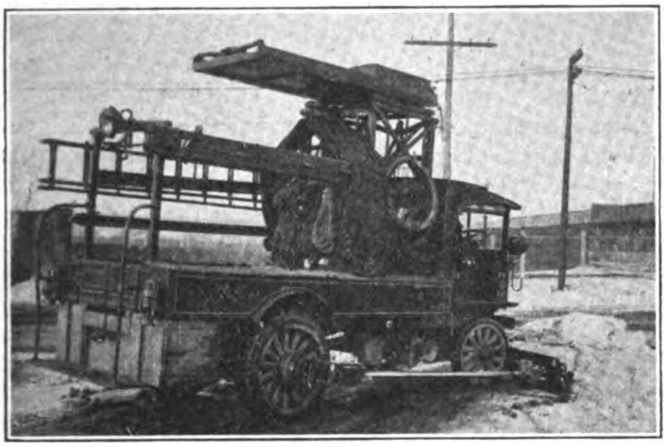
C. N. DUFFY,
Vice-president and General Manager.

Still other cash awards were made to conductors and motormen as a result of a "conductors' and motormen's group accident prevention contest." In this the employees were divided into three groups, denominated respectively "red," "white" and "blue."

At the meeting Retiring President Santiago reviewed the work of the year, J. M. Bury read his inaugural address as president-elect, and other incoming officers spoke briefly. C. N. Duffy, general manager of the company, explained the purpose of the several awards and urged the members to make the most of the various competitions open to them.

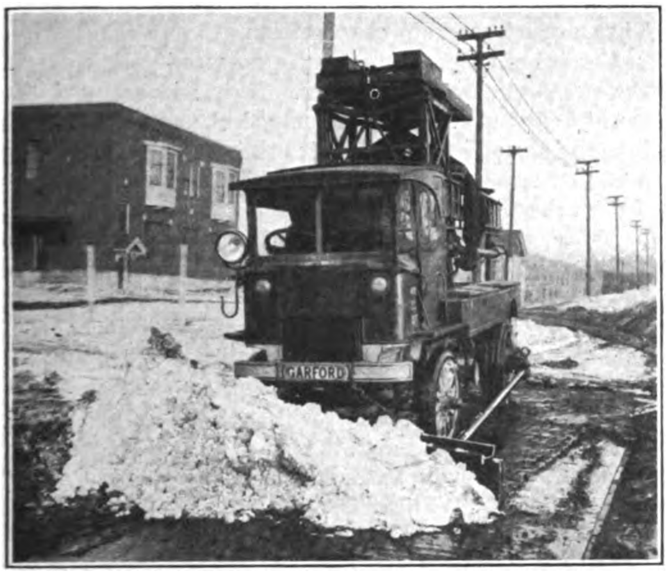
Line Truck Used for Removing Snow

MANY and ingenious have been the devices for removing snow from railway tracks and streets, and to some extent those adopted by any railway will depend upon local conditions. Snowplows and sweepers are, of course, essential for clearing the tracks of the heavier falls of snow. For lighter snow, however, and more especially for cleaning the points not directly on the railway track, the United Railways of St. Louis has devised a type of equipment which seems to be both novel and efficient.


LINE TRUCK AT ST. LOUIS CLEARING SNOW FROM STREET

Some time ago a Garford truck chassis was purchased by this company and equipped in its own shops with a body comprising a pole-raising device and an adjustable tower for repairing trolley and feed wires. Recently the truck has been used as a snowplow.

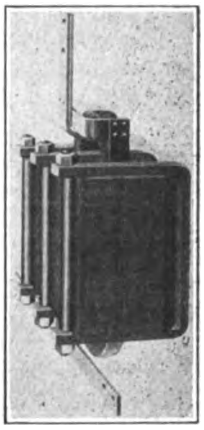
A snowboard is attached by means of a rod on each side fastened to loose hubs on the rear wheels. The improvised plow rests on the ground and, to prevent side movement, is fastened to the front of the truck by means of chains. The object in fastening the rods to the rear instead of the front hubs is to allow for inequalities in the surface of the pavement. To provide sufficient weight to hold the snowboard on the ground a heavy T-rail is laid across the top.



SAME TRUCK CLEARING SNOW FROM CAR TRACKS

No figures as to the cost of construction or operation of the snowboard are available at this time, but the cost was amply low to justify the outlay. The truck shown here may be used for general utility work, pole setting, wire repairing, or snow cleaning, the equipment thus being kept in constant use.

Track Impedance Bonds for Signal Circuits


IMPROVED TRACK IMPEDANCE BOND

THE impedance bond manufactured by the Union Switch & Signal Company, which is made up by assembling silicon steel laminations about a spirally wound coil of strap copper, has been improved by bringing the terminal connections for the rails out at the side in such a way that the cables will come between ties and be protected against dragging equipment.

The spiral winding of flat or strap copper allows for satisfactory insulation between turns, and at the same time provides a sufficient surface for dissipation of heat. The two windings are so arranged as to neutralize any mechanical stresses due to surges of propulsion current. Rail cables can be connected without removing the bond cover. A sloping cover also provides for protection against dragging equipment.

Increasing the Usefulness of Bonding Equipment

ONE of the most handy arrangements of the Lincoln bonding outfit which has recently come to notice is that in use by the Denver (Col.) Tramway. As shown in the accompanying illustration, this machine mounted on a Ford automobile makes a very satisfactory emergency outfit for the repairing of all open rails and similar welding work, when car service cannot be delayed.

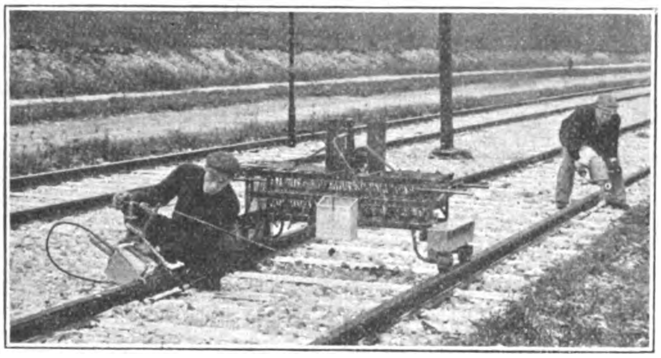
The New Brunswick (Canada) Power Company furnishes another example of increasing the usefulness of bonding outfits. Instead of putting its Lincoln bonder away for the winter this company uses it daily in the shops at welding armatures, bearings, etc., thus making the machine earn dividends twelve months a year.

THE FORD MAKES BONDING EASY

A 140-Lb. Welding Outfit for Rail Bonds and Arc Welding

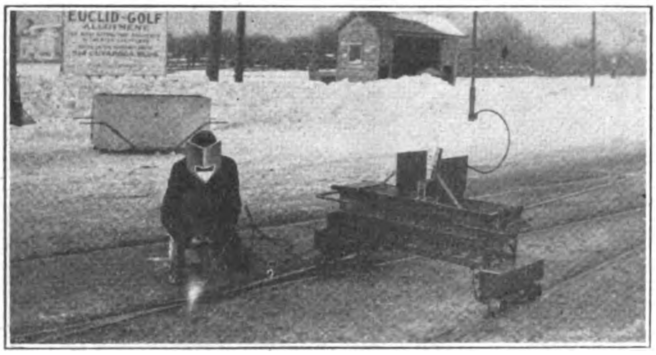
ALTHOUGH the 140-lb. combination portable welder rheostat of the Electric Railway Improvement Company, Cleveland, Ohio, has already been successfully installed on a number of railways, for rail bonding and arc welding, particulars of its operating principles and construction have not been made available until now.

The standard outfit will operate on any voltage between 250 and 750. The welder weighs 65 lb., and consists of an inclosed furnace box with a graphite plate on the front side. The carbon electrode enters this box through an opening in the rear, and the heating is produced by drawing an arc between the carbon electrode and graphite plate. The furnace box is further surrounded with a magnetic coil which is in series with the line and which focuses and directs the arc. For bond welding the apparatus will draw from 75 to 100 amp. from the line and consumes from 1½ to 2 kw.-hr. per No. 0000 bond. The actual time of welding is about one minute per terminal on a No. 0000 bond.



PORTABLE WELDER IN USE FOR RAIL BONDS

For rail bonding the power is taken directly from the trolley wire, with the rheostat and welder in series. The rheostat is used to regulate the heating by producing the proper voltage for the welder. For arc welding the power is taken from the trolley wire through the rheostat to the metal pencil.



PORTABLE WELDER IN USE AS AN ARC WELDER ON SPECIAL WORK

The rheostat is provided with thirteen parallel paths, all tied together at the busbar. Four of these paths are permanently connected to the main switch. Each of the remaining nine paths connects with the main switch through a "cut-in" switch. Each path gives approximately 15 amp. at 600 volts, thus 60 amp. is the lowest current obtainable at that voltage. By throwing in "cut-in" switches, the current can be brought up to full load of 195 amp. in steps of 15 amp. each.

The rheostat is also provided with three "cut-in" switches connected to the busbar. The purpose of these switches is to cut out part of the rheostat to compensate for a decreased line voltage.

Progress on the Toledo Power Plant

THE new Acme power plant of the Toledo (Ohio) Railways & Light Company has been completed to a point where it is ready to furnish current for both light and power to the system which has heretofore been depending upon the Water Street plant alone. One turbo-generator of 20,000-kw. capacity has been installed and the plans call for two more generators, the combined capacity of the three, together with that of the old power house, being 200,000 kw. This is sufficient for a city many times larger than Toledo, but provision has been made not only for the growth of the city, but for the development of the use of electric power and the increase in the operation of the local and interurban lines.

The plant is located in what is known as East Toledo, on a plot of forty-two acres. Of this about a third is high ground, while the remainder lies below the level of the Maumee River. This is to be filled and developed as needed.

Three buildings of reinforced concrete, steel and brick construction have been practically completed. Eight boilers are ready for operation and a complete automatic stoker system has been installed. Coal is carried to the bunkers by a belt conveyor from pits outside at a speed of 150 tons an hour, if necessary. A submerged storage system, which is to have an ultimate capacity of 200,000 tons, is being constructed. It will consist of four pockets of 50,000 tons each, and one will be completed at once. The bottom of the pockets is 20 ft. below the lake level and the top is 10 ft. above. They are of concrete construction.

A reinforced concrete trestle on wood piling carries the necessary railway tracks. It is so arranged that twenty cars of coal can be dumped at one time, directly into the storage pits. Coal is stocked and reclaimed by a 160-ft. crane, which has a capacity for stocking from the tracks to the center of the pits at about 250 tons per hour, and for reclaiming at 150 tons per hour.

Three large tunnels connect the plant with the river. They are 9 ft. high, 9 ft. wide and 500 ft. long, and each has a capacity of 400,000 gallons per minute. Two will be used for intake purposes and the third for discharge. The tunnels are 22 ft. below the lake level.

G. W. Saathoff, engineer with the Henry L. Doherty Company, superintended the construction of the new plant. Others who have been identified with it are Fred J. Derge, William Long, M. R. Bump, E. J. Billings, J. R. Ruggles, J. M. Strike and engineers with the Bentley & Sons Co.

The recent winter has been unusually severe in its effect of causing flat spots on car wheels. In December the mechanical department of the Detroit (Mich.) United Railway reground 379 pairs of wheels and placed 397 new pairs on axles, making a total handled of 1552 during the month.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

How to Join Army Engineers

Men Trained in Engineering Can Engage in Their Specialty by Joining Replacement Regiment

The Kaiser has placed the keenest engineering talent of his own and allied empires into the Imperial armies of the Central Powers to defeat the world. During these last three years the best engineering skill of France, Great Britain, Russia and Italy and their allies has been matched against the enemy. Up to this time voluntary enlistments of the high-class technical men in the United States Army are below requirements. This deficiency is probably due in part to the lack of proper information concerning the engineering branch of the service.

FIRST REPLACEMENT ENGINEERS

An important factor in keeping up the engineering strength of our army in the future will be the First Replacement Regiment of Engineers, which was organized at Washington Barracks, D. C., on Dec. 14, 1917, with the express idea of accomplishing this end. This regiment has not only the responsibility of finding men to fill up depleted ranks, but it must also fit them to step into the work of trained, efficient and disciplined soldiers.

The preliminary work of the recruit is first a thorough training in military drill. Drills gradually give way to engineer work and specific technical training. The engineer soldiers must know how to tie all the important kinds of knots and lashings, to build spar and truss bridges, to construct revetments, dig trenches, place wire entanglements, construct machine-gun emplacements, build pontoon bridges and to construct roads. They must also know the methods of demolition, sapping and mining. Specialized training in lithography, zincography, surveying and other branches are also given to those qualified for further training.

WIDE RANGE OF WORK

Engineers are called upon to perform such a wide range of work that practically every man with any technical training or mechanical ability can find a place in this organization. Every male citizen in the United States who is physically fit, and between the ages of eighteen and twenty-one, and thirty-one and forty, is eligible to join the regiment by voluntary enlistment.

To be assured of assignment to this regiment, the applicant for enlistment should write to the Commanding Officer, First Replacement Regiment Engineers, Room 107, Headquarters Building, Post of Washington Barracks, D. C., for application blank. If the blank shows the man to be eligible, an enlistment card is filled out and sent to the recruiting officer nearest to the applicant's place of residence, with instructions to enlist the man for service in this regiment. Transportation and means will be furnished by the recruiting officer, and the man will be instructed to report at the post for duty.

Avoid Unnecessary Work

California Commission Thinks Utilities Should Not Be Bound by Franchise Requirements

The Railroad Commission of California, upon its own initiative, has been conducting an investigation into the transportation system of that State during the emergency created by the war. It recently announced several recommendations which it directed to be called to the attention of interested parties.

Most of the suggestions have to do with the problems of steam operation, but one directly concerns electric railways and other utilities in California. It deals with franchise requirements, and the opinion of the commission is summed up thus:

"State, county and city governmental authorities should not require utilities, during the present emergency, to live up to franchise requirements which call for improvements, street work, etc., that is not absolutely necessary for operation. Moreover, all public improvements not necessary in the prosecution of the war should be deferred so that the labor and materials may be available for railroads or other necessary war work."

Commenting upon this point the commission said:

"Steam, electric interurban, and street railways, as well as other public utilities, should not be required at this time to live up to such of their franchise stipulations as necessitate otherwise uncalled for new construction, such as street paving in cities, replacement of existing T-rail with more expensive girder rail, and similar items. The latter suggestion will, of course, have its effect also on maintenance and capital expenditures and consequently on the net earnings of the carriers.

"We recommend that the commission address the appropriate state, county and city governmental authorities, inviting their co-operation with the program. We also suggest that the commission offer its informal assistance in cases where, by reason of franchise requirements, a city insists upon construction work which is not essential and which would appear to interfere with the more important railroad work."

New Franchise Suggested

Company at Norfolk Submits Proposal for Thirty-Year Grant With New Tax and Paving Provisions

The Virginia Railway & Power Company has submitted to the business men's traction committee at Norfolk, Va., a proposition embracing a general scheme of rerouting, skip stops, new franchises and taxation, the development of which to final completion would require several years, and with the shortest possible relief, outside of the skip-stop feature, not to be effective for less than four months.

Two new franchises are suggested, each to run for a period of thirty years. One of them embraces the Norfolk Railway & Light Company's railway system and electric lighting system, and the other, in the name of the Virginia Railway & Power Company, takes care of the various other electric railways not embraced in the Norfolk Railway & Light Company's system.

TAX IN LIEU OF OTHER PAYMENTS

Under present regulations the company pays a tax of 6 per cent on its gross receipts in the city and also must pay for the paving of all streets between the tracks and for 2 ft. on each side of the tracks. In lieu of this the company proposes a tax of 4 per cent on its gross receipts not only in the city but from all service outside the city east of the southern branch of the river, taking in the Ocean View and Terminal lines.

T. S. Wheelwright, president of the company, presented the proposition for his company, and after reading a prepared statement, submitted five separate plans for improving electric railway service in Norfolk. After discussing the paving and tax questions to which reference has just been made, Mr. Wheelwright said:

"As to the matter of railway fares, the 5-cent fare is now considered the minimum compensation for this service, especially in view of the fact that more than 100 electric railway systems throughout the country have been granted fare increases above the 5-cent fare and many other applications are now pending for an increase over this amount.

"As to the 2½-cent school tickets, while the service rendered to school children costs quite as much as for any other passenger, the policy of the company has always been in the direction of being liberal on this point. The original provision for 2½-cent tickets for school children was limited to public schools or such schools as do not make a charge for tuition, and the understanding is that school tickets shall

Valuation Commission for Pittsburgh

Railway, City, Surrounding Boroughs and Public Service Commission All Represented on New Valuation Body

A commission of five engineers, one representing the city of Pittsburgh, one representing the boroughs surrounding that city, two representing the Pittsburgh Railways and the fifth, the chairman, representing the Public Service Commission of Pennsylvania, has been selected to direct a valuation of the property of the Pittsburgh Railways. This is in accordance with the decision of the Public Service Commission in connection with the case against the railway growing out of the new fares put into effect by the company on Jan. 22. The members of the commission are as follows:

F. Herbert Snow, chairman, chief engineer of the State Public Service Commission.

Robert M. Feustel, member of the firm of Sloan, Huddle, Feustel & Freeman, consulting engineers of Chicago and Boston, representing the city of Pittsburgh.

George Warren Fuller, New York, member of the firm of Fuller & McClintock, representing the boroughs.

Morris Knowles, Pittsburgh, chief engineer in charge of housing for the United States Shipping Board, under whose direction the filtration plant at Aspinwall was built, representing the Pittsburgh Railways.

J. A. Emery, New York, appraisal manager of Ford, Bacon & Davis, representing the Pittsburgh Railways.

It is expected that the members of the commission will sit on Thursday and Friday of each week.

CAREERS OF THE ENGINEERS

The work done previously by Messrs. Snow, Feustel and Emery is more or less well known to the readers of the ELECTRIC RAILWAY JOURNAL. With Messrs. Fuller and Knowles, however, the case is somewhat different. For this reason there follows a summary of their activities:

Mr. Fuller is a graduate of the Massachusetts Institute of Technology, and for fifteen years has been engaged in valuation work, principally of water companies. He spent several years in Cincinnati and Louisville in charge of works for the purification of the Ohio River water supply to these cities. He has been adviser on the water supply of New York, New Haven, Paterson, N. J.; Washington, D. C.; Buffalo, Columbus, Indianapolis and New Orleans, and has been on the city side in valuation and other cases.

Mr. Knowles was chief engineer of the Pittsburgh city bureau of filtration, 1901-10, in which time the Aspinwall filtration plant was placed in successful operation. He has been engaged for years in private practice as a consulting engineer, and now is in charge for the Shipping Board of its plan for housing shipyard workers.

Chairman Ainey of the Public Service Commission said at one of the sessions at which the fare in Pittsburgh was under discussion:

"The only way to establish what is a reasonable rate of fare is to find what fare would yield a just return on the money invested, and the only way that can be done is by taking an impartial valuation of the properties of the company."

(*Concluded from page* 581)

apply only to pupils under eighteen years of age attending institutions where no tuition is charged, and upon proper certification that they are entitled to such transportation.

"The rates for light and power recommended are the same as those filed with the State Corporation Commission and in effect in Richmond, Petersburg and other divisions of the system. They are worked out on the block system and are more favorable than the present prevailing rates for retail light and power in Norfolk.

"The matter of increase or decrease in the electric railway fares and increase or decrease in the light and power rates to be left open after a period of ten years for decision by the State Corporation Commission, as was recommended by the committee and approved in the previous franchise.

"Much of this work has been carefully studied and outlined in the franchises previously recommended by the joint committee and which will be of great value in facilitating an early and definite disposition of the whole matter.

"It is our understanding that whatever plan is now agreed upon will be supported by the citizens of Norfolk and recommended by them to the Council, and when the matter is brought up for consideration by our board of directors, it will have our recommendation and support; all legal questions, of course, to be subject to the approval of the general counsel of our company and the city attorney of Norfolk."

St. Louis Bill Up March 22

The board of Aldermen of St. Louis, Mo., decided on March 15 to postpone action on the United Railways "compromise" bill until March 22, when the bill, with the amendments ratified by the board of public service, will be made a special order of business before a committee of the whole, after the regular meeting.

The principal amendments to the aldermanic bill recommended by the board of public service, after two months' consideration, are the reduction of the tax on gross earnings from 3 per cent as originally proposed to one-half of 1 per cent, thus reducing the tax from approximately $480,000 a year to approximately $65,000; permitting the company to pay the accrued mill tax, amounting to approximately $2,300,000, in ten annual payments without interest, instead of in five annual payments; allowing the company twelve months instead of nine in which to accept the "compromise," unless the war ends before that period expires; and, if it does, the company to file its acceptance of the ordinance within six months of the end of the war; and permitting a change in the $60,000,000 valuation to any valuation fixed by the State Public Service Commission.

Community Ordinance In

Sponsors of Toledo Grant Think Presentation of Measure Now to Be Ill-Advised

The community plan ordinance was introduced in the City Council of Toledo, Ohio, on March 12, by Councilman Irwin. It was referred to the street railway committee. This action seems to have been a surprise to the members of the commission which formulated the ordinance. The Toledo *News-Bee*, of which Commission Cochran is editor, said that the draft is incomplete. The Toledo *Blade*, edited by Commissioner Wright, contends that the ordinance was forced into Council. Member Thurston advances the idea that the introduction of the measure was the work of some one who is adverse to the ordinance. The Toledo *Times* asks the commissioners what they expected would be done with the ordinance if it was not to be put before the people for discussion.

It is said that the ordinance makes no provision for a valuation of the property, although a valuation must be made before negotiations could be completed for assumption of control by the proposed new community traction company. The question is asked as to who will make this valuation. It is supposed that Council will have to make provision for this and other things that must be done, in the event that the ordinance meets with approval. There must be a referendum vote after Council has acted on the draft.

$100,000,000 Chicago Program Advanced

The local transportation committee of the City Council of Chicago, Ill., on March 20 concurred with the recommendation of the Traction & Subway Commission's physical plan for the immediate construction of three subways and four elevated line extensions. This would provide a complete revolution of local transportation, increasing the rapid transit facilities 150 per cent in the first six-year period. The new plan would serve 60 to 70 per cent of the population with rapid transit where now 20 per cent is served. The program involves the expenditure of more than $100,000,000. The money is at hand. A sub-committee has been appointed to draft an ordinance and submit it to the local committee at an early date. This sub-committee will designate the length of the franchise.

News Notes

Commission Membership Increased.—Governor Edge of New Jersey has signed the bill to increase the membership of the board of Public Utility Commission from three to five.

Merchants Oppose Municipal Ownership.—The directors of the Merchants Association of New York have entered a protest against the passage of bills now pending in the New York State Legislature authorizing municipal ownership and operations of public utilities.

Springfield Men Receive an Increase.—The Springfield (Ohio) Railway has announced an increase of 1 cent an hour in the wages of motormen and conductors, effective on April 1. The schedule ranges from 27 cents for one-year men to 31 cents for men who have been in the service four years.

Bill Taxing Gross Incomes Signed.—Governor Edge of New Jersey has signed Assembly Bill No. 69, which provides for a tax on the gross income of electric railway, gas and electric corporations, instead of the personal property assessment that prevailed previously. The law is to become operative on Oct. 1 next.

Joplin Strike Ended.—The strike of the employees of the Joplin & Pittsburg Railway, Pittsburg, Kan., has ended and the men have returned to work after having been out for one month. It is said that the international officials of the union held that the men had no right to refuse to work under a contract which they had accepted and signed and that the men must live up to the contract.

Strike in Waco.—Conductors and motormen, to the number of 110, employed by the Texas Electric Railway in the operation of the local lines in Waco, Tex., went on strike at midnight of March 9, following rejection of their demands by A. J. Bush, Jr., assistant general manager of the railway and general superintendent of the Waco lines. The men demand recognition of the union and a basic nine-hour day with time and one-half for overtime.

Bought Thrift Stamps.—Many of the patrons of the Pittsburgh (Pa.) Railways who received the rebate on the excess night fares are said to have bought War Savings Stamps with the money which was returned to them. The amount invested in this way is estimated to have been more than $35,000. James Francis Burke, director of savings in Western Pennsylvania, made the suggestion about this use of the rebates to the benefit of the government.

City Representatives Inspect Railway.—Members of the street railway committee of the City Council of Cleveland, Ohio, made their annual inspection of the property of the Cleveland Railway on Feb. 21. Councilman Stannard is the new chairman of the committee. Charles H. Clark, superintendent of maintenance of way of the company; Paul E. Wilson, secretary to J. J. Stanley, president of the company, and Fielder Sanders, Street Railway Commissioner of the city, accompanied the members of the committee.

Conference on Daylight Saving.—Operating managers of the various transportation companies in the city of New York notified the Public Service Commission at a conference on March 20 that they anticipated no difficulty in conforming to the daylight saving plan. Each company will turn the hands of the clock ahead one hour at 2 a.m. on March 31. The managers did not see any necessity of changing the present rush-hour schedules. As the change will take place on Sunday morning, it will help the public in getting used to it before a work day begins.

Railway Dragged Into Politics.—Roy Smock, the first city railway supervisor under the franchise secured by the Des Moines (Ia.) City Railway, is without desire on his part playing an important part in the city campaign which is now on. Steve Hill, styled by many as the Chamber of Commerce candidate for Mayor, charges that Mr. Smock has been favorable to the interests of the Des Moines City Railway to the detriment of the interest of the city, and states openly that if elected one of his first acts will be to discharge Mr. Smock.

Seek to Amend Vestibule Bill.—A bill to amend the public service commission's law in relation to inclosing the platforms of street cars has been introduced in the Assembly and referred to the committee on railroads. The new section, as amended, would read as follows: "Power of commission to order street car platforms inclosed. The commission having jurisdiction shall, after a hearing either on its own motion or on a complaint, have power to make an order compelling the inclosing or vestibuling of all platforms on street cars for the safety and comfort of the employees and public, operated in any city of over 450,000 inhabitants upon any line or lines of street railways therein."

Increase in Wages Asked in Hamilton.—The conductors and motormen employed by the Hamilton (Ont.) Street Railway, whose agreement expires on April 1, have asked the company for an increase of wages of 12 cents an hour over the present schedule, and for other concessions. The new rates requested are: First year men, 36 cents an hour; second year men, 38 cents an hour; three years and over, 42 cents an hour. The men also ask time and a half for overtime and legal holidays, double time for Sundays, 25 cents a day extra for training beginners and operating snow sweepers. They also want free uniforms for men who have served more than a year.

M. O. Path in Tacoma Not Easy.—Members of the City Council of Tacoma, Wash., see a possibility of the Federal Board of Investments refusing to sanction a bond issue at the next spring election for the purchase by the city of Tacoma of the Tacoma Railway & Power Company's system, as proposed by Commissioner C. D. Atkins. Mayor Fawcett is opposed to purchase of the traction system, suggesting as an alternative that the city condemn portions of the property as the company's franchises expire within the next few years. The other members of the Council consider the Mayor's plan to be faulty, in that it would take years for the city to acquire the system by the condemnation method outlined.

Motorman Sentenced for Reckless Driving.—One of the few cases in which a motorman has been sent to the penitentiary in connection with accidents in which life was lost is that of Fred West, who was received at the Indiana Reformatory, Jeffersonville, Ind., on Feb. 19, from Indianapolis, to serve a term of from two to twenty-one years for involuntary manslaughter. On Aug. 12, 1917, a car operated by West ran off the tracks at College and Fairfield Avenues and overturned. A number of persons were injured and several were killed. An indictment was returned charging West with operating his car at excessive speed in violation of a city ordinance. West pleaded that his brakes refused to hold and that he was unable to control the car.

Another Hearing on Chicago Program.—A public hearing was held in the City Council chamber in Chicago on March 13 on the program outlined by the local transportation committee for the solution of the traction problem. Chairman Capitain and G. T. Seely, assistant general manager of the Metropolitan West Side Elevated Railway, Northwestern Elevated Railroad and the South Side Elevated Railroad, explained the plans in detail. A number of representatives of improvement associations also spoke, most of them desiring extensions of rapid transit lines into remote territory. There was also some objection to building a two-level elevated structure on one of the downtown streets. The committee took all these matters under consideration and will hold another meeting at an early date.

Asks Mayor to Be Accurate.—Mayor Hylan of New York uses the Brooklyn Rapid Transit lines to reach the City Hall. He is impatient of delays such as the regular operation of a railroad impose at times, and in several instances has scored the company unjustly. One of his habits is to use figures carelessly. For this he has already been called to account by Chairman Straus of the Public Service Commission. On March 14 Acting Chairman Whitney of the commission felt it incumbent upon him to write the Mayor about his besetting sin. Mr. Whitney said in conclusion: "In view of the facts it must be again apparent to you that your statement that the B. R. T.

has thirty-two fewer cars in operation now than in 1917 or 1913 is not justified by the facts, and in all fairness should not be repeated."

Programs of Meetings

National Lumber Manufacturers' Association

The National Lumber Manufacturers' Association will hold its sixteenth annual meeting at the Congress Hotel, Chicago, Ill., on April 8-9.

New England Street Railway Club

The banquet committee of the New England Street Railway Club announces that on March 25 seat assignments will close for the eighteenth annual meeting and banquet of the club, to be held at the Copley-Plaza Hotel, Boston, on March 28. The speakers are Thomas N. McCarter, chairman of the war board of the American Electric Railway Association and president of the Public Service Railway, Newark, N. J., and John W. Weeks, Senator from Massachusetts.

Wisconsin Electrical Association

The program has been announced for the tenth annual convention of the Wisconsin Electrical Association at the Hotel Pfister, Milwaukee, on March 27 and 28. The opening of the session at 9.30 a. m. on March 27, will be followed by the address of the president. The afternoon session will be in conjunction with the Wisconsin Gas Association. A joint convention dinner will be held in the Fern Room of the Hotel Pfister on the evening of March 27, at 7 o'clock.

The program of the papers for March 27 follows:

"Depreciation in Connection with Public Utilities," by Edwin S. Mack, of Miller, Mack & Fairchild, Milwaukee, Wis.

"Public Regulation of Public Service Companies," by John H. Roemer, formerly chairman of the Railroad Commission of Wisconsin.

"The Presentation of a Case Before a Public Service Commission," by Harold L. Geisse, secretary of the Railroad Commission of Wisconsin.

The program of the papers for March 28 follows:

"The Utilities and the War," by M. C. Ewing, secretary-treasurer of the Wisconsin Valley Electric Company, Wausau, Wis.

"Metal Electrode Welding," by Dean Treat, manager of the Wisconsin Railway, Light & Power Company, La Crosse, Wis.

"Increasing the Efficiency of Hydroelectric Plants," by Daniel W. Mead, of Mead & Seastone, consulting engineers, Madison, Wis.

"Three-Phase Four-Wire Distribution," by George E. Wagner, superintendent of plant of the Madison Gas & Electric Company, Madison, Wis.

In addition to the papers on March 27 there will be an address by W. N. Fitzgerald, State Fuel Administrator for Wisconsin.

Financial and Corporate

British Columbia Meeting

£44,000 Transferred from Reserve Fund to Meet Dividends—Net Gain of £26,000 for Year

At the annual meeting of the British Columbia Electric Railway, Ltd., Vancouver, B. C., it was announced that the net income of the company for the year ended June 30, 1917, was £160,844. After adding the preceding year's balance and transfers, and deducting interest on debentures and debenture stock and dividends already paid on the 5 per cent cumulative perpetual preference stock, there remained a balance of £7,032 to be carried forward. In order to meet the dividend payments accounted for it was necessary to transfer £44,000 from the reserve fund. The figures given represent an improvement of approximately £26,000 over the previous year's results.

It was stated at the meeting that for the first four months of the current year the gross earnings showed an increase of approximately £29,400. This increase, however, was more than absorbed by increased expenses due to higher wages and increased cost of materials. As a consequence, the net earnings showed a decrease of £520.

Owing to the uncertain outlook for the immediate future, the directors felt it prudent to postpone the payment of the interim dividend payable on Jan. 15, 1918, on the 5 per cent cumulative perpetual preference stock. If at the end of a financial year an improvement in operating results is shown, however, the whole or part of the dividend may be distributed next July.

Spokane Valuation Hearing

Washington and Idaho Commissions Begin Hearings to Fix Rate-Making Values

Hearings were held for two days recently before the Public Service Commission of Washington and the Public Service Commission of Idaho to fix a valuation on which will be based the new rates to be charged by the Washington Water Power Company, Spokane, operating 110 miles of electric railway. At the outset the company objected to the Public Service Commission of Idaho fixing rates on power developed in Washington. The company contended that this was beyond the jurisdiction of the Idaho commission.

J. S. Simpson, an engineering accountant for the Washington commission, told how the company had grown from a corporation with an investment of $235,000 in 1889 to one with nearly $25,000,000 at the end of 1916. He said that there was a dollar of actual investment for every dollar of outstanding stock or indebtedness.

All matters pertaining to the affairs of the Washington Water Power Company in Idaho were asked to be separated from the Washington figures by the Idaho commission. Mr. Simpson promised to see that this was done.

Attorney Post for the company served notice on the joint commission that he will ask that the valuation be based on the level of 1917 war prices rather than on the five-year average ended Dec. 31, 1916.

Chairman Blaine of the Washington commission thought it was impractical for the commission to base its valuation on the abnormal prices prevailing since the war began. The commission had followed the plan of averaging costs for a period of five years and basing its valuations accordingly. He thought the commission, when considering the cost of operation, would take into consideration the increased cost of labor and operating material.

The cost of reproduction fixed for the company's property follows:

Property in Washington	$21,625,969
Property in Idaho	2,492,815
Total	$24,118,784
PROPERTY IN WASHINGTON	
General office buildings	$295,073
Power plants	6,993,897
Railway system	5,664,512
Storage battery	178,338
Transmission lines	1,047,236
Rural extensions	79,580
Telephone lines	98,198
Substations	1,492,281
Distribution system	2,903,210
Miscellaneous property	302,681
Pole line easements	29,916
Working capital	115,200
Lands	1,531,992
Total	$20,732,114
Non-operating property	893,855
Total	$21,625,969
POWER PLANTS IN WASHINGTON	
Monroe Street power plant	$681,019
Little Falls	1,943,711
Long Lake	4,369,167
Total	$6,993,897

The hearing will be continued on April 8.

Ten Per Cent Gain in Ottawa Operating Net

The net earnings from operation of the Ottawa (Ont.) Traction Company for the calendar year 1917 amounted to $535,289 as compared to $484,564 in the year preceding. The increase, therefore, was $50,724, or 10.4 per cent. The gross receipts in 1917 totaled $1,240,627 as compared to $1,154,912 in 1916. The total expenses, including mileage payments, taxes and interest, were $830,961 in 1917 and $776,587 in 1916.

The usual quarterly dividends of 3 per cent were paid during the year, and a bonus of 3 per cent. The reservation for depreciation was $110,000. The balance to the credit of profit and loss account at the end of the year was $267,590. A total of 29,347,692 passengers were carried in 1917, as compared to 27,033,778 in 1916, an increase of 2,313,914.

I. T. S. Shows Revenue Needs

Detailed Exhibit Presented to Illinois Commission to Support Petition for Emergency Rates

The principal exhibit of the Illinois Traction System, Peoria, Ill., in the emergency rate case now pending before the Public Utilities Commission, consists of a series of compilations showing the company's financial condition. Previous references to the hearings on the company's blanket application for increased rates on fourteen city railway, electric and gas properties were made in the ELECTRIC RAILWAY JOURNAL of Feb. 23, page 389, and March 9, page 479.

WHAT THE EXHIBITS SHOWED

The exhibit was submitted in two sections, each one containing compilations for each class of petitioning service and for certain combinations of classes and all classes combined. Part I showed the average earnings and expenses and the average return received by each property during 1914, 1915 and 1916 (the three pre-war years). It also showed the earnings and expenses as estimated for 1918, on the assumptions that the rates remained without change during the year, that the business continued approximately the same as in 1917, and that the prices of coal, oil, labor and materials prevalent in December, 1917, continued in effect. Part II differed only in that it showed the estimated earnings for 1918 under the proposed higher rates.

The accompanying table shows the data submitted for the railway departments of the various properties. The tables from Part I and Part II have been combined to avoid the repetition of the first five columns. With business the same as in 1917 and prices the same as in December, 1917, the railway departments would show $497,236, or 5.74 per cent, available for depreciation and return under 1917 rates, and $638,807, or 7.62 per cent, under the proposed rates.

The fair value of all the petitioning properties on Jan. 1, 1918, was put at $22,684,818. This figure was obtained by totaling actual prices paid, as shown by cost vouchers. The average amount available during 1914-1916 for depreciation and return was $2,122,141, or 10.31 per cent. Under 1917 conditions as regards rates and business, and with prices in effect in December, 1917, the amount available for depreciation and return in 1918 would be $1,505,871, or 6.64 per cent. With business the same as in 1917 and prices continuing the same as in December, 1917, but with rates increased as proposed, the amount available for depreciation and return in 1918 would be $2,140,533, or 9.38 per cent.

FINANCIAL DATA COVERING ONLY THE CITY RAILWAY DEPARTMENTS OF ILLINOIS TRACTION SYSTEM

	Three Year Average Operation 1914—1915—1916					Estimated Operation—1917 Business and Rates, with Prices Prevalent at End of 1917				Estimated Operation—1917 Business and Rates Adjusted to Proposed Rates, and Prices Prevalent at End of 1917			
			Available for Depreciation and Return					Available for Depreciation and Return				Available for Depreciation and Return	
	Gross Operating Revenue	Expense and Taxes	Amount	Per Cent	Fair Value Jan. 1, 1918	Actual Revenue, 1917	Estimated Expense and Taxes	Amount	Per Cent	Earnings Under Proposed Rates	Estimated Expense and Taxes	Amount	Per Cent
Jacksonville Ry. & Lt. Co.	$48,944	$34,053	$14,891	6.29	$243,876	$44,509	$33,766	$10,743	4.40	$50,860	$33,766	$17,094	6.77
B. & N. Ry. & Lt. Co.	202,021	127,632	74,389	6.84	1,116,060	183,363	163,709	19,654	1.76	203,963	163,709	40,254	3.61
Caro Elec. & Trac. Co.	57,388	38,358	19,030	8.99	274,300	52,234	45,947	6,287	2.29	62,154	45,947	16,207	5.91
Danville St. Ry. & Lt. Co.	213,397	111,271	102,126	9.39	1,113,800	248,618	195,395	53,223	4.78	252,618	195,395	57,223	5.14
Decatur Ry. & Lt. Co.	216,851	123,676	93,175	11.21	804,500	238,943	161,122	77,821	9.67	245,243	161,122	84,121	10.45
Galesburg Ry., Lt. & Pr. Co.	149,709	102,616	47,093	6.45	846,000	141,216	123,230	17,986	2.12	147,916	123,230	24,685	2.92
Northern Ill. Lt. & Trac. Co.	41,952	30,788	11,164	8.36	145,820	28,117	18,600	9,517	6.52	28,117	18,600	9,517	6 52
Peoria Ry.	783,731	523,149	260,582	12.18	2,477,470	859,670	665,617	194,053	7.83	932,670	665,617	267,053	10.78
Quincy Ry.	208,408	128,625	79,783	7.68	1,044,000	213,821	149,885	63,936	6.12	225,021	149,885	75,136	7.20
Urbana & Champaign Co.	146,307	84,453	61,854	11.53	554,000	145,704	101,688	44,016	7.95	149,204	101,688	47,516	7.27
Total	$2,068,708	$1,304,621	$764,087	9.62	$8,619,886	$2,156,195	$1,658,959	$497,236	5.74	$2,297,766	$1,658,959	$638,807	7.62

Application Made for Receiver

Chancellor Walker has signed an order requiring the Trenton, Lakewood & Seacoast Railway to show cause at Long Branch, N. J., why a receiver should not be appointed for the company. The order carries with it a preliminary injunction restraining the company from disposing of any of its assets pending the receivership application, which is made by Frank Tilford, New York, a bondholder. The company was formed to build an electric railway 40 miles long, extending from Trenton by way of Allentown and Lakewood to Point Pleasant.

In 1908 the Court of Chancery named James M. Dickinson receiver for the company and he sold the property to new interests. Mr. Tilford sets up in his bill of complaint that no part of the road has ever been constructed; that in July of 1910 the company executed to the Trenton Trust & Safe Deposit Company as trustee a mortgage to secure $1,500,000 of gold bonds, of which $260,000 have been issued; that the company has no income; that judgments have been entered against it, and that it owes Charles R. LeCompte and James H. Butcher $19,800 for money loaned or advanced by them. He declares that a receiver is necessary for the protection of those interested.

1917 Returns for York

Gross Earnings Increased 8.7 Per Cent, but Operating Expenses Increased 22 Per Cent

Although increased travel brought about a wholesome improvement in revenues for the York (Pa.) Railways during the year ended Nov. 30, 1917, the cost of transportation showed a preponderating increase. The gross earnings in 1917 totaled $1,051,472, an increase of $83,975 or 8.7 per cent over those for the preceding year. Operating expenses and taxes, however, rose $118,565, or 22 per cent, to a total of $655,873. The expenses included an item of $60,161 for depreciation, an increase of $19,620.

The net earnings at $395,658 represented a decrease of $34,589. The payments for interest and bond discount showed a small decrease, however, and as a result the net income fell off $27,154 or 15.8 per cent, to a figure of $144,018. The surplus balance on hand on Nov. 30, 1917, amounted to the sum of $240,813.

CONSTRUCTION CURTAILED

Owing to high cost, the difficulty of obtaining equipment and the desire of the government for companies to avoid making unnecessary demands upon the investment market, the York Railways did not in 1917 engage in any construction work not absolutely required. The expenditures charged to cost of property for the railway lines were $39,764.

FLOATING INDEBTEDNESS KEPT DOWN

During the last fiscal year no securities were sold and no floating indebtedness was incurred. The deferred dividend on the preferred stock, amounting to 2½ per cent, was fully paid up on Jan. 30, 1917. Items aggregating $44,325 were written off and charged to depreciation. A sum of $13,656 was realized from the sale of obsolete and worn-out equipment and credited to construction. Real estate amounting to $1,310 was sold by the company.

Wants Valuation Discontinued

Declaring that continuance of the work of making a physical valuation of the country's railroad systems, authorized by Congress several years ago, would involve an expenditure of upwards of $50,000,000 at a time when this money could be used for more vital war purposes, directors of the Philadelphia Bourse have adopted and forwarded to Washington resolutions urging that Congress repeal the law under which the valuation is being made.

A bill providing for the repeal of the physical valuation act has already been introduced and the Bourse makes an earnest plea that it be favorably acted on.

Financial News Notes

Wheeling Suburban Line Leased.—Arrangements are said to have been completed by which the property of the Steubenville, Wellsburg & Weirton Railway, consisting of about 14 miles of line, will be operated under lease by the Wheeling (W. Va.) Traction Company.

Additional Preferred Stock for Rochester Company.—The Public Service Commission for the Second District of New York has granted permission to the Rochester Railway & Light Company to issue $2,000,000 par value of its 7 per cent cumulative preferred stock. The company will use the additional capital in paying off notes taken up for construction work and to reimburse its treasury for sums expended for purposes of capitalization.

Indiana Road for Sale Under Foreclosure.—Herbert E. Bucklen, appointed receiver for the St. Joseph Valley Railway, Elkhart, Ind., in the Superior Court at Elkhart several weeks ago, has been ordered to sell the property and advertised the road to be sold on March 20. It was proposed to offer the road first as a going concern and if it could not be sold that way to sell it in parcels. Should this manner of selling prove unprofitable, the ties, rails and rolling stock will be sold separately and the road junked. The road is 9 miles long.

Funds Deposited to Meet Pittsburgh Coupons.—The Pittsburgh (Pa.) Railways has deposited funds with the trustees for the coupons that were in default on the various issues of bonds, except the $4,804,000 of United Traction Company, Pittsburgh, bonds. The coupons will be paid on presentation. The bondholders' protective committee, of which Thomas S. Gates is chairman, has a suit pending seeking to compel recognition by the Philadelphia company of responsibility for the principal and interest on underlying bonds of companies in the Pittsburgh Railways.

Object to Abandonment. — A joint resolution has been adopted by the Common Council of Richmond, Va., and will now go to the Board of Aldermen asking City Attorney Pollard to report as to what steps will be necessary to compel a resumption of service by the Richmond & Chesapeake Bay Railway, or else remove the company's tracks from the streets of Richmond. The suspension of operation by the company was noted in the ELECTRIC RAILWAY JOURNAL of Jan. 12, page 105.

Debentures Offered by Cities Service.—Stockholders of the Cities Service Company, New York, N. Y., are given the right to subscribe to $3,000,000 series "B" 7 per cent convertible gold debentures. They are dated Jan. 1, 1918, and are due Jan. 1, 1966. Coupon debentures, which may be registered as to principal, are in denominations of $1,000 and $500. Debentures, registered as to principal and interest, are in denominations of $5,000, $1,000, $500, $100, $10 and multiples of $10 up to $100. Interest on coupon debentures is payable semi-annually on Jan. 1 and July 1 in each year. Interest on debentures, registered as to principal and interest, is payable by check at the option of the holder, either annually, semi-annually, quarterly or monthly, except that interest on debentures of less than $100 principal amount shall be payable on Jan. 1 annually. The only interest bearing obligations of Cities Service Company, other than these series "B" debentures, are $54,900 series "A" 5 per cent debenture bonds yet remaining unconverted and a note given in purchase of Liberty Bonds.

Dallas Return 2 Per Cent in January.—Figures showing the earnings of the Dallas (Tex.) Railway for January, 1918, under the Hobson-Strickland franchise, as compared with those for January, 1917, under the old franchises, have been prepared by M. N. Baker, supervisor of public utilities. The gross earnings for January, 1918, show an increase of $3,736 over those of the same month in 1917, but a decrease of $6,234 as compared with December. Railway operating expenses increased materially, the increase being mainly for power purchased, salaries and wages, and expenses in connection with the operation of the Interurban Terminal Building. Operating statistics show that more cars were operated in January, 1918, but that the earnings per car-mile were considerably less. Up to Jan. 31, 1918, a total of $45,386 had been expended on improvement requisitions by the railway. The balance available for the authorized return for January, 1918, was at the approximate annual rate of 2 per cent of the authorized property valuation. The return was about 4 per cent for the first four months of operation under the new franchise. This period included the time of the Texas State Fair, when business was particularly heavy.

Electric Railway Monthly Earnings

CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$46,120	*$27,356	$18,764	$6,535	$12,229
1 " " '16	40,284	*22,346	17,938	6,552	11,386
12 " " '17	464,081	*298,247	165,834	78,652	87,182
12 " " '16	393,666	*231,265	162,401	78,327	84,074

COLUMBUS (GA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$103,820	*$42,155	$61,665	$31,782	$29,883
1 " " '16	84,383	*30,166	54,217	28,527	25,690
12 " " '17	1,096,066	*420,461	675,605	359,102	316,503
12 " " '16	881,353	*351,233	530,120	343,574	186,546

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$209,590	*$129,650	$79,940	$38,573	$41,367
1 " " '16	176,496	*109,857	66,639	36,859	29,780
12 " " '17	2,088,121	*1,384,871	703,250	450,880	252,370
12 " " '16	1,944,839	*1,236,107	708,732	438,993	269,739

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$31,192	*$20,311	$10,881	$5,075	$5,806
1 " " '16	29,777	*15,080	14,697	5,240	9,457
12 " " '17	343,133	*216,452	126,681	61,300	65,381
12 " " '16	326,398	*186,459	139,939	63,916	76,023

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '18	$3,569,021	$*1,964,320	$1,604,701	$1,170,105	‡§$726,346
1 " " '17	3,630,692	*1,707,049	1,923,643	1,005,214	‡§975,997
7 " " '18	23,238,037	*13,059,033	10,179,004	7,652,190	‡§4,260,578
7 " " '17	22,653,717	*10,885,528	11,768,189	6,978,987	‡§5,196,829

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '18	$575,927	*$291,809	$284,118	$217,531	$66,587
1 " " '17	541,294	*234,332	306,962	216,231	90,731

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '18	$542,301	$370,858	$171,443	$94,665	$76,778
1 " " '17	490,380	282,843	207,537	84,008	123,529

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$971,130	*$611,043	$360,087	$203,619	$156,468
1 " " '16	788,880	*443,296	345,584	184,923	160,661
12 " " '17	9,454,861	*5,854,019	3,600,842	2,351,187	1,249,655
12 " " '16	8,107,371	*5,120,995	2,986,376	2,212,982	773,394

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Dec., '17	$492,941	*$359,717	$133,224	$92,201	‡$51,497
1 " " '16	373,412	*223,729	149,683	81,746	‡72,965
12 " " '17	4,889,915	*3,341,183	1,548,732	1,004,426	‡611,511
12 " " '16	3,987,616	*2,327,407	1,660,209	827,569	‡853,606

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '18	$841,724	$662,165	$179,559	$160,515	$19,044
1 " " '17	897,932	612,161	285,771	149,363	136,408

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*Includes taxes. ‡Includes non-operating income. §Includes accruals under rapid transit contracts with city payable from future earnings.

Traffic and Transportation

Lincoln Petition Heard

Nebraska Commission, Having Decided Against Emergency Rates, Proceeds with Permanent Appeal

The State Railway Commission of Nebraska on March 4 opened the hearing on the application of the Lincoln (Neb.) Traction Company for a permanent increase in the rates of fare. The commission had previously denied an amended appeal for emergency increase. This was noted in the ELECTRIC RAILWAY JOURNAL for March 2, page 435.

RATE AND CAPITALIZATION CASES COMBINED

As a first move the commission decided to consolidate the rate case with the application to issue $281,000 of new preferred stock. This the commission did over the objection of the company. W. E. Sharp, president of the company, took the position that inasmuch as the company was entitled to earn a specific per cent, 7 per cent or some other rate, on the actual investment the amount of stocks or bonds was immaterial, as the distribution of what was left after operating expenses were met was a matter for the company to determine under the supervision of the commission.

The commission had issued orders that certain improvements should be made, and the money of the company was used in making them. It was now asking that it be authorized to sell securities to replace the money. Mr. Sharp had always insisted that rates should be large enough to permit the company to meet all its charges and also build up a surplus to take care of the refinancing and abnormal conditions.

O. J. Shaw, secretary of the company, testified with regard to the details of operation of the company. He said that if the company carried the same number of passengers in 1918 that it did in 1917 it would require an average revenue from each of 6.51 cents to give a return of 1 per cent on the investment. The interests of the company require that the rate of fare shall not be so high that it will drive traffic away from the railway.

SUGGESTIONS FOR CUTTING EXPENSES

Mr. Shaw said there were several ways in which the expenses could be curtailed. One way was to get rid of duplications, reduce unnecessary service and by consolidating lines. Instead of making a flat rate of fare with free transfers, he proposed several alternatives. One was to make a basic rate of fare, with additional charges for zones. Another was to charge for transfers. Attention was also called to the fact that the selling of school tickets at ten tickets for a quarter was just about half the cost of carrying the holders, and that it was impossible to prevent the abuse of the school tickets and the fraudulent use of transfers by passengers, owing to the location of the lines.

VALUE PLACED AT $3,300,000

Mr. Shaw figured the total actual value and investment in the railway, the light and power, and the heating department as in excess of $3,300,000. In arriving at these figures he took the basic valuation as determined by the commission in 1909, when the consolidation took place, which was $1,992,000, and to this added all additions and betterments and made the necessary deductions. He found values as follows: railroad plant, $2,861,724; of the light and power plant, $341,163, and of the heating plant, $131,431.

Oregon Commission Upheld

Circuit Court Upholds Right of Commission to Fix Rates—Necessity or Reasonableness Not Considered

The 6-cent fare ruling of the Public Service Commission of Oregon in the case of the Portland Railway, Light & Power Company was upheld by a unanimous opinion handed down on March 14, by the six circuit judges of Multnomah County sitting en banc.

The opinion states that the "expediency, necessity or reasonableness" of the 6-cent fare was not considered, but that the opinion was based solely on the points of law involved in the question of whether the commission has the power to regulate the rates of any public utility. The opinion covers all the arguments advanced both for and against the 6-cent fare during the hearing.

The city will appeal the case to the State Supreme Court.

DECISION A VICTORY FOR COMPANY

The decision is regarded as a signal victory for the company as the collection of 6-cent fares can continue. This would not have been the case if the opinion had been unfavorable.

The decision of the commission in the case was reviewed at length in the ELECTRIC RAILWAY JOURNAL of Jan. 26, page 184. The hearing on the appeal of the city to the courts from the decision was begun on Feb. 26 and the testimony was reviewed in the issues of this paper for March 9, page 479, and March 16, page 543. In addressing the court Assistant Attorney General Bailey, who represented the commission, said that the only question before the court in the case was whether or not the court had the jurisdiction to change the rates.

Franchise Relief Refused

Washington Body Dismisses Service Complaint, But Otherwise Is Uncertain of Its Authority

The Public Service Commission of the State of Washington, in a recent decision in Tacoma, dismissed the complaint of certain Tacoma residents against the Tacoma Railway & Power Company, filed for the purpose of compelling the company to improve service given on Center Street. The majority of the commission took the view that the commission was without power to grant the railway authority to increase its fares beyond the 5-cent limit fixed by the State law.

COMMISSIONERS NOT FULLY AGREED

Each member of the commission wrote an opinion in the case. Commissioners A. A. Lewis and Frank R. Spinning both expressed the belief that the maximum 5-cent fare, fixed by the State law, could not be exceeded. Chairman E. F. Blaine, however, took an entirely opposite view, holding that it was the province and duty of the commission to say what was a reasonable and fair rate, irrespective of the 5-cent maximum given in the State law. The commissioners, however, in view of the varied opinions of its members, expressed the hope that the matter will be taken to the Supreme Court, and a precedent established on which they may base future decisions.

Corporation Counsel Caldwell of Seattle has been instructed by the City Council to appear in the case, as a friend of the court, in the event an appeal is taken. Counsel Caldwell, in calling the matter to the attention of the court, pointed out that, from the decision in the Tacoma case, it would seem likely that any attempt of the Puget Sound Traction, Light & Power Company, Seattle, to obtain an order increasing its fares, would meet the unfavorable action of the commision, unless one course is to be followed in Tacoma and another in Seattle.

CASE CARRIED TO COURT

Immediately following the decision of the commission, Louis H. Bean, manager of the Tacoma Railway & Power Company, secured a writ from Chief Justice Ellis, directing the Public Service Commission to either grant the Tacoma company such relief at once, or show cause before the Supreme Court on March 15 why it should not be done. The petition recites that while the commission, in the recent Tacoma Avenue decision, denied the company's prayer for increased fare and relief from franchise obligation, it also found that the company could not render safe, adequate and sufficient service without such relief. In seeking a writ, the company contends "that great and irreparable injury will be done the city of Tacoma, Pierce County, and the United States if the commission's policy as announced by the majority opinion is carried out, because of existing war demands for adequate transportation."

Connecticut Fare Brief Filed

Answer of Company in Rate Case Says City Has Failed to Prove Six-Cent Fare Unreasonable

In concluding its brief filed with the Public Service Commission of Connecticut in the case involving the appeal of the city of Hartford for the restoration of the 5-cent fare in that city, the Connecticut Company made the following statement of remedies suggested for the relief of the present financial condition of the company:

"In addition to a finding by the commission that at the present time the 6-cent fare upon all its lines is not unreasonable and excessive, we still feel that there are other remedies which should be granted to the company, although most, if not all, of these remedies lie rather in the power of the Legislature than in the power of the Public Utilities Commission.

REMEDIES SUGGESTED

"1. The company should be allowed to earn a sufficient amount to pay its operating expenses, taxes, fixed charges, maintenance and depreciation, and a fair return upon the value of the property devoted exclusively to the public use, irrespective of how this revenue shall be secured.

"2. The industry is such an important part of the community life that any further legislation should look toward permanent means of keeping the property in a safe and convenient operating condition, and to secure to the company the opportunity of raising either public or private funds in such a way that the development of the property may be constant, both with respect to the extension of lines and enlargement of facilities on existing lines.

"3. There should be no change or alteration in the law which permits the directors of the Connecticut Company to manage the properties as they have been accustomed to do in the past, but they should still be subject to inspection and supervision by the Public Utilities Commission. Especially should no change be made in the fare regulatory powers of the commission.

"4. The company should be relieved of the burdens placed upon it by statute, providing for the construction and maintenance of pavements between its tracks, and the company should not be subject to the construction programs of municipalities which vary from year to year, and which compel the expenditure of money out of capital or earnings, the expenditure of which funds is entirely non-productive to the car rider.

"5. The company should be given relief from the excessive burden due to ornamental bridge construction, which falls within the same class as the burden with respect to new pavement and pavement repairs.

"6. There should be passed legislation with respect to the competition of jitneys, so that if this form of transportation is to exist it may be taxed by the State and regulated by the commission, so that the competition between the two forms of transportation should be upon a fair basis.

"7. The only manner in which first class electric railway service can be assured to the car rider, regardless of whether public or private capital is employed, is for the rate of fare to be sufficient tc pay a proper rate of interest, and if public funds are to be employed, any deficit in operating expenses must be made up from taxes upon the community served.

"The solution suggested by Mr. Brush is the service-at-cost scheme, which has been tried in Cleveland, Dallas and Kansas City. This plan involves a graduated scale of fares to go up and down automatically as the rehabilitation fund is increased or depleted. It is similar to the Cleveland scheme, with the exception that it avoids the criticism of the latter in that it has no maximum rate of fare. Such a scheme avoids any hearing upon what rate of fare shall be charged. As this scheme is in an embryonic state, it will not do in this brief to go into the subject, but for a final solution of the street railway difficulties some such method undoubtedly must be adopted eventually."

THE CITY'S POINTS ANSWERED

In conclusion, the company answered the points of counsel for the city at the end of his brief, by stating:

"1. That Hartford has no right to be considered separate and apart from all the other properties of the Connecticut Company for the purpose of determining whether or not the 6-cent fare in Hartford is reasonable for the reasons hereinbefore stated. That the company is not delinquent in keeping its books, as they are kept in accordance with the Interstate Commerce Commission system of accounting, and in the form prescribed by the Public Service Commission of Connecticut, and that it has been justified in keeping them in this manner, though the method employed does not meet with the approbation of the city of Hartford.

"2. That no rearrangement of the fare zones should be made at the present time, or made at any time, without the most careful study into both social and economic conditions.

"3. That the proof shows very clearly that, owing to the large increase in operating expenses of the company, the 6-cent fare is not unreasonable or unjust to the short rider than was the former 5-cent fare.

"4. That the city has failed to maintain its burden of proof that the 6-cent fare is an unreasonable and excessive rate of fare or charge in the city of Hartford, and from Hartford to adjoining towns, and that the petition of the city of Hartford should be dismissed."

The brief of the city was reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 339. The city did not concede that in so far as Hartford was concerned the company needed additional revenue, but it argued that if this were the case then there should be a rearrangement of the fare zones, with a central 5-cent fare zone as a base.

Relief for Jersey Interurban

Company Authorized to Increase Fare from Five Cents to Six Cents in Each of Seven Zones

The Northampton, Easton & Washington Traction Company, Easton, Pa., was authorized by the Board of Public Utility Commissioners of New Jersey on March 11 to increase the rate of fare from 5 cents to 6 cents in each of the seven fare zones from Phillipsburg to Port Murray, N. J., a distance of 17 miles. This is in accordance with the application made previously to the commission, but denied by that body in July, 1917, because of court rulings, which have since been more liberally construed.

PETER ROBBED TO PAY PAUL

At the previous hearing it was shown that there was a deficit of $7,150 for the year 1915; and a deficit of $5,311 for the year 1916. The additional proofs offered when the appeal to the commission was renewed showed a deficit of $7,131 for 1917, and a comparative deficit for January and February, 1918, of an increased amount. The proofs also showed that conditions were growing worse instead of better. Not one dollar had been set aside for depreciation in any of the years mentioned. The net operating return had been and continued to be insufficient to meet interest on the bonded debt, but the interest on the bonded debt of the company had been paid, any deficit in the sum of money required for the payment of interest having been loaned by the Northampton, Easton & Washington Traction Company of Pennsylvania to the New Jersey Company.

The New Jersey board in its previous report dated July 16, 1917, recognized the serious financial condition of the company, but felt constrained to deny it relief because of its interpretation of the decision of the New Jersey Supreme Court in the case of the Atlantic Coast Electric Railroad vs. the Publis Service Commissioners, 89 N. J. Law, page 407.

The petitioner caused the findings of the Board of Public Utility Commissioners in its proceedings to be reviewed by the Supreme Court, and the decision filed during the present February term holds that it is the duty of the Board of Public Utility Commissioners to approve the establishment of a just and reasonable rate, when it appears that the existing rate is insufficient regardless of limitations contained in municipal ordinances respecting rates of fare.

The order in question was therefore set aside and the Northampton, Easton & Washington Traction Company renewed its application before the New Jersey Board for the increased fares.

Suburban Seeks Increase

Trenton-Princeton Road Wants to Boost Fare Unit from Five Cents to Six Cents

The New Jersey & Pennsylvania Traction Company on March 16 asked the Board of Public Utility Commissioners of New Jersey to sanction an increase of 4 cents in the fare between Trenton and Princeton. The company would also have the board rescind the order requiring it to sell blocks of twelve tickets for $1. The commissioners set April 12 for a hearing on the request.

FARE INCREASE FROM TWENTY TO TWENTY-FOUR CENTS

The Princeton branch is at present divided into four 5-cent zones. The company is asking the commission to allow it to demand 6 cents for each zone, making the fare 24 cents one way. The block tickets were ordered continued by the Utility Board when the fare was made 20 cents in 1916. They are good for travel from Lawrenceville to Trenton or Princeton. The traction company maintains that the use of the tickets is being abused for continuous rides between Trenton and Princeton. The company contends that to eliminate the tickets and make the fare 6 cents for each zone would increase the revenues "sufficiently to overcome, in part at least, the advanced operating expenses now being incurred."

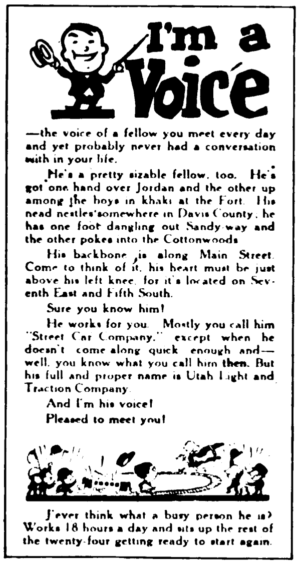
Frank S. Katzenbach, counsel for the company, sets forth that its net earnings for 1916 were $19,417, but that they dropped last year to $13,328 because of the increased cost of labor and materials. Gross earnings for 1917, however, increased $4,004 over 1916.

FARE ONCE TEN CENTS

The road was in the hands of a receiver in 1913, when the fare to Princeton was 10 cents. The Utility Board ruled that the income was insufficient and Princeton and Princeton Township revoked their ordinances which prohibited any increase. The Utility Board fixed the rate at 15 cents, but on two years' trial ruled that the sum was still too low and then 20 cents was decided upon. The board declared in 1913 that a net profit of $30,000 was warranted by the value of the property.

Opposition Organizes

At a conference of the executive committee of the New Jersey State League of Municipalities on March 14 after the postponement of the hearing before the State Board of Public Utility Commissioners on the application of the Public Service Railway for an increase in fares, it was agreed to ask the cities effected to contribute an assessment of 2 cents per capita to raise a fund of between $25,000 and $35,000 to fight the proposed increase. George N. Seger, Mayor of Passaic, president of the league, was authorized to engage ex-Congressman Marshall Van Winkle of Jersey City as chief counsel for the league in the matter.



I'm a Voice

—the voice of a fellow you meet every day and yet probably never had a conversation with in your life.

He's a pretty sizable fellow, too. He's got one hand over Jordan and the other up among the boys in khaki at the Fort. His head nestles somewhere in Davis County; he has one foot dangling out Sandy way and the other pokes into the Cottonwoods.

His backbone is along Main Street. Come to think of it, his heart must be just above his left knee, for it's located on Seventh East and Fifth South.

Sure you know him!

He works for you. Mostly you call him "Street Car Company," except when he doesn't come along quick enough and—well, you know what you call him then. But his full and proper name is Utah Light and Traction Company.

And I'm his voice!

Pleased to meet you!

J'ever think what a busy person he is? Works 18 hours a day and sits up the rest of the twenty-four getting ready to start again.

Enters—Another Baby!

The Utah Light & Traction Company, Salt Lake City, Utah, has begun the publication of a four-page weekly, in which it will carry the message of the company to its patrons. The first issue was dated March 2. The paper has not yet been named. The company is leaving that for its patrons to do, subject, of course, to certain limitations. This process will be turned into a competition best told by the paper itself, as follows:

"Jimminy!

"Oh, my, this is awful!

"They've sent me out all dolled up and haven't given me a monacher—something for folks to call me by when they want me.

"I feel all fussed—just like I'd run off without a necktie—or worse!

"I've simply got to have a name, even if I have to pay to get one. I figure my folks will stand for at least $25 to get me christened.

"So I make you this proposition—

"If you'll find me a name, one that has a lot of pep to it, and that will give folks a good idea of just who, what and why I am, I'll see that a check for $15 goes to the man, woman or child whose name for me is selected by a committee as the best one sent in. For you who are good scouts enough to try, and come close, I'll make $5, a second prize, $3, a third prize and $2 a fourth prize.

"Remember my mission in life—to start the liveliest kind of a conversation on the transportation likes and dislikes, needs and wants of the Salt Lake public and their neighbors and visitors. Put all that in your name, spice it up with a snappy sound, and you'll get those prize simoleons."

The first page of the first issue of the new paper is shown above.

Refer the Doubters to Us

"If you don't believe the situation in the electric railway industry is serious, yes, menacing, read the ELECTRIC RAILWAY JOURNAL of Jan. 5, 1918."—*Watts Watt* of the Portland Railway, Light & Power Company, Portland, Ore.

President McMeen's Story

He Acquaints the Public of Columbus, Ohio, with the Necessity for Increased Fare

In a public statement made on March 13, Samuel G. McMeen, president of the Columbus Railway, Power & Light Company, Columbus, Ohio, said in part:

"We have been telling facts about the cost of railway service and the reason why an increased fare is necessary. We shall continue to do so from day to day. There still remain many facts to be told and many conclusions to be drawn.

ASKING HIGHER FARES DISTASTEFUL

"We do not like to ask for higher fares. But as we are subject to the same trying conditions as others, we must meet them with such action as they require.

"In our discussion of the problem with you and your representatives we mean to be frank, sincere and patient. After all, the task is one calling for a rational meeting of minds, and we feel that some progress has been made. We do not doubt the ultimate fairness of the people of Columbus."

CITY AND COMPANY INTER-DEPENDENT

In one of its advertisements the company calls attention of the inter-dependence of the city and the street railway. The advertisement states that this mutual necessity imposes an obligation upon both. Because the company needs the city and the city needs the railway, it is necessary to take into consideration the means of keeping the road in the best operating condition and at the same time place no undue burden upon the public.

In another advertisement the company defines the ride, instead of the trip, as the unit of measure in electric railway service. The ride consists of three elements, boarding the car, remaining on the car after it has started, and alighting from the car. A trip, if it consists only of a ride, has but the three elements, but if it consists of two rides it has six elements, and if three rides are necessary then there are nine elements.

Whether the passenger proffers for his ride 5 cents, 3⅛ cents or a transfer, the company is compelled to furnish the ride. Hence the ride is the unit of service and for this the company is receiving an average of only 2.6 cents per passenger.

BRINGING APPRAISAL UP TO DATE

According to an estimate furnished the City Council by G. Herman Gamper, the cost of making an appraisal of the present unvalued property of the company would be between $5,000 and $6,000. The Public Utilities Commission's appraisal furnishes the figures for about two-thirds of the property. A committee of Council had been instructed to make an investigation of the cost with the idea of securing data for conducting intelligent negotiations with the company in the future.

City Heard

City Engineer of St. Louis Regards Present Fare Adequate if Franchise Relief Is Granted

C. E. Smith, city engineer of St. Louis, Mo., testified on March 14 before the Missouri Public Service Commission on the United Railways' petition for increased revenues. Mr. Smith said that in his opinion the company would receive a fair return under the present 5-cent passenger fare if it were relieved of the mill tax, other city taxes were reduced, and a franchise extension granted. He added that the company would have to effect certain additional operating economies. Mr. Smith also stated he believed a 5-cent-an-hour increase for carmen was fair, instead of the 10-cent-an-hour increase the men demand.

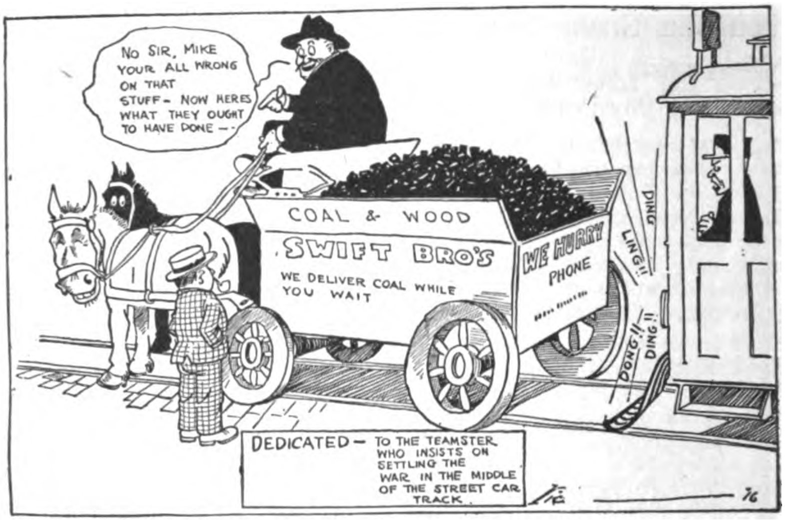
Mr. Smith said that when the United Railways sought a settlement of the mill tax and a thirty-one-year extension of its franchises last year the company's books were opened to him. The company's first financial difficulties came in 1910, when notes for $1,405,000 fell due. The city announced it would fight to collect the mill tax, then about $1,500,000, and also showed it was not disposed to grant an extension of the Jefferson Avenue franchise, which expired in 1911. This franchise has not been renewed. These matters coming at the same time prevented the company from getting new capital, and it had not since been able to obtain the capital. The net earnings of the company from 1910 to and inclusive of 1917 were $31,558,000, or an average of $4,294,775 a year, a sum equal to 10 per cent of the market value of the company's securities, or 4 per cent of the capital value during that period. The net earnings were spent in improvements. Had the earnings gone into dividends the company soon would have faced receivership.

PRESIDENT McCULLOCH CROSS-EXAMINED

The session of the commission of March 13 was given over almost entirely to the testimony of Richard McCulloch, president of the company. He was cross-examined by City Counselor Daues. He testified that he considered the Keokuk dam and the Union Electric Light & Power Company power contracts among the most valuable assets of the United Railways.

Mr. Smith also referred to the pending franchise settlement with the company. He reviewed briefly the terms of the tentative grant and expressed the opinion that the passage of the ordinance would go a long way toward stabilizing the position of the company.

It was decided by the commission to continue the hearings on March 25. James E. Allison, former chief engineer of the City Public Service Commission, who is engaged in revising the valuation of the United Railways property made by him in 1911, will be the next witness for the city in the hearing of the company's application.


No SIR, MIKE YOUR ALL WRONG ON THAT STUFF - NOW HERES WHAT THEY OUGHT TO HAVE DONE --
COAL & WOOD
SWIFT BRO'S
WE DELIVER COAL WHILE YOU WAIT
WE HURRY
PHONE
DING
LING!!
DONG!!
DING!!
DEDICATED - TO THE TEAMSTER WHO INSISTS ON SETTLING THE WAR IN THE MIDDLE OF THE STREET CAR TRACK.
'16

"ELECTROGRAM" ILLUSTRATES THE TEAMSTER NUISANCE

Seattle Cases Go Over

Ticket and Gross Earnings Litigation Will Come Up Before State Supreme Court in May

Argument of the 4-cent ticket case, and the 2 per cent gross earnings case, in both of which the Puget Sound Traction, Light & Power Company and the city of Seattle, Wash., are the principal litigants, which was set for March 13, has been postponed until the opening date of en banc hearings at the May term of the Supreme Court. The Supreme Court recently advised Hugh M. Caldwell, corporation counsel of Seattle, to this effect, taking the view that the cases are of such importance that the entire bench should have opportunity to pass on them.

The 4-cent ticket case went to the Supreme Court on appeal taken by the city of Seattle from a decision of Superior Court Judge J. R. Mitchell, at Olympia, in affirming the order of the Public Service Commission eliminating the 4-cent tickets without advising the city of any pending petition with that end in view.

The 2 per cent gross earnings case reached the court on an appeal taken by the company from Judge Ronald's decision in awarding the city a judgment against the company for about $62,000, representing unpaid gross earnings tax for 1916. The company has made an appeal to the Public Service Commission to be relieved of certain of its franchise obligations, including 2 per cent of the gross earnings annually, and, while willing to pay the amount under protest, refused to do so unless the city dismissed litigation for the enforcement of the obligations, pending an order by the commission.

Safety Campaign Helpful

The safety campaign of the Toledo Railways & Light Company, Toledo, Ohio, under the management of Raymond T. Metzger, is bearing fruit. Accidents through February of this year, both on the streets and in the shops, show a decided decrease over those of the same month in 1917. In all there were 296 accidents during the past month, while the number was 389 for February a year ago.

Of these 114 were automobile accidents and fifty were to horse-drawn vehicles. Last year there were fifty-six accidents to persons boarding and alighting from cars. The number this year was reduced to twenty-seven. Mr. Metzger attributes this reduction partly to the use of pay-as-you-enter cars, but the additional safety devices provided and the campaign of education among the employees have had much effect.

Accidents to shop employees numbered twenty-one this year, compared with fifty-two during February, 1917.

Large calendars, bearing safety illustrations, have been placed in every school room in the city, and the company invites persons who have the care of any number of children to call for these calendars and place them where they can be seen.

Slow Progress in New York Fare Cases

At the hearing on March 14 before Governor Whitman, in regard to a bill to authorize a 6-cent fare throughout New York, Joseph K. Choate, chairman of the committee of ten of the New York Electric Railway Association, described in detail the critical condition of electric railways in the State. In the course of his remarks Mr. Choate said that petitions for increased fares had been filed ten months ago with the First and Second District Commissions, but that no hearings in the First District had been brought to a conclusion and only six or eight cases had been finished in Albany. This delay, he said, had been almost unavoidable in complying with the law and the requirement of the commissions that the right to increase rates can be authorized only on the basis of a "fair return upon a fair valuation." This requirement has been complied with or is being complied with at the present time, but it has of necessity required a long time to prepare and hear the cases.

Rhode Island Recommendations Defended

Legislative Committee Examines Members of Special Commission Which Recommended Zone Fares

The question of financial relief for the Rhode Island Company, Providence, R. I., is being considered by a special legislative committee created for the purpose of reviewing the report presented by the commission which has been studying the matter for the past year and which recently recommended the establishment of a modified zone system and other changes estimated to increase the revenue of the company $890,000 a year.

In the meantime, under acts passed by the Legislature and signed by the Governor, the establishment of the zone system is held up, and the Public Utilities Commission has been ordered not to authorize or allow any change to be made in the present fare system or rates until further authorization from the Legislature.

The first act of the legislative committee was to give a hearing to the officials of the company. Mr. Jennings of the committee ascertained from C. A. Babcock, comptroller of the company, that since 1908 the company has borrowed $3,500,000 from the New Haven Railroad and an additional $1,662,000 through the Industrial Trust Company, Providence. Mr. Jennings asked the company's officials if it was considered good financing to borrow money and at the same time pay dividends. They suggested that this was a question to be referred to the trustees, who were not present.

ZONE SYSTEM DESIRABLE

The second day of the hearings was taken up with a presentation of the case by Chairman Zenas W. Bliss of the special commission which recommended the zone system, and William C. Bliss, also of that board and chairman of the Public Utilities Commission. Both of these men defended the report and declared that the establishment of the zone system as recommended was desirable and for the best interests of all concerned. Zenas W. Bliss declared that State ownership was not, to his mind, a good solution of the electric railway problem in Rhode Island. He declared that the State could not operate the lines with a 5-cent fare, even if they were taken over. Mr. Bliss explained the details of the zone system and declared that it was a just and equitable arrangement.

William C. Bliss stated that in the act creating the commission that body was directed to make a report and show a "just and equitable" system of fares. He showed that under the present system some lines carry a passenger 9 miles for 5 cents where other lines take a passenger only 2 miles for 5 cents. He declared that such unjust conditions as those should not be continued and certainly could not be made a part of a just and equitable fare system. The commission therefore eliminated them and made the zones as near equal in length as reasonable under existing conditions. He said: "Naturally those persons who have been able to get a long ride for little money would be compelled under the zone system to pay a greater increase than those who in the past had been paying for all they got in the form of a ride."

Zenas W. Bliss said that absolute State control of the road, with a guaranteed return to the owners, was the best solution.

Officials of the city of Providence appeared at the third hearing. The fourth hearing was devoted to listening to the opinions of members of the General Assembly. The committee is directed to make a report on or before March 26 to the Assembly.

I. T. S. Rate Case Closed

With the hearing of oral arguments at Springfield, Ill., on March 20, on the petition of fourteen local utilities included in the Illinois Traction System, Peoria, for emergency increases in rates the case was closed and the Public Service Commission took the matter under advisement. Arguments opposing the proposed increases were presented by representatives of Bloomington, Champaign, Decatur and other cities, while in some of the cases the opposition was withdrawn. The Council of Clinton has already accepted the rates. Quincy, Jacksonville and Ottawa were not represented for argument. Counsel for the city of Bloomington questioned the authority of the commission to change the franchise rates. H. I. Green, counsel for the company, cited the case of the Chicago & West Towns Railroad as a precedent. The ruling of the commission on the application of this company was referred to in the ELECTRIC RAILWAY JOURNAL for Feb. 9, page 295. Mr. Green closed for the company.

Transportation News Notes

One-Man Cars for Houston.—The Houston (Tex.) Electric Company expects to receive eighteen one-man cars during April.

Skip-Stop Trial in Des Moines.—The skip-stop plan will be tried in Des Moines for a month, starting on April 1 on the University line.

Interurban Uses Skip Stop.—The Indianapolis & Louisville Traction Company is adopting the skip-stop plan to an extent in the local interurban service between Louisville, Ky., and Indianapolis, Ind.

Fare Appeal in Jackson.—The Michigan United Railways, through J. F. Collins, vice-president and general manager, has appealed to the City Commission of Jackson for permission to put a 6-cent fare into effect in that city.

Augusta-Aiken Fares Increased.—Passenger fares on the Augusta-Aiken Railway & Electric Company's lines from Augusta to Aiken, S. C., through the Horse Creek Valley, were increased on March 1, from 25 cents to 40 cents, with the approval of the Railroad Commission of South Carolina.

Twenty per Cent Freight Increase Allowed.—The Public Service Commission of New Hampshire has granted the Claremont Railway & Lighting Company a 20 per cent increase in freight rates, to take effect immediately, pending a further investigation of the proposed increase, placed with the commission some months ago.

Road Wants Mileage Fares.—The Missouri & Kansas Interurban Railway, the so-called Strang line, which operates between Kansas City, Mo., and Olathe, Kan., has applied to the Public Utilities Commission of Kansas for permission to establish a passenger rate of 3 cents a mile between all points in Kansas. At present the road is divided in zones.

New Hampshire Company Seeks Increase.—The Keene (N. H.) Electric Railway, operating between West Keene and Marlboro, also between West Keene and Spragueville, has petitioned the Public Service Commission for a new schedule of fares. At present the single fares are 6 cents, and the company desires that the single fare be raised to 7 cents. Books containing seven-trip tickets and 100 rides will be sold for slightly less than the single fare.

Stops Eliminated in Reading.—In line with the efforts of the police department more effectively to regulate traffic and complying with the government's advocacy of fewer car stops to conserve power, the Reading Transit & Light Company, Reading, Pa., recently agreed to discontinue a number of half square car stops, especially where lines intersect Court and Cherry Streets. These continued to be stopping places after half square stops were generally abandoned several years ago. The new order went into effect on March 17.

Meralco Hit by Coin Shortage.—Because of the emergency arising out of the shortage of copper coins and 5 centavo pieces, the Manila Electric Railroad & Light Company, Manila, P. I., has been forced to resort to the use of "1 centavo fare coupons" as small change on the cars. Each conductor received a book containing 100 of the coupons, which are of the same size as car tickets now in general use. Ten of the coupons are accepted for one second-class fare, and twelve of them for one first-class fare. They are also accepted toward the purchase of car tickets and in the payment of electric light bills.

Another Company Feels the War Burdens.—J. A. Cleveland, vice-president and general manager of the Saginaw-Bay City Railway, Saginaw, Mich., has issued a statement to the press of the cities in which the company operates reviewing the conditions of increasing costs that confront the utilities. Mr. Cleveland said that "conditions have reached a point where it is now spelling disaster to the public utilities of the country and the inevitable result will be that these companies will cease to be able to furnish proper and adequate service to the public depending upon them unless some relief is obtained and this relief obtained immediately."

Owl Service Considered for Dallas.—Owl car service on all the principal lines of the Dallas (Tex.) Railway is being considered by Richard Meriwether, general superintendent, on petitions from a number of residents of the city. The matter has also been referred to M. N. Baker, supervisor of public utilities, who is investigating to determine the amount of patronage such service could expect. Messrs. Meriwether and Baker have addressed inquiries to the persons who signed the petitions, asking on what lines cars should be operated and how often. If it is shown that the service is really desired, Mr. Meriwether declares that it will be started.

Fare Charge Upheld.—The borough of Catasauqua complained that the cash fare of 10 cents charged by the Lehigh Valley Transit Company, Allentown, Pa., for single trips between Allentown and Catasauqua was discriminatory and excessive, and that the practice of selling round-trip tickets between these points only at the offices of the company was unreasonable. After a hearing, the Public Service Commission of Pennsylvania decided that the fare of 10 cents for a single trip was neither excessive nor discriminatory, but that the company should place the sale of round-trip tickets in the hands of the conductors on all cars operating between Catasauqua and Allentown.

Steam Road Protests Electric Interchange.—The Lake Erie & Western Railroad (steam) has filed a suit against the Public Service Commission of Indiana seeking to have set aside an order of the commission requiring that company to receive freight in carload lots from the Chicago, Lake Shore & South Bend Railway (electric). The Lake Erie & Western Railroad contends that the electric railway does not have the terminal facilities, trackage or equipment that would compare with its own and that it is being forced to make business for the electric railway company under the order of the commission. The steam railroad further contends that all of the towns reached by the interurban railway are now connected by steam railroad.

Chicago Revival Makes Traffic Problem.—With about 50,000 people in attendance on Sunday, March 10, the first day of the Billy Sunday campaign in Chicago, which is to be conducted there during the coming six weeks, the revival promises to create an unusual traffic problem for the Chicago Surface Lines. The Sunday tabernacle is located on Chicago Avenue, near the Lake Shore Drive. It is served mainly by the Chicago Avenue line, with the Grand Avenue line about five blocks away. It is quite distant from the nearest elevated line. To facilitate handling the large crowds the Surface Lines have put in a new cross-over with a stub track which holds twenty-five cars. The Chicago Motor Bus Company is running extra buses, also, to take care of the people.

Complaint Hearings in Pennsylvania.—The Public Service Commission of Pennsylvania, during the week ended March 16, heard electric railway cases in which conditions in Philadelphia, Pittsburgh and Harrisburg were considered. The commission also discussed in executive session the question of jurisdiction in complaints against increases of fare where a 5-cent rate is specified in a franchise ordinance. Complaints of the city of Philadelphia, associations and individuals of that city against the Philadelphia Rapid Transit Company were heard on March 14 in Philadelphia; city of McKeesport against the Pittsburgh Railways in Harrisburg on March 11, and George A. Herring against Harrisburg Railways in Harrisburgh on March 13.

Service Hearing in Trenton on April 30.—The Board of Public Utility Commissioners of New Jersey, at the close of the recent hearing on the application of the city of Trenton for improved electric railway service adjourned the matter until April 30 in order to give ample time for the board to conduct an independent investigation by its own inspectors of the service of the Trenton & Mercer County Traction Corporation, its alleged defects and suggested remedies. Peter Witt, Cleveland, testified as to how the company could increase its revenues and at the same time reduce expenses. Rankin Johnson, president of the company, said one of the greatest sources of trouble was the narrow streets. Mr. Witt suggested the installation of fare boxes. He estimated that the use of the boxes would increase the gross revenue materially.

Transfer Interchange Action Likely.—It is regarded as more than likely that the city of Los Angeles, Cal., will attempt to compel the interchange of transfers between the Los Angeles Railway and the Pacific Electric Railway. City Attorney Albert Lee Stephens has announced that in his opinion this is a matter affecting rates, and as the State Railroad Commission has jurisdiction over rates, he would ask the City Council to bring an action before the commission. Following the announcement of Mr. Stephens, Councilman O. P. Conaway, chairman of the public utilities committee of the Council, stated that he would advise action by the Council. Prior to 1915 when the rate-fixing power passed into the hands of the State Railroad Commission, the courts held against the city in a suit known as the Ninth Street case, brought for a similar purpose.

864,400 Miles One Man's Record.—The local paper at Stroudsburg, Pa., said recently: "'Bill' Starner, the well-known motorman on the Stroudsburg Passenger Railway, has the proud distinction of being the most traveled man in this part of the world. 'Bill' has traveled over the billowy main—snow banks and all—with wonderful regularity, for a period of nigh thirty years. It may not be known that 'Bill' travels 100 miles a day, but he does this nevertheless and smilingly acknowledges that most of the trip is taken on a 'moving sidewalk,' i. e., a trolley car. It is interesting to note from 'Bill's' log that, as said before, he has been a-going nearly thirty years and has been feeling just right because his circulation has always been well taken care of from early morning until 'early' at night." The paper estimates that Mr. Starner has traveled 864,400 miles.

Changes in Downtown Pittsburgh Traffic.—The engineering conference committee, consisting of representatives of the city of Pittsburgh, the Pittsburgh Railways and the Public Service Commission of Pennsylvania, after investigating various matters connected with the railway situation in Pittsburgh, made certain recommendations for improvements, and the commission after considering the matter as thus presented issued orders to the railway and recommendations to the municipal authorities designed to carry out the determinations of the committee. These recommendations and orders relate principally to the routing of cars, the changing of stops and the bettering of traffic conditions by various measures which tend to relieve the congestion in the downtown district. They are of interest principally to residents of Pittsburgh or to those familiar with the topography of that city. The case is reviewed in Complaint Docket No. 1571 of the commission.

Diversion of Cars Not Upheld.—The Supreme Court of the State of Washington recently dismissed the order of the Public Service Commission which required the Puget Sound Traction, Light & Power Company to divert the Twenty-third Avenue car line through the downtown section of Seattle during the heavy traffic hours of morning and evening. The case has been in litigation for two years. The Supreme Court held that the through service order granted by the commission in 1915 and later upheld by the Superior Court of Thurston County was unreasonable and that some inconvenience must be expected in reaching the city by residents of the outlying district. The company contended that its yearly operating expenses would be increased $19,000 by routing its cars through the city. The decision states that in satisfying the public need a carrier is not also bound to satisfy a public convenience at any considerable loss to itself, when the service is already adequate.

Personal Mention

J. W. Wood has recently been appointed claim agent of the Savannah (Ga.) Electric Company to succeed J. J. Garity.

R. Frank Jones has recently been appointed secretary of the Macon Railway & Light Company, Macon, Ga., to succeed E. W. Cabaniss.

T. L. Small has recently been appointed assistant treasurer of the Savannah (Ga.) Electric Company to succeed L. E. Drew.

T. C. Nielson has been appointed claim agent of the Alton, Granite & St. Louis Traction Company, Alton, Ill., to succeed C. H. Bartels.

Floyd L. Brewster has been appointed master mechanic of the Binghamton (N. Y.) Railway. Mr. Brewster was graduated from Syracuse University, College of Applied Science, class of 1912, with the degree of electrical engineer. Immediately upon graduation he entered the employ of the New York State Railways at Syracuse as night man at one of the substations. A few months later he was transferred to day work at the Townsend Street substation. In the fall of 1912 he was made chief clerk to the master mechanic of the New York State Railways, and on Jan. 1, 1918, was appointed assistant master mechanic of the company. He resigned from the last-mentioned position to become connected with the Binghamton Railway.

F. L. BREWSTER

E. R. Kennedy has recently been appointed master mechanic of the Cairo Railway & Light System, Cairo, Ill., to succeed C. C. McGarvey.

G. S. White has recently been appointed purchasing agent of the Chicago & Interurban Traction Company, Chicago, Ill., to succeed C. E. Cox.

C. R. Harvey has recently been appointed treasurer of the Fairburn & Atlanta Railway & Electric Company, Fairburn, Ga., to succeed J. H. Longino.

S. J. Steiner has been appointed engineer of maintenance of way of the Aurora, Elgin & Chicago Railroad, Aurora, Ill., to succeed D. H. Howard.

W. L. Campbell has recently been appointed purchasing agent of the Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., to succeed G. H. Ludeking.

J. J. Thames, Jr., has recently been appointed treasurer and auditor of the Macon Railway & Light Company, Macon, Ga., to succeed Richard Oudersluys.

Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio, has been elected first vice-president of the National Baseball Federation.

Oscar S. Straus, nominated by Governor Whitman of New York to the Public Service Commission for the First District of New York to succeed himself, has been confirmed by the State Senate.

W. J. Harvie, treasurer and general manager of the Syracuse & Northern Electric Railway, Inc., Syracuse, N. Y., has in addition been elected vice-president of the company to succeed T. C. Cherry, now president of the company.

Harry W. Alexander, director of publicity of the Society for Electric Development, Inc., New York, N. Y., has resigned to become assistant to president on sales of the American Writing Paper Company, New York, and Holyoke, Mass.

C. N. James, formerly engineer of overhead construction of the St. Petersburg & Gulf Railway, St. Petersburg, Fla., is now a sergeant with the Fourth Company, Coast Artillery Corps, at Fort Dade, Fla. He plans to enter the school for electrician sergeants at Fortress Monroe, Va.

T. C. Cherry was elected president of the Syracuse & Northern Electric Railway, Inc., Syracuse, N. Y., on March 15. Mr. Cherry succeeds C. Loomis Allen as president of the road. He is vice-president of Allen & Peck, Inc., engineers and operators in charge of the operating management of the Syracuse & Northern Electric Railway, formerly known as the South Bay road.

Roy B. Woolley of the publicity and sales department of the Society for Electrical Development, Inc., New York, N. Y., but late of the American Ambulance Field Service, Verdun sector, France, has been appointed director of publicity of the society to succeed Henry W. Alexander, whose appointment to the position of assistant to president of the American Writing Paper Company, New York, N. Y., is noted elsewhere in this department.

William Priest, since March 1, 1907, division electrician of the Union Traction Company of Indiana at Muncie, has resigned to accept a position on the Coast. Mr. Priest has been connected with the Union Traction Company and its predecessors for nineteen years. He was working in the shops at Muncie in 1899 when the Citizens' Street Railway, Muncie, the City & Interurban Railway and the Anderson City Street Railway were consolidated and the line built between Muncie and Indianapolis. Mr. Priest continued at Muncie until the completion of the substations at that place and at Daleville, when he went to Daleville to operate the station. In the spring of 1901 he was transferred to the Marion substation, where he worked until the line was started between Indianapolis and Logansport. He was then transferred to Tipton to help install substations. Since then he has been engaged on construction work.

C. H. Van Hooven, claim agent of the Manila Electric Railroad & Light Corporation, Manila, P. I., who has been visiting the United States on a vacation and for the purpose of consulting with officers of the J. G. White Management Corporation, New York, N. Y., the operating managers of the Manila corporation, is returning to the Philippines by way of Hawaii and Japan. While in the United States Mr. Van Hooven also devoted considerable time to inspecting the claim methods of electric railways in a number of large cities. He has been connected with the Manila Electric Railroad & Light Company for the last ten years. Mr. Van Hooven was recently admitted to the Philippine bar, having successfully completed the law course at Manila University.

C. H. VAN HOOVEN

Gilbert Duffy, formerly office manager in the engineering department of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has been appointed secretary to the manager, succeeding J. M. Wilmott, who had been appointed sales manager for the coal mines.

Theodore P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., contributed an article, "Sociology and Traction, City's New Rapid Transit Problem," to the magazine section of the New York *Sun* for

March 10. Mr. Shonts showed the relation between the growth of population and the increase of transportation facilities. He also considered what is in store for the traveling public of New York in the future.

J. R. Lowe has been appointed superintendent and assistant chief engineer of the San Diego & South Eastern Railway, San Diego, Cal. Mr. Lowe is thirty-five years old. He was connected with the Pacific Electric Railway for twelve years, the last eight years in charge of all field survey work in the maintenance of way department. Mr. Lowe is also superintendent and assistant chief engineer of the San Diego & Arizona Railway, which has consolidated with the San Diego & South Eastern Railway.

W. B. Jackson, for many years editor of the public utility column of the *Wall Street Journal*, and later with Claude Meeker, investment broker, is now associated with the bond department of Henry L. Doherty & Company, New York, N. Y. Mr. Jackson is regarded as one of the best posted newspapermen as regards not only public utilities, but various other corporations, as he is intimately acquainted with financing as well as operating problems.

C. Nesbitt Duffy, vice-president and general manager of the Manila Electric Railroad & Light Corporation, Manila, P. I., has been elected president of the board of directors of the Manila Merchants' Association. He succeeds Harold M. Pitt, who has held the office for five years. Mr. Duffy has been actively interested in the welfare of the organization since he entered the Manila business community. He served several years as vice-president of the board.

E. B. Sisson, formerly local superintendent of the Terre Haute, Indianapolis & Eastern Traction Company at Terre Haute, Ind., has been appointed assistant superintendent of transportation of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, with offices at South Bend, Ind. Mr. Sisson entered the service of the Terre Haute, Indianapolis & Eastern Traction Company in 1903 as interurban motorman, and was promoted to the position of inspector three years later.

J. D. Bowles has resigned as electrical superintendent of the Springfield Railway & Light Company, Springfield, Mo., to become connected with a manufacturing company. Mr. Bowles was graduated from Missouri University in 1909 with the degree B.S., and in 1910 received the degree E.E. He engaged in contracting work with a St. Louis and Chicago firm and then entered the service of the Public Service Commission of Missouri. He resigned from the commission to accept appointment to the company at Springfield.

William Baker, assistant chief engineer at the Anderson power plant of the Union Traction Company of Indiana for several years, has been appointed acting chief engineer to succeed Henry Comiskey, resigned. Mr. Baker was chief engineer for the Indiana Rolling Mill Company from 1908 to 1912. After leaving the Indiana Rolling Mill Company he was appointed chief engineer of the so-called Honey Bee Company about one year before it was taken over by the Union Traction Company. From there he was transferred to the Anderson power plant as assistant chief engineer.

Robert F. Scott, Jr., is on an indefinite leave of absence from the Terre Haute division of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., of which he is engineer maintenance of way. Mr. Scott left on March 6 for an Atlantic port to take up his new duties as first lieutenant in the railway transportation division. He has been with the Terre Haute property in his present capacity for the last nine years, going there soon after his graduation from Princeton in the class of 1907. Mr. Scott is widely and popularly known in electric railway circles in the Central Electric Railway Association territory.

Robert S. Tomkins was recently appointed assistant treasurer of the Public Service Railway, Newark, N. J., to succeed Robert D. Miller, deceased. Mr. Tomkins entered the employ of the Jersey City & Bergen Railroad, now included in the system of the Public Service Railway, as a clerk in August, 1889. He continued in the employ of the railways in Jersey City until July, 1895, when he was made paymaster for the Consolidated Traction Company. He continued as paymaster of the North Jersey Street Railway, Jersey City, Hoboken & Paterson Street Railway and the Public Service Railway until he was appointed to succeed the late Mr. Miller.

J. R. Ong has resigned as electric railway engineer for the Railroad Commission of Wisconsin to accept the position of traffic engineer for the board of control of the Kansas City (Mo.) Railways. Mr. Ong was graduated from Purdue University in 1909. His practical railway experience began in car shops and power plants during the construction and early operating period of the Indianapolis & Cincinnati Traction Company and the Chicago, Lake Shore & South Bend Railroad. After he was graduated from Purdue Mr. Ong became an apprentice in the East Pittsburgh works of the Westinghouse Company and was later transferred to the Philadelphia sales office of the company. In 1911 he became superintendent of substations on the Fort Dodge, Des Moines & Southern Railway. In December, 1911, Mr. Ong accepted the appointment as electric railway engineer on the joint engineering staff serving the Railroad Commission of Wisconsin and the Wisconsin Tax Commission. In this position Mr. Ong has made extended studies for the Railroad Commission relating to operating matters and service on the electric railways of Wisconsin. The valuation of the electrical equipment of power plants and substations made by the engineering staff was also under Mr. Ong's direction.

New Publications

Finding and Stopping Waste in Modern Boiler Rooms

A reference manual to aid the owner, manager and boiler-room operator in securing and maintaining plant economy. Harrison Safety Boiler Works, Philadelphia, Pa. 274 pages. Flexible cloth, $1.

Of special value in these times of fuel shortage is this little manual on a very live subject. In it sections are devoted to fuels, combustion, heat absorption, boiler efficiency and boiler testing, and boiler plant proportioning and management. A few pages at the end are taken up with clear diagrams of meters made by the company.

The book is replete with data and is liberally illustrated, principally with curves, showing the relations of the various quantities which have to do with combustion. The subject matter of the book was intended originally as an appendix to one of the company's catalogs, but during preparation it grew to such magnitude and took on such a comprehensive character that it was deemed advisable to put it into separate book form.

The Calorific Power of Fuels

By Herman Poole. Third edition, rewritten by Robert Thurston Kent. John Wiley & Sons, Inc., New York, N. Y. 267 pages. Cloth, $3 net.

In revising the text of the late Mr. Poole's work on fuels, Mr. Kent found that during the eighteen years since the last edition was published there have been so many advances that it was necessary practically to rewrite the book. In doing so he has utilized the researches of the United States Geological Survey and Bureau of Mines and has adopted as units the pound and the B.t.u., instead of the kilogram and calorie which were used in the earlier editions. In the new edition the measurement of the heating value of fuels and the results of a study of the general characteristics of available fuels are gone into very thoroughly. Numerous calorimeters are described with the aid of cross-sectional drawings. Each important commercial fuel is treated separately with full data of composition and combustion qualities. Valuable suggestions are also given as to the operation of furnaces, flue-gas analysis, etc. In an appendix is given the full text of the "Power Code" of the American Society of Mechanical Engineers. A number of steam and other standard tables are also included.

The conductor grabbed *at* her—
I heard his teeth chatter
As the pavement she struck with a flop.
'Twas in very bad taste
To alight in such haste,
For the car had not come to a stop.
—*A-Z-U-R-I-D-E, Los Angeles Railway.*

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Havre de Grace-Taneytown Electric Railway, Havre de Grace, Md.**—Incorporation papers for the Havre de Grace-Taneytown Electric Railway have been approved by the State Tax Commission. The company plans to construct a line from Havre de Grace to Taneytown, via Towson, Finksburg and Westminster, about 65 miles. Officers: C. Stanley Stirling, 423 Calvert Building, Baltimore, president; J. Frank Foster, Colora, vice-president; George O'Brien, secretary, and James P. Reese, 32 South Street, Baltimore, treasurer.

Franchises

Birmingham, Ala.—The Alabama Interurban Railway has asked the Board of Revenue of Jefferson County for franchises covering its proposed line from Birmingham to the Warrior River. [March 16, '18.]

Tampa, Fla.—The Board of Public Works has granted permission to the Tampa Electric Company for the construction of an extension to the plant of the Tampa Shipbuilding & Engineering Company and the Oscar Daniels Company, and work will be begun immediately.

Hammond, Ind.—The city of Hammond has begun suit in the Indiana courts to compel the Chicago & Hammond Street Railway to forfeit a fifty-year franchise, obtained from the city in 1904, on account of insufficient service.

Butte, Mont.—The Butte Electric Railway has received a franchise from the City Council of Butte to construct an extension on Main Street from Galena Street to Quartz Street.

Trenton, N. J.—The Board of Public Utility Commissioners of New Jersey has approved the ordinance granted the Camden Horse Railroad by the town of Collingswood for the relocation of certain of its track and the establishment of double tracks in certain streets of Collingswood.

Track and Roadway

Little Rock Railway & Electric Company, Little Rock, Ark.—The city of Little Rock has awarded a contract to the Missouri Valley Bridge & Iron Company, Leavenworth, Kan., at $5,900, for the construction of a steel and concrete viaduct 40 ft. long, 36 ft. wide at Eleventh Street and Summit Avenue. The cost of the viaduct will be divided between the city and the Little Rock Railway & Electric Company.

Atlanta & Anderson Electric Railway, Atlanta, Ga.—It is reported that steps have been taken by the Atlanta & Anderson Electric Railway, under the authority recently given by the Georgia Railroad Commission, to issue $20,000,000 of 5 per cent, forty-year first mortgage bonds for construction purposes, with the Empire Trust Company of Atlanta as trustee. According to the report, the building of the company's line from Atlanta, Ga., to Anderson, S. C., about 140 miles, has been postponed until business conditions have improved. J. L. Murphy, Atlanta, president. [Dec. 8, 1917.]

Chatham County Traction Company, Savannah, Ga.—Construction will be begun at once by the Chatham County Traction Company on its line from Stiles Avenue to the Brampton tract. [March 9, '18.]

Fort Madison (Iowa) Street Railway.—Work will soon be begun by the Fort Madison Street Railway on the construction of an extension on Jefferson Avenue and Santa Fe Avenue, terminating at Second Avenue.

Trenton, Lakewood & Seacoast Railway, Trenton, N. J.—Chancellor Walker has signed an order requiring the Trenton, Lakewood & Seacoast Railway to show cause at Long Branch, N. J., why a receiver should not be appointed for the company. The order carries with it a preliminary injunction restraining the company from disposing of any of its assets pending the receivership application, which is made by Frank Tilford, New York, a bondholder. The company was formed to build an electric railway from Trenton to Lakewood and Point Pleasant, via Allentown, 40 miles, but no construction work has been done on the line. [June 2, 1917.]

Interborough Rapid Transit Company, New York, N. Y.—Henry Bruckner, Borough President of the Bronx, will present to the Board of Estimate plans for an extension of the new Lexington Avenue subway route clear through to City Island. According to an estimate made by Louis F. Haffen, Borough Engineer, the extension would cost about $1,000,000. Plans for the new structure, drawn by Mr. Haffen, were submitted some time ago to the Public Service Commission for the First District of New York and turned over by that body to Chief Engineer Turner for investigation and report. Under Mr. Haffen's plan the new extension would cross Eastchester Creek to Rodman's Neck, thence across Pelham Bay to City Island. Practically all of the land along the proposed extension is at present owned by the city.

Philadelphia, Pa.—Bids were opened on March 5 by the Department of City Transit of Philadelphia for furnishing and delivering cast-iron fillet brackets for columns in Frankford Avenue between Church Street and Dyre Street, the lowest bidder being George B. Clopp, Philadelphia, at $7,820.

Dallas (Tex.) Railway.—Work is under way by the Dallas Railway on the double-tracking of the Ervay Street line to the city limts and the double-tracking of the Columbia Avenue line. The company is experiencing great difficulty in securing laborers for carrying forward its program of improvements and betterments under the terms of its franchise.

Seattle (Wash.) Municipal Railway.—Plans have been submittted by City Engineer A. H. Dimock to the Board of Public Works for a proposed elevated line to the shipyards. As planned, the line will extend from First Avenue South and Washington Street to West Spokane Street and West Waterway and will permit more rapid transit to Riverside, the ship yards and West Seattle. The cost is estimated at about $350,000.

Shops and Buildings

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala.—Lightning recently caused the destruction of the carhouse of the Gadsden, Bellevue & Lookout Mountain Railway at Gadsden, together with three electric cars. The loss is estimated at several thousand dollars. It is proposed to reconstruct the carhouse at once.

Northern Ohio Traction & Light Company, Akron, Ohio.—Plans are being made by the Northern Ohio Traction & Light Company for the construction of new warehouses, laboratory, clubhouse and other buildings at Akron at a cost of about $200,000.

Power Houses and Substations

New York & Queens County Railway, New York, N. Y.—This company has abandoned its former power plant at Long Island City fronting the East River, and has leased the property to the Maritime Warehouse Corporation.

Lehigh Valley Transit Company, Allentown, Pa.—Construction work has been completed on a tie line between the systems of the Lehigh Valley Transit Company and the Pennsylvania Utilities Company at Easton, a section of the line being constructed for 13,200 volts and the remainder for 33,000 volts. The new line will provide for an interchange of about 1200 kw. and will facilitate matters in the event of a breakdown on either system.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Lubricants and Oils Rapidly Advancing

Sale to Public Utilities Increases 50 Per Cent—Market in Upset Condition

The raw material—that is, crude oil—from which most of the machine lubricants are derived is not only high but is becoming scarce, refiners say. At least, it is not so easily obtainable as it was even a year ago. With a continually advancing market, the latest increase a few days ago, 25 cents a barrel, brings crude up to $4 a barrel for Pennsylvania oil. There has also been an increase of 36 per cent on Southwestern crude. As one of the best-known refiners or manufacturers explained the situation to the ELECTRIC RAILWAY JOURNAL last week, an abnormal demand on crude stocks has drawn the reserve down rapidly. Last year 30,000,000 bbl. were taken from storage for domestic consumption; 50,000,000 bbl. were exported, 7,000,000 bbl. were imported and placed in storage.

Nevertheless, with apparently heavy stocks in various parts of the country, the danger line of insufficient crude for refining into lubricants and for other commercial purposes is not far off at the present rate of consumption, it is held. For transformer and other oils, which must be of the highest grade, for motors, dynamos, generators, turbines, and in fact all electrical machinery, prices are not only high but are constantly advancing. The last increase, which occurred two or three weeks ago, was 10 per cent. The supply of wood barrels is growing short, labor is difficult to retain, and the cost of delivery, declare refiners, is another controlling factor in to-day's refined-oil market. Manufacturers report great difficulty in securing proper quantities of oil to fill transformer orders. This situation is mostly due, it was said, to rail embargoes. The government is taking tremendous amounts of crude for fuel oil. In truth, its requirements dominate the oil market; or, as one representative refiner phrased it, oil will win the war. In 1915 crude oil sold at 9 cents. Now it sells at 20 cents, and at least 100 new refineries are under construction. Turbine and transformer oils absorbed at least 10 per cent of the surplus stock of crude oil. There is a comparatively easy market, deliveries are better, and government control would be an advantage. Further, according to the same authority, there has been fully 50 per cent increase in the sale of various fine oils for use by public utilities. Still another lubricant manufacturer stated that there has been from 10 to 50 per cent increase in the demand for electrical machinery oils and that deliveries were too uncertain even to talk about.

Recent Advance in Price of Car Seatings

Entire Line Affected—Scarcity of Basic Material—Some Goods Have Doubled in Cost

Material used in the construction of car seats and seatings is occasioning more or less uneasiness on account of the growing scarcity. Rattan covering, which comes from Singapore, is most uncertain, and the situation is becoming acute. Prices have not only advanced, but the goods are in short supply. Plush and leather have doubled in cost, and artificial leather has followed closely. According to one of the several manufacturers of car seats, who operate on a large scale, and are accustomed to carrying heavy reserve stocks of raw material, market conditions are fluctuating continually so much so that an increase of from 10 to 15 per cent was found necessary within the last few weeks.

Deliveries of malleable iron fixtures have been held up at all the foundries. The situation is not so acute as it was a few months ago, and some slight relief has been had, but the freight embargoes are still hindering shipments. In fact, as another manufacturer stated, some commodities in this class had been delayed fully six months.

Every manufacturer of recognized standing in the trade dwells upon the high cost of essential material; and while, as in other lines, some factories, anticipating their wants, are better prepared than others to meet emergency or hurried orders, it is conceded that the price advance is general and made obligatory by prevailing conditions.

Denver Sells Boilers

The tremendous demand for boilers is shown by some sales which have recently been made by companies which have been able to reduce their steam-generating capacity through more efficient operation. One of these is the Denver Tramway Company which reports the sale recently of five boilers of 415 hp. of the Sterling type, equipped with chain grate fittings, etc., to the Pennsylvania Shipbuilding Company at $30 a horsepower. The boilers were installed in Denver about thirteen years ago, and the total amount received for them was $62,250.

When the Purchasing Agent Should Use Foresight

A Supply Man Who Believes Deliveries Would Be Assisted If Requirements Were Anticipated

Doubtless the patience of everyone is tried to the breaking point when suspended shipments and delayed deliveries affect the arrival of needed car equipment and supplies. When priority orders and the difficulties of transportation at the present time are considered it may be borne in mind that every effort is being made to secure to the customer the best delivery time. In order to minimize confusion and make sure of receiving the immediately necessary articles a little foresight on the part of purchasing agents, storekeepers, or buyers in general would be of assistance. The buying trade has been repeatedly admonished to look the situation squarely in the face and anticipate sufficient requirements with consideration for prevailing delivery dates. Otherwise, according to the complaint, even reasonable deliveries cannot be effected.

In this connection a leading supply man takes occasion to criticize the dilatoriness of purchasing agencies in placing orders without due regard for current unavoidable delays in shipping and deliveries. The letter reads in part as follows:

"There is a matter which we think worthy of a little editorial attention, namely, the storekeeper or purchasing agent who waits until he is all out of a certain vitally necessary part before placing a requisition or order for the same; and who then proceeds to make the life of the supply man miserable with imploring and then threatening letters and telegrams regarding delivery. In these war times, with shortages in labor and raw materials and maddening freight and express delays and embargoes, prompt shipments and deliveries are not to be expected.

"If the railways would anticipate their future needs and place orders for these materials a reasonable period in advance of their actual requirements (specifying, if necessary, that deliveries were not desired before certain dates), they would have the material in their storeroom when required and not have to lay up equipment because of its non-receipt, and would actually save money at the same time, as in the endeavor to make prompt shipments and deliveries, manufacturers are obliged to offer exorbitant wages to workmen and to ship goods by express instead of by freight, and the consumer pays the excess, you may be sure."

Electric Hoist Manufacturers Complete Organization

Officers Selected and the Aims and Objects of the New Association Formulated

Believing that the experimental stage has been well passed and acceptable designs developed the various manufacturers of electric hoists have organized as the Electric Hoist Manufacturers' Association. The manufacturers of the United States, which comprise the new body, propose to co-ordinate and make available for the user all that is best in electric hoist design and practice. The following companies make up the membership:

Brown Hoisting Machinery Company.
Detroit Hoist & Machine Company.
Euclid Crane & Hoist Company.
Franklin-Moore Company.
Link-Belt Company.
Roeper Crane & Hoist Works.
Shepard Electric Crane & Hoist Company.
Sprague Electric Works of the General Electric Company.
Yale & Towne Manufacturing Company.

The officers of the association are as follows: F. A. Hatch, chairman, Shepard Electric Crane & Hoist Company; F. W. Hall, vice-chairman, Sprague Electric Works; C. W. Beaver, secretary-treasurer, Yale & Towne Manufacturing Company.

The association holds monthly meetings for the purpose of studying the specific needs of the hoist user. It will consider uniform nomenclature pertaining to types and parts of electric hoists, fix upon a standard by which hoist motors shall be rated and promote their standardization as far as possible. It will also collect and disseminate information and statistics relative to the industry. The membership of the association is confined to those engaged in the manufacture of monorail electric hoists.

Australian Railways Buy American Shop Equipment

American manufacturers should study carefully the market for railway shop machinery and tools in Australia and New Zealand, says a report completed to-day for the Bureau of Foreign and Domestic Commerce, Department of Commerce, by Commercial Agent Frank Rhea. Of all the various lines of railway equipment and supplies in use in those countries, machinery and tools are first in volume of imports from the United States.

Other supplies and equipment for the state railways are purchased to some extent in America, because in some respects railway conditions in Australia and New Zealand are similar to those in the United States, but the tendency is to manufacture at home all possible supplies. In shop machinery and tools the American manufacturer, by reason of the recognized excellence of his product, is able to compete more successfully with European and domestic concerns than in any other line, as shown by the business done in the past.

Copies of "Railway Materials, Equipment and Supplies in Australia and New Zealand," Special Agents Series No. 156, can be obtained at 25 cents a copy from the Superintendent of Documents, Government Printing Office, Washington, D. C., or from any of the district or co-operative offices of the Bureau of Foreign and Domestic Commerce.

Rolling Stock Deliveries

Further Evidence That Six Months or So Is Prevailing Time for Order

Many reports have been abroad concerning long deliveries of electric railway cars which the manufacturers state are entirely contrary to fact. In this connection, W. H. Heulings, Jr., vice-president and general sales manager of the J. G. Brill Company of Philadelphia, has made the following statement for the ELECTRIC RAILWAY JOURNAL:

"The situation hasn't changed any for some time and a delivery of about six months is the prevailing time. We could make deliveries in six months from the time of receipt by us with the complete information to enable us to proceed, but we cannot make deliveries in six months from the time the order is first talked of or closed unless the manufacturing data are forthcoming without any loss of time."

This confirms the statement of Nic LeGrand, general sales agent of the St. Louis Car Company, which appeared in the March 2 issue of the ELECTRIC RAILWAY JOURNAL, in which the prevailing delivery period was given as five to six months upon receipt of the order.

Rolling Stock

Saginaw-Bay City Railway, Saginaw, Mich., is mentioned in the March 2 number of the ELECTRIC RAILWAY JOURNAL as ordering seven double-end double-truck city cars from the St. Louis Car Company, which are to be delivered in four months. The specifications follow:

Number of cars ordered	7
Name of road	Saginaw-Bay City Ry. Co.
Date order was placed	Jan. 20, 1918
Date of delivery	4 months
Builder of car body	St. Louis Car Co.
Type of car	28-in. double end double truck semi-steel
Seating capacity	40
Weight (total)	36,000 lb.
Length over bumpers	42 ft. 4 in.
Length over vestibule	4 ft. 0 in.
Width over all	41 ft. 0 in.
Body	Semi-steel
Interior trim	Mahogany
Headlining	3-ply poplar
Roof	Arch
Air brakes	Westinghouse
Bumpers	Hedley Anti-Climber
Car trimmings	St. Louis Car Co.
Control type	K
Couplers	St. Louis Car Co.
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	St. Louis Car Co.
Door operating mechanism	St. Louis Car Co.
Fenders	Root
Hand brakes	St. Louis Drop Handle
Heaters	P. Smith Hot Air
Headlights	Ohio Brass Co.
Journal boxes	St. Louis Car Co.
Registers	R-5 Int.
Sanders	St. Louis Car Co.
Sash fixtures	St. Louis Car Co.
Seats, style	Hale & Kilburn
Seating material	Rattan
Step treads	Teralin
Trolley catchers	Ohio Brass Co.
Trucks, type	St. Louis Max Tract. No. 106a
Ventilators	St. Louis Car Co.
Buzzers	Faraday
Track scrapers	Root "Air"

Hudson & Manhattan Railroad, New York, N. Y., which operates the tunnel and subway system under the Hudson River and in New York, as well as the line from Jersey City to Newark, N. J., now under the control of the government, is reported to be making preparations to construct a spur to Port Newark and intermediate shipbuilding points for the transportation of the workmen. From sixty to 100 new all-steel cars are also being considered in the same connection, specifications for which, it is stated, have been requested by the Emergency Fleet Corporation. When the work and equipment are finally decided upon it will go forward at top speed.

Brooklyn (N. Y.) Rapid Transit Company has requested cost specifications on fifty new center-entrance trail cars.

Washington Railway & Electric Company, Washington, D. C., is reported about ready to place an order for from twenty-five to thirty-five new cars.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has asked car builders for quotations on ten one-man city car bodies for the Lafayette division, but it proposes to use the present trucks and equipment. The company also has received proposals on twenty-five one-man cars complete, eight for Logansport and seventeen for the Fort Wayne division.

Saginaw-Bay City Street Railway, Saginaw, Mich., which was referred to in the ELECTRIC RAILWAY JOURNAL of March 2 as ordering fourteen one-man cars from the St. Louis (Mo.) Car Company, has specified the following equipment:

Number of cars ordered	14
Name of road	Saginaw-Bay City
Date order was placed	Jan. 20, 1918
Date of delivery	Four months
Builder of car body	St. Louis Car Co.
Type of car	One-man
Seating capacity	30
Weight (total)	14,000 lb.
Length over bumpers	27 ft. 9½ in.
Width over all	8 ft.
Body	Semi-steel
Interior trim	Birch
Headlining	Three-ply veneer
Roof	Arch
Air brakes	Westinghouse
Car trimmings	St. Louis
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	St. Louis
Fenders or wheelguards	Root
Hand brakes	St. Louis
Heaters	Smith Hot Air
Headlights	Ohio Brass
Journal boxes	St. Louis
Registers	Int. R5
Sanders	St. Louis
Sash fixtures	St. Louis
Seats, style	St. Louis
Seating material	Rattan
Step treads	Feralum
Trolley catchers or retrievers	O. B.
Trucks, type	St. Louis 72A
Ventilators	St. Louis
Wheels (type and size)	26-in. Grey
Special devices, etc	Safety control

Slate Belt Electric Railway, Pen Argyl, Pa., mentioned in last week's ELECTRIC RAILWAY JOURNAL as ordering interurban cars from the J. G. Brill Company, has furnished the following specifications:

Number of cars ordered	4
Name of road	Slate Belt Electric Ry. Co.
Date order was placed	Feb. 21, 1917
Builder of car body	J. G. Brill Co.
Type of car	Combination passenger and smoking, convertible bodies
Seating capacity	48
Weight (total)	48,800 lb.
Bolster centers, length	24 ft. 0. in.
Length over bumpers	47 ft. 0 in.
Length over vestibule	46 ft. 0 in.
Width over all	8 ft. 5 in.
Height, rail over trolley board	11 ft. 4¼ in.
Body	Semi-steel
Interior trim	Cherry
Headlining	"Agasote"
Roof	Plain arched
Air brakes	Westinghouse
Axles	"EB" Hammered steel
Bumpers	J. G. Brill Co.
Car trimmings	J. G. Brill Co.
Control, type	"H. L." (Westinghouse)
Couplers	Portable draw bar
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	Illuminated
Door operating mechanism	Brill Manual
Gears and pinions	Westinghouse
Hand brakes	Brill standard
Heaters	"Peter Smith" hot water
Journal boxes	Brill standard
Motors	Westinghouse No. 306, inside hang
Paint, varnish	J. G. Brill Co. standard
Registers	Ohmer
Sanders	Universal Air
Sash fixtures	O. M. Edwards Co.
Seats, style	Brill standard "Winner"
Seating material	Plush in passenger and Fabrikoid smoking compt.
Springs	Brill standard
Step	Oak with "Feralum" tread
Trucks, type	Brill 27 MCB2X
Ventilators	Automatic Ventilators Co.
Wheels (type and size)	33-in. cast steel

Pittsburgh (Pa.) Railways has just had delivered the last of the fifty cars ordered from the St. Louis Car Company last year.

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala., had its carhouse and three passenger cars destroyed, with a fourth badly damaged by fire, on March 6, which was caused by lightning. The loss was several thousand dollars. The cars will be replaced as soon as possible, and the carhouse rebuilt at once.

Washington-Virginia Railway, Washington, D. C., recently acquired from the J. G. Brill Company two interurban cars originally ordered for the Slate Belt Electric Street Railway, Pen Argyl, Pa., as mentioned in last week's issue of the ELECTRIC RAILWAY JOURNAL. The specifications are the same in both cases, with the exception that in the Washington company cars there were a few minor changes, the most important being the substitution of seats upholstered in cane for both the smoking and passenger compartments.

Cincinnati & Columbus Traction Company, Cincinnati, Ohio, reports it needs a motor-equipped freight car of 50,000 to 60,000 lb. capacity.

Wason Manufacturing Company, Springfield, Mass., advises the ELECTRIC RAILWAY JOURNAL it has had no order for trail trucks from the Cumberland County Power & Light Company, Portland, Me., for a year. This matter was referred to in this column last week.

Illinois Traction System, Peoria, Ill., is speeding up the repair of electric motors which were disabled during the recent winter blizzards. The company had about thirty electric locomotives, which were so damaged during the storms that their further use was prohibited until extensive repairing had been done.

West Penn Railways, Pittsburgh, Pa., has recently placed an order for twenty-nine all-steel, double-truck, double-end city cars, to be used on its lines in Wheeling, W. Va. Also nine semi-steel, center-entrance, interurban cars for interurban service between Wheeling, W. Va., and Steubenville, Ohio. Also four semi-steel, center-entrance interurban cars for use on its lines in the coke region of Pennsylvania. The cars will be built by the Cincinnati Car Company.

New Advertising Literature

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.: Pamphlet containing articles on heavy traction by F. H. Shepard, which appeared in recent issues of the *Electric Journal.*

National Pneumatic Company, New York and Chicago: A pamphlet entitled "Maximum Revenue Mileage from the Electric Railway Car." This publication reviews the many advantages of pneumatic door and step control from the standpoints of increased mileage, greater safety, better fare collection, decreased car upkeep, elimination of manual labor and cultivation of public good will.

Trade Notes

Easton Car & Construction Company, Easton, Pa., announces the opening of a branch office in Washington.

Fred B. Duncan has been appointed manager of the Chicago office of the Packard Electric Company, Warren, Ohio.

Union Smelting & Refining Company, Newark, N. J., has moved into its new plant at Avenue L and St. Charles Street.

Gulick-Henderson Company, Inc., New York, N. Y., inspector engineer, has removed its offices from 21 Park Row to the Herald Square Building, 141-145 West Thirty-sixth Street, in order to provide larger and more suitable quarters.

Economy Electric Devices Company, Chicago, has sold to the Fort Wayne & Northern Indiana Traction Company its energy checking devices, Sangamo economy meters, for installation on the cars of the Fort Wayne-Decatur 1200-volt interurban line.

National Pneumatic Company, New York and Chicago, is to equip the 100 new double-end cars of the Philadelphia Rapid Transit Company with its 2⅝ x 4½ National pneumatic door engines, door shafts and other door and step control fittings complete. National pneumatic interlocking safety door control is also provided to be operative for either single or two-car operation. In train operation the conductor at the rear of the first car will also control the front doors of the following car.

Chicago (Ill.) Varnish Company has placed on the market a new enameling system for car painting under the trade name of Enamelite Ce Ve System. This new system is clearly a war time process which makes possible high grade painting and finishing of cars at a marked saving in the cost of labor and material. The new system of painting is equally as applicable to wood and steel car bodies. It embodies the undercoats of the well-known Ce Ve process and a double coat of Enamelite enamel, giving a very durable finish to the body without sacrificing any of the quick drying qualities for which the Ce Ve process has become noted.

RAILWAY MATERIALS

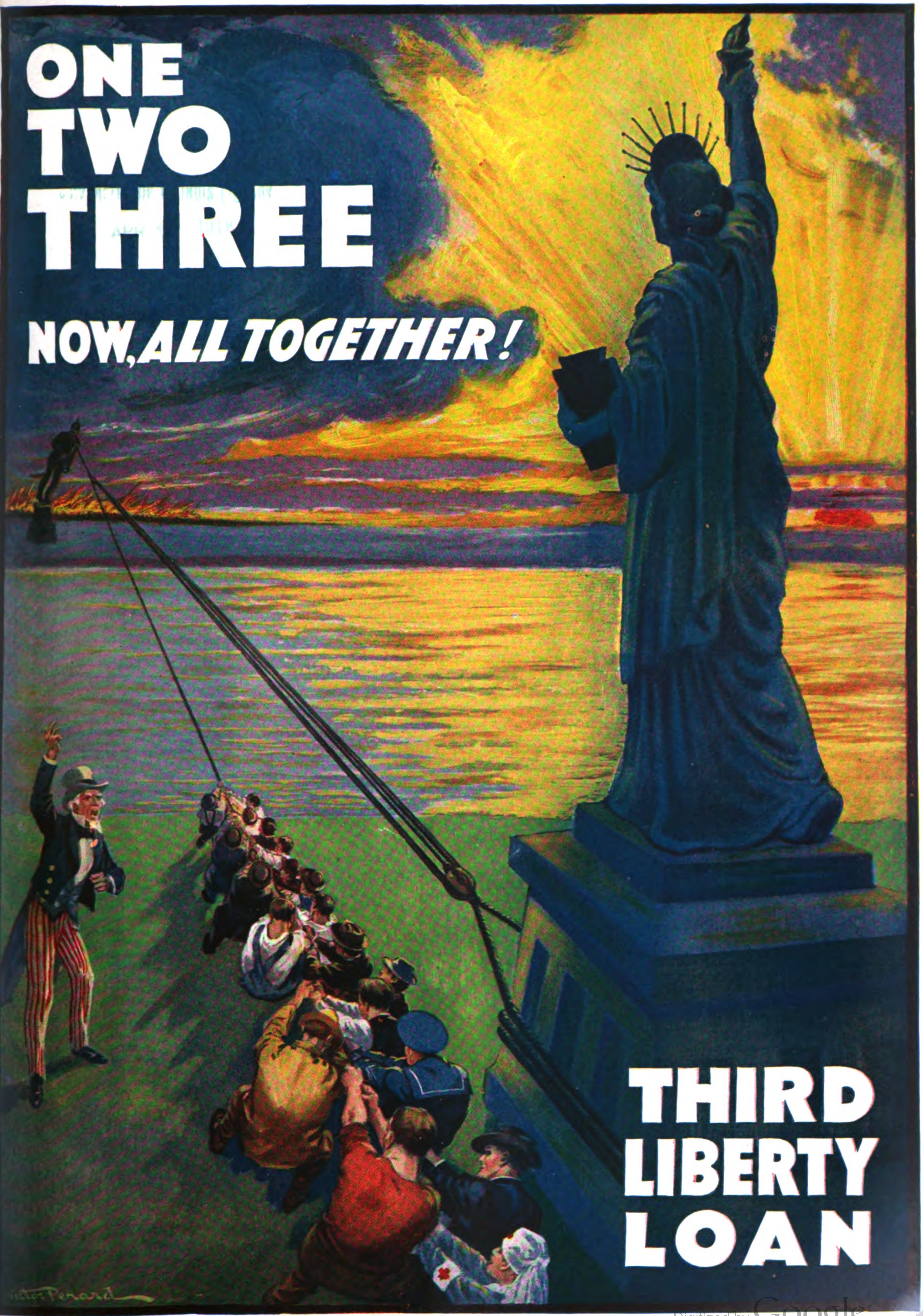
	Mar. 13	Mar. 20
Rubber-covered wire base, New York, cents per lb.	27-30	27-30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb.	$3.50	$3.50
Railroad spikes, 9/16 in., Pittsburgh, per 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb.	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb.	$4.90	$4.90
Sheet iron, galvanized (24 gage), Pittsburgh, per 100 lb.	$5.80	$5.80
Galvanized barbed wire, Pittsburgh, cents per lb.	$4.35	$4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb.	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.25
Cement (carload lots), Chicago, per bbl.	$2.31	$2.31
Cement (carload lots), Seattle, per bbl.	$2.65	$2.65
Linseed oil (raw, 5 bbl. lots), New York, per gal.	$1.53	$1.58
Linseed oil (boiled, 5 bbl. lots), New York, per gal.	$1.54	$1.59
White lead (100 lb. keg), New York, cents per lb.	10	10
Turpentine (bbl. lots), New York, cents per gal.	44½	44½

NEW YORK METAL MARKET PRICES

Copper, ingots, cents per lb.	23½	23½
Copper wire base, cents per lb.	26¼ to 26¾	26¼ to 26¾
Lead, cents per lb.	7¼	7¼
Nickel, cents per lb.	50	50
Spelter, cents per lb.	7¾	7¾
Tin, Straits, cents per lb.	*85.00	*85.00
Aluminum, 98 to 99 per cent, cents per lb.	†32	†32

OLD METAL PRICES—NEW YORK

	Mar. 13	Mar. 20
Heavy copper, cents per lb.	22	22
Light copper, cents per lb.	19½	19½
Red brass, cents per lb.	18	18
Yellow brass, cents per lb.	13	13
Lead, heavy, cents per lb.	6	6.38
Zinc, cents per lb.	5½	5½
Steel car axles, Chicago, per net ton	$42.41	$42.41
Old car wheels, Chicago, per gross ton	$30.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60.00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00


ONE
TWO
THREE
NOW, ALL TOGETHER!
THIRD
LIBERTY
LOAN
Victor Perard

Supplement to Electric Railway Journal, March 30, 1918

THE LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, March 30, 1918 *Number 13*

"Daylight Saving" Can Help in the Peak-Flattening Crusade

WHEN this issue of the JOURNAL reaches its readers the "daylight saving" law will be in operation. The slight inconveniences incident to pushing the clock hands forward an hour will have already been overcome. To be sure, the early risers will feel for a while that, as far as the light is concerned, it is February instead of April, but the sensation will be no more than that due to a journey across a railroad time-zone boundary, or from a residence on the eastern slope of a mountain to one on the western slope.

The relations of daylight saving to railway operation have been covered thoroughly in previous articles in this paper. There is an additional phase of the subject which is worthy of attention now.

Electric railways is many parts of the country are taking the initiative in persuading merchants and manufacturers to modify their opening and closing hours to permit the railways to give better transportation service. The inauguration of "daylight saving" should assist them in this worthy effort. While the new clock time will go into effect with perfect smoothness, it remains true that the relation of "sun time" to clock time will be different. Some of those whose present working schedule fits in best with the natural lighting under the present clock time will have a tendency to maintain their previous relation to sun time; in other words to begin and close an hour later *by the clock* than formerly. If some users of the electric cars change their schedule and some do not, obviously the load peak will be flattened—in other words, the "diversity" will be increased. During the next few days, therefore, railway managers should take advantage of the period of transition to secure peak-flattening co-operation which at other times might be out of their reach.

Buy Liberty Bonds and Help Sell Them to Others

THE third Liberty Bond sales campaign begins next week, Saturday. The government needs money just as it does men, and to be successful in the war we must raise $3,000,000,000 as requested by Secretary McAdoo. To symbolize the situation, we are publishing a supplement with this week's issue illustrating how, if all pull together, it will be possible to haul the Kaiser off his pedestal.

The popular slogan during the coming three or four weeks will be "Buy Liberty Bonds." Electric railways, as far as their restricted resources will allow, will do their full duty in this respect, just as they eagerly did in connection with the First and the Second Loans. But they can do much more; they can help to promote the success of the Third Loan by inducing others to buy bonds.

Electric railways are in an especially good position for presenting to employees and patrons the merits of Liberty Bonds. Through their regular publicity channels, through their ready means of close contact with employees, they can easily emphasize the need of monetary support to the last dollar. Indeed, as is shown elsewhere by the result of our canvass among some representative electric railways, the companies, by their work in the two previous loans, have already accomplished most if not all of the fundamental work necessary in educating people to become bond buyers. Now, therefore, they can make their main talking point the amount of bonds to be purchased, rather than the question of purchase itself.

The result should be increased sales. We hope so, for the government needs unmistakable evidences of the most loyal support. Does money talk? Then make it shout loudly enough to be heard in Berlin!

Why Not Form Company Sections During War Time?

WE ARE pleased to note that the Rhode Island Company plans to form a company section of the American Electric Railway Association. It is more than a year now since the last company section was born, although during the three years preceding the formation of the Toledo section on Feb. 15, 1917, new sections were seeing the light at the rate of one every four and one-half months. As has been said in these columns before, if company sections are a good thing in time of peace they are or should be doubly good in war time. The function of the company sections is to increase the value of employees to the electric railway and at the same time to furnish new sources of inspiration and education to the men themselves. Of course, these two things go together because a man cannot be a more useful employee without being happier in his work, and *vice versa*.

It was inevitable that a slowing up of the activities of those interested in pushing the company section movement should have accompanied the putting of our country on a war footing. This, however, is now rapidly being accomplished and company section work should again begin to expand. Company sections should be organized as a war measure, if for no other reason, because they furnish the auspices under which patriotic movements can be furthered. This fact was clearly illustrated in the review of a year's work of the company sections printed in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 27, 1917, page 767. No other proof of the fact that these groups of enthusiastic men are contributing as groups to the winning of the war should be necessary.

The best way for the movement to spread is through the contagion of enthusiasm as has evidently happened in the present case. The highly efficient Connecticut Company section has apparently inspired the desire for an organization on the part of employees of the neighboring Rhode Island Company. It is significant that the evening of March 21 was "Rhode Island Night" in the Connecticut Company section, a suggestion of hospitality and propaganda to other sections. The best wishes of the ELECTRIC RAILWAY JOURNAL go out to the new section, which will be No. 12, and as it has done in the case of the other sections the paper will do everything in its power to further the work of this one.

Cars Earn Money Only When On the Road

CLOSELY connected with standardized cars is the question whether such a car should be built to last, say, ten years or thirty years. We would say emphatically: For not more than ten years. It has been one curse of the electric railway industry that so much weight—and therefore money—was tied up in a car that it was financially impossible to take full advantage of progress in the car builders' art. Almost everywhere we see systems, a line-up of whose rolling stock reveals the history of electric railways from Van Depoele to date. The operators on these roads know full well that two, or even three, of these veteran cars are not equal in mileage revenue production to one new car. But the operating company usually has already sunk so much money in these veteran cars that when it comes to changing to one-man operation, for example, the management will spend $1,500 on each of three old-timers, or $4,500, instead of buying one new car of equivalent mileage possibilities for $5,500 to $6,000. Is it really easier to find money for such foolish rehabilitation and higher operating costs than to buy or rent new cars? If it is, a magnificent banking opportunity is being overlooked.

We have spoken of the new car as being three times as good in mileage production as an old car. This is not an exaggeration. We do not confine ourselves to schedule speed alone but have in mind the frequency with which the old cars are laid up for days at a time. The trouble is that too many managers look at cars from a mechanical viewpoint instead of one based on their transportation or mileage-production capabilities. The fact that a car has served fifteen years doesn't mean much unless we know whether it has averaged 10 miles or 100 miles a day during this period.

Herbert Spencer has said that human life should be measured by breadth as well as length. So may we say that car-life should be measured not only by years but also by miles. It is better to build a car light and operate it so intensively that it will average 50,000 miles a year for ten years and then replace it out of savings by the very latest type, than to get the same mileage in a generation out of a lumbering schooner. "Better fifty years of Europe than a cycle of Cathay!"

More Attention Should Be Paid to Transfer Problems

THE transfer question will not down. It is so inseparable a part of the financial side of the traction industry that wherever the matter of adequate revenue is under consideration the extent to which transfers are used must also be studied. This was done for the benefit of the Massachusetts Public Service Commission by Mr. Beeler in his report on the Boston situation, with most interesting results.

The Boston management has been progressive in fare collection methods and has given serious consideration to means of checking abuse of the transfer privilege. The combination of rapid transit and surface car systems had made this problem a complex one. The company has done more than any other, perhaps, to extend the use of prepayment stations which provide for bodily transfer of passengers and a consequent reduction in the use and abuse of paper transfers. Nevertheless, the annual loss from the abuse and misuse of transfers has been estimated by the company as between $200,000 and $250,000.

Whether or not the recommendations made by Mr. Beeler for a reduction of this loss will prove effective under the "local conditions" of Boston, the fact remains that the transfer privilege is always possible of abuse, and railway managers everywhere must place more safeguards over it. Potentially every transfer ticket is equivalent to a 5-cent fare, and wherever it is used by any one who is not entitled to it in lieu of fare payment, the company is defrauded by the full amount of the fare and has just the same operating expense as though it had received cash.

To effect a reform in transfers, the most important thing, first of all, is to forget that a transfer ticket is "free." Employees must be impressed with the fact that it represents value, and considerable value. If a company pays 20 cents a thousand for printing them and then redeems from the persons who have secured them fraudulently the cost of transfers to the company is not 20 cents but $50 a thousand.

One of the most useful committees of the Transportation & Traffic Association is the one which has been reporting for years past on the question of fares and transfers. Time and again members of that committee found an apparent indifference on the part of railway operators when inquiries were being made as to transfer practice. The same operators may have been keenly alive to methods for safeguarding cash fares, but to them a transfer was a mere bit of paper—a token which entitled the holder to a continuing ride under certain conditions. It did not seem to matter if an unscrupulous employee gave a bunch of them to his friends, and if a passenger occasionally imposed on the conductor by making a round trip for one fare. That was "only an incident of the business." Statistics showed that transfer passengers during a ten-year period increased at more than twice the rate of revenue paying passengers, yet the necessity of protecting the transfer was not generally appreciated.

A communication which appeared in the Nov. 10, 1917, issue of this paper, page 866, was intended to call attention to these conditions. A careful rereading of that article would not be lost time for the railway man. If the Boston system is losing $200,000 or more each year through its transfers, it is not unlikely that other companies are failing to secure a large amount of cash which they ought to receive from passengers. To obtain this cash it is possible that the legitimate use of the transfer privilege may have to be restricted, and it is certainly true that its misuse ought to be minimized. The possibilities of securing additional revenue through this channel should not be overlooked.

What the War Finance Bill Will Do and Will Not Do

THE conference on the war finance bill between the representatives of the House and the Senate has been continued this week, and possibly by the time this paper comes to its readers agreement upon its final form will have been reached and the bill passed by both branches of Congress. The time will be none too soon to help the public utilities of the country which have maturing obligations to meet.

That such help should be granted by the government is obvious. If it were not for the needs of the government in financing itself, these obligations could be met. But with the government loans monopolizing the money market, and properly so, the utilities naturally have to stand aside.

But the passage of the war finance bill does not mean that the government will necessarily assume all of the burden of caring for all of the obligations of solvent public utility companies which mature during this period of financial stringency caused by government borrowings. Owners cannot shift the whole burden on Uncle Sam even if they wish to do so. Although the bill has not yet been enacted into law, it is evidently the intention of the government to put a considerable portion of the onus of caring for these maturities on those directly interested in the properties. They must show this faith and do their share in behalf of their own enterprise. It is only after they have exhausted every reasonable effort to refinance their property through the regular banking channels that the federal government may be called upon for help. The announcement on March 28 by Mr. McAdoo of the terms on which the government is taking up the New Haven notes gives explicitly the reasons for the action taken in that case.

This does not mean, however, that a company ought to be obliged to defray all of the expenses of preparing its property to take care of war business. This is an entirely separate question from that of refinancing, but it is one which is being faced by a number of companies at the present day. They are so situated that additions to their equipment, say, for transportation or power, would be very useful to war workers in the present emergency. They realize, however, that this service is not profitable in itself and that the additional equipment will cost perhaps double its normal price if installed now. In such cases we believe the government can properly look upon the extra expense as a war charge and as such assessable on all the taxpayers rather than solely upon the owners of the particular utility concerned. Otherwise, a company which undertook this work would be greatly handicapped after the war if it should have to meet in competition a new company with equipment purchased at normal prices.

Conserve Resources by Reducing Waste of Unprofitable Lines

"THE history of street railway development throughout the country has shown very clearly that many lines have been built which should never have been constructed." In these words the Street Railway Investigation Commission, which recently reported on problems relating to street railways in Massachusetts, summarized an unhappy story which is ancient history in some cities and current fact in other localities.

Everyone is familiar with this feature of the early development of transportation when the success of some projects made it appear that electric railways could make money almost anywhere. Such experiments were not always a success, and when these non-paying lines were later merged into a large system they frequently continued as a burden for which the charges had to be carried by the rest of the property.

We have already spoken of the desirability of slowing up on extension work during war times. For the same reason electric railways can well be permitted to cut down or even temporarily abandon operation on some of their unprofitable routes. The special Massachusetts commission, in discussing this subject, mentioned several alternatives, one of which was that in case the continuance of a line is sufficiently important to the community the company could receive some form of subsidy or community assistance. This might be arranged for in certain instances and would appear to be a reasonable solution. The Oregon commission in the Portland case referred to an instance of subsidies which had proved insufficient to cover losses of operation on certain routes.

It is a simple matter to tell whether a line is on a paying basis. The disproportion between car-miles and earnings per mile will show this, and if the figures for a system are carried also on a car-hour basis the manager will come pretty close to knowing what parts of the road are bringing in the net income.

There are cases where the public authorities designate what extensions should be built. This arrangement must not be criticized if the new lines are constructed where they meet the traveling needs of the community. If it should develop, however, that mistakes have been made in choosing certain locations for service the public should see that the wrong is undone. It may be necessary to tear up the rails for junk and abandon service in that district.

Neither the company nor the people should tolerate such examples of non-paying lines as one mentioned in Massachusetts where it costs nearly 50 cents per passenger, and another where the taxes alone amounted to more than the gross receipts. Rather should they adopt the frequently commended plan of Cleveland where when real estate promoters desire to enhance the value of their land by providing transportation facilities, they furnish money to the company to build the desired extensions, and in some cases pay deficits on these lines until they become self-sustaining parts of the property. Such plans are worthy of serious thought, especially in these times when economies must be practised to the limit to make even the most heavily traveled lines pay a fair return on the investment.

The Cause Is Holy; the Effort, Timely

BY T. P. SHONTS

President Interborough Rapid Transit Company, New York, N. Y.

TO THOSE who appreciate the value of service—in the highest sense of the word—the Third Liberty Loan campaign offers both opportunity and inspiration. The opportunity lies in the timeliness of effort for the general welfare, and the inspiration in the holiness of the cause.

Now, more than ever before, the need for indomitable courage presents itself. With the progress of the great war the complications resulting have become so numerous and vital as to emphasize most strongly the urgent need for every man to do his full duty. It has been impressed upon us by one incident after another that the great goal we have before us, the winning of this war for freedom, can be attained only through whole-hearted co-operation and exertion by every one of our citizens.

To those accustomed to the vagaries of public demand, especially in a field so wide as that of public utilities and so open to criticism, these considerations should have a special appeal. The man who expects a challenge every few minutes of the day, or a delegation of irate citizens every few hours, or a complaint from an official body every few days, has gained experience which should stand his country in good stead in this hour of need.

He has learned the lesson of serving others, and can adapt it and mold it to patriotic uses now. He can be of tremendous aid in spreading the gospel of the Liberty Bond. In hundreds of ways he can assist in this campaign to provide the funds needed in our great emergencies, whether it be by advertising methods or otherwise. And in doing these things he can have a satisfaction more real than the cheerful feeling that pervades him when he is able to meet the needs of the public in his own field of activity.

To the patriotic man in the public utility field today service in the great Liberty Loan campaigns should and must be regarded as a point of honor, just as completely as service in our military and naval forces is regarded as a point of honor among our brave young men. To the hundreds of us who have relatives and friends at the front it is almost unnecessary to say these things. For the others, too, it probably is unnecessary to emphasize these things, and yet it cannot be amiss to direct attention to them anew at this time.

Service in the great Liberty Loan campaigns must be regarded as an inspiration of the highest kind. It carries us away from the sordid view of life and makes us feel that we can capitalize in a most material sense the sum total of our experience, and capitalize it for a holy cause.

Needless to say, a large amount of the Liberty Bonds of the Third Loan will be purchased by the men in the traction field, but let us feel that our duty does not end there. Let us go further and do all that is in our power to get others to buy them—particularly those who have been able as a result of conditions to increase their earning power beyond all records. This refers especially to the various classes of workers whom it is ordinarily hard to reach in any campaign for the sale of investments.

How the Electric Railways Have Been Fostering the

Canvass Among Representative Companies Shows Eager Desire to Aid Employees to Buy Bonds

CHICAGO (ILL.) SURFACE LINES

L. A. BUSBY, *President*

On Oct. 10, before our Second Liberty Loan campaign, we issued a bulletin urging subscription by employees. A $50 bond could be paid for at the rate of $1 a week, or $2 each semimonthly pay day. Interest was allowed to employees on their payments at the rate of 4 per cent. The company offered to hold employees' bonds without charge for safe keeping, subject at all times after payments to the order of the owner.

Subscription blanks were furnished by receiving clerks and superintendents. As a result of the campaign, according to a bulletin issued on Oct. 27, more than 12,000 employees, over 90 per cent of the entire organization, subscribed to the Second Liberty Loan. The total of these subscriptions amounted to $825,400.

In the transportation department, out of a total of 9277 men, 8876 men, or over 95 per cent, subscribed a total sum of $558,750. In several of the divisions, every man subscribed. In every department the average was high.

> *"The supreme test of the nation has come. We must all speak, act and serve together."*
>
> —PRESIDENT WILSON

NEW YORK STATE RAILWAYS, ROCHESTER, N. Y.

JAMES F. HAMILTON, *Vice-President*

The banks of Rochester took care of the subscriptions to the Liberty Loans, and through them our employees were permitted to subscribe and make partial payments without interest. The banks carried the loans and issued pass books to those subscribing through the company. We deducted each week from the employee's pay the payment due and issued a receipt which he took to the bank and had entered in his pass book.

We conducted our campaign for subscriptions through the heads of departments, each one making a personal solicitation among those under him. We posted advertising matter conspicuously on the property, and, in addition, each employee was seen in person.

Make the Liberty Loan Your Business

BY T. S. WILLIAMS

President Brooklyn (N. Y.) Rapid Transit Company

WHILE the war has brought inconvenience and sorrow to many homes, it has done much to foster a general appreciation of the value of unselfish public service. The emergency now faced by the nation calls for "team work" to such a degree that the doctrine of public service has been spread much more widely than was possible before the conflict started.

In other words, the public actually has learned to appreciate public service through having been forced to take part in it in a most thorough individual sense. Every good American to-day feels that whatever he can contribute to the success of the war in any field of activity constitutes the very least he can do. To a very great extent, the activities behind the battle lines call for unstinted co-operation, but at home the need for individual effort is much clearer and much more easily realized. Every one of us, for instance, recognizes that a boon can be conferred upon our armies by doing Red Cross work or work in some other field contributing to the comfort and safety of our troops. In undertaking work of this sort, each of us realizes that it represents a service to the country, as well as a service to the individual units of our fighting forces.

The Third Liberty Loan campaign presents an ideal opportunity for the rendering of similar public service. There are two ways to help in this great campaign. One is by buying the bonds and the other is by getting other people to buy them. In the long run, the man who encourages and persuades others besides himself to invest in these bonds is doing as great a service to the United States as if he made the total purchase himself. The reason for this is that so far as the United States is concerned, the battle in which we are engaged to-day is distinctly a war of the people, by the people, for the people. Each of us will benefit equally by the overthrow of the dangerous forces now in control of Germany's future. In return for the common enjoyment of the privilege of freedom, it is the duty of everyone to work for the maintenance of the form of government which makes them possible. While that duty constitutes something which he should do for himself, it also demands from the average citizen the expenditure of effort in behalf of the entire nation. In this sense he is doing a public service when he promotes the success of Liberty Bonds, and he can promote it to the fullest extent by inducing his fellow citizens to understand it.

The tremendous support to be gained by the government through a very wide distribution of the new Liberty Bonds would be as great an argument against Kaiserism, as great a blow to the hopes of the Hun, as could possibly be given.

It, therefore, becomes the duty of each of us to adopt the Liberty Loan campaign as part of our personal business and to regard its promotion as being part of our own responsibility. The two elements of duty involved—that is, buying as many bonds as we can afford ourselves, and then getting others to buy their proportionate amount—are so thoroughly interwoven that they can hardly be distinguished. If one is considered, the other must be inevitably accepted. The opportunity is before us to justify our claim to be citizens of a free country, and the moment must not be neglected.

Liberty Loan Spirit Among Their Employees and Patrons

Companies Are Planning to Push Third Campaign When Details of New Bond Issue Are Announced

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

EDWARD KAROW, *Assistant to President*

During both the First and the Second Liberty Loan campaigns we gave a considerable amount of free advertising space in our cars and buildings for the benefit of the loan. We also posted bulletins at our various carhouses, shops and office buildings, outlining plans whereby employees could subscribe to the Liberty Bonds on easy payments, which would be deducted from their pay checks.

Department heads and foremen had subscription blanks. The company purchased from the government such bonds as employees might wish to order through the company, and allowed the employees one year in which to pay for them, in regular installments. During this year the company allows the purchasers 4 per cent interest on the money paid in on the account. During the first campaign the plan was new and did not take as readily as during the second campaign. Then the subscriptions were extremely heavy. We are planning to follow the same general arrangements during the Third Liberty Loan campaign.

Shall we be more tender with our dollars than with the lives of our sons?

UNION TRACTION COMPANY OF INDIANA, ANDERSON, IND.

W. H. FORSE, *Secretary and Treasurer*

We made a campaign among our employees for subscriptions to the Second Issue of Liberty Bonds, and more than 500 of them subscribed for sums ranging from $50 upward. Most of the subscriptions were for $50 each.

The company agreed with the employees that payments could be made at the rate of $1 a week for each $50 face value of bonds purchased, deductions to be made semi-monthly from the pay checks. It was further agreed that in the event a subscribing employee left the service of the company or was unable to complete the payment as agreed, the company would, upon written request, refund the amount paid and cancel the subscription.

It is probable that the same plan will be followed for the Third Loan.

WASHINGTON RAILWAY & ELECTRIC COMPANY, WASHINGTON, D. C.

L. B. SCHLOSS, *Publicity Agent*

For the First Loan we did not enter into an extensive campaign among our employees, with the result that but 160 employees subscribed $15,750 to the issue. The company, however, subscribed $5,000, making a total subscription of $20,750. A refund of $877 has been made to employees who have left the employ of the company, or enlisted in the government service, or found themselves unable to keep up their payments.

The bonds were purchased by the company and sold to employees on a partial-payment plan. A white card [shown on page 606] was used to record the agreement and the payments. The plan provided for weekly, semi-monthly or monthly installments. A special partial-payment plan with pink cards was devised for trainmen. These men agreed to pay $5 a month until the payments equaled the subscription, plus accrued interest at 4 per cent on the total and less 4 per cent interest on the installments from the dates of payment. In the event of discontinuance of payments, the company agreed to refund the amount already paid, without interest, in cash or in bonds plus cash, according to whether the total of the payments would permit the purchase of a bond.

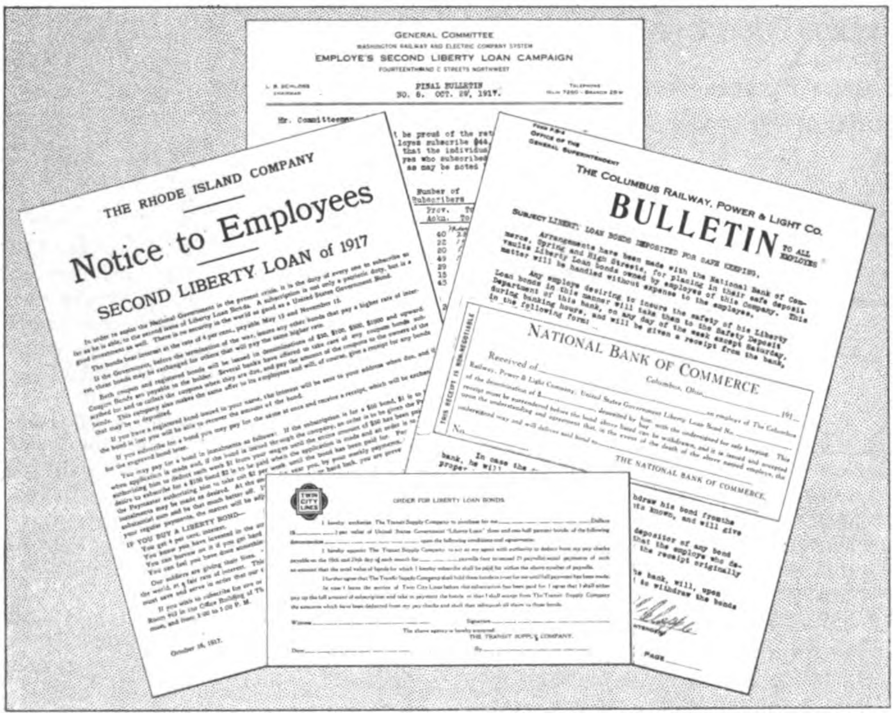
In the case of the Second Loan we entered into an extensive campaign, with the writer as chairman of a committee of eighty employees, selected from all departments. Bulletins were sent to each member of the committee daily. As a result of the work, 745 employees subscribed $44,900. In addition the company purchased $50,000 of the issue. Up to March 1, $1,772 had been refunded to subscribers for the same reasons as in the case of the First Loan.

We carried dash signs on all cars advertising the loans, and regulation advertising matter furnished by the Treasury Department was displayed at our general offices, carhouses and shops. The company also contributed $500 to the local committee for advertising in the newspapers. Considerable reading matter in the news columns of the newspapers was given to the company for its efforts, which added interest to the campaign among employees.

VIRGINIA RAILWAY & POWER COMPANY, VA.

THOMAS WHEELWRIGHT, *President*

The officials and directors encouraged subscriptions among employees and underwrote subscriptions made on the installment plan. We have advertised the loans as freely as possible through *Public Service News* on the Richmond division and through *Public Service Chat* on the Norfolk division. We have been glad to furnish whatever publicity was desired and have also paid for many page advertisements in the newspapers throughout our territory.



GENERAL COMMITTEE
WASHINGTON RAILWAY AND ELECTRIC COMPANY SYSTEM
EMPLOYE'S SECOND LIBERTY LOAN CAMPAIGN
FINAL BULLETIN
NO. 6. OCT. 27, 1917.

THE RHODE ISLAND COMPANY
Notice to Employees
SECOND LIBERTY LOAN of 1917

THE COLUMBUS RAILWAY, POWER & LIGHT CO.
BULLETIN

NATIONAL BANK OF COMMERCE

ORDER FOR LIBERTY LOAN BONDS

BULLETINS AND OTHER BOND NOTICES ISSUED BY RAILWAYS

THE CONNECTICUT COMPANY, NEW HAVEN, CONN.

L. S. STORRS, *President*

Through the courtesy of Morgan G. Buckley, president Aetna Life Insurance Company, the Aetna plan for deferred payments on First Loan bonds was afforded to the employees of the Connecticut Company. This plan provides for the monthly payment of 5 per cent of the face value of the bonds subscribed for.

Prior to the active solicitation lists were circulated throughout the various departments. These were signed by individuals to indicate the amount for which they would subscribe. During the days of the active drive arrangements were made at carhouses, shops and other points for gatherings of the employees to be addressed by bond salesmen. This resulted in a total subscription of $135,850 by 1925 employees. The campaign for the Second Loan was conducted in practically the same way, resulting in a smaller subscription.

No definite plans have yet been devised for the Third Issue, but a very active campaign is conducted constantly for the sale of Thrift Stamps and War Savings Stamps. The president of the company has been appointed an agent for the sale of such stamps, and he has appointed as subagents all cashiers, including express cashiers. A plan has been worked out for establishing honor rolls among the cashiers for the greatest monthly sales record, the idea being to recognize in some way the cashier having the best quarterly record.

UNITED TRACTION COMPANY, ALBANY, N. Y.

H. B. WEATHERWAX, *Vice-President*

During the campaign for the sale of both the First and the Second Liberty Loan Bonds our company held meetings at which officials addressed the men. They also in a few cases invited other speakers to address the employees.

The company advanced the money for the purchase of the bonds, and allowed the employees to pay for them on the plan of semi-monthly and monthly payments, the amount of each installment being deducted from the pay. Out of approximately 1580 employees, 1444 or 94 per cent subscribed for bonds to the extent of $74,150 for the Second Issue.

The company also decorated some of its cars and conducted a parade through the streets of Albany and Troy. Photographs of these cars were published in the ELECTRIC RAILWAY JOURNAL of Nov. 10, 1917.

While no definite plans have been decided upon for advertising and assisting in the sale of bonds of the Third Issue, the campaign among our employees will be conducted practically in the same manner as for the previous issues.

THE RHODE ISLAND COMPANY, PROVIDENCE, R. I.

A. E. POTTER,
President and General Manager

To advertise the Liberty Loans, the Rhode Island Company posted notices announcing the issues and outlining the manner in which the employees might subscribe. [One of the notices is reproduced on page 604.] The payment plan provided for a weekly installment of $1 for each $50 bond. The company offered to take care of coupon bonds bought by employees and to collect and pay the coupons. The company expects to follow the same procedure in connection with the Third Loan.

PUBLIC SERVICE RAILWAY, NEWARK, N. J.

J. L. O'TOOLE, *Assistant to President*

In connection with the First and Second Liberty Loan campaigns we displayed posters in all of our cars and on the bulletin boards at the various carhouses. The company also caused a number of meetings of employees to be held. These meetings were addressed by a representative of the company, who explained in detail what the Liberty Bonds meant and how they could be subscribed for.

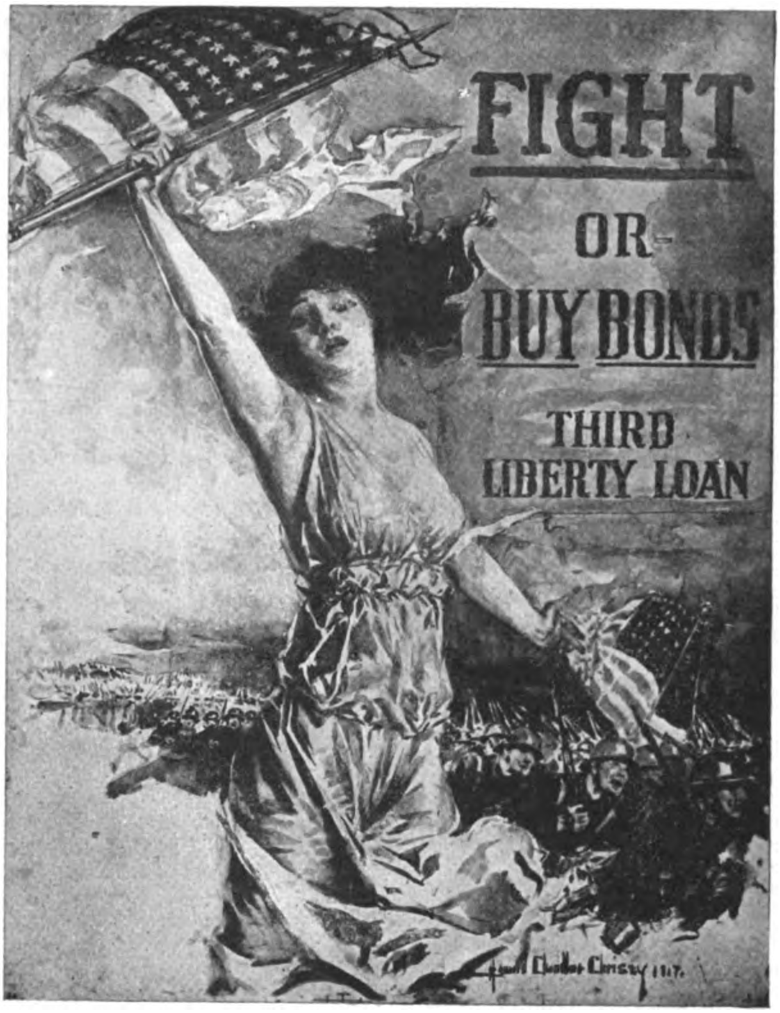
The company adopted a plan of carrying employees' subscriptions while the men were making payments at the rate of $1 a week for each $50 bond. The employees responded generously in both the first and the second campaigns. No concerted action has been taken as yet with regard to the forthcoming issue, but it is altogether likely that similar efforts will be put forth.

CAPITAL TRACTION COMPANY, WASHINGTON, D. C.

J. H. HANNA, *Vice-President*

Poster signs were carried on the front of our cars during the first and second campaigns, and notices were posted on the bulletin boards in the various carhouses to induce the men to purchase bonds to the best of their ability. In the second campaign a series of meetings was held in all divisions. Addresses were made by different officers of the company, and some success was attained in the sale of the bonds.

We have made no plans in connection with the Third Loan, but we will undoubtedly advertise it on our cars and bring the matter to the attention of our employees.



THIS IS A MESSAGE TO YOU

INTERNATIONAL RAILWAY, BUFFALO, N. Y.

E. J. DICKSON, *Vice-President*

The work which we consider most essential in a campaign of this kind is to advertise it thoroughly among our employees before any energy is used in the obtaining of subscriptions. In order to do this we had four or five large posters placed in our carhouses, shops and all other conspicuous places where our employees could not help but be impressed with the vital importance of the sale of Liberty Bonds.

Then we arranged to have literature explaining the reasons why each individual should purchase Liberty Bonds, what the bonds were and how they could be purchased, delivered to each employee together with a letter from the company urging their purchase. This letter explained that the bonds could be purchased through the company for cash or by having a certain amount deducted each week from the pay; also from any bank for cash or by paying so much a week to the bank.

We held several meetings with speakers from the general committee in order to create talk and enthusiasm among the employees. In the meantime we organized committees and subcommittees through the organization and told the chairmen that we wanted results and that each employee should be seen personally and urged to purchase bonds. All the committee members were furnished with application blanks and the necessary data for answering any questions that might be asked. After the meetings the committees were directed to start the campaign for subscriptions, and in three or four days each employee on the system was approached in regard to buying bonds. The plan worked so well in the Second Loan that nearly 1500 subscriptions, amounting to more than $115,000, were obtained.

They are doing their best "over there"; we must not fail in our duty over here.

At the present time we have not made any preparation for the Third Liberty Loan, as we do not know enough about it. We believe that by waiting until the details are worked out and then having a whirlwind campaign for subscriptions better results are secured than by dragging the campaign over several weeks.

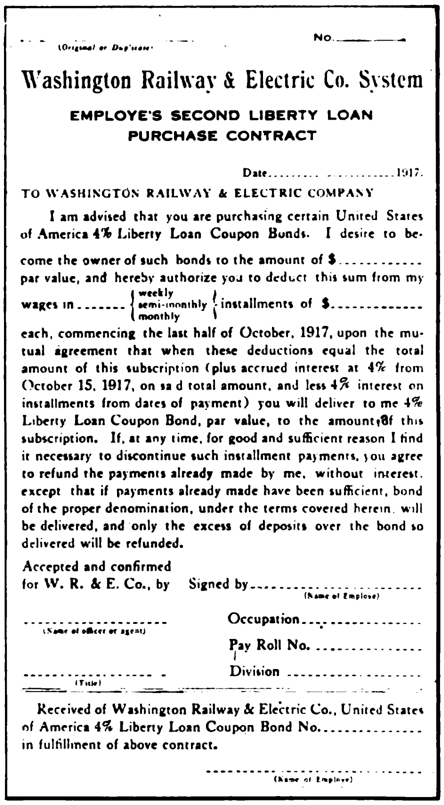
Illinois Traction System, Peoria, Ill.

E. W. Fowler,

Assistant to Vice-President Executive

Printed matter descriptive of the bond issues and the purposes to be served thereby was received from the government publicity committee, and copies were sent to each customer of our gas and electric properties, as per the addressograph list. Display cards were posted in our street cars, in our interurban cars and in the offices. Our gas and electric properties have a fixed amount of space contracted for with the newspapers in each community, and this space was used for suitable advertising concerning the bond issues.

All employees were urged to subscribe for Liberty Bonds. While the company purchased outright the bonds so subscribed for, the employee was allowed to make his payments extend over a period of ten months. Thus 5 per cent of the subscription was withheld from each semi-monthly pay check, and interest was allowed on payments so made.



(Original or Duplicate) No.

Washington Railway & Electric Co. System

EMPLOYE'S SECOND LIBERTY LOAN PURCHASE CONTRACT

Date.................1917.

TO WASHINGTON RAILWAY & ELECTRIC COMPANY

I am advised that you are purchasing certain United States of America 4% Liberty Loan Coupon Bonds. I desire to become the owner of such bonds to the amount of $............ par value, and hereby authorize you to deduct this sum from my wages in .... { weekly / semi-monthly / monthly } installments of $............. each, commencing the last half of October, 1917, upon the mutual agreement that when these deductions equal the total amount of this subscription (plus accrued interest at 4% from October 15, 1917, on said total amount, and less 4% interest on installments from dates of payment) you will deliver to me 4% Liberty Loan Coupon Bond, par value, to the amount of this subscription. If, at any time, for good and sufficient reason I find it necessary to discontinue such installment payments, you agree to refund the payments already made by me, without interest, except that if payments already made have been sufficient, bond of the proper denomination, under the terms covered herein, will be delivered, and only the excess of deposits over the bond so delivered will be refunded.

Accepted and confirmed
for W. R. & E. Co., by

Signed by..........................
(Name of Employe)

....
(Name of officer or agent)

Occupation..................

Pay Roll No. ....

Division ....

....
(Title)

Received of Washington Railway & Electric Co., United States of America 4% Liberty Loan Coupon Bond No............. in fulfillment of above contract.

....
(Name of Employe)

EXAMPLE OF BOND CONTRACT OF WASHINGTON RAILWAY & ELECTRIC COMPANY

Cleveland (Ohio) Railway

H. J. Davies, *Secretary and Treasurer*

The company sent out circular letters to its employees in regard to subscriptions for the First and Second Liberty Loans, urging them to buy bonds and telling them how the company would allow payment to be made within a year. The employees were permitted to authorize deductions from wages or to make payments at such other times as were found more convenient.

In addition this letter, cardboard bulletins urging subscriptions were posted in all the operating stations, shops and offices. These bulletins contained, in large type, but in fewer words, the information in the letters.

Kansas City (Mo.) Railways

Philip J. Kealy, *President*

For the First and Second Liberty Bond issues this company carried placards on all cars. These were furnished by the local bond committee, and they carried an emblem identical with that on the buttons.

Blank applications for loans were circulated among our employees. These provided that payment be made in three monthly installments or ten monthly installments, each applicant designating the bank at which it would be preferable for him to pay.

Regarding the third issue of Liberty Bonds, we are going to do something along the same lines.

Columbus Railway, Power & Light Company, Columbus, Ohio

Samuel G. McMeen, *President*

We issued several bulletins and pamphlets to employees during the First and the Second Liberty Loan campaigns. Two of these are shown in the illustrations on pages 604 and 607. In the first campaign we used the printed material in connection with addresses on patriotic duty and thrift, these addresses being made by officers of the company, heads of departments, etc. Weekly installments of $1 per each $50 bond were permitted, and subscription blanks were filled out by department heads.

We omitted much of the fundamental work in the second compaign, because by that time all our people were more fully informed. We conducted the details through the regular channels of our organization, sending out information and receiving the results just as if the transactions were a matter of detail routine business of our own affairs.

This actually amounted to a test of efficiency between special and standard methods, and we were gratified with the results of the second campaign because they were as good as in the first, and, of course, were secured at much less cost of time and nervous energy. The results in both cases were gratifying financially, and we have felt that our group acquitted itself well.

Chicago (Ill.) Elevated Railways

Britton I. Budd, *President*

A campaign was organized and conducted for the first and the second bond issues through the heads of departments, each of whom delegated certain persons to solicit subscriptions. In the shop department shop foremen and clerks assisted in soliciting; in the maintenance of way department the foremen and their clerks handled the subscription list; in the transportation department the superintendents, clerks, trainmaster, dispatcher and others all worked to obtain subscriptions. A point was made to urge each employee to subscribe for bonds.

When the campaign opened, notices were posted in the trainmen's rooms, stations and shops, directing the attention of employees to the advantages of subscribing and urging them to do so. Large supplies of printed matter, setting forth the attractive features of the bonds and urging subscriptions on the ground of patriotism as well as savings, were distributed, a copy being given to each employee.

Two plans of payment were adopted, a cash plan and a deferred-payment plan. Under the cash plan, for the First Loan, the subscriber had until July 15, 1917, to pay for his bond, the subscriptions closing on June 15. For the Second Loan, subscriptions for which closed on Nov. 15, he had until Jan. 15 to pay. The deferred-payment plan provided for twenty equal semi-monthly payments, which could be made either by deduction from wages or salary due the employee, or by cash payment at the treasurer's office. Interest at the same rate carried by the bond is allowed on all payments from the date the cash is received.

There is immediate, urgent, imperative need for every dollar you can possibly spare.

We have consistently encouraged those who have been making payments on the deferred-payment plan to anticipate the payments and take up the bonds before the end of the allotted period.

While our plans with reference to the Third Issue of Liberty Bonds have not yet been perfected, we expect to proceed on the same general lines.

Boston (Mass.) Elevated Railway

M. C. Brush, *President*

Upon the announcement of the First Liberty Loan, our company appointed a committee to carry out a very active campaign throughout the entire property. Arrangements were made by this committee with the Second National Bank to take over the entire subscriptions of our employees. Many posters were distributed and displayed at our offices, carhouses, power stations and shops, and speakers were procured from the local Liberty Loan committee. Committees were organized at each carhouse to report directly to their division superintendent. These made their report direct to the committee of three at headquarters. Applications were accepted on the government plan, weekly plan, and monthly or cash-payment basis. A great number of the employees subscribed on the weekly basis. A total subscription of $325,000 was the mark reached in the First Liberty Loan, and there have been very few withdrawals or cancellations.

The Second Liberty Bond issue was conducted in a similar manner, with the exception that the bank made a few changes as to the manner in which deposits should be received. The amount of bonds subscribed for by employees of this company was $59,000.

Put your money in the Bank of Liberty and help wage the war of the people.

We intend to advertise the third issue just as strongly as we have the previous two. Instead of handling it directly through our own organization, however, we are going to work hand in hand with the local committees and banks and persuade the men to make their payments directly to the bank or committee in their locality.

TOLEDO RAILWAYS & LIGHT COMPANY, TOLEDO, OHIO.

FRANK R. COATES, *President*

After two successful campaigns for the sale of Liberty Loan Bonds in Toledo, in which the company contributed greatly toward the splendid results, we have started on our third campaign of co-operation with the government for the coming big drive. While we plan to do greater things from an advertising standpoint in the third drive, we shall not have a company organization in the field, in order to avoid conflict with the general sales organization which will be headed by the president of the railway, as formerly.

When the first sale of Liberty Bonds was held, the company not only placed the inside and outside advertising space of its 300 or more cars at the disposal of the local committee, but coined a number of slogans and donated the posters which were used in the street-car advertising. These were kept in the cars for some time before each campaign started and during the weeks of the sale. A large electric sign, reading "BUY LIBERTY bonds NOW," was donated by the president and placed at the most prominent location in the city while the sale of bonds was on.

A committee of company employees was also organized to handle the sale of bonds among the 2000 employees of the company. Through the efforts of this committee about $82,000 of bonds were disposed of during the first sale of 1917 bonds.

The same committee worked among the company employees during the Second Liberty Bond campaign, and $63,000 of bonds were sold to company employees. In both the First and Second campaigns arrangements were made whereby a certain sum would be deducted from the pay of each employee, the payments to be completed in a year's time.

Beginning on Monday, March 18, and continuing for a period of seven weeks, the Toledo company will use the advertising space, both inside and outside the cars, for Liberty Loan advertising only. The company will pound continuously during this period upon the importance of buying bonds of the third issue, and it expects to aid materially in the sale of Toledo's quota, which will be $20,000,000.

The large electric sign urging everyone to buy Liberty Bonds will be again erected. The sale of bonds to employees will be handled by salesmen from the general sales force, which will consist of about 3000 persons.

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

A. H. FORD,
Vice-President and General Manager

To assist in making the campaign for the sale of the First and the Second Liberty Loans a success, the Cumberland County Power & Light Company, together with its subsidiary companies, viz., the Lewiston, Augusta & Waterville Street Railway, the York County Power Company and the Westbrook Electric Company, "carried on" as follows:

The company's part consisted in agreeing with its employees to purchase whatever bonds the employees subscribed to and to hold them until the full amount of each subscriber's bond had been paid for. Payments were to be at the rate of $1 a week for each $50 bond. Upon final payment the company was to turn over to the employee the total number of bonds purchased, together with all the coupons.

Each and every American has a personal responsibility in making the Third Liberty Loan a success. Everyone must contribute to the ending of Kaiserism by buying bonds himself as far as he can and perhaps even more by making unceasing efforts to persuade others to buy them.

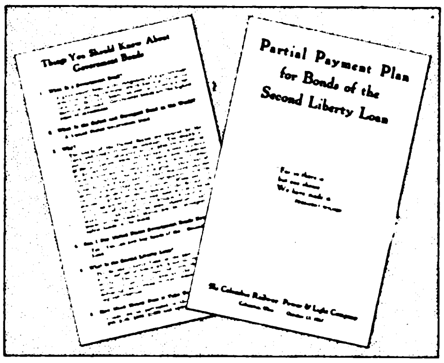
The employees' part consisted in appointing a member from each department of each company to canvass thoroughly all the men in his department for subscriptions. The result in the case of the Second Loan was a total subscription of $45,100, the total number of men employed being about 1400.

It is our intention to conduct a similar campaign for the third issue of Liberty Bonds.

MAHONING & SHENANGO RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO.

R. P. STEVENS, *President*

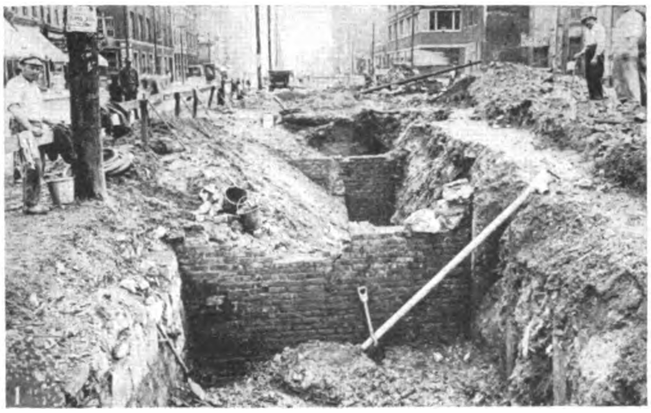
Our company was quite active in the First Liberty Loan campaign, carrying the bonds for the employees. At the time of the second campaign, we were in the throes of financing our floating debt and did not have the cash available to go into the matter in a broad way. We thought it advisable not to attempt any active steps toward financing purchases by our employees at that time.



Partial Payment Plan for Bonds of the Second Liberty Loan

BOND BOOKLET AND CATECHISM USED IN COLUMBUS, OHIO

We have had under discussion the matter of the company's participation in floating the Third Liberty Loan. It has been decided that although it will probably be inadvisable for the company to finance employees on account of purchases of these bonds, we will, however, donate the services of our stock sales department (which department we have organized, with a large number of salesmen, for the purpose of selling our preferred stock) to the sale of Liberty Bonds. We think we can serve the government in this way. It is believed that where an employee's capacity for saving is limited to $5 or $10 a month, it will be better policy to advise such employees to purchase Thrift Stamps instead of attempting to buy Liberty Bonds by borrowing the money. We feel that by having our sales force devote its entire time during the campaign to the sale of the bonds in the local communities, we can probably accomplish more than by directing their efforts among our employees.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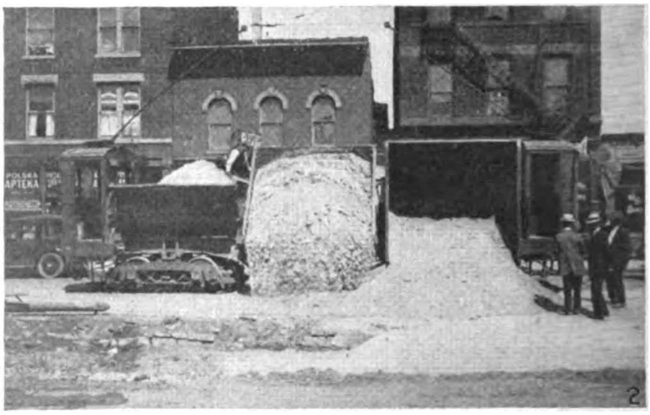
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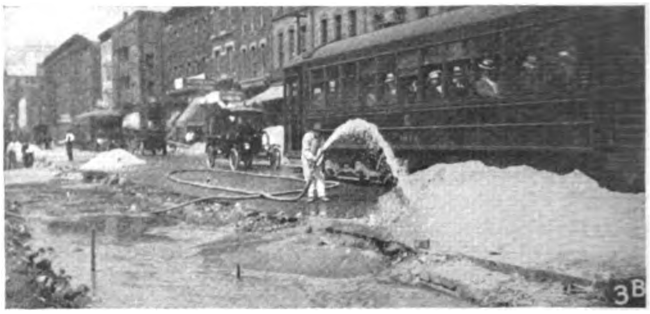
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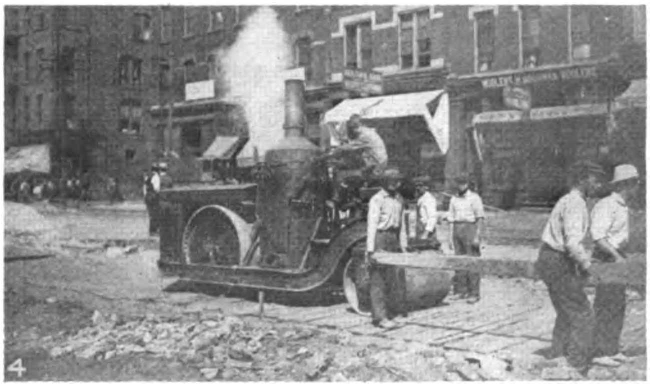
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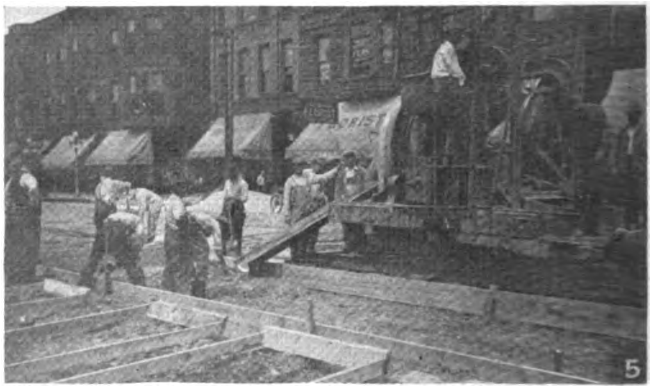
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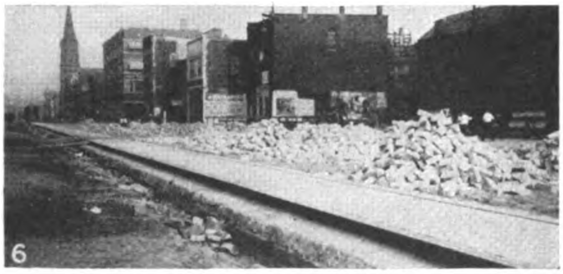
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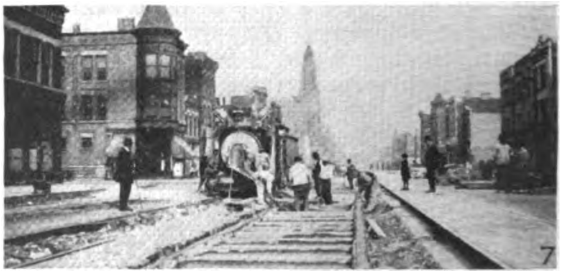
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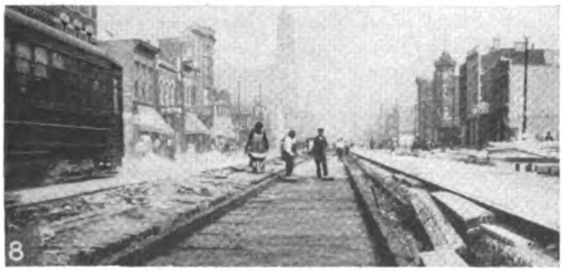
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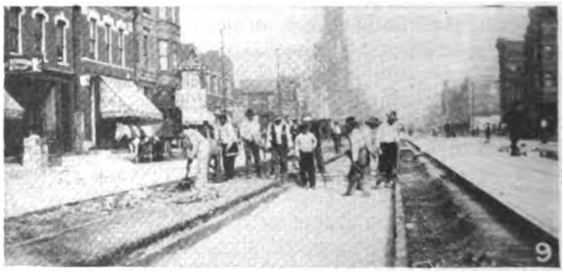

9

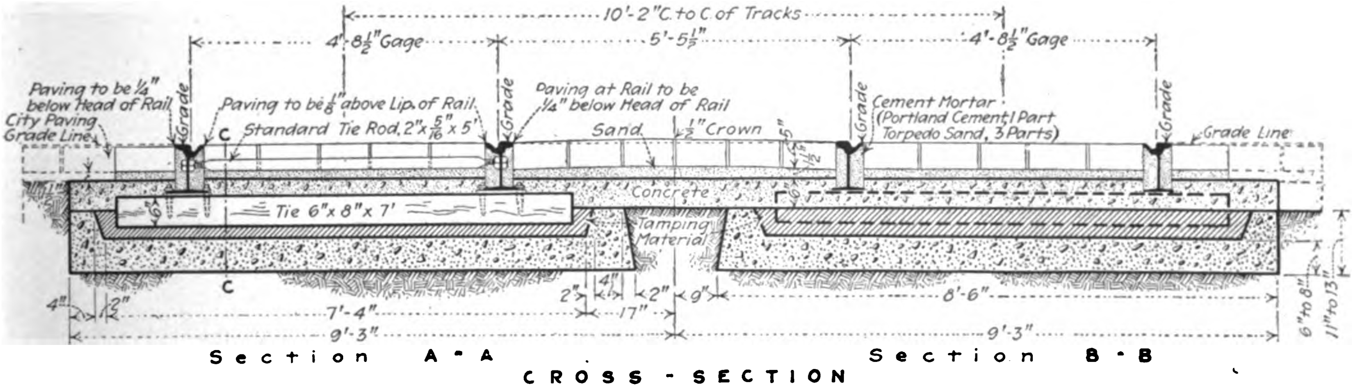
1. Uncertain right-of-way on which new track had to be placed.
2. Sand for filling hauled in side-dump cars.
3. (a-b) Shoveling and washing sand into holes.
4. Rolling the filled-in right-of-way.
5. Pouring between outside forms with curbing forms ready to use.
6. New eastbound track completed.
7. Inside forms in place as curbing is poured.
8. Forms removed and layer of screenings going in.
9. Placing the ties and removing paving from old track.

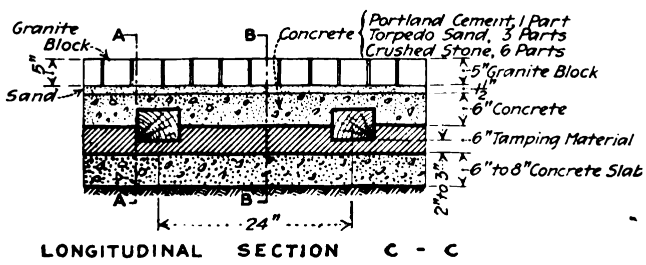
Photographic Description of Chicago Track Construction Methods

Track Construction Methods Employed in Great Street Widening Plan

Increasing Width of Twelfth Street Necessitated Complete Rebuilding of Double Track of Chicago Surface Lines—New Type of Sub-Grade Construction—Many Labor Saving Devices Employed to Keep Ahead of the Paving Contractor

TAKING up two well-laid tracks set in concrete construction, moving them more than 20 ft., and placing one of them along what was formerly the front end of a store basement, was, in brief, the part that the Chicago Surface Lines had to take in the $2,000,000 plan of widening Twelfth Street, one of the principal east and west thoroughfares of Chicago. The width of the street was increased along the south side from 66 ft. between building lines and 38 ft. between curbs, to 108 ft. and 78 ft. respectively. Much credit is due M. J. Faherty, president of the board of local improvements, for the speedy accomplishment of the task of co-ordinating and satisfying all the diversified interests involved in the widening of the street over a distance of 1½ miles, which as a main thoroughfare was occupied by all the utility companies and a great variety of commercial enterprises. The completion of this project marks the first step in the much-talked-of but long-delayed "Chicago Beautiful" plan as laid out by the Chicago Commission.


10'-2" C. to C. of Tracks
4'-8½" Gage
5'-5½"
4'-8½" Gage
Paving to be ¼" below Head of Rail
City Paving Grade Line
Grade
Paving to be ⅛" above Lip of Rail
Standard Tie Rod, 2"x 5/16" x 5'
Paving at Rail to be ¼" below Head of Rail
Sand
½" Crown
Cement Mortar (Portland Cement, 1 Part Torpedo Sand, 3 Parts)
Grade Line
C
Concrete
Tie 6"x 8"x 7'
Tamping Material
4"
2"
7'-4"
9'-3"
2"
4"
2"
9"
17"
8'-6"
9'-3"
6" to 8"
11" to 13"
Section A-A
Section B-B
CROSS-SECTION

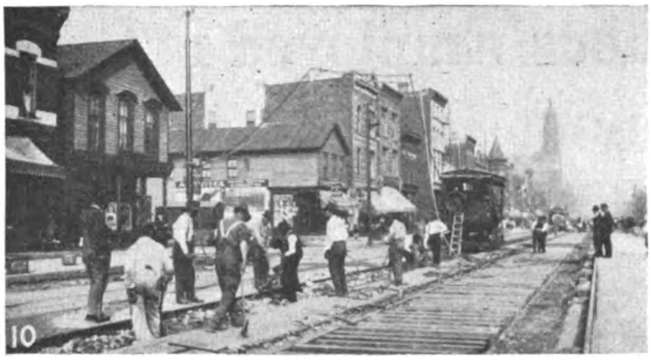

Granite Block
A
B
Concrete { Portland Cement, 1 Part Torpedo Sand, 3 Parts Crushed Stone, 6 Parts
5"
Sand
5" Granite Block
½"
6" Concrete
6" Tamping Material
6" to 8" Concrete Slab
2" to 3"
24"
LONGITUDINAL SECTION C-C

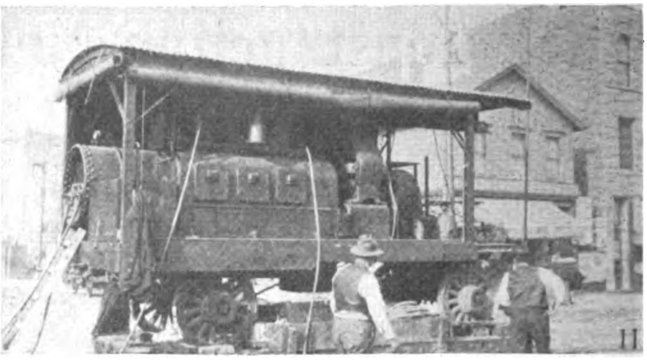
CROSS AND LONGITUDINAL SECTIONS OF TWELFTH STREET, CHICAGO, TRACK CONSTRUCTION

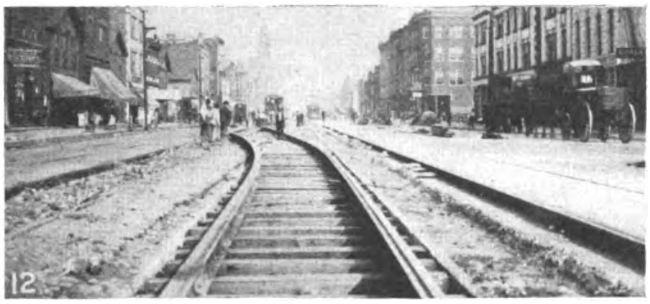
The work of the street railway company in connection with the program involved taking up and building anew 1.38 miles of double track on Twelfth Street, including seven special-work layouts, and rebuilding 300 ft. of double track on either side of Twelfth Street at each one of these seven intersections on account of the change in grade. In all, the job comprised the building of more than 3 miles of single track and was completed between the dates of July 14 and Nov. 11, with eleven days out for bad weather and six days out for delay caused by the contractors. The average number of men employed was about 210. Because other men could not be obtained the company employed many labor-saving devices to help make up the shortage and to keep out of the way of the paving contractors who, with their $500,000 contract for 60,000 sq. yd. of pavement, were working under a time-penalty clause.

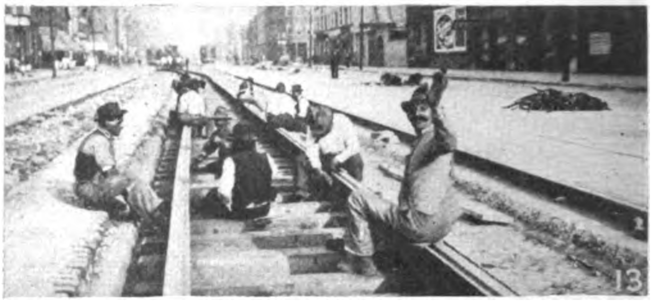
The story of the construction job from the time the railway company began its work until the track was completed is fairly well portrayed in the series of pictures herewith reproduced. Before the railway company began work the contractors had moved back or cut off the front section of buildings along the south side of the street. The curbing and sidewalk construction had been torn up and a row of open basements partially filled with debris and rubbish remained as a foundation for the new eastbound track. Preliminary to track construction it was necessary to excavate to the bottom of the old basements and to refill them with lake sand in order to be sure of the foundation. The sand was hauled in side-dump cars originally purchased for hauling garbage for the city, dumped as near the fill as possible, and then shoveled or moved hydraulically into the holes. Wherever walls occurred that were sufficiently solid, they were not removed. While the filling-in process was going on the work was flooded to aid the settlement, and at some places planks were laid down over the trackway and the fill was compressed with a 10-ton roller. The space outside the trackway was also flooded so that the weight of the roller would force the sand into voids, as it was desired to control the foundation over a strip 10 ft. outside the right-of-way.

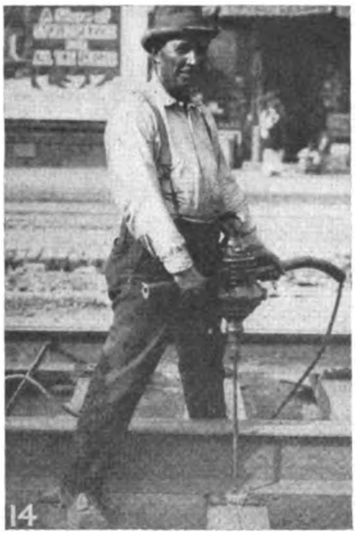
On the new foundation the concrete slab for the eastbound track was laid, and this construction was completed all the way through before the old tracks were disturbed. Eastbound traffic was then operated over the new track, leaving the former eastbound track free

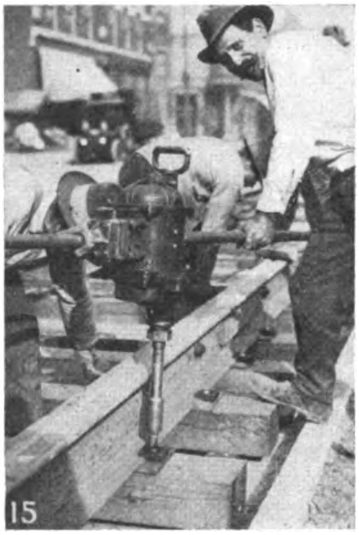


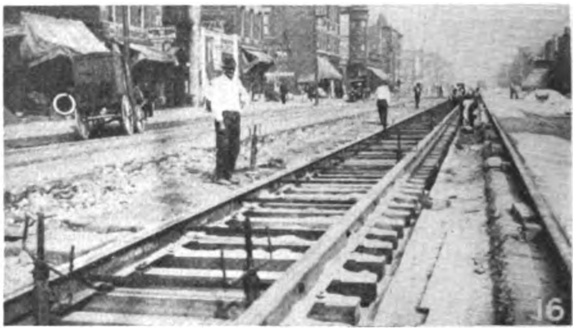


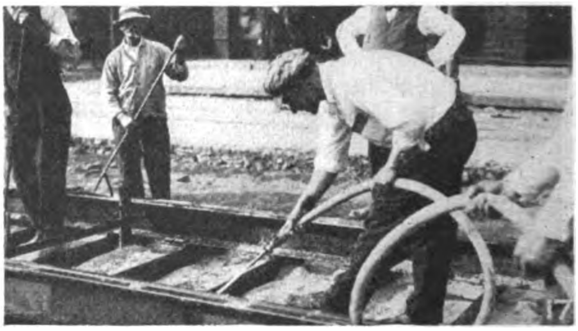


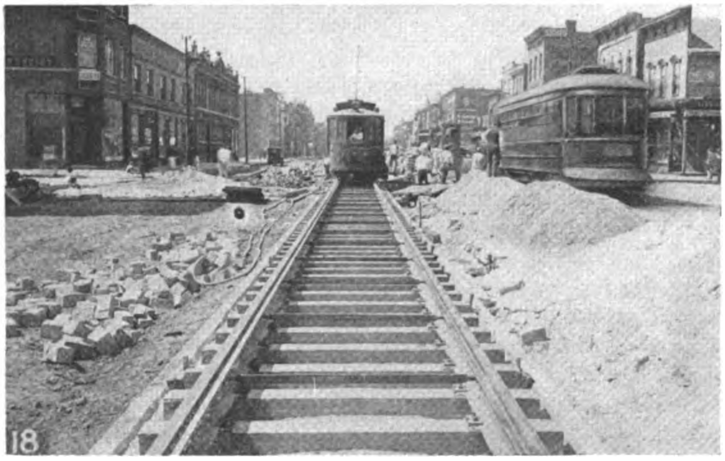


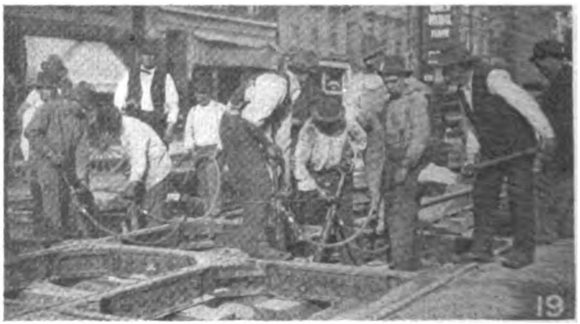












10. Cutting away the old concrete to free the rails, and new ties ready to receive rail.
11. Shop compressors used in tamping track.
12. Prying the rail over to new track location.
13. Cleaning off the old cement on the rails.
14. Boring the screw spike holes.
15. Driving home a screw spike
16. Track jacked up ready for tamping.
17. Wetting the tamping material and washing it under the ties
18. Track tamped and blocked laterally in alignment ready for concreting.
19. Pneumatic tampers prove especially effective on special work

Photographic Description of Chicago Track Construction Methods (Continued) for the use of work and material cars. As the subgrade construction work for the new westbound tracks progressed the rails of the old eastbound track were shifted, in good condition, over onto the new ties and foundation. Finally upon the completion of the second track, westbound car service was transferred to this and the old westbound track torn up and removed.

UNCERTAIN FOUNDATION MAKES BOTTOM SLAB CONSTRUCTION NECESSARY

The type of track construction used on Twelfth Street differs in some interesting ways from the Chicago standards. Deviation from the standard solid concrete track in which the ties are completely incased in concrete was thought necessary because of the uncertain character of the foundation, placed as it was over a new fill some 9 ft. deep. In view of this condition it seemed advisable to provide an assurance against sagging by building, along the right-of-way, a concrete slab on which to place the track construction. With a slab foundation it was necessary to use a certain amount of ballast in order satisfactorily to surface the track. Fine washed screenings were used for this purpose. To retain the screenings entirely under the ties or prevent them from scattering out over the roadway in tamping, the concrete foundation slab was formed with a curbing along each side. The curbs were also useful in lining up the track. Wedges were driven down between a tie end and the curb at intervals, thus holding the track exactly where wanted without danger of accidental knocking out of alignment during the concreting. The curb construction necessitated a somewhat wider base on the concrete foundation slab than the standard concrete construction provides, in order properly to support the curbing. The width was therefore increased from 7 ft. 4 in. to 8 ft. 6 in.

In respects other than those already mentioned the type of track construction used on Twelfth Street is the standard 2-A Board of Supervising Engineers construction for use in paved streets. The ties are 90 per cent heart yellow pine. The rail is 9-in., 129-lb., Lorain section No. 403, set on tie plates having a single shoulder placed at the outside edge of the rail base. The rail is fastened to the ties by screw spikes, two on the inside and one on the outside of the rail at each tie, and inserted through rail clips and through the tie plates.

The space between ties and above the screenings was filled with concrete which was carried up well over the base of the rail. On top of this a 1½-in. layer of torpedo sand, instead of the bedding sand generally used in Chicago, was spread as a cushion for the paving, which was laid with No. 1 Wisconsin granite block the full width of the trackway. This was grouted by means of a 1 to 1½ cement grout, which runs down between the blocks to make the sand a solid mass, thus sealing over the top of the entire track construction against seepage of water from above down into the interior track construction.

After the new eastbound track was completed for traffic, work was begun on the new westbound track, and this was especially interesting because of the fact that the rails of the old eastbound track were moved over and used on the new track without separating the electrically welded joints. All work on the sub-foundation was therefore completed for a section, and then as the concrete mixers and work cars moved back, having been preceded by the material trains, which distributed cement, tamping material, rails, ties, rods, plates, clips, spikes, etc., the rails of the old track were freed from their fastenings and pried over.

The concrete bottom channel was first poured, using from one to three motor-driven Chicago concrete mixers delivering a ¾-yd. batch at a time and mounted on cars which were run on an adjacent portable track. The forms for this channel-shaped slab consisted of a single row of boards set on edge against stakes along the outer sides of the slab and extending up to the top of the curb, and sectional forms blocked up between these boards to form the inner sides of the curbing. The material for the slab was poured in to the full thickness and then the inner forms were put in place and the curbs poured immediately. After the concrete had set these inside forms were removed and a layer of tamping material was spread over the concrete. The ties were then laid and spaced ready for the rails.

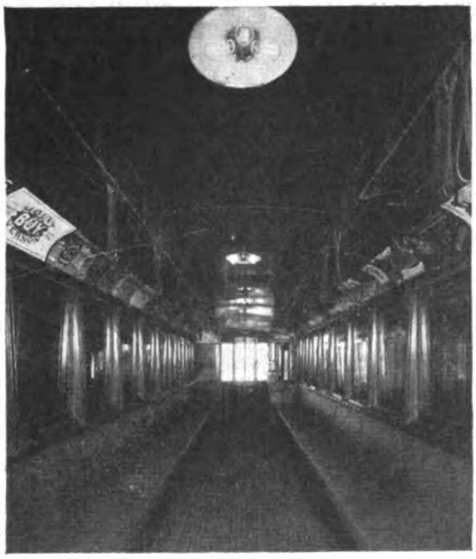
Gangs of men following the mixers as they receded from the first end of the job were engaged in tearing up the paving around the old track and in breaking out the concrete around the rails so that they might be freed from the ties. To expedite this work a spare compressor from the railway shops was loaded on a small flat car and taken to the job to supply air to eight Ingersoll-Rand pneumatic tampers fitted with special tools for chipping out the concrete. These tools were effective in removing the concrete over the base of the rail and the grouting at the web of the rail. They were also used later in tamping the ties up to grade and were found especially valuable in tamping up the new special work at the seven intersections.

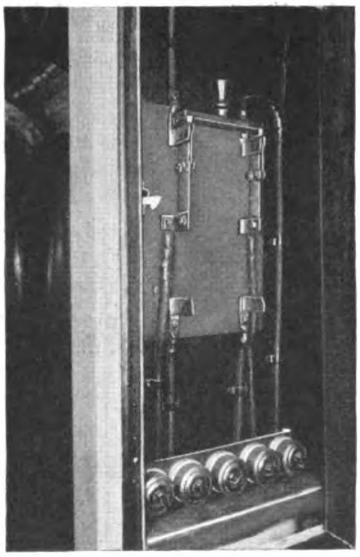
TRACKS MOVED WITHOUT BREAKING ELECTRICALLY WELDED JOINTS

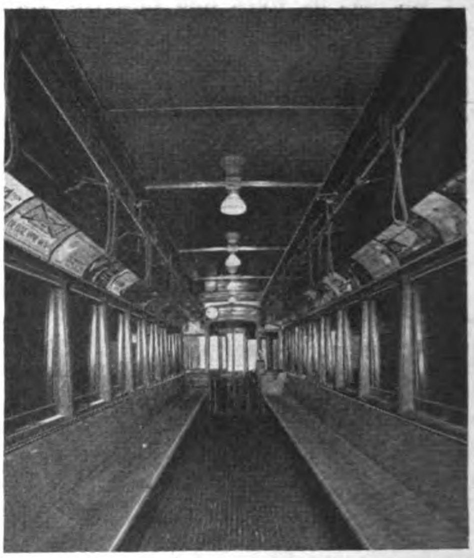
As the rails were cleared of concrete they were moved over onto the ties at the new track location. This moving process was done gradually by a gang of men who used crowbars to pry the rail over to its new position. It was possible to do this without breaking any of the Lorain welded joints. After the rail was in its new location another gang of men cleaned the rail to receive the new concrete and grouting.

The work of tearing up the old paving outside the rails in order to free the rails was greatly expedited by placing jacks underneath two or three tie rods at a time, after the inside paving had been removed. Lifting up on the jacks bent the rods up and pulled the rails toward each other and away from the outside paving, thus avoiding the necessity of removing the first row or two of blocks by hand.

As the rail was moved over to the new ties it was set to gage and the ties blocked up approximately to grade. The tie plates were then put under the rails and the holes bored in the ties to receive the screw spikes. These holes were bored by means of Chicago Pneumatic Tool Company's electric drills and the spikes screwed in with heavy No. 4 drills made by the same company. This screwed the spikes down and set them tight as the motor stalled. The spikes were driven through rail clips, two spikes and clips on the inside and one on the outside at each tie. Each spike ma-


THE OLD STYLE—FIFTEEN 23-WATT LAMPS


PANEL BOARD FOR NEW LIGHTING


THE NEW STYLE—FIVE 56-WATT LAMPS

Reducing Car Lighting Costs from 36 Cents to 8 Cents per 1000 Car-miles

By Arthur R. Johnson

Assistant to Superintendent of Equipment, Mechanical Department, Third Avenue Railway System, New York

IN CONNECTION with the remodeling of the Third Avenue Railway System of fifty standard 28 ft. closed cars into prepayment type for its lines in Westchester the car lighting is being changed from 23-watt to 56-watt units because of the great success of the larger units on the fifty low-level steel cars operated in the Borough of the Bronx. These cars, which were described in the ELECTRIC RAILWAY JOURNAL of Feb. 14, 1914, have five 56-watt tungsten lamps in Macbeth-Evans Alba shades along the center line of the car, as illustrated. Previously there were three five-light clusters with Benjamin shades and 23-watt lamps.

The new semi-direct system gives a well-diffused illumination. The tungsten lamps form one series circuit, the second circuit being made up of five 2-cp. lamps for the destination signs and headlights. In case a tungsten lamp burns out, the equivalent resistance can be cut in by turning the snap switch provided for each of the five lamps. These snap switches are located in a panelboard at the front of the car. The same panel carries a double-throw switch required for changing from underground conduit to overhead trolley operation.

Experience since 1914 with the equipments on the low-level cars shows that these larger units instead of costing for maintenance three-eighths as much as the 23-watt outfits as estimated actually cost less than one-quarter as much. A recent check shows that the lamp costs per 1000 miles for the past year were 36 cents on the system as a whole and only 8 cents for the fifty low-level cars alone. Only 270 lamps, or less than one lamp per day, were required for these fifty cars, which made approximately 900,000 miles.

(*Concluded from page* 611)

chine was protected from excessive overload by a circuit breaker mounted on a pole hooked over the trolley wire to supply the power. These circuit breakers also served to start and stop the motor, and were controlled by a solenoid energized through a double push-button control at the handle of the drill.

After the rails were fastened to the ties they were jacked up to grade by means of screw jacks set about 30 ft. apart on each rail, and the additional screenings were placed between the ties and the latter tamped to permanent grade. The tamping was made more solid by wetting down the screenings and by washing them underneath the ties. This was done by directing a nozzled stream at the bottom edge of the tie. With the track thus tamped to grade and aligned, the jacks were removed and the upper concrete or paving foundation poured. This was poured from mixers operated on the track under construction. The paving was then laid as described above, and wherever the condition of the old blocks was satisfactory they were relaid, the pitch with which they were formerly bound having been thoroughly cleaned off in order that the new grouting would be effective.

All work on the improvement was finally completed on Dec. 2, which date had been set for a formal opening of the street. A considerable celebration attended by some 10,000 people and accompanied by appropriate speeches from the Mayor and other prominent city officials marked the conclusion of this important work.

Kansas City Railways Active in Local N. S. C. Council

THE Kansas City Railways has been one of the most helpful of active members of the local council of the National Safety Council, and its representatives at the foremen's round tables have helped to give the discussion a practical value. At the recent election of officers, George J. Smith, superintendent of rolling stock and shops, was chosen as vice-president, while Julien H. Harvey, superintendent of efficiency, has served two terms as local president. At the last council dinner there was an attendance of 420.

Automobile Parking Chokes Washington Traffic Channels

In This Section of His Report John A. Beeler Says Greatest Single Source of Relief to Washington Car Service Is Restriction of Parking Privileges—Other Suggestions Dealing with the Washington Railway & Electric Company Include One-Way Vehicular Traffic, Double-Berthing, Loading Platforms, Front-End Fare Collection and Rerouting

ON MARCH 9 John A Beeler submitted to the Public Utilities Commission of the District of Columbia his fifth unit report. This deals largely with relief measures for the lines of the Washington Railway & Electric Company. The most congested section of this railway system is in the region bounded by Ninth Street, Fourteenth Street, F Street and G Street (see Fig. 1), and in many ways the conditions here are worse than on Fifteenth and adjoining streets, discussed in the report on the Capital Traction Company, abstracted in the issue of this paper for Feb. 2. The roadways are narrower, so that many vehicles have to run on the car tracks, especially if machines are parked along the curbs. This reduces the speed of car traffic to that of the slowest vehicle on the rails and results in bunching and irregular service. Since the number of cars that can pass through this portion of the railway system determines the service that can be rendered on the remainder of the lines, schedules are very seriously deranged.

> **A considerable amount of parking is done by those who drive to work in the morning and leave their machines on the streets all day while in their offices. In the afternoon they drive back home, but not until the general public has been exasperated by the delays to the street cars consequent on the use of the public streets as a private garage. If a street car company were to run its cars downtown in the morning and leave them in the street until needed in the afternoon, it would not take the public long to invoke the police powers and have the company officials run out of town.**
>
> JOHN A. BEELER.

The section under consideration is the heart of the city. Here are concentrated the bulk of the retail business and the principal office buildings, many of which are now filled with government employees engaged on war work. Very little space is left for the construction of additional tracks, as the streets are well covered as it is. Through this small area is operated every city route of the Washington Railway & Electric Company, with the single exception of the Columbia line, which is but a short distance north, on New York Avenue.

In the main portion of this territory, that bounded by Ninth, Fourteenth, F and G Streets, there are twelve street corners. Six of them are electric railway crossings, and at each crossing there are one or more curves that still further complicate the special work. The effect of the track intersections is invariably to slow down the speed, since cars are now required to come to a full stop before crossing other tracks. On account of the breaks in the conductor rails inherent to the conduit system, it is necessary for the cars to proceed without power over the intersections, which not only reduces the speed but makes it inadvisable for cars to follow each other closely.

The maximum number of cars operated in one direction over each street is shown in Fig. 3. The heaviest service over any piece of track is that between F and G Streets on Fourteenth, where 107 cars are scheduled to pass one way in one hour. With a stop at G Street, a division of cars at the switch between northbound and eastbound, and the ever-present automobile traffic, the problem demands action.

Second place is accorded to the two squares on G Street between Ninth and Eleventh, where ninety-nine cars are scheduled westbound in one hour. Here the vehicle traffic is less, so that the situation is not so severe. The general traffic, however, is so great that the street cars are not all passed through on schedule time.

The large number of track intersections over which the cars in this territory have to pass has proved a serious limitation on the number of cars that can be operated over the main routes. This is indicated in Fig. 4, which shows the number of cars scheduled to pass over each intersection in this territory.

The maximum number scheduled is at Fourteenth and G Streets, where 283 are supposed to pass in one hour. Next to this is the intersection with the Fourteenth Street line of the Capital Traction Company at Fourteenth and H Streets, where 259 cars in an hour are scheduled. The smallest number at any point in this section is at Eleventh and E Streets, where but fourteen cars are scheduled in the maximum hour.

No more cars can be run than can be passed over the crossings. It takes on an average about eight seconds for a car to pass over an intersecting street. It is possible for two cars to pass at the same time in opposite directions, and this is done in some cases. It is ordinarily the case in Washington that each car comes to a full stop before entering the intersection. The

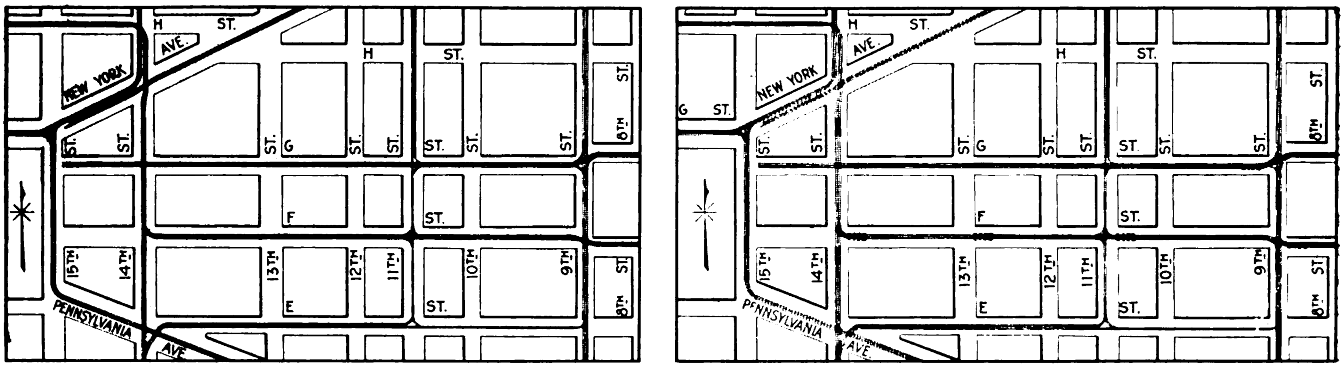
DISTANCES TRAVELED WITH 1½ M.P.H.P.S. ACCELERATION

In the first	second	1.1 ft.,	total from start 1.1 ft.
In the second	second	3.3 ft.,	total from start 4.4 ft.
In the third	second	5.5 ft.,	total from start 9.9 ft.
In the fourth	second	7.7 ft.,	total from start 17.6 ft.
In the fifth	second	9.9 ft.,	total from start 27.5 ft.
In the sixth	second	12.1 ft.,	total from start 39.6 ft.
In the seventh	second	14.2 ft.,	total from start 53.8 ft.
In the eighth	second	16.4 ft.,	total from start 70.2 ft.

time required is then limited by the acceleration of the car. At a rate of acceleration of 1½ m.p.h.p.s., which is the average for this city, the car would move the distances given in the table on page 613.

In this table is an absolute limit to the speed which can be obtained in going over a crossing. This requires power to be kept on all the time while moving over the intersection. With the conduit system this is impossible, as the conductor rails are necessarily interrupted where the two tracks cross.

If ten seconds are allowed as the lowest average time for the passage of a car from the time the signal to proceed is given until the intersection is cleared, it follows that the maximum number of single-car units that can pass over a right-angled crossing is 180 for a thirty-minute period, or 360 per hour. To do this would require no waste time between cars, that every car moves with clock-like regularity, and that no breaks occur due to interference of any kind whatsoever. This virtually means that the street cars and all vehicular traffic would have to be operated over the intersections in such a way as to co-ordinate the movements of the latter with that of the street cars. This figure represents the theoretical capacity rather than that actually obtainable.



FIGS. 1 AND 2—EXISTING AND PROPOSED CAR STOPS IN CONGESTED SECTION OF WASHINGTON RAILWAY & ELECTRIC COMPANY'S SYSTEM

CONGESTION INCREASED BY AUTOMOBILES

The streets in this territory are quite wide, F Street being 100 ft. wide and G Street 90 ft. wide. The active roadways are encroached upon by wide sidewalks of which a large proportion has been appropriated by private property owners for stairways, areaways and projecting show windows. The roadway is rendered still less effective by the large number of automobiles parked at all points in this district. In several cases machines are allowed to park at an angle with the curb, which still further reduces the roadway. Even at the street corners, where the public is supposed to have a chance to board the cars, the number of automobiles is so great that it is frequently difficult for prospective passengers to reach the cars they desire to take.

The danger to pedestrians is also increased by the extensive parking. An automobile driver never knows when a pedestrian will appear from behind a parked machine; and a person who desires to cross the street or catch a car is never sure that he will reach his objective in safety.

A considerable amount of parking is done by those who drive to work in the morning and leave their machines on the streets all day while in their offices. In the afternoon they drive back home, but not until the general public has been exasperated by the delays to the street cars consequent on the use of the public streets as a private garage. If a street car company were to run its cars downtown in the morning and leave them in the street until needed in the afternoon, it would not take the public long to invoke the police powers and have the company officials run out of town. In fact, the situation has been fully covered by Sec. 64 of Art. XII of the Police Regulations, which states: "A driver of a street car shall not allow it to stand upon a street for a longer period than five minutes unless the way is obstructed . . . " This is a most commendable regulation, but it seems to be a case of unconscious discrimination in favor of the automobile to allow it privileges that are denied the more public conveyance.

The result of all these delays is to interfere seriously with schedules, especially during the rush hours. The cars are slowed down until they move scarcely as fast as a man can walk. The schedule speed called for on the time-table is low enough, being but 6.6 m.p.h.

On F Street the speed in the morning by fifteen-minute periods was found to vary from 6.71 down to 2.96 m.p.h., averaging about 4.6 m.p.h. for both directions. In the evening rush period the speed varied from 9.75 down as low as 2.84 m.p.h., the average being approximately 4.5 m.p.h. for all cars. The speed on G Street in the morning was fair, being 6.5 m.p.h., which was reduced in the evening to 5.5 m.p.h., the range in speeds being from 8.21 down to 3.01 m.p.h. The slightly better showing on G Street east of Fourteenth is counteracted by the speed in the block from Fourteenth to Fifteenth, where the average speed was less than 2.5 m.p.h. The maximum speed recorded in this block for a fifteen-minute period was 2.78 m.p.h. The average time required to turn a car on the crossover, based on 154 observations, was sixty seconds.

The average speed on Ninth Street is somewhat better than on F and G Streets. The morning observations by fifteen-minute periods showed an average speed of 7 m.p.h. on Ninth Street, which, however, fell to 5.6 m.p.h. in the evening rush. Under similar conditions the speed on the Eleventh Street line during the morning rush was 5.9 m.p.h., and in the evening 4.2 m.p.h.

These average speeds may be tabulated as follows:

AVERAGE SPEED OF CARS IN MILES PER HOUR

Line	Morning Rush	Evening Rush
F Street	4.6	4.5
G Street (East of Fourteenth)	6.5	5.5
G Street (West of Fourteenth)	....	2.5
Ninth Street	7.0	5.6
Eleventh Street	5.9	4.2

The situation is still further complicated by the variety of cars used. On F and G Streets may be seen every kind of street car, from the large center-entrance type used on the Maryland line to the small hand-brake cars that still do duty for rush-hour service on practically all the lines. Apparently no attempt has been made to segregate types of equipment by routes. This mixture of car types has proved wasteful, since the cost of platform labor time is increased, power is wasted because the faster cars crawl along on the resistance points of the controller, and the accommodations given the patrons are so reduced that the carrying capacity of the road is materially decreased.

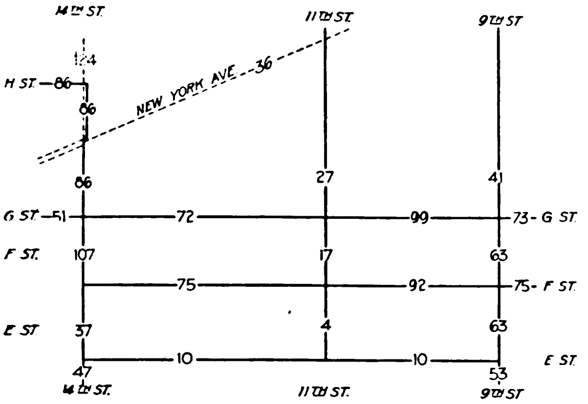


FIG. 3 — MAXIMUM NUMBER OF CARS IN ONE DIRECTION SCHEDULED IN DOWNTOWN DISTRICT, WASHINGTON RAILWAY & ELECTRIC COMPANY

MEASURES AVAILABLE FOR RELIEF

The measures which should be put in effect immediately are the following:

1. Street cars must be given precedence by the traffic officers, and must be passed over intersecting streets in pairs as far as possible, especially during the hours of congestion.
2. Parking of automobiles must be limited to permit freer movement of the street cars and to provide greater safety to the public.
3. Certain portions of the streets must be limited to one-way vehicular traffic.
4. Equipment of the company must be so distributed that, as far as possible, all the cars on one street shall be of the same general type.
5. Cars of greatest capacity and highest speed must be used on the principal routes, and the slower and smaller cars transferred to the less congested lines.
6. Stopping places must be combined and reduced to the smallest number that will accommodate the public properly.
7. Double berthing must be employed at all the stops in this territory.
8. Loading platforms must be provided where they can be used to advantage; at the other stopping places zones of safety must be provided.
9. Front-end collectors must be employed at the stops in this territory wherever the car type is suitable; at other points inspectors should aid in loading the cars.
10. A rerouting of the cars in this region should follow as soon as practicable. This will be considered in detail in a section of this report to follow.

1. *Precedence for Street Cars.* The cars must be given preference by the traffic officers at all intersections in this territory. By passing cars in pairs the movements will be facilitated and congestion reduced to a minimum. As at other points already referred to in the first unit report, the officers should endeavor always to keep the near-side berths empty and the far-side berths filled. If the track clearance on curves is such that cars of certain types cannot pass safely the officers should be well informed of the fact and should make due allowance in their actions governing the movement of cars.

2. *Parking of Automobiles Limited.* Parking of automobiles interferes seriously with the movements of cars in this congested territory. It is recommended that no parking be allowed on F and G Streets between Ninth and Fourteenth Streets, and on Ninth Street between F and G Streets, and that automobiles be required to proceed through the streets, draw up parallel with the curb, and receive or discharge passengers only. Commercial vehicles should be allowed to stand in front of stores only long enough to transact legitimate business.

3. *One-Way Vehicular Traffic.* It is also recommended that F Street between Seventh and Ninth be closed to westbound traffic, that G Street between Seventh and Ninth be closed to eastbound traffic, and that Ninth Street between F and G be closed to northbound traffic. This should apply to all vehicles except those having business with the Patent Office, which is the only building within this boundary, and which is served principally by the entrance on Seventh Street.

4. *Segregation of Types of Equipment.* The Washington Railway & Electric Company has no one type of car that can be called standard. There are, however, several types of which the company owns a considerable number. These are the center-entrance, the pay-as-you-enter, and the old-style open platform box cars. Sufficient cars of each of these types are in service completely to equip various lines with a single type. This will make it possible to speed up all lines except those on which the slowest cars must be placed. All cars

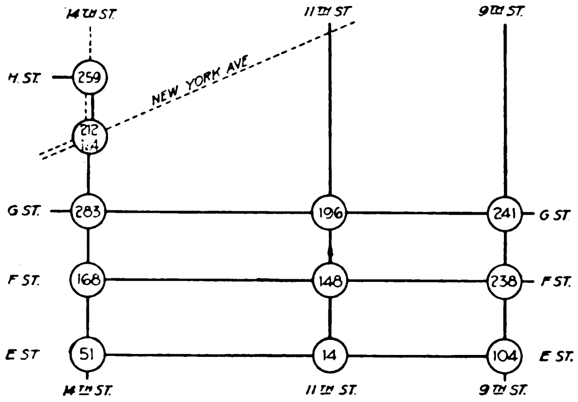


FIG. 4—CARS SCHEDULED TO CROSS INTERSECTIONS BETWEEN 4.30 AND 5.30 P.M.

running to the Bureau of Engraving should be of the prepayment type, as otherwise it is not possible for the conductor to collect all the fares in a crowd before reaching the downtown section where most of the passengers transfer to other lines.

5. *Suitable Equipment for Various Routes.* The routes with the heaviest travel should be operated with the largest and fastest cars on the system. It is desirable to use the same type of car on both the Connecticut Avenue and the Georgetown lines, so as to make the equipment entirely interchangeable. The most suitable car for this line is the center-entrance type. This is largely due to the fact that it is the only type (except the hand-brake car) of which there are sufficient to completely equip these lines.

6. *New and Fewer Locations for Stopping Places.* The number of stops can be materially reduced without in any way discommoding passengers, and in most instances it merely makes the difference between stopping on one side of the street or the other. The proposed locations for stopping places in this area are shown in Fig. 2. The total number of stopping places in the area considered will be reduced by their change from fifty-two to thirty-two, saving twenty or 38 per cent.

7. *Double Berthing.* Double berthing must be employed at all these stops in order to get the maximum benefit from the change. The double berthing must be used at all times of the day and night. In every case the car must take the first berth if empty. If not, there should be no hesitation, but the car should be stopped promptly at the second position.

8. *Loading Platforms and Safety Zones.* The streets in this area are comparatively narrow, and it is impossible to obtain sufficient width for loading platforms at all points. However, they must be constructed, and it is essential to have them, at the following places:

Fourteenth Street, midway between G Street and New York Avenue, for both directions.
F Street at Fourteenth, for both directions.
F Street at Thirteenth, for both directions.
F Street at Eleventh, for both directions.
F Street at Ninth, for both directions.
G Street at Ninth, eastbound.
Ninth Street, midway between F and G Streets, northbound.

The platforms should be about 10 in. high and 96 ft. long, which will accommodate two cars of the longest types in use on any of the company's lines. The width should be 4 ft. 6 in. for all except those on Fourteenth Street, which can be 6 ft. wide. It is considered advisable to maintain a width of roadway sufficient to allow the passage of two automobiles side by side, which requires approximately 13 ft. as a minimum. To keep traffic moving it is not considered desirable to have the roadway quite so narrow. To facilitate vehicle movement, the platforms could have the corners away from the track rounded off or beveled. This will prevent danger from collisions of vehicles with the platform. The standing limit for automobiles (there being no parking) should also be moved back a sufficient distance from the platform for a moving vehicle to swing in an easy curve to the roadway between the platform and the curb, instead of having to make a sharp turn between a standing vehicle and the platform.

9. *Front-End Collection.* Comparatively few of the cars of this company have been used with prepayment of fares and few are equipped with doors which can be kept closed while the cars are in motion. The center-entrance type, which is the largest prepayment car used by this company, has only a single door, so that a separate collector on the street could not help in collecting fares from passengers as they board the cars. An inspector on the loading platform could, however, aid materially in loading by holding back entering passengers until those leaving are all out and by assisting passengers, as in providing tickets and change, before the arrival of the car.

While it will be comparatively difficult to modify the open platform cars to make them into the regular prepayment type with inclosed platforms, it will be quite simple to prevent passengers from entering the cars at the front end. This can be done by issuing instructions to the motormen, and with the co-operation of the public it should not be difficult to use the front platform for exit only. As a matter of safety, passengers should not be allowed to ride on the front platform.

The use of the rear platform as the only regular entrance to these cars will make it possible for the company to use them with a modification of the prepayment system, so that the conductor will always remain at the rear entrance, and collect the fares as the passengers board the car. This will aid in keeping the cars moving, as the conductor will always be in a position where he can see the rear step and know whether it is safe for the car to proceed. It will also tend to reduce accidents, as the conductor will be where he can supervise to a certain extent the movements of boarding passengers.

Another advantage of this arrangement is that in the congested zone front-end collectors can assist in loading the cars by standing on the loading platform or in the safety zone and collecting fares from passengers entering the car by the front door. Frequently these front-end collectors will also be able to assist in loading passengers at the rear entrance, as a man on the street can assist in directing the movements of persons entering or leaving the cars better than the conductor.

On all closed cars, except on interurban cars where special compartments are provided, smoking should be prohibited. The rear platform should be kept clear for the ingress of passengers. This is in keeping with the best modern practice.

10. *Rerouting Desirable.* Apparently the lines of this company are not so arranged as to give the best possible service to all parts of the city which are included in its territory, especially when non-competitive. In order to accommodate all districts to the best advantage, considerable rerouting is desirable so that some sections now under-serviced will receive a proper proportion of the available transportation facilities. To obtain relief immediately, it is recommended that the first nine items be adopted without waiting for the more comprehensive treatment necessary in considering a rerouting plan. Rerouting possibilities will be presented in sections of the report to follow.

RESULTS TO BE OBTAINED

The results to be obtained in the proposed immediate changes are very similar to those described in the first unit report. An increase in speed in the congested region should follow at once. This in turn will have

Rate-Making Is a Sovereign Power

Oregon Circuit Court Unanimously Rules That the State Through the Public Service Commission Can Change Rates Set in Municipal Franchises

BY A UNANIMOUS vote the six circuit judges of Multnomah County, Ore., sitting *en banc*, handed down on March 14 a decision upholding the right of the Public Service Commission to grant a 6-cent fare to the Portland Railway Light & Power Company. The sole question involved was the power of the commission to raise rates prescribed in franchises.

The history of the 6-cent fare in Portland dates from last autumn, when the company petitioned for increased revenues. A 6-cent fare was then denied, although partial financial relief along other lines was granted [ELECTRIC RAILWAY JOURNAL, Oct. 27, 1917, page 757]. The commission later granted a rehearing and in January, 1918, approved a 6-cent fare [ELECTRIC RAILWAY JOURNAL, Jan. 26, 1918, page, 184]. In February the city of Portland brought suit against the company and the commission, alleging that the latter had acted illegally.

STATE HAS RATE-FIXING POWER

In now upholding the commission's decision the Circuit Court begins with the statement that the power to establish fares for the transportation of passengers by common carriers is a sovereign power of the State. The State may not entirely denude itself of this power. It may delegate, but it cannot abdicate. It may delegate to a municipal corporation authority to grant a franchise upon the streets and establish an unalterable rate fare for the limited duration of the franchise, but such authority can be delegated only by express grant or clear intention. (Woodburn *vs.* Public Service Commission, 82 Ore. 114; Stanilaus County *vs.* San Joaquin, etc., Canal, etc., Company, 192 U. S. 201; Howe Telephone Company *vs.* Los Angeles, 211 U. S. 265; Milwaukee Electric Railway *vs* Railroad Commission, 153 Wis. 592, No. 238 U. S. 174.)

With this doctrine so clearly and finally established, the court says, it remains to be considered whether the Legislature has delegated sufficient authority to the city of Portland to execute an inviolable contract for rates of fare. By Sec. 94 of the charter of 1903 the city is authorized to grant for a limited time franchises in its streets and public ways. Sec. 112 reads as follows:

> Every grant of a franchise which provides for this charging of rates, fares and charges shall contain a provision fixing the maximum rate of fares, rates and charges which the grantee, his, its or their successors or assigns can charge or collect for services rendered or performed by virtue of or during the life of such franchise and the operation of his or its plant or property thereunder; and said grant may also in addition provide that the council reserves the right to thereafter from time to time change, alter, regulate and fix fares, rates or charges which the grantee, his, its or their successors or assigns can charge or collect thereunder during the life of such grant or franchise.

Under these charter provisions the city granted the franchises of the Portland Railway, Light & Power Company. Each franchise contained a provision, in substantially identical terms, that the grantee could collect 5 cents and no more for each passage in one general direction. Provision for the regulation of fares by the Council was omitted from practically all of the franchises. Did the State by this delegation surrender its power of regulation?

The Circuit Court thinks not. The only reference to rates is in Sec. 112, and this is not a grant of power to fix an unalterable rate, as against the State, but is a limitation on the power of the city to grant franchises without fixing the maximum rate of fares therein. In Portland Railway, Light & Power Company *vs.* City of Portland, 210 Fed. 119, Judges Bean and Wolverton of the Federal Court construed these very provisions, in these words:

> Sec. 112 of the charter does not in terms or by necessary implication authorize or empower the city to enter into an irrevocable contract with the grantee of a franchise fixing the rates of fares which may be charged by such grantee. . . . [The section] is in the nature of a command from the supreme legislative power of the State to the city that it shall, in granting franchises which provide for a charge of fares, insert a provision fixing the maximum charges which the grantee or its assigns may charge or collect for services rendered during the lifetime of the franchise. It is a limitation rather than the grant of a power to contract or barter away the governmental right of regulating fares, . . . and the fact that no provision was entered in the franchise reserving to the city the right to change the rate cannot affect its power to do so.

STATE IS IMPORTANT FACTOR IN SUIT

The court considered with care two cases upon which much reliance was placed by city counsel, Detroit *vs.* Detroit Street Railway, 184 U. S. 368, and Cleveland *vs.* Cleveland Electric Railway Company, 194 U. S. 538. These were cases, the court remarks, in which the city was attempting to regulate rates, and the State was not a party. In certain situations the rate provisions of a franchise might be binding between parties, and neither of the immediate parties could alter the rates, but the State might regulate them in the exercise of its sovereign power. The Oregon Supreme Court evidently had this line of decisions in view when it said in Woodburn *vs.* Public Service Commission, *supra:*

> It must be borne in mind throughout the discussion of this case that the State, acting through its Public Service Commission, is a party to this suit, and consequently judicial precedents arising out of controversies between none but the immediate parties to a franchise are not controlling here. Moreover, the present juncture does not call for a decision of the relative rights of the grantor and grantee of the franchise as between themselves.

The court concludes, therefore, that the State did not surrender its sovereign power to regulate rates by its grant of franchise powers in the charter of 1903; that the delegation is not sufficient to extinguish the power of the State to alter these rates; that the immediate parties to the franchise contracted in this rela-

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(*Concluded from page* 616)

the effect of passing more cars through the downtown area in a given time. Higher speed will in turn increase the amount of service in proportion, and also make the movements safer and more agreeable to the public, particularly in the material reduction of crowding, because the same number of cars will make a greater number of trips.

Even so inexpensive an innovation as the raised loading platform is of material benefit to the public in making it safer to board the cars, besides affording a convenient place to stand out of the wet and slush of inclement weather.

A. R. E. A. Approves Reports

An Abstract of Results of Discussion at Chicago Convention of Special Interest to Electric Railway Men Is Given

AT THE annual convention of the American Railway Engineering Association held last week at Chicago recommendations of fourteen of the committees were adopted. Abstracts of the reports of a number of these were printed in the issue of the ELECTRIC RAILWAY JOURNAL for March 23, page 565; that on stresses in railroad track is given below.

A large part of the time devoted to the paper on ballast was taken up with a moving picture of the Ingersoll-Rand pneumatic tamper at work. The purpose of the picture was to show the labor saving which results from the use of a device of this sort. The only extended discussion on the recommendations of the committee on ballast was over the adoption of a specific section calling for 24 in. of ballast. A standard section for 24-in. depth of ballast was, however, adopted, not for the purpose of stipulating that 24 in. of ballast should be used but that where such depth is used the standard should be followed.

The chairman of the committee on ties suggested that as the report of the committee consisted entirely of recommendations and information rather than any definite plans to be adopted, the committee make no report at this time but continue for another year. This suggestion was followed. Specifications were adopted for quenched carbon and carbon alloy steel joint bars, to be substituted for the specification for heat-treated oil-quenched steel joint bars now in the Manual. Specifications were also adopted for quenched carbon alloy steel track bolts and nuts, and for medium carbon steel track bolts and nuts, to replace the existing specifications for track bolts. The committee's recommendations regarding the location for physical test specimens and of chemical sandals from rails were accepted. With certain slight modifications also, the ten conclusions relative to the drainage of roadway through station and yards were adopted.

On the subject of signs, fences and crossings recommendations specifying the dimensions of flangeways were adopted as were conclusions relative to concrete fence posts. One conclusion adverse to the use of concrete posts in the general vicinity of salt water was referred back to the committee. Photographs illustrating different types of fences were approved for the purpose of supplementing matter now in the Manual.

The recommendations of the committee on track with respect to certain changes in the Manual were accepted and a design for cut track spikes was adopted.

PROGRESS REPORT ON STRESSES IN RAILROAD TRACK

This report was presented by a joint committee of the American Railway Engineering Association and the American Society of Civil Engineers and is being presented simultaneously to each society. Owing to its volume, it occupying nearly 200 pages of the Bulletin, only a brief résumé can be given here. It presented the results of study and experiment extending over a period of more than four years. These tests show that rail stresses are reduced by solid and rigid roadbed construction, by deep ballast, by heavy rail and by thorough tamping. Thousands of measurements of track depression and rail stresses were made, under both standing and moving loads. As a whole they demonstrate that railway track is an elastic structure, acting in accordance with Hooke's law and thus susceptible to exact engineering treatment. More specifically, various practical facts were brought out, among them the following:

1. The span between ties does not govern the stresses in the rail, these being determined by the general track depression.
2. Both rail stress and track depression increase in direct proportion to the load.
3. Both rail stress and depression are least for well-ballasted roadbed and greatest for poor roadbed; stone ballast is better than cinders and deep ballast better than shallow ballast. Thorough tamping reduces deflections and stresses.
4. Rail stresses are less in heavy rail than in light rail.
5. A train produces higher rail stresses at high speed than at low speed; the increase may exceed 50 per cent.
6. The stress in the outer flange of the rail generally is much larger than that in the inner flange. The rail is subjected to a certain amount of transverse bending.

(*Concluded from page 617*)

tion with the view that the State might later intervene and regulate the rates to meet new and changing conditions, and the rate provisions of the contract do not constitute inviolable contracts, binding upon the State.

In disposing of other contentions of the city of Portland, the court notes that Sec. 2207 of the State laws prohibits under penalties any street railway in cities having a population of more than 50,000 from charging a fare of more than 5 cents within the corporate limits. This law, general in terms but local in its operation, was enacted in 1901. The court believes that it has been repealed by necessary implication by the public service law, just as this act amended or superseded all municipal charters of the State in conflict with its provisions. The public service act embraces the whole subject of rates for public service, and it was the plain purpose of the framers to give expression to the whole law therein.

Whether the public service act is retrospective, or prospective only, is a question of construction. In the court's opinion, the act was plainly intended to embrace antecedent rate contracts. The language of the act itself, various provisions contained therein, the history of its introduction and passage by the legislative assembly, as well as the extended discussion before its ratification by the people under the referendum, all indicate that purpose and intention. The valuation of all public utilities, the submission of reports, the schedules of rates required to be filed with the commission, with the practical construction placed upon the act by the officers charged with the duty of executing its provision, are persuasive reasons for this conclusion. Moreover, this statute has been construed to be retroactive in the state of its origin. (President and Trustees *vs.* Southern Wisconsin Power Company, 135 N. W. 504; Manitowoc *vs.* Manitowoc & Northern Traction Company, 129 N. W. 929; Woodburn *vs.* Public Service Commission, *supra.*)

Public Utility Situation Outlined

Regional and State Committees Appointed and General Condition of Public Utilities Described in Statement Just Issued by National Joint Committee—Utilities Willing to Bear Their Share of War's Burden, but in Interest of Nation They Should Be Kept in Condition to Render Good Service

THE national committee on public utilities, with headquarters at 957 Munsey Building, Washington, D. C., has just issued a statement describing the public utility situation under war conditions. Copies of this statement have been sent to the branch regional committees representing the War Board of the American Electric Railway Association and the other associations concerned, so that they will take steps to bring this matter to the attention of the public. A copy of the statement follows:

A committee representing the American Electric Railway Association, the National Electric Light Association, the American Gas Institute and the National Commercial Gas Association, and consisting of Philip H. Gadsden, E. K. Hall and H. H. Crowell, has brought to the attention of the government officials at Washington the condition and needs of the public utility industry, with the result that President Wilson, Secretary McAdoo and Comptroller of the Currency Williams have all publicly expressed their concern as to the situation and have urged, in the interest of the national program, that state and local authorities take such steps as may be necessary to assist the utilities in preserving their credit and their service. These utterances of the President and his associates have been printed in pamphlet form and widely distributed.

The officers of the national associations believe the reasons that actuated those government officials in sounding a public warning of the necessity for liberal and sympathetic treatment of utilities should be brought to the attention of regulatory commissions and local authorities by the national associations interested, not from the standpoint of any particular corporation or utility and not affecting the interests of any one company or group of companies, but solely with regard to the broader national interest involved and the relation of the utilities to the general war program and the whole financial structure. Something more than the preservation of these utilities themselves is at stake.

The prompt and successful mobilization of men, money and materials, essential to the winning of the war, is predicated upon a continuous and constantly extending provision of light, heat, power and urban and interurban transit facilities in every section of the county. The services which in ordinary times were a local convenience have become in this period of universal stress a national necessity.

The average person never stops to think that if the services of the public utilities throughout the country should stop, the whole war program would instantly collapse. It follows that in so far as the efficiency of the public utilities is impaired the war program is proportionately delayed and interfered with.

While new construction and extensions will, during the period of the war, be held down to necessary requirements, it is absolutely impossible to refuse arbitrarily to make any additions or extensions. The direct war program or the general welfare of the public will require in most sections of the country some additional service. This, of course, requires funding of extensions to plant which can only be consummated by the rehabilitation and preservation of the credit of the utilities. The rapidly rising line of increasing operating costs has in some instances already crossed the horizontal line of inflexible rates—rates that were fixed on a pre-war basis and that are totally inadequate to meet existing conditions.

The securities of public utilities have long been a favorite form of investment for both small and large investors, savings banks, insurance companies and trustees, and are to be found as collateral for loans in every national and state bank. Their depreciation accordingly threatens the whole financial structure. If relief cannot speedily be had and the companies are forced generally to adopt the practice of suspension of dividends, the nation's ability to subscribe for Liberty Bonds, and one of the government's chief sources of supply for income taxes, will be seriously diminished. Paul Warburg of the Federal Reserve Board recently stated before the Senate finance committee that it would be most serious for the nation's financial program if the corporations should be forced to suspend payment of dividends.

The conclusion reached by the officials of the government, in Washington, from their study of the situation, was that the really fundamental solution of the problem lay in a speedy increase of rates to absorb the increased costs of doing business, brought about by war conditions. It is equally clear that they were satisfied that the ordinary procedure for an increase of rates was utterly inadequate to meet the emergency.

It is the belief of the national associations that if the general public utility situation can be presented to the state commissions, and municipal authority along the same general lines on which it was presented to the authorities in Washington, that they must inevitably come to the same conclusion. Accordingly, the national associations are undertaking to have the general public utility situation brought to the attention of the state commissions and municipal authorities in conferences entirely dissociated from any individual rate case, in the hope that the matter of increased rates may be approached from the broad point of view of the vital general public and community interest and the interest of the nation itself, rather than solely from the viewpoint of a controversy between a local utility and its patrons.

To bring the question before the local authorities from this point of view it was thought that it would be effective to have it presented by representative committees in each state acting for and in behalf of the national associations.

The national associations have asked P. H. Gadsden, E. K. Hall and H. H. Crowell, the committee which represented the associations in Washington, to take charge of this work and to organize regional and state committees throughout the country for this purpose. Such committees have already been formed.

Apparently several of the commissions do not realize that the whole principle of regulation is now receiving its supreme test. If it is found to be too inelastic to respond promptly to abnormal conditions, it will have failed to justify its existence. It is vastly more important that the regulatory system should demonstrate its ability to preserve the efficiency and comprehensiveness of the service, than it is to demonstrate that it is able to prevent, here and there, an occasional exhorbitant rate, all of which have long ago been corrected.

Everyone will agree that no public utility ought to make any additional profit by reason of the war, but this is an entirely different proposition from the suggestion that their profits should be cut during the war. Utility profits at all times are limited to a reasonable return on the investment. Anything less than that becomes permanent loss, for it can never be recouped from profits always limited to a reasonable return. The result is sure to be impairment of utility credit and reduction in the efficiency of its service.

If a utility's "assuming its share of the burdens of the war" means that officers and employees of public utilities must furnish more service with less facilities and equipment to work with than under normal conditions; that they must find a way to continue these services, notwithstanding increasing costs of materials and labor; that they must work harder to overcome extraordinary obstacles and handicaps in order to accomplish more than ever before, then of course the public utilities should bear their share of the burdens of the war, and they are doing it now and will continue to do it gladly. But if it is intended to suggest that the utilities should furnish these services at less than the cost of production and that these services should in part be rendered gratuitously, this is asking them to carry more than their fair share, it is neither just nor in the public interest, for the result must be impairment of credit, shrinkage of value and securities, reduction in dividends and a consequent reaction upon the many thousands of investors holding these securities, which will diminish their capacity to subscribe for government loans and ultimately threaten the foundations of the general credit structure of the entire country.

REGIONAL AND STATE COMMITTEES

Announcement has also been made in Washington of the appointment of the regional and state committees of the National Committee on Public Utility Conditions, the functions of a regional committee being to appoint a committee for each state in its district. The names of the members of the regional committees and the chairmen of the state committees already appointed follow:

REGIONAL COMMITTEES

I—*Maine, New Hampshire, Vermont, Massachusetts and Rhode Island.*

*H. G. Bradlee, Stone & Webster, Boston, Mass.; C. L. Edgar, Edison Electric Illuminating Company, Boston, Mass.

II—*New York, Pennsylvania, Connecticut, New Jersey and Maryland.*

*J. K. Choate, J. G. White Management Corporation, New York City; T. N. McCarter, Public Service Corporation of New Jersey, Newark, N. J.; C. M. Cohn, Consolidated Gas, Electric Light & Power Company, Baltimore, Md.

III—*Ohio, Michigan, Indiana and Illinois.*

B. I. Budd, South Side Elevated Railroad, Chicago, Ill.; *H. H. Crowell, Michigan Railway, Grand Rapids, Mich.; F. W. Coen, Lake Shore Electric Railway, Sandusky, Ohio.

IV—*Wisconsin, Minnesota, South Dakota, Iowa, Nebraska, Kansas and Missouri.*

P. J. Kealy, Kansas City (Mo.) Railways; William Chamberlain, Brown, Chamberlain & Hanselik, Cedar Rapids, Iowa; *James D. Mortimer, North American Company, New York City.

V—*Utah, Colorado, Idaho, Wyoming, Montana, Washington and Oregon.*

F. T. Griffith, Portland Railway, Light & Power Company, Portland, Ore.; *M. H. Aylesworth, Utah Power & Light Company, Salt Lake City, Utah; G. W. Talbot, Pacific Power & Light Company, Portland, Ore.

VI—*California and Nevada.*

*J. A. Britton, Pacific Gas & Electric Company, San Francisco, Cal.; Paul Shoup, Pacific Electric Railway, Los Angeles, Cal.

VII—*Virginia.*

*George J. Seay, Government Federal Reserve Bank, Fifth District, Richmond, Va.; B. B. Ferguson, Portsmouth (Va.) Gas Company; J. W. Hancock, Lynchburg Traction & Light Company, Lynchburg, Va.; T. S. Wheelwright, Virginia Railway & Power Company, Richmond, Va.

VIII—*Georgia.*

R. C. Congdon, Atlanta (Ga.) Gas Light Company; John S. Bleecker, Columbus (Ga.) Electric Company; *P. S. Arkwright, Georgia Railway & Power Company, Atlanta, Ga.

*Asked to assume responsibility of organizing committee.

CHAIRMEN OF OTHER STATE COMMITTEES

Alabama—J. S. Pevear, Birmingham Railway, Light & Power Company.

Arizona—R. G. Arthur, Douglas Traction & Light Company.

Arkansas—C. J. Griffith, Little Rock Railway & Light Company.

Delaware—T. W. Wilson, Wilmington & Philadelphia Traction Company.

Florida—C. I. Day, Southern Utilities Company, Jacksonville.

Hawaii—L. T. Peck, Honolulu Rapid Transit Company.

Kentucky—Donald McDonald, Louisville Gas & Electric Company.

Louisiana—D. D. Curran, New Orleans Railway & Light Company.

Mississippi—H. E. Brandli, Meridian Light & Railway Company.

New Mexico—W. S. Townsend, Las Vegas Transit Company.

North Carolina—R. L. Lindsey, Durham Traction Company.

North Dakota—R. B. Griffith, Grand Forks Street Railway.

Oklahoma—J. W. Shartel, Oklahoma Railway.

Philippine Islands—C. N. Duffy, Manila Electric Railroad & Light Corporation.

Porto Rico—O. M. Sewall, Porto Rico Railway Light & Power Company, San Juan.

South Carolina—William Elliott, Columbia Railway, Gas & Electric Company.

Tennessee—T. H. Tutwiler, Memphis Street Railway.

Texas—L. C. Bradley, Stone & Webster Management Corporation, Houston.

Washington, D. C.—Howard Reeside, Washington Gas Light Company.

West Virginia—J. O. Watson, Monongahela Valley Traction Company, Fairmont.

Connecticut Six-Cent Fare Is Reasonable

Commission Denies Preferential Fare to City of Hartford — Says Modified Zone System Would Require Careful Investigation

A 6-CENT fare is not excessive or unreasonable for the Connecticut Company, New Haven, Conn. Such is the finding of the Public Utilities Commission, handed down on March 23. The plea of the city of Hartford for the restoration of the old 5-cent fare has thus been denied.

On Oct. 1, 1917, after an announcement made ten days before, the Connecticut Company increased its unit fare from 5 to 6 cents on all sections of its 503-mile system. This action was taken under the commission law, which permits utilities to modify company-made rates subject to commission review upon complaint. The city of Hartford petitioned for relief from the new rates, and its allegations formed the sole basis for the case now decided.

NOT NECESSARY TO FIX RATE OF RETURN

In its analysis of the situation the commission states that the question of the valuation of the company's property as a whole loses its importance because the present rates are not producing sufficient revenue to pay any dividends. Moreover, the question of a proper rate of return is not material or necessary for the commission to determine in this case, as the minimum rate of return, without being confiscatory, on a most conservative valuation of property as a whole, would be considerably more than the present fare will produce.

The city of Hartford conceded that the company as a whole should receive more revenue than that obtained under the old rates, but it asserted that its lines and those extending from it should be treated independently. The commission states, however, that during the exhaustive hearings no facts were shown which would warrant a finding that any particular division or municipality, or combination of divisions or municipalities less than that involving the whole system, should bear all the burden of producing the necessary increased revenue, or that any particular division or municipality should be relieved from bearing its share of such a burden.

In discussing further the unity of the company's system in rate-making, the commission says:

"If the lines in the city of Hartford were to be segregated and an accurate account of each could be obtained, it would undoubtedly show that certain lines could be operated even on a 5-cent basis at a substantial margin of profit, while others would be operated at a loss. If all the lines in Hartford were to be segregated from radiating and contributing lines, it might show that the Hartford city lines with the traffic from radiating and contributing lines could be operated at a profit on a 5-cent unit of fare. But the present volume of traffic on the city lines, as well as the general business of the city, is more or less dependent upon the traffic brought in over the suburban and contributing lines, and any segregation of parts or radical differentiation in rates would detrimentally affect the social and economic structure upon which all the co-related communities were developed.

"It is unquestionably true that in the electric railway development of Connecticut, certain remote and isolated lines and extensions were built which are not and never have been self-supporting, but which are connected with and form a part of the company's present system. If these lines were to be segregated and made entirely dependent upon their own produced revenue, the rates for the limited service thereon would have to be so high as to be prohibitive, and abandonment would necessarily follow. Electric railways have been important factors in the commercial and industrial development of Connecticut, and the abandonment of some of the remote and unprofitable lines would be a very serious loss to the territory thus served, and a step backward in the general development of the State.

"Hartford and its suburban adjoining and contributing sections are not dissimilar in electric railway conditions from other populous centers in the company's territory and their respective suburban adjoining contributing sections, excepting that Hartford, under an ancient agreement, has the benefit of 2 per cent of the gross receipts of fares received within the city limits."

MODIFIED ZONE SYSTEM WOULD REQUIRE STUDY

The present fare system of the company is based upon a 6-cent unit fare for sections of varying length, longer rides being allowed in the more densely populated localities. The city of Hartford attacked this system as inequitable and urged that if the elimination of the present system in the populous centers, as Hartford, is impracticable, the city zone should be contracted with outer limits of equal radius from the recognized center, the charge therein to be the 5-cent unit of fare, and that traffic outside of such zone should be carried either on the present zone system, rearranged, or on a mileage basis.

In regard to this proposal the commission says:

"No traffic figures were produced from which it could be determined how much increased revenue, if any, such a plan would produce. Its general adoption, however, would eliminate the populous centers and relieve the larger number of electric railway passengers from sharing the burden of producing the necessary increased revenue, which would then have to fall upon the comparatively few.

"However defective the present long-established system may be, any radical change therefrom should not be adopted without careful study and analysis of traffic and other railway conditions on the particular lines and system to be affected. This is a practical though somewhat complex economic problem which the transportation company itself, with its experts and intimate knowledge of operating conditions, should primarily solve.

"If the solution is to be made by the commission or any mandatory order issued by it, changing the present system to a mileage system, a combination of mileage and zone system, 'service-at-cost' system or any other system, it could only be done after a careful investigation such as has not been made and could not have been made upon the facts presented in this case. We must, therefore, at this time determine the reasonableness of the rates complained of as levied and collected on the system used by the company."

PAVING OBLIGATION IS HEAVY

The commission remarks that with an estimated increase of 10 per cent or $904,682 in passenger revenue the company has not reached a solution of its troubles. It adds that the company's statutory obligation to maintain streets and highways is very heavy.

In regard to war burdens, the commission feels that these should be equitably distributed. In its opinion, the added burdens should be borne in part at least by the stockholders as a patriotic duty, as well as by the patrons. That which in normal times would be a fair return in the way of dividends for capital invested, might in war times cause an unequal distribution of the burdens in favor of the stockholders. On the other hand, rates of fare which in normal times would be reasonable, might in war times be unreasonably low, thereby causing an inequitable distribution of the burdens in favor of the patrons. The commission concludes, therefore, that any rate established under war time conditions and influenced by such conditions should be the subject of review as soon as such conditions cease to exist.

Digest of B. of S. Electrolysis Bulletin

SAMUEL S. WYER, consulting engineer, Columbus, Ohio, has prepared a digest of the publications of the United States Bureau of Standards on electrolysis of underground structures caused by stray electric current. The digest is divided into nine parts with the following titles: (1) Cause and Economic Importance of Electrolysis Troubles. (2) Electrolysis Surveys. (3) Corrosion Principles. (4) Relation of Soil Characteristics to Electrolysis. (5) Electrolysis of Concrete. (6) Current Leakage. (7) Mitigation Applicable to Pipes. (8) Mitigation Applicable to Railway Negative Return. (9) Electrolysis Regulation. The digest is well indexed and forms a pamphlet of nearly 100 pages. Copies can be obtained from the Bureau of Standards, Washington, D. C.

Bituminous Coal Mines Doing Better

The latest weekly report of the United States Geological Survey shows that the present rate of output of bituminous coal is considerably above the rate at this time last year. While there was a decline of 579,000 tons during the week ended March 16, the rate of production per working day during that week was 1,781,000 tons, the first time in five weeks during which the production per working day fell below 1,800,000 tons. The average during March, 1917, was 1,729,000 tons.

Public Service Needs $3,500,000

President McCarter Explains Company's Revenue Requirements at Rate Hearing in Trenton—Must Spend $6,600,000 for Government Construction

ASSERTING that national needs require the preservation of utility operation, Thomas N. McCarter, president Public Service Railway, Newark, N. J., told the Board of Public Utility Commissioners of New Jersey on March 27 how his company is confronted with an emergency demanding nearly $3,500,000 of increased revenue. His statements were made at a hearing in Trenton on the company's application for a 7-cent fare, a 2-cent charge for transfers and a 1-cent charge for a transfer upon a transfer.

After explaining the utility situation as seen by Comptroller of the Currency Williams, Secretary of the Treasury McAdoo and President Wilson, Mr. McCarter said that his company's application is not based upon a valuation of the property but is for emergency relief. All the company desires is to be put back upon the 1916 basis. In January and February, 1918, the company ran $82,500 behind last year in operating revenue, but $50,000 of this was made up in March. Upon the basis of an estimated increase of about 2½ per cent in operating revenues for 1918, however; of estimated expenses based on present actualities; of 1916 depreciation expenses on a 1918 cost basis, and of an 8 per cent return on new capital since 1916, the company calculates a deficit of $2,601,698 which must be overcome to reach the 1916 figure.

To the above-stated deficit Mr. McCarter added $635,714 for additional wage increases which the company feels are necessary and which it will make if the desired fare relief is substantially granted. A further sum needed is $257,061 for franchise and income taxes, making the total $3,494,473.

RAISING THE REQUIRED REVENUES

Mr. McCarter expressed the opinion that a 6-cent fare would produce a 10 per cent increase in revenue, or $1,850,000, and a 7-cent fare a 15 per cent increase, or $2,800,000. A 2-cent transfer charge was estimated to yield $850,000, making a total of $3,650,000. The revenue from the 1-cent extra transfer charge, included above, was put at only $20,000 or $30,000.

In the company's view, the only two fares capable of producing the desired revenue are the 7-cent fare with the stated transfer charges, or a 6-cent fare with a suspension of the transfer privilege. Either would be agreeable, but the company believes the first more equitable.

Mr. McCarter said that ultimately a passenger should pay for the distance traveled. With the enormous travel on American railways, however, with the difficulty of collecting the fares and with the interweaving of municipalities in New Jersey, the installation of a zone system would be a protracted job, impractical in the present emergency. An inquiry in regard to ultimate relief along this line, however, would be welcomed. Mr. McCarter added that after temporary relief is granted the company will have no objection to a thorough investigation of its revenue needs on a regular rate-making basis.

Mr. McCarter then proceeded to tell how the urgent requests of the government for help will involve a total railway expenditure of $6,643,043 for construction and equipment at present abnormal costs. Including twenty-five new cars just received, 300 new cars are desired for 1918, 125 of these being to meet the wishes of the government.

CAPITAL EXPENDITURE FOR SAKE OF GOVERNMENT

The Shipping Board, Mr. McCarter stated, must have transportation to Port Newark Terminal. The government recently has entered into a contract with the company to advance more than $800,000 to build a 2½-mile extension, on which an extra fare will be charged. The board has agreed to spread the peak so that the cars will carry 50 per cent of the traffic. On the money advanced the company is to pay 5 per cent during the war, and at the end of this the government will assume 50 per cent of the improvement cost as cost due to the war and the company will pay to the government the remaining 50 per cent, less depreciation, in five annual installments.

The Shipping Board also wants the company to operate additional cars to industries between the Hackensack and Passaic rivers, the companies or the board to build switch and loop tracks for easy entrance. More service is desired on the property of the New York Shipbuilding Company and to the shipyards of Gloucester in the Southern Division, and more power facilities in the Essex Division and the Southern Division.

Mr. McCarter said that for the government A. L. Drum had been making an examination of the railway needs and F. W. Darlington of the power needs. As to whether the government would contract for more than the first unit, as mentioned above, Mr. McCarter thought that the company would get further government aid only in case the government is satisfied that the railway is a solvent going concern. For the carrying out of government plans it is absolutely essential that the whole system be up-to-date and efficient.

CITIES QUESTION JURISDICTION

Jerome T. Congleton, city counsel of Newark, questioned the power of the commission to pass upon the application, in view of local ordinances providing for a 5-cent fare and transfers. The chairman of the commission said that the question of law had just been passed upon by the Supreme Court, but Mr. Congleton replied that the issue might be carried to the Court of Errors and Appeals.

The case referred to above, which was decided by the New Jersey Supreme Court in February, was that of the Northampton, Easton & Washington Traction Company *vs.* the Board of Public Utility Commissioners.

The company had asked the consent of the board to increase its zone rate from 5 to 6 cents. According to the court's findings it was shown to the satisfaction of the board that the railway was being run at a loss each year even without making the necessary allowance for depreciation.

In such a situation the company could not perform its public duty to furnish safe, adequate and proper service and maintain its property in such condition as to enable it to do so. The commission thought that this duty was of inferior obligation to what it conceived was an irrepealable contract in favor of inferior branches of the State government—the municipalities through which the railway runs. The court, however, stated that it was unable to take this view, for reasons stated in an opinion filed the same day in the Collingswood case. The Northampton case, therefore, was remitted to the Board of Public Utility Commissioners for further proceedings, and it might be remarked that the desired fare increase has now been granted, as stated in the ELECTRIC RAILWAY JOURNAL of March 11.

FRANCHISE RATE MUST BOW TO STATE WILL

It appears that in the Collingswood case (Collingswood Sewerage Company *vs.* Borough of Collingswood), by a consent given by the municipality to the company under the act of 1898, maximum and minimum rates were fixed. Subsequently the sewerage company petitioned the New Jersey commission for increased rates, but the board refused permission on the ground of a lack of power.

The Supreme Court on review held that an ordinance granting consent and fixing maximum and minimum rates is a grant upon condition rather than a contract, and that the Legislature may clothe a commission with power to fix higher rates upon petition. The fixing of franchise limits between which the actual price of the service might be established by agreement or otherwise is rather in the nature of a legislative act to prevent extravagance than of a contract. The court considered the question of jurisdiction settled in favor of the board by at least three prior decisions: Public Service Railway *vs.* Public Utility Board, 85 N. J. Law 123; North Wildwood *vs.* Public Utility Commissioners, 88 N. J. Law 81; Atlantic Coast Electric Railway *vs.* Public Utility Board, 89 N. J. Law 407.

The court did not praise the Board of Public Utility Commissioners for turning over to the Borough of Collingswood a duty which the statute imposed on the board. According to the court's decision the board in effect and by inference found that the present service was not adequate, that extensions were reasonable and practicable, that the financial condition of the company could be made to justify the expenditures, and that new capital could be obtained for the purpose if the municipality would consent to a modification of rates. If this view was correct, the court said, the board should have ordered the necessary modification of rates and not shifted the responsibility to the municipality.

The Public Utilities Commission of Illinois has issued an order directing the Chicago, Ottawa & Peoria Railway to observe its agreement with LaSalle, Ill., relative to carrying county officers free of charge to and from county institutions until further notice.

Fuel Administration Announces Zone System for Coal Distribution

New Method of Distribution Will Increase Rate of Flow Equivalent to 5 Per Cent Increase in Production

THE United States Fuel Administration in co-operation with the Director-General of Railroads has announced a zone system to govern the distribution of bituminous coal during the coal year beginning April 1, 1918. Heretofore coal has been distributed practically without regard to the distance between the mine and the consumer. Under the zone system it will be distributed to consuming territory under restrictions designed to avoid transportation waste, but with consistent maintenance of the greatest possible production and a proper supply to all coal users. Every effort will be made to preserve long-established trade relations.

In addition to the saving in transportation the system will provide for the possible retention of something like 5,000,000 tons of coal for Eastern states which heretofore has gone west by rail. As an indication of the saving to be effected by this system it will eliminate the moving of more than 2,000,000 tons of Pocahontas coal to Chicago and other Western points over a haul of about 660 miles. Chicago can obtain this tonnage of coal, and under this system must obtain it, from southern Illinois mines with an average haul of 312 miles. Allowing for the difference in quality in the two coals there will thus be saved 11,400,000 car-miles, estimated to be equivalent to 285,000 car-days. This will permit fourteen additional round trips of twenty days each from West Virginia mines to zone destinations, permitting an additional production of at least 700,000 tons of Pocahontas coal. Similar savings will occur in other sections of the country.

The production of bituminous coal, the movement of which only is regulated by the zone system, is about 300,000,000 tons or 60 per cent of the total production. Based on this production there will be saved on round trips from and to mines almost 160,000,000 car-miles. This will permit the same cars to make almost 300,000 additional trips from the mines, equivalent to an increase of 5 per cent in production. The increases in total production in 1917 over 1916 resulting from all efforts was about 8 per cent.

The zone system affects all bituminous coal except (1) That used for railroad fuel, (2) that moved on inland waterways which is in no way restricted by the system, and (3) that delivered to Canada, which is subject to regulation of the fuel administrator.

The early buying of next winter's supply of coal by consumers throughout the country is considered imperative by both the Fuel Administrator and the Director-General of Railroads. Ample production capacity has been assigned to each of the consuming zones, but these producing fields must be kept working as nearly as possible at the maximum capacity.

The method of enforcement of the zone system is that the Fuel Administration prohibits distribution beyond the limits of the zone and the railroad administration supplements these prohibitions by railroad embargoes. The Fuel Administration will issue permits for the shipment of coal for special purposes to points outside the zone in which the particular coal desired originates. Applications for permits are to be addressed to the United States Fuel Administration, Coal Zone License Bureau, New Interior Building, Washington, D. C.

Rates the Feature of Meeting

Large Part of First Session of Wisconsin Meeting Given Up to This Topic—Fuel and Taxes Also Discussed

ADDRESSES dealing with problems affecting public utility rates were the feature of the tenth annual convention of the Wisconsin Electrical Association at Milwaukee, March 27-28. Other topics including fuel and technical problems were discussed, but the sessions at which three able speakers presented different angles of the present rate situation were easily the banner sessions. President B. F. Lyons of Beloit sounded the keynote of the meeting in his address pointing out the needs of the utilities of Wisconsin for increased rates and commenting briefly on the national measures of conservation including the shutting down of isolated plants, the interconnection of generating stations and the passage of the daylight savings bill.

The first of the addresses was one by Edwin S. Mack of Miller, Mack & Fairchild, Milwaukee. He dealt with two important phases of public utility depreciation. The first of these was the method treating depreciation reserve in Wisconsin. He contended that while the Wisconsin commission has included depreciation reserve in value, it has not followed out to the logical result that where the depreciated value basis is used, the return on the fund should go to the investor and not to the fund. He expressed the hope that the commission would come to the value-new theory as the one logical and continuous base. So long, however, as the present basis is adhered to it should be kept in mind that depreciation must be on the straight line basis. The other phase of depreciation discussed dealt with the elements of depreciation reserve. The speaker urged that in all valuation cases in determining the rate for setting aside depreciation reserve the commission should grant the allowances not only for the factors indicated in the life tables, which include only age and wear, but also for such other important unforeseeable and dangerous factors as obsolescence, inadequacy and public requirement.

William J. Hagenah, basing his address on curves showing the range of commodity prices over a period dating back to 1817, predicted that few if any public utility managers in the room would live to see prices return to their pre-war level. For this reason he urged the closest co-operation between the utilities and the commissions so that the utilities may be adjusted to the changed conditions under which they are operating and will be obliged to operate for many years.

The third speaker on rates was Harold L. Geisse, secretary of the Railroad Commission of Wisconsin. His paper was devoted to showing public utility men how to prepare and to present rate cases to expedite their passage through the hands of the commission. He made two pertinent suggestions. The first was that the company seeking increased rates advise the local city attorney or other authority likely to contest the plea of its plans in advance so that this individual could not claim surprise and ask for a delay to prepare for the case. The other suggestion was that at times the use of logarithmic charts for presenting comparative data be adopted for the sake of clarity.

Speaking on the fuel situation W. N. Fitzgerald, Wisconsin State Fuel Administrator, declared that the coming winter would bring a national demand for increased production amounting to 100,000,000 tons. It will be possible to increase production only 50,000,000 tons. The rest will have to be saved by conservation measures. He urged public utilities to help in this work. The committee on taxation, C. S. SeCheverell, Superior, chairman, repeated its assertions of former years that public utilities are discriminated against in the matter of taxes.

Other papers which were to be delivered at the second session were "The Utilities and the War," by M. C. Ewing, Wausau; "Metal Electrode Welding," by Dean Treat, La Crosse; "Increasing the Efficiency of Hydroelectric Plants," by Daniel W. Mead, Madison, and "Three-Phase Four-Wire Distribution," by George E. Wagner, Madison.

AMERICAN ASSOCIATION NEWS

War Board Issues Bulletin on Government Control

AS NO. 13 in its series of bulletins the Electric Railway War Board has sent out a reminder of the duty of the electric railway companies to return to the Commissioner of Internal Revenue a statement of employees' incomes where such exceed $800 per annum. Some extracts are also given from the federal control bill S3752, which was signed by the President on March 21, indicating certain phrases which refer to electric railways.

Rousing Public Service Meeting at Jersey City

THE meeting of the Public Service section held in the Montgomery Street carhouse, Jersey City, on March 21 was one of the most enthusiastic ever held by the section, 400 employes being in attendance. The meeting was a smoker with quite an elaborate luncheon and a general "get together." Informal addresses were delivered by N. W. Bolen, general superintendent; R. E. Danforth, general manager, and R. E. Perrin, claim agent.

Mr. Bolen summarized the growth of the electric railway business from the early days, and then took up the question of how best to handle the greatly increased business which the war has brought to the State of New Jersey. He analyzed this growth by referring to the increase in a number of industries stretching all the way from Camden to Edgewater. Mr. Danforth told of the greatly increased cost in operation, due to labor and materials price advances, and strongly emphasized the need for additional revenue. He urged the men to do their bit by conserving power and thus saving fuel. Mr. Perrin directed the thought of the meeting along the lines of safe and efficient operation, in order that the expenditures for claims settlements may be minimized.

As would be expected at a smoker entertainment features of the meeting were prominent. There was music from the Hudson division band and from the West Hoboken carhouse quartet. Two Greenville conductors gave an exhibition four-round boxing bout and the whole company sang patriotic and other songs.

"Electropneumatic Interlocking" Has the Floor at Chicago

A MEETING of the Chicago Elevated Railroads company section was held on March 19, the principal speaker being J. W. Stephenson, signal engineer of the company. He presented a paper on "Electropneumatic Interlocking," with the aid of lantern slides, the idea being to show the members the relation of this feature of operation to their several departments.

M. J. Feron spoke briefly of the gratifying results which had been obtained through the installation of coasting clocks, and took the occasion to express his appreciation of the spirit of co-operation which exists between the men of the transportation and traffic departments, without which this excellent showing could not have been made. H. A. Johnson followed with remarks along the same line, and answered questions which had been asked by a motorman with regard to coasting.

Interspersed with the technical discussion were songs, recitations and ukulele solos. Following a custom which seems to be general among the sections the program opened and closed with patriotic songs. Vice-President R. N. Griffin presided at the meeting, which was attended by seventy-five members and guests.

Rhode Island Company Employees Appoint Section Organization Committee

AS ANNOUNCED in the issue of the ELECTRIC RAILWAY JOURNAL for March 23, employees of the Rhode Island Company, Providence, R. I., plan to form a company section of the American Association on April 9. In response to an inquiry as to the steps which led to the present plan, A. E. Potter, president Rhode Island Company, stated substantially as follows:

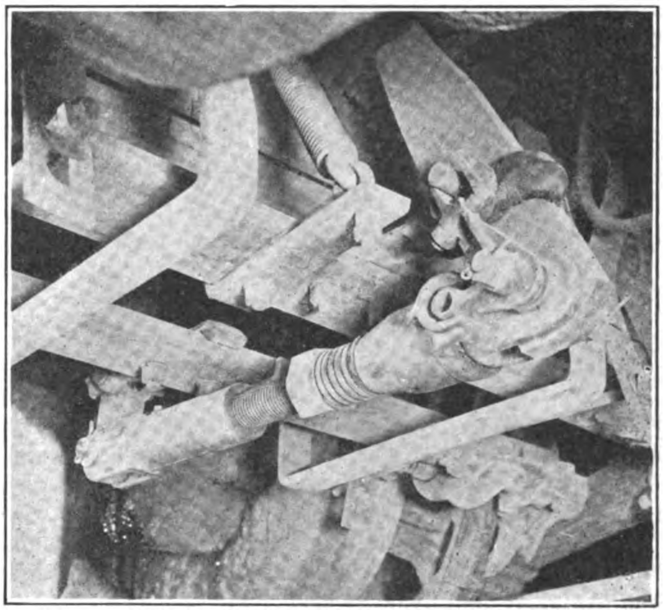
"In order to explain the difficulties confronting the company and the efforts which were being made to secure relief through an increase in fares, etc., the management arranged a meeting on Nov. 30, 1917, to which the heads of departments, foremen and clerical forces were invited. This meeting proved so popular that other meetings were held on Jan. 29 and March 5. At the last meeting the suggestion was made that a company section be formed, and this met with immediate approval. It was unanimously voted to appoint a committee to arrange for the organization of a section.

"The committee appointed consisted of R. R. Anderson, superintendent of transportation; E. J. Cooney, executive assistant; A. B. Gardiner, superintendent of track; A. E. Paddock, general freight agent; C. E. Redfern, claim agent; H. W. Sanborn, chief engineer; H. B. Shaftoe, assistant to the comptroller; B. T. Whitcomb, chief electrician of power distribution, and W. D. Wright, supervisor of equipment. This committee met with E. B. Burritt, Martin Schreiber and H. C. Clark, representing the American Association on March 19. At this time it was decided to hold a meeting for the purpose of organization on April 9. The general committee has selected two sub-committees, one to submit by-laws and the other to submit nominations for officers at the April 9 meeting."

The Use of Slack Adjusters as a War-Time Economy

Philadelphia Rapid Transit Company Is Installing More than 4000 Adjusters After Investigation Covering Several Years

MORE than five years ago, in February, 1913, the Philadelphia Rapid Transit Company installed on a car equipped with Brill 39-E trucks its first equipment of Anderson slack adjusters. This equipment was put on for the purpose of giving the device a thorough test, and its operation has since been under the surveillance of the head of the bureau of tests, which is a part of the rolling stock department of the railway company. Whenever there was any adjustment needed and at stated times the engineer of tests examined the adjusters. They have operated so satisfactorily, however, that practically no attention from him was required. About a year ago an outfit was placed on a car equipped with Brill 27-G trucks, also with satisfactory results.



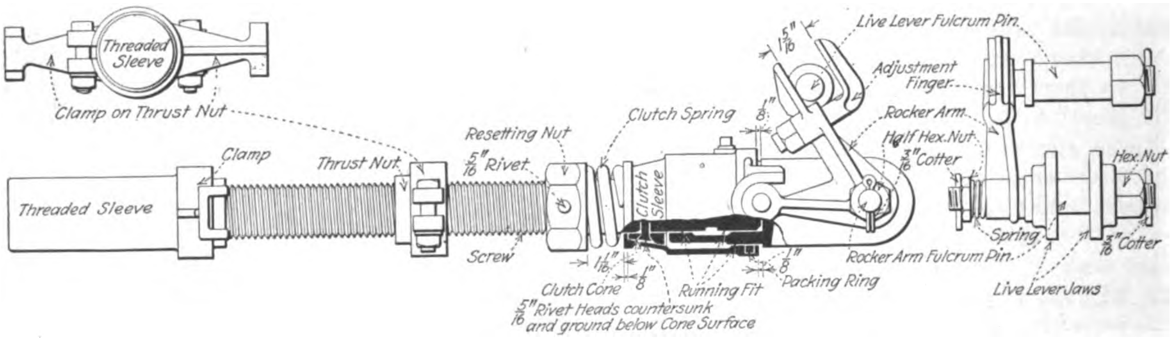
SLACK ADJUSTER IN POSITION ON TRUCK

Picture selected to show general principle of P. R. T. adjuster but not detail of brake-beam clamp, for which see drawing.

As a result of the tests the company, some months ago, decided to install the adjusters on 2149 cars, and they are being put on now as fast as received.

In deciding to install slack adjusters on such a large scale the officials of the company were convinced that their use would very greatly cut down the labor of inspection and adjustment of brake rigging. Experience had shown that with them no adjustment is necessary during the entire lifetime of a brakeshoe, six weeks or more on the P. R. T. system, on the average. Without them the "brakemen" must go over the brake rigging every day or every two days taking up slack. With slack adjusters, when the proper brake setting is once made, the inspector has ample time to attend to other elements of the equipment and the inspection as a whole is much more thoroughly done than would otherwise be the case.

The adjustment of the brake rigging is not only a tedious and time-consuming process, but even a careful pitman is apt to overdo it in the matter of taking up slack and to leave the rigging too tight. The result is that a car leaves the carhouse with brakeshoes in contact with the wheels. That cars do leave the carhouse with brakes set too tight is indicated by the sluggishness with which some of them operate for a time after inspection. They slow down far too rapidly when power is shut off. The result of tight setting is to cause an excessive rate of consumption of brakeshoe metal and of electrical energy, besides producing a tendency to decreased schedule speed.



GENERAL ASSEMBLY DRAWING OF AUTOMATIC SLACK ADJUSTER FOR USE ON DOUBLE-TRUCK CAR

Obviously the slack adjusters will cause a reduction in brakeshoe wear, accompanied by less wheel wear and less armature maintenance cost. The last-named item is one considered as very important by the P. R. T. engineers.

Aside from the direct savings mentioned above as due to the use of slack adjusters, a great operating advantage is secured in the smaller number of car "pull-ins," particularly those due to failure of the brakes to hold. A common complaint from motormen has been: "The brakes on this car are not holding well." They turn the cars in for brake adjustment, and thus car-hours are lost while the cars are awaiting their turn for inspection, and man-hours (or man-minutes) are lost while the adjustments are being made. There is also a psychological operating advantage in always having the brakes in "A-1" condition, in that the motormen will operate their cars with greater confidence and will thus have an easier time in keeping up the schedule speed.

From the standpoint of the brake rigging itself there is a great advantage in having a uniform piston travel, and the tests have shown that with the adjuster the variation is very small. On the P. R. T. property it varies between 5¼ and 5½ in.

A description of the Anderson slack adjuster as applied to single-truck cars (Brill 21-E, Taylor and St. Louis trucks) appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 30, 1916, page 690. The accompanying line drawing shows the device as adapted to the Brill 39-E truck, the construction shown being that used on the P. R. T. system for trucks of this type. The adjuster connects the lower end of the live lever with the brake beam by means of a screw, the rotation of which increases the distance between the brake beam and the end of the live lever and thus makes up for brake wear.

The screw is rotated by means of a clutch at one end, operated through a bell-crank by the upper live-lever fulcrum pin. At the right in the drawing are shown the special live lever fulcrum pins which are necessary to support and operate the bell crank and also to support the clutch end of the screw. The upper fulcrum pin plays between two jaws, one of which is adjustable, the clearance being just sufficient to permit normal operation of the brake rigging when properly adjusted.

If when the brakes are applied there is too much slack the clutch is rotated by the bell-crank in a clockwise direction, the outer shell slipping upon the cone. The clutch slips because the main screw, being under compression, is practically locked against rotation. When the brakes are released the bell crank rotates the clutch in a counter-clockwise direction, taking the screw along with it and compensating for wear.

The illustration shows all of the parts mentioned and in addition the clutch spring for maintaining the proper pressure between the cone and shell of the clutch, with the nut for adjusting it; the thrust nut and clamp for connecting the screw to the brake beam, etc.

Graphical Presentation of Accident Data

IN ORDER forcibly to present data on accidents occurring in its plants the United States Steel Corporation has classified more than 150,000 of these and presented the results in graphical form for consideration by its employees. While the particular classification would not be applicable to electric railways, the method of presentation would be effective in this field. First, all accidents are segregated in groups and the numbers reduced to percentages. The entire list is represented by a large circle divided into sectors, in the familiar fashion, the whole representing 100 per cent. The groups in this case are hand labor, machinery, mines, roalroads, burns, eyes, falls and all other causes. Surrounding the large circle are seven smaller one each representing one of these groups and each appropriately subdivided.

A boiler-inspection bureau for the State of New Jersey was provided by the legislature at its recent session by passage of Senate Bill No. 209. The act goes into effect immediately.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Vote to Develop Water Power

Nation's Business Men Call on Congress to Provide for Utilizing the Country's Water Power

By sweeping majorities of 500,000 business executives who comprise the membership of the United States Chamber of Commerce adopted resolutions on March 27 calling on Congress to make provision for harnessing the millions in water horsepower that now are idle. The vote was taken through the more than 1000 commercial organizations throughout the country which compose the National Chamber.

The balloting was based on a series of recommendations contained in the report of the committee on water power development of the United States Chamber of Commerce. These recommendations were presented in the following order:

1. That federal legislation encouraging the development of water powers should at once be enacted; adopted by the almost unanimous vote of 1324 to 6.
2. That authority to grant permits should be vested in an administrative department; carried by a vote of 1253 to 17.
3. That the permit period should be at least fifty years, any shorter period being at the applicant's option; in favor 1216, opposed 42.
4. That tolls should attach only to use of public lands or benefits derived from head-water improvements; adopted by a vote of 1191½ to 40½.
5. That permittees should be entitled to acquire the right to use public lands forming only a small and incidental part of the development; carried by a vote of 1210 to 25.
6. That recapture should be exercised only upon payment of fair and just compensation; in favor 1234, opposed 25.
7. That if recapture is not exercised, the investment of the permittee should be adequately protected; adopted by a vote of 1226 to 26.
8. That rates and service should be regulated by state commissions where the service is intrastate, with federal regulation only where several states are directly concerned and do not agree, or there is no state commission; carried by a vote of 1177 to 57.
9. That if any jurisdiction to regulate the issuance of securities is exercised it should be solely by the state; in favor 1114, opposed 117.
10. That no preference should be granted as between applicants amounting to a subsidy from the government creating unequal competition; adopted by a vote of 1191 to 38.

The committee which drew up the report and presented the resolutions was composed as follows:

L. S. Gillette, chairman, Minneapolis; Harry A. Black, Galveston; Rome G. Brown, Minneapolis; Henry S. Drinker, Bethlehem, Pa.; Frank P. Glass, Birmingham; E. K. Hall, New York; Horace C. Henry, Seattle; Henry L. McCune, Kansas City; Samuel V. Stewart, Virginia City, Mont.; George F. Swain, Boston, and C. F. Weed, Boston.

While the committee's report is in itself favorable to positive legislation to enlarge water-power development, every ballot sent out was accompanied by an argument in the negative which clearly and positively set forth objections to the recommendations so that those voting had at hand data on which to base their judgment for or against.

Peter Witt on Co-operation

Former Commissioner of Cleveland Tells How City and Company Benefited Under Tayler Grant

Peter Witt, former street railway commissioner of Cleveland, Ohio, was a witness recently before the Massachusetts legislative committee on street railways. He urged the service-at-cost plan of operation for the roads there. During the hearing he reviewed the railway situation in Cleveland. Mr. Witt is reported to have said:

"Neither Tom Johnson and his followers nor the officials of the railway in Cleveland thought very much of the plan at the time it was adopted, but at the end of eight years it has proved a success from every viewpoint and nobody in Cleveland would think of going back to the old order of things.

"Let me tell you how the plan was started. Mr. Johnson and his followers wanted public ownership. This the laws of the State denied. The railway wanted private ownership. The voters were opposed to this. The service-at-cost plan was then devised, after prolonged negotiation. Its purpose was, and is, not only to give the people the sort of service that they want and need, but also to protect the investors and assure them a reasonable return on their money.

"In Cleveland, experiences show that one of the first benefits to be gained through the co-operative plan is in getting the confidence of the riding public, and to change people who have been continual 'knockers' into sincere 'boosters.' Again, the plan makes it easy to finance the properties. This, in turn, enables the companies to make improvements when and where they are needed."

Construction Disapproved

California Commission Carries Into Effect Its Recently Announced General War Policy

The Pacific Electric Railway, Los Angeles, Cal., has been denied authority by the California Railroad Commission to build a line from Anaheim through Tustin to the town of Irvine, a distance of about 11 miles, and also a line from Glendora to Lone Hill, about 4 miles. Witnesses for the company testified that arrangements had practically been completed for laying the tracks. The estimated total cost of both lines is more than $440,000, of which more than $127,000 has been spent for right-of-way, engineering work and materials.

In its decision refusing the application the commission stated, in part: "There is nothing to indicate that either of these lines is more needed now than before the war. The company states that these new lines are planned primarily to increase net revenue. The fact that the country is at war, and is husbanding for war purposes its resources in men, money and materials is a factor too powerful to be ignored. True, the Pacific Electric Railway was not included among the railroads taken by the government, but the Southern Pacific, which controls the Pacific Railway, was included and so was the Santa Fe."

Commissioner Alex Gordon, who wrote the decision, did not agree with President Paul Shoup of the Pacific Electric Railway that it is the policy of the government to turn business from the steam to the electric lines if the electric lines are first to be constructed. Commissioner Gordon said:

"There is another phase of the situation which should be mentioned. The Southern Pacific and the Santa Fe are competing with each other for business over the entire southern part of the State. Neither could make extensions without the consent of the Director-General of Railroads. However, the Pacific Electric Railway, a subsidiary company of the Southern Pacific, which was not included in the government's orders, can make such extensions as it desires, as far as the federal government is concerned. As the new lines are so close to existing lines of the Santa Fe, the bulk of the earnings of both lines will come from freight diverted from the Santa Fe. If the railroads are eventually turned back to their private owners the present situation seems to be unfair, although this aspect of the matter is possibly one for the federal government rather than for this commission to consider."

Letters and Opinions Fly in New York

Lively Discussion by Mayor, Railroad Executive and Commissioners Follows Fare Appeal

A four-cornered exchange of letters and expressions of opinion in New York City has resulted from the appeal of the electric railways to the Legislature for a 6-cent fare. The participants have been Theodore P. Shonts, president of the Interborough Rapid Transit Company; Mayor John F. Hylan and Public Service Commissioners Hervey and Whitney. The exchange of amenities was started by Mr. Shonts, who in a letter to the Mayor, pointed out that the purpose of the increase was to insure the payment of the Interborough's preferential under the dual system contracts and to insure sufficient earnings to keep the New York Railways out of bankruptcy. In part, Mr. Shonts wrote as follows:

"Using this increased rate as applicable to the Interborough's earnings of last year—which aggregated about $40,000,000 on a 5-cent basis—and on the theory that all persons who rode on a 5-cent basis would ride on a 6-cent basis, the Interborough earnings would be $8,000,000 greater, and, of course, this would have been all net.

"Therefore, assuming that the average preferential which the Interborough would receive out of this $8,000,000 was $2,000,000 a year, it would leave $6,000,000 for other purposes. On the theory that the city will have, when the work is completed, $100,000,000 invested at 4½ per cent in the Interborough's system, the next deduction from the $8,000,000 increase above mentioned would be $4,500,000 to pay the return on the city's investment. This on top of the $2,000,000 to pay the Interborough's preferential in full would absorb $6,500,000 of the $8,000,000, leaving $1,500,000 out of which to meet the increased labor demands which, in the nature of things, will be presented at the expiration of the present contracts with the Interborough employees—about Sept. 1 of this year.

"I further pointed out to you that this $4,500,000 chargeable to the city could only be provided for in one of two ways; either by putting the burden on the taxpayer in the one case, or on the farepayer in the other."

Mayor Hylan in his letter to Mr. Shonts indicated that he would not aid any attempt to increase fares on New York transportation lines, but would do all he could to have the lines taken over and operated by the city. The Mayor also made it plain that he heartily disapproved of the dual system contracts.

In a later letter to Mr. Shonts the Mayor stated that it was his belief that even though the 6-cent fare was not put into operation the Interborough will be forced under the rapid transit contract to put the dual system into operation. In the letter the Mayor flayed the Public Service Commission for its delays in putting the Lexington Avenue and Seventh Avenue subways into operation, and intimated that its reluctance might be due to the hope that the delay might help in securing the 6-cent fare.

Public Service Commissioner Charles S. Hervey next issued a statement in which he opposed legislation at Albany for a 6-cent fare on the surface and rapid transit lines of the city. Mr. Hervey's objections are based on his belief that, so far as the surface lines are concerned, the present public service law is adequate to give promptly any relief to the companies which is justified by present conditions. With respect to the subway and elevated lines of the city, he pointed out that there was no need for legislation because the Board of Estimate & Apportionment, the Public Service Commission and the railroads acting jointly could fix any rate of fare that was adequate and proper, by a modification of the existing dual contracts. Such a modification did not require action by the Legislature.

COSTS BROOKLYN COMPANY 6⅓ CENTS FOR EACH PASSENGER

Travis H. Whitney, of the commission, indicated in a statement issued on March 25, that despite the Mayor's opposition to 6-cent fares the commission was sympathetically inclined toward the plaint of the Brooklyn Rapid Transit Company. Mr. Whitney said that every 5-cent passenger on the new subway lines costs that company about 6⅓ cents. His statement dealt with No. 4 of the dual subway contracts between the city and the company. Mr. Whitney said that from August, 1913, to January, 1918, the city's deficit had been $4,947,244 and that of the Brooklyn Rapid Transit Company $1,148,221. He explained that the company was permitted under the contract to dip into the pooled earnings to pay its interest and sinking fund. War conditions were responsible for the deficits. He compared the situation to that in which the railroads found themselves when the government took over their operation. He said:

"The principle that when the public requires large extensions of service, or control of operation, the company is entitled to a certain preferential and that the public will pay the remaining expenses out of taxes has been followed in the case of trunk line railroads of the United States. The President has taken the railroads because of war conditions and the companies are being guaranteed a certain return. If the revenues are insufficient the deficit is to be cared for out of appropriations by Congress of moneys arising out of some form of taxation.

"In order to keep such deficit, payable by Congress, to a minimum, Director General of Railroads McAdoo has indicated his intention to increase rates, eliminate duplicate service, reduce passenger service and effect other economies. The principles which the commission and the city placed in the dual contracts in 1913 are the principles now being followed in respect to the national control of the railroads of the country."

Mayor Hylan sent another letter to Mr. Shonts on March 26 in reply to the letter, in which Mr. Shonts asked the Mayor to define his position in regard to the Interborough's request to be allowed to charge a 6-cent fare on its lines. In his letter of March 26 the Mayor called upon Mr. Shonts to furnish him with data showing in detail the expenses of his various companies as well as the number of passengers carried on all the lines during the last five years. In regard to fares the Mayor said:

"No further proposition need be made to me. I will not become involved in any plan that connected me in any way with those who have been in sympathy with this method of plundering the city. I shall direct the commissioner of accounts, the corporation counsel, and every other public official that I can command, to look into these transactions and see if something cannot be done to protect the city."

Mr. Shonts has promised to have the data prepared at the earliest possible moment.

Exciting Times

Session of New York Senate Enlivened by Passage at Arms Over Municipal Ownership

The Senate of New York on March 26 passed by a vote of twenty-eight to twenty the resolution of Senator Elon R. Brown creating a committee of seven Senators to investigate the question of municipal ownership. Senator Brown asserted that municipal ownership was a step toward socialism, and that now that the war is on the people should devote their energies to supporting the battle line of the allies in France and not to upset established institutions, as the bolsheviki in Russia are doing. On the other hand, Senator Wagner, the Democratic leader who introduced the bill, fostered by Mayor Hylan of New York, charged that the resolution was a parliamentary trick and an effort to sandbag the whole proposition.

Senator Slater charged that the municipal ownership bill was nothing but a political boom for William Randolph Hearst. He is reported to have said:

"It is the jellyfish and toad bill, and it was born in Palm Beach after a conference attended by Hearst, Hylan and Fingy Conners."

After Senator Ottinger had also criticised Mayor Hylan, Senator Foley, a

Tammany member, objected to his language on a question of personal privilege.

A second resolution by Senator Brown, appropriating $5,000 so that the municipal ownership committee could continue its investigations through the summer and fall and report to the next Legislature was defeated, getting only twenty-five votes. The result is that the committee will have to consider all municipal ownership measures at this session unless the Senate reverses its position later.

Sympathetic Strike in Kansas

Railway Company Not Affected, but Some Light and Power Company Men Go Out

Business agents of labor in Kansas City, Mo., on March 15, following suggestions from several of their unions, announced that a general strike would take place on March 23 unless the laundry owners had effected a settlement with the drivers who quit on Feb. 18. Since the strike of the laundry drivers, the laundry owners, who had resumed operations with other workers than the strikers, have consistently responded to all suggestions of arbitration that they were operating their plants and had nothing to say to the unions.

The situation is far different in regard to this strike of laundry drivers, and the general threatened strike, than was the case last summer and fall. At that time, for various reasons, a considerable public sentiment was on the side of the striking electric railway employees, and workers in other industries that were suspended. Eventually sympathy turned the other way; and it has been getting stronger the other way ever since. At the present time, there is very little public sympathy on the side of the union men who are fomenting the general strike. The public seems to believe that a general strike would be merely a useless union expedient to compel unionization of plants which are now giving almost normal service with non-union labor.

The negotiations looking toward a settlement failed, and the sympathetic strike began on the morning of March 27. The employees of the Kansas City Railways voted not to join in the strike and apparently cars will not stop. Four employees at the power plant of the company belonging to other unions struck, but this has not hampered operation. The railway power load, however, increased by reason of the strike of union men employed by the Kansas City Light & Power Company at its two power plants. The brewery workers, bartenders and building trades were the only unions that quit in a body, but many individual engineers and firemen in downtown buildings also quit. In addition a few other minor industries were effected.

A press dispatch dated March 28 indicated that the railway men had gone out under threats of intimidation.

Chicago Program Moving

Rapid Transit Plans Started on Their Way with Possibility of Vote In November

Rapid transit prospects for Chicago through the building of subways and the extension of elevated lines were advanced a step by the action of the local transportation committee of the City Council, which on March 20 concurred in the recommendations of the Traction & Subway Commission and the modifications proposed by the companies.

COMMITTEE WILL DRAFT COMPLETE ORDINANCE

The physical side of the commission's report was abstracted in the ELECTRIC RAILWAY JOURNAL for Dec. 9, 1916. The companies agreed to this plan, with a few changes in the location of new elevated lines and the advancement of certain work into an earlier period. Now that the committee has gone on record as favoring the modified plan, a sub-committee of seven Aldermen will proceed with the work of drafting a complete ordinance. If the final report is approved by the City Council, the people of Chicago will have an opportunity to vote upon it, probably next November. If any enabling legislation is necessary, this will be taken up with the next session of the State Legislature in January, 1919.

The transportation improvements so far agreed to call for an expenditure of about $104,000,000 within a six-year period. Of this amount between $20,000,000 and $25,000,000 is already available in city's traction fund derived from a portion of the net proceeds paid to the city during the last ten years by the surface railway companies.

THREE SUBWAY AND FOUR ELEVATED LINES

In brief, the plan calls for the construction of three subways and four elevated railway extensions. One of these subways is intended for use by surface lines, to avoid congestion in the downtown district. Another one will be used to provide additional capacity for rapid transit lines running north and south through the same district. Some of the Aldermen wanted extensions of elevated lines beyond the limits agreed to by the companies, but they were told that to do this would mean that the system would not be on a self-supporting basis.

H. M. Brinckerhoff, who was chief engineer for the commission which made the report, was present at the final session and enlightened the members on several matters about which there was some doubt.

The Traction & Subway Commission is composed of William B. Parsons, Robert Ridgeway and Bion J. Arnold. The expenditure of $100,000,000 recommended by them in 1916 was called for in the course of nine years. The ultimate investment to carry out the plans of the commission through the year 1950 is placed at a minimum of $260,000,000.

Status of Franchises

Action Begun in Tacoma To Determine Whether Commission Can Set Aside Franchise Provisions

The Tacoma Railway & Power Company, Tacoma, Wash., has taken mandatory action to the Supreme Court, to determine finally whether city franchise provisions can be set aside and the statutory limitation of electric railway fare to 5 cents disregarded by the Public Service Commission.

COMPANY DENIED RELIEF.

On petition of Louis H. Bean, manager of the company, Chief Justice Ellis of the Supreme Court has issued an alternative writ of mandate commanding the commission to authorize cessation from franchise obligations and increase of fare, or show cause in the Supreme Court why this should not be done.

In its application for mandatory action, the company declares that the commission has denied it relief from the 5-cent fare limitation and from franchise obligations which require it to pay a gross earning tax, contribute to cost of paving and bridge building and carry employees free, while at the same time the commission holds in the Tacoma Avenue case that unless the company is allowed to charge rates in excess of 5 cents and is relieved of its franchise obligations, it cannot furnish the safe, adequate and sufficient service which the public demands.

In this case, the Supreme Court will have to pass directly upon the disputed law points of whether the commission is empowered by the law creating it to disregard franchise provisions, and to increase fares.

SERVICE HEARINGS AWAIT COURT DECISION

The hearing before the commission on the Tacoma Commercial Club's complaint, charging inadequate railway service in Tacoma, has been postponed until after April 1. Similar action has been taken with respect to the hearing on Seattle complaints.

If the Supreme Court holds in favor of the company's contention that the commission has the power to increase fares and set aside franchise provisions, the commission will then proceed with hearings for the purpose of determining to what extent such action shall be taken. Application made by the company for a writ of mandate provides for this later exercise of jurisdiction by the commission.

Electrics Exempted

President Signs Measure Providing for Government Control of Railroads Until After War

President Wilson signed the railroad control bill on the afternoon of March 21. So far as the electric railways are concerned the measure follows the proclamation of the President on Dec. 26 putting the railroads under government control, but exempting the street and interurban railroads, only those electric railways whose freight receipts exceed their passenger receipts being taken over. That part of the measure dealing with the electric roads is as follows:

"That every railroad not owned, controlled or operated by another carrier company, and which has heretofore competed for traffic with a railroad or railroads of which the President has taken the possession, use and control, or which connects with such railroads and is engaged as a common carrier in general transportation, shall be held and considered as within 'Federal control,' as herein defined, and necessary for the prosecution of the war, and shall be entitled to the benefit of all the provisions of this act: Provided, however, that nothing in this paragraph shall be construed as including any street or interurban electric railway which has as its principal source of operating revenue urban, suburban or local interurban passenger traffic, or sale of power, heat and light or both."

Federal control of the railroads is to continue for and during the period of the war and for a reasonable time thereafter, not to exceed one year and nine months following the date of the proclamation by the President of the exchange of ratifications of the treaty of peace.

Signal Corps Openings

Many Electrical Men Required for Various Branches of Radio Communication Work

The Signal Corps, United States Army, has announced that it can use the services of a large number of wiremen, expert electricians, storage battery men, telegraph and wireless operators, and men with electrical engineering training and experience. They are needed especially in connection with the radio communication systems for use in the miltary service. This branch of the service has been most aptly characterized as the nerve system of the army. The scope of the work requires men who will fall in general into three classes, namely, radio operators, radio mechanics and field radio experts.

Application blanks for this service may be secured by addressing the office of the Chief Signal Officer, Land Division, Training Section, Washington, D. C. Men of draft age may make application and if qualified will be inducted into the army, at their request, for service in this branch of the Signal Corps. After enlistment or induction, all personnel will be sent to one of several radio schools for six weeks to three months of intensive training in one of the three general branches of the radio work for which their previous experience qualifies them. Some of the personnel completing these courses will be commissioned, and the opportunity for advancement for all graduates will be dependent on the individual ability.

News Notes

Increase in Wages at Huntington.—A voluntary increase of 2 cents an hour for motormen and conductors has been announced by the Ohio Valley Electric Railway, Huntington, W. Va.

Wage Award Accepted.—Arthur E. Stone, treasurer of the Boston & Worcester Street Railway, Boston, Mass., has reported to the State Board of Conciliation & Arbitration that the company had accepted the wage award of Feb. 14. Under the award the men in the employ of the corporation will receive back pay for a period of eighteen months in some cases.

Advance in Wages in Fort Wayne.—A notice has been posted announcing a wage increase of 2 cents an hour to employees of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., with an additional 3 cents an hour when one-man cars are placed in service. Under the new wage schedule men in the service less than a year receive 24 cents an hour. The maximum rate is 28 cents an hour. This applies to men in the service five years or more.

Electrical Workers Strike.—Fifty union electrical workers in the employ of the Des Moines (Ia.) City Railway and the Inter Urban Railway are on strike. The men are asking for an increase of 5 7/9 cents an hour. The company has offered an increase of 2 cents. James J. Barrett, representing the Federal Department of Labor, is at Des Moines, attempting a settlement. The strike affects the armature men, linemen and power-house and substation men.

Would Change Commission Law.—Wilson T. Hume, one of the attorneys who represented the city of Portland, Ore., in the case before the court involving the Public Service Commission and the Portland Railway, Light & Power Company over 6-cent fares is drafting a measure that will provide for the enactment of an initiative law vesting municipalities with power to regulate utilities in incorporated cities. He is said to have expressed the opinion that the abolition of the Public Service Commission would not remedy the 6-cent fare situation. Under the measure proposed by Mr. Hume the commission would still have jurisdiction over the grain department, logging franchises, and utilities outside incorporated cities.

Municipal Railway Fund Provided.—At the city election in Seattle on March 5 the voters authorized the transfer of bonds in the sum of $350,000 from an original bond issue of $800,000, for the construction of a double-track municipally owned and operated elevated railway over Washington Street, Railroad Avenue, Whatcom Avenue and Spokane Street, extending from the west margin of First Avenue South to the West Waterway. The line will provide at least a partial solution of the congestion problem in the industrial district and give increased transportation for shipyard workers. Work will progress immediately, and it is expected that the line will be completed within less than six months. Of the $800,000 bond issue authorized for the construction of the Seattle municipal street railways, $425,000 has been used to date.

M. O. Negotiation Progress.—The report of M. M. O'Shaughnessy, city engineer of San Francisco, Cal., on the general negotiations for the purchase of the entire United Railroads' properties by the city has been favorably received by the special committee working with the Mayor and the public utility committee of the supervisors. This committee has indorsed that part of the report which arrived at the basis of valuation of the physical properties and the city engineer was authorized to proceed with William von Phul, vice-president and general manager of the United Railroads, to see if an agreement can be reached as to what the net earnings of the company might be for the remaining term of its franchises. Points of agreement previously established in the negotiations were referred to in the ELECTRIC RAILWAY JOURNAL for March 16, page 536.

Suit for $450,000 Dismissed.—When the United States Supreme Court recently dismissed the suit of the Puget Sound Traction, Light & Power Company against the Duwamish Waterway for $450,000, the last of the suits was disposed of that were filed against the Waterway district growing out of the several hundred condemnations made by the district several years ago. The company alleged that through the straightening of the river to make the improvements authorized by the district, its power plant had its fresh water supply cut off. Superior Court Judge Kenneth Mackintosh upheld the right of the district to make the improvement. An appeal to the State Supreme Court followed. In affirming Judge Mackintosh's decision, the State Supreme Court held that the plaintiff company had no property right in fresh water in a navigable stream, nor in the bed of the river, as had been held by Judge Mackintosh. The appeal to the United States Supreme Court followed.

Financial and Corporate

Denial Entered

Pittsburgh Companies Ask Dismissal of Action in Which Application Was Made For a Receiver

Reply has been made by the companies to the bill in equity, on behalf of Benjamin C. Allen, acting for himself and other holders of the first mortgage bonds of the Union Traction Company, Pittsburgh, Pa., filed on Feb. 15 against the Philadelphia Company, the Pittsburgh Railways and the United Traction Company, Pittsburgh, in the District Court of the United States in the Western District of Pennsylvania. In the bill of complaint it was charged among other things that the responsibility for the principal and interest on underlying bonds of the companies which go to make up the Pittsburgh Railways system was with the Philadelphia Company, and the court was asked to "recognize and enforce the liability which the Philadelphia Company, by its recent defaults, has sought to avoid." The court was also asked to appoint a receiver for Pittsburgh Railways and to require an accounting by the Philadelphia Company of the management of the railway company and subsidiary and affiliated companies.

No Cause for Action Claimed

Dismissal of the actions is asked by the defendants to both suits, on the grounds that the bills do not make out any cause of action against the defendants and that cause of action, if any, is vested in the Maryland Trust Company, trustee under the deed securing the general mortgage 5 per cent bonds of the United Traction Company.

In its reply to the Allen suit, the Philadelphia Company demands proof of the allegation in the complaint that a syndicate "caused $17,000,000 par value of common stock to be issued and delivered to it without paying the United (United Traction Company) any real or cash value therefor.

The defendant company avers it purchased the stock referred to "in good faith and without knowledge of any alleged invalidity of said stock so issued or any part thereof."

The answer of the Pittsburgh Railways and the United Traction Company to the same suit, says:

"The defendants deny that $3,000,000 par value of preferred stock was sold and the proceeds thereof together with the proceeds of the aforesaid bonds used to pay the purchase price of the properties acquired by the United, and the defendants deny that the $17,000,000 par value of common stock was issued and delivered without giving to the United or its subsidiary companies any real or cash value therefor.

"Briefly, all the common capital stock of the United Traction Company of Pittsburgh was issued in payment for the properties known as the Second Avenue Traction Company; all the preferred stock and $800,000 in cash was given in payment for the properties known as the Northside Traction Company, including the Federal Street & Pleasant Valley Passenger Railway and approximately $2,500,000 in cash was given in payment for the capital stock of the Pittsburgh, Allegheny & Manchester Traction Company. There was thus a total cash disbursement of approximately $3,300,000 which was realized by selling the mortgage bonds.

"It is further denied that the $3,000,000 par value of preferred stock of the United Traction Company was or is owned by the Philadelphia Company."

Further M. O. Negotiations

The directors of the London & Lake Erie Railway & Transportation Company, London, Ont., have decided to throw open all books to the inspection of Sir Adam Beck and the London & Port Stanley Railway Commission, and to make an offer to sell out to the city of London for $420,000.

Some time ago the company made a move to sell to the city and asked Sir Adam Beck, who is chairman of the commissions in charge of the London & Port Stanley Railway and the Peterboro Radial Railway, both municipally operated, to name a price. Sir Adam answered that he would be prepared to recommend to the people that they pay $286,000 for the road at which rate it would pay its way. The company wanted double that amount, however, and gave notice of intention to tear up the rails and scrap the line. The road is 28 miles long.

"Going Value" Tax Overruled

Justice Black in the New Jersey Supreme Court has handed down an opinion in which he reduces the tax assessment of the Trenton & Mercer County Traction Corporation by $568,052. This assessment on the "going value" of the company for the year 1916 was held legal by the State Board of Taxes and Assessments. Judge Black holds that "going value" cannot properly be included in appraising taxable value of property of public utility corporations. Frank S. Katzenbach, counsel for the company, argued against the arbitrary adding of this amount to the assessment by the State board as "going value" and characterized it as double taxation. The court holds that the "going value" was already taxed by a levy upon the gross receipts of the company.

Report of Referee Ratified

Each Non-Assenting Holder of $1,000 of R. S. & E. Bonds Has $346 Coming to Him

The report of George H. Bond as referee in the foreclosure suit of the Columbia Trust Company, New York, N. Y., against Hendrick S. Holden and C. Loomis Allen as receivers of the Rochester, Syracuse & Eastern Railroad, Syracuse, N. Y., has been ratified by Justice Hubbs.

Mr. Bond's report shows that there were outstanding 44,897, $1,000 first mortgage forty-year 6 per cent gold bonds, totalling $4,897,000. The amount of principal and interest due on the mortgage on March 16, 1917, was $5,656,368, so that $1,115 was due on each $1,000 bond.

The proceeds of the sale of the road were $1,691,079. The reorganization committee composed of Arthur W. Loasby, Elbert Harvey and DeForest Settle received deposits of bonds to the amount of $4,855,000. Owners of the bonds who participated in the reorganization received for each $1,000 bond $500 par value of first mortgage 5 per cent bonds, $500 of 6 per cent cumulative preferred stock, $100 of 6 per cent cumulative preferred stock for unpaid interest, and $200 of common stock. By an order made by Justice Hubbs the amount of $14,563 is to be set aside to make payments of $346.76 on each of the forty-two bonds not participating.

Preferred Dividend in Scrip

The directors of the American Public Utilities Company, Grand Rapids, Mich., have declared the usual quarterly dividend on the preferred stock of the company, payable in scrip on April 1. The scrip will be in the form of warrants, payable on or before April 1, 1923, bearing 6 per cent interest.

The directors of the company deem it prudent, in view of the very uncertain financial condition now prevalent, and which may continue during the war, to make payment of the dividend in scrip, instead of cash, in order to conserve the resources of the company and its subsidiaries. While not authorizing any unusual construction expenditures by the subsidiary companies, at the same time the directors feel that they must provide for the constant demands upon them for added service at existing plants, and as there is no certainty that funds for these unavoidable expenditures can be obtained through the sale of securities in the usual way, they must be taken from the earnings of the companies which ordinarily are devoted to the payment of dividends.

The earnings of the company, considering war conditions, are satisfactory, and while the dividend scrip is payable five years from date, it is not anticipated that the dividend payments will be deferred for that length of time. The time is set at five years more as a precautionary measure than anything else.

Electric Railway Statistics

Comparison of Returns for Year Ended Dec. 31, 1917, with Those for 1916 Shows Electric Railways To Be Disastrously Affected by Rising Costs

A comparison of electric railway statistics for the twelve months ended Dec. 31, 1917, with figures for the corresponding period of 1916, made by the information bureau of the American Electric Railway Association, brings out rather clearly the effect rising costs of materials and supplies used by electric railways, together with increases in wages and taxes, have had upon the railway companies net.

Data for the twelve months ended Dec. 31, 1917, representing 8437 miles of line of companies scattered throughout the country, indicate an increase in operating revenues of 5.77 per cent, in operating expenses, one of 12.78 per cent, and a decrease in net earnings of 5.91 per cent. Data representing 7005 miles of line indicate an increase in the amount of taxes paid of 13.87 per cent, while operating income decreased 10.04 per cent.

The operating ratio of the United States as a whole increased from 62.51 in 1916 to 66.65 in 1917. That of the Eastern district increased even more—from 62.46 in 1916 to 67.42 in 1917.

TABLE IV—OPERATING REVENUES AND EXPENSES OF ELECTRIC RAILWAYS PER REVENUE CAR MILE, YEAR ENDED DEC. 31, 1917

Account	United States		Eastern District		Southern District		Western District	
	Amount 1917 (in cents)	Increase over 1916 per cent.	Amount 1917 (in cents)	Increase over 1916 per cent.	Amount 1917 (in cents)	Increase over 1916 per cent.	Amount 1917 (in cents)	Increase over 1916 per cent.
Per revenue car mile:								
Operating revenues	30 87	4 08	32.99	3.68	24.91	6 36	28.65	14.45
Operating expenses	20 06	9 68	21.45	11.49	14.90	7.74	18.90	6.60
Net earnings	10 81	†4.93	11.54	†8.27	10.01	4.38	9.75	0.52
Revenue car miles *	469,904,724		272,046,596		36,464,707		161,393,421	
Av. No. miles represented	1917, 6,668; 1916, 6,609		1917, 4,447; 1916, 4,410		1917, 603; 1916, 595		1917, 1,618; 1916, 1,604	

OPERATING REVENUES AND EXPENSES OF ELECTRIC RAILWAYS PER REVENUE CAR HOUR, YEAR ENDED DEC. 31, 1917

	United States		Eastern District		Southern District		Western District	
	(In dollars)		(In dollars)		(In dollars)		(In dollars)	
Per revenue car hour:								
Operating revenues	2.88	3.60	3.06	2.68	2.21	6.25	2.72	4.21
Operating expenses	1.87	8.72	1.99	10.56	1.32	7.32	1.80	6.51
Net earnings	1.01	†4.72	1.07	†9.32	0.89	4.71	0.92	.....
Revenue car hours *	50,438,956		29,366,405		4,101,284		16,971,267	
Av. No. miles represented	1917, 6,668; 1916, 6,609		1917, 4,447; 1916, 4,410		1917, 603; 1916, 595		1917, 1,618; 1916, 1,604	

* The last three figures are omitted. † Decrease.

The operating ratios of the Western and Southern districts have also increased though not quite as much as that of the Eastern district.

The number of revenue passengers carried by companies represented by 6688 miles of line increased 4.91 per cent, while the number of transfer passengers increased 2.67 per cent, the revenue car mileage 1.28 per cent and the revenue car hours 1.95 per cent. Though the average fare per revenue passenger increased 0.79 per cent and the average fare per passenger including transfers increased 1.25 per cent, the net earnings, as pointed out above, have decreased almost 6 per cent and the operating income decreased 10 per cent. It must also be borne in mind in this connection that both of the fare figures are based upon the combined returns of both city and interurban of revenue passengers per passenger car mile increased 3.55 per cent.

The returns from the city and interurban electric railway companies, as shown in detail in the appended tables, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Table I shows the revenues, expenses and net earnings of approximately 100 electric railways in the United States as well as the operating income of a slightly smaller number of companies reporting taxes. Difficulty in obtaining the needed data, together with the limited time after the close of the calendar year 1917 available for tabulation, made it impossible to include a greater number of companies in this summary. It is believed, however, that data here given is fairly representative of conditions as a whole of the three groups shown. Returns for the Southern are the most encouraging. Though the operating revenues for this group increased somewhat less than those of the Eastern and Western groups, local conditions have apparently enabled the roads in the South to keep down their expenses, so that the net earnings for this group are almost unchanged. As a whole, while the operating revenues of the three groups increased at a normal rate, operating expenses and taxes have increased tremendously. The operating expenses of the Eastern group, for instance, have increased 13.74 per cent and the taxes 14.33 per cent, while operating revenues increased by 5.37 per cent and the net earnings decreased 8.54 per cent.

Table II shows the details of the operating expenses of companies represented by 7127 miles of line. An examination of this table reveals what was perhaps to be expected—that the largest increases occur in the expenditures for "power" and for "conducting transportation"—that is, for coal and for labor. Due to measures of economy apparently there is but little increase in the expenditures for "maintenance of way and structure," while on the other hand, in order, it seems, to avoid buying new cars and thus release mill and plant facilities for the use of the government a great deal of car repairing has apparently been done, thus increasing the expenditure for this account by some 13 per cent. The "general and miscellaneous" account has also increased some 10 per cent. The largest increase in the "power" account has occurred in the Eastern district—one of 30.59 per cent, while the largest in the "conducting transportation" account was in the Western district, one of 11.02 per cent.

ONLY NORMAL INCREASE IN TRAFFIC

Table III gives the traffic statistics of companies, representing 6668 miles of line. All groups indicate normal increases in the number of passengers carried. The Eastern and Western indicate, moreover, slight increases in the car mileage and car hours run. The Western district shows the greatest percentage increase in both the number of revenue and the number of transfer passengers carried; the Southern, the least percentage increase in the number of transfer passengers carried. A number of companies keep no record of free passengers, and the records of free passengers as shown on the table are, therefore, somewhat smaller than the actual figures. Though net earnings have decreased the average fare per revenue passenger has increased slightly in all districts, as has also the average fare per passenger including transfers. The largest increase in the number of revenue passengers carried per revenue car mile has occurred in the Southern district.

In Table IV there are shown the revenues, expenses and net earnings per revenue car mile and per revenue car hour, together with the per cent increase or decrease over the corresponding figures for 1916. There are also given the number of revenue car miles and car hours involved with the last three figures omitted. For the United States as a whole the net earnings both per revenue car mile and revenue car hour show decreases of more than 4½ per cent.

TABLE I—COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR TWELVE MONTHS, JANUARY-DECEMBER, 1917 AND 1916

Account	United States				Eastern District				Southern District				Western District			
	Amount, January-December, 1917	Per Mile of Line			Amount, January-December, 1917	Per Mile of Line			Amount, January-December, 1917	Per Mile of Line			Amount, January-December, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating revenues	$190,045,411	$22,525	$21,296	5.77	$122,578,032	$20,979	$19,909	5.37	$12,958,884	$16,342	$15,565	4.99	$54,508,495	$30,249	$28,303	6.88
Operating expenses	126,663,441	15,013	13,312	12.78	82,636,305	14,143	12,435	13.74	7,560,872	9,535	8,899	7.15	36,466,264	20,236	18,090	11.86
Net earnings	63,381,970	7,512	7,984	†5.91	39,941,727	6,836	7,474	†8.54	5,398,012	6,807	6,666	2.12	18,042,231	10,013	10,213	†1.96
Opr. ratio, per cent.	1917, 66.65; 1916, 62.51				1917, 67.42; 1916, 62.46				1917, 58.35; 1916, 57.17				1917, 66.90; 1916, 63.91			
Aver. No. miles represented	1917, 8,437; 1916, 8,364				1917, 5,843; 1916, 5,793				1917, 793; 1916, 785				1917, 1,801; 1916, 1,786			

COMPANIES REPORTING TAXES

Operating revenues	$159,546,552	$22,776	$21,653	5.19	$100,122,719	$20,568	$19,643	4.71	$9,300,508	$17,255	$16,546	4.29	$50,123,325	$31,366	$29,504	6.31
Operating expenses	105,265,068	15,027	13,378	12.33	66,311,138	13,622	12,079	12.77	5,313,141	9,857	9,097	8.35	33,640,789	21,052	18,783	12.08
Net earnings	54,281,484	7,749	8,275	6.26	33,811,581	6,946	7,564	8.17	3,987,367	7,398	7,449	0.68	16,482,536	10,314	10,721	3.80
Taxes	10,175,689	1,453	1,276	13.87	5,904,587	1,213	1,061	14.33	776,558	1,441	1,321	9.08	3,494,544	2,187	1,915	14.20
Operating income	44,105,795	6,296	6,999	†10.04	27,906,994	5,733	6,503	†11.84	3,210,809	5,957	6,128	†2.79	12,987,992	8,127	8,806	†7.71
Opr. ratio, per cent.	1917, 65.98; 1916, 61.78				1917, 66.23; 1916, 61.49				1917, 57.13; 1916, 54.98				1917, 67.12; 1916, 63.66			
Aver. No. miles represented	1917, 7,005; 1916, 6,939				1917, 4,868; 1916, 4,824				1917, 539; 1916, 533				1917, 1,598; 1916, 1,582			

† Decrease.

TABLE II—DETAILS OF OPERATING EXPENSES OF ELECTRIC RAILWAYS FOR THE YEAR ENDED DEC. 31, 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, January-December, 1917	Per Mile of Line			Amount, January-December, 1917	Per Mile of Line			Amount, January-December, 1917	Per Mile of Line			Amount, January-December, 1917	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Operating expenses	$101,484,369	$14,239	$12,794	11.29	$63,413,346	$13,344	$11,794	13.14	$7,560,872	$9,535	$8,899	7.15	$30,510,15	$19,286	$17,734	8.75
Way and structures	10,975,589	1,540	1,517	1.52	6,902,025	1,452	1,405	3.35	869,005	1,096	1,067	2.72	3,204,559	2,026	2,079	2.55
Equipment	9,656,177	1,355	1,191	13.77	5,517,656	1,161	1,005	15.52	780,968	985	958	2.82	3,357,553	2,122	1,863	13.90
Total maintenance and renewal *	26,665,973	3,742	3,503	6.82	16,878,720	3,552	3,280	8.29	1,649,973	2,081	2,025	2.77	8,137,280	5,144	4,908	4.81
Power	17,017,376	2,388	1,921	24.31	11,464,145	2,412	1,847	30.59	1,091,279	1,376	1,120	22.86	4,461,952	2,820	2,540	11.02
Conducting transportation	42,731,134	5,995	5,440	10.20	25,980,476	5,467	4,973	9.93	3,621,633	4,576	4,227	8.04	13,129,025	8,299	7,449	11.41
Traffic	324,227	45	55	†18.18	110,702	23	40	†42.50	45,258	57	61	†6.56	168,267	106	96	10.42
General and miscellaneous	14,796,610	2,076	1,882	10.31	8,980,554	1,890	1,654	14.27	1,152,729	1,454	1,466	†0.82	4,663,327	2,948	2,774	6.27
Transportation for investment—Cr.	†50,951	†7	†7	.....	†1,251	......	......	......	......	......	......	.....	†49,700	†31	†33	....
Aver. No. miles represented	1917, 7,127; 1916, 7,057				1917, 4,752; 1916, 4,702				1917, 793; 1916, 786				1917, 1,582; 1916, 1,569			

* Contains an amount not apportioned between "Maintenance of Way and Structures" and "Maintenance of Equipment." † Decrease.

TABLE III—TRAFFIC STATISTICS OF ELECTRIC RAILWAYS FOR THE YEAR ENDED DEC. 31, 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount January-December, 1917 (in thousands)	Per Mile of Line			Amount January-December, 1917 (in thousands)	Per Mile of Line			Amount Jan'y-December, 1917 (in thousands)	Per Mile of Line			Amount January-December, 1917 (in-thousands)	Per Mile of Line		
		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase		1917	1916	% Increase
Passenger revenue	$138,466	$20,766	$19,667	5.59	$84,505	$19,003	$18,061	5.22	$8,836	$14,654	$13,975	4.86	$45,125	$27,889	$26,193	6.48
Revenue car miles—total	469,905	70,472	69,579	1.28	272,047	61,175	60,426	1.24	36,465	60,472	61,529	†1.72	161,393	99,749	97,729	2.07
Passenger car miles	464,319	69,634	68,743	1.30	267,542	60,162	59,430	1.23	36,154	59,957	60,902	†1.55	160,623	99,273	97,260	2.07
Other revenue car miles	5,586	838	836	0.24	4,505	1,013	996	1.71	311	515	627	†17.86	770	476	469	1.49
Revenue car hours—total	50,439	7,564	7,419	1.95	29,366	6,604	6,458	2.26	4,101	6,801	6,905	†1.51	16,971	10,489	10,253	2.30
Passenger car hours	49,732	7,458	7,311	2.01	28,788	6,474	6,327	2.32	4,056	6,727	6,815	†1.29	16,887	10,437	10,200	2.32
Other revenue car hours	707	106	108	†1.85	578	130	131	†0.76	45	74	90	†17.78	84	52	53	†1.89
Passengers—total	3,448,065	517,106	495,231	4.42	2,049,501	460,873	442,634	4.12	213,37	353,855	340,538	3.91	1,185,190	732,503	697,222	5.06
Revenue passengers	2,706,276	405,860	386,875	4.91	1,663,949	374,173	358,277	4.44	174,544	289,462	276,531	4.68	867,782	536,330	506,433	5.90
Transfer passengers	706,990	106,027	103,270	2.67	364,183	81,894	79,795	2.63	34,546	57,289	55,950	2.39	308,262	190,520	185,365	2.78
Free passengers	34,799	5,219	5,086	2.62	21,369	4,806	4,562	5.35	4,283	7,104	8,057	†11.83	9,146	5,653	5,424	4.22
Average fare per passenger																
Per revenue passenger	*5.12	......	......	0.79	*5.08	......	......	0.79	*5.06	......	......	0.20	*5.20	......	......	0.58
Per passenger (including transfers)	*4.06	.....	......	1.25	*4.17	......	......	1.21	*4.23	......	.....	0.71	*3.84	....	......	1.32
Average number of revenue passengers per passenger car mile	5.83	...	......	3.55	6.22	......	......	3.15	4.83	......	......	6.39	5.40	......	......	3.65
Aver. No. miles represented	1917, 6,668; 1916, 6,609				1917, 4,447; 1916, 4,410				1917, 603; 1916, 595				1917, 1,618; 1916, 1,046			

† Decrease. * Cents.

Financial News Notes

Foreclosure Sale on March 30.—The property of the Northern Cambria Street Railway, Patten, Pa., which operates an electric railway 15 miles in length, will be sold on March 30 by the trustee, the Cambria Title Savings & Trust Company, Ebensburg, Pa.

Northern States Issues Additional Bonds.—A syndicate composed of Harris Trust & Savings Bank, Chicago; H. M. Byllesby & Company, Chicago; Guaranty Trust Company, New York, and Bonbright & Company, New York, is offering $1,000,000 Northern States Power Company first and refunding mortgage 5 per cent bonds, due on April 1, 1941.

Foreclosed Road Transferred.—The Orleans-Kenner Electric Railway has been transferred to the Orleans-Kenner Traction Company, Inc., New Orleans, La., as a result of the recent receivers' sale, when J. Blanc Moore bought the property for the reorganized company. The line is about 16 miles long, from New Orleans to Kenner, La., this including 4 miles operated under a trackage agreement.

San Diego Sale Authorized. — The California Railroad Commission has made final its authority granted last November to the San Diego & South Eastern Railway to sell its physical assets and properties to the San Diego & Arizona Railway, San Diego, Cal., the consideration of $1,500,000 to stand on the books of the purchasing corporation as an indebtedness due to the selling company, with interest at 6 per cent, until such time as bonds authorized to be issued in payment have been delivered.

Receivership Application Denied. — Application for appointment of a receiver for the Trenton, Lakewood & Seacost Railway, Trenton, N. J., has been denied by Vice-Chancellor Foster. The application was made by Frank Tilford, New York, who claimed that the company had no income and that conservation of interests of bond and stockholders demanded the naming of a receiver. The company was formed to build a line from Trenton to Point Pleasant, a distance of about 40 miles. No construction work was ever done.

Ohio Commission Authorizes Abandonment.—One division of the Interurban Railway & Terminal Company, Cincinnati, Ohio, will be abandoned under an order of the Public Utilities Commission issued on March 20. The portion abandoned lies between Coney Island, Hamilton County, and Bethel. It is known as the Bethel division. Its receipts last year were $7,000 less than the operating expenses. This division is parelleled between Amelia and Bethel by the Cincinnati, Georgetown & Portsmouth Railroad. For the remaining 6 miles the roads are from 2 to 3 miles apart, but the commission found that fair service can be given by the other road, even in this district.

Cincinnati-Dayton Line Reorganized.—The Ohio Public Utilities Commission on March 20 issued an order approving the reorganization of the Cincinnati, Dayton & Toledo Traction Company under the name of the Cincinnati & Dayton Traction Company. The new company will have a capital stock, all common, of $1,250,000 and is authorized to issue $4,750,000 of bonds. The capital liabilities of the old company amounted to $7,250,000. J. M. Hutton and company and Claude Ashbrook, brokers, Cincinnati, with other interests, took a leading part in the reorganization which was effected in behalf of a bondholders' committee. Attorney Judson Harmon, former Governor, conducted the legal proceedings. The Cincinnati, Dayton & Toledo Traction Company is operated as a part of the Ohio Electric Railway. The line extends from Cincinnati to Dayton.

Option Secured on Abandoned Road.—Announcement has been made by George H. Taylor, personal representative of Frank J. Gould, president of the Richmond & Chesapeake Bay Railway, Richmond, Va., that a thirty-day option to buy the road has been granted to T. Garnett Tabb, president of the Hermitage Country Club, Inc., who voiced his intention of purchasing the property with a view of restoring the service between Richmond and Ashland at the earliest possible date. Mr. Taylor said: "It was never the intention of Mr. Gould to scrap this property, and how such a report could have started is beyond me. We are all interested in seeing service restored on the Richmond & Chesapeake Bay Railway, and before we granted the option to Mr. Tabb he expressed his purpose of intending to buy with a view of operating."

I. T. S. Passes Common Dividend.—The Illinois Traction Company, Peoria, Ill., has announced that the quarterly dividend of three-quarters of 1 per cent on the common stock, starting with that due on May 15, will be passed owing to abnormal conditions due to the war. The regular quarterly dividend of 1½ per cent on the preferred stock has been declared and will be paid on April 1. The company has $12,330,800 of common stock and $7,289,500 of preferred stock outstanding. In an official statement the company says that the cost of coal, labor and every material entering into the production of electric, gas and all utility service has mounted to such a degree during the past year that it applied to the Illinois Public Service Commission for an emergency increase in city utility rates partly to counteract the effect of war prices. The hearings in this case have been reviewed in the ELECTRIC RAILWAY JOURNAL. The case has been closed and is before the commission for decision.

Electric Railway Monthly Earnings

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BATON ROUGE (LA.) ELECTRIC COMPANY					
1m., Jan., '18	$21,529	*$11,117	$10,412	$3,695	$6,717
1m., Jan., '17	20,445	*9,977	10,468	3,565	6,903
12m., Jan., '18	233,048	*120,553	112,495	42,866	69,629
12m., Jan., '17	214,312	*101,634	112,678	42,070	70,608
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, CLEVELAND, OHIO					
1m., Dec., '17	$42,943	*$29,133	$13,810	$11,564	$2,245
1m., Dec., '16	40,499	*22,481	18,018	11,723	6,295
12m., Dec., '17	539,107	*339,045	200,062	140,038	60,024
12m., Dec., '16	466,604	*263,168	203,436	137,414	66,022
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Jan., '18	$108,978	*$41,606	$67,372	$31,893	$35,479
1m., Jan., '17	89,607	*33,181	56,426	28,520	27,906
12m., Jan., '18	1,115,436	*428,885	686,551	362,475	324,076
12m., Jan., '17	899,013	*353,668	545,345	343,407	201,938
EL PASO (TEX.) ELECTRIC COMPANY					
1m., Jan., '18	$114,360	*$74,781	$39,579	$6,513	$33,066
1m., Jan., '17	116,343	*65,144	51,199	5,245	45,954
12m., Jan., '18	1,281,542	*811,408	470,134	68,276	401,858
12m., Jan., '17	1,121,778	*675,140	446,638	59,700	386,938
FEDERAL LIGHT & TRACTION COMPANY, NEW YORK, N. Y.					
1m., Jan., '18	$310,344	*$212,003	$98,341	$50,184	$48,157
1m., Jan., '17	243,878	*150,265	93,613	49,727	43,886
12m., Jan., '18	2,933,776	*2,072,203	861,573	594,912	266,661
12m., Jan., '17	2,520,477	*1,636,654	883,823	587,017	296,806
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.					
1m., Jan., '18	$194,182	*$132,913	$61,269	$39,282	$21,989
1m., Jan., '17	163,075	*113,216	49,859	36,910	12,947
12m., Jan., '18	2,119,228	*1,404,568	714,660	453,252	261,408
12m., Jan., '17	1,951,476	*1,243,222	708,254	439,312	268,942
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.					
1m., Jan., '18	$29,422	*$20,554	$8,868	$5,075	$3,793
1m., Jan., '17	28,753	*18,683	10,070	5,225	4,8s
12m., Jan., '18	343,802	*218,322	125,480	61,150	64,330
12m., Jan., '17	330,315	*188,101	142,214	63,618	72,596
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
1m., Dec., '17	$167,571	*$107,350	$60,221	$39,336	$20,885
1m., Dec., '16	149,815	*97,916	51,899	36,558	15,341
12m., Dec., '17	1,786,011	*1,210,690	575,321	421,333	153,988
12m., Dec., '16	1,818,551	*1,022,712	595,839	436,647	159,192
NEW YORK (N. Y.) RAILWAYS					
1m., Dec., '17	$918,775	*$762,955	$155,820	$282,419	†‡$66,918
1m., Dec., '16	946,071	*799,387	146,684	279,411	†‡64,089
6m., Dec., '17	6,306,105	*4,699,063	1,608,042	1,691,167	‡225,567
6m., Dec., '16	5,393,560	*4,185,894	1,207,666	1,690,097	†‡144,505
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1m., aJn., '18	$960,089	*$588,004	$372,085	$204,491	$167,594
1m., Jan., '17	787,869	*471,237	316,632	191,925	124,707
12m., Jan., '18	9,627,081	*5,970,786	3,656,295	2,363,754	1,292,541
12m., Jan., '17	8,225,647	*5,160,961	3,064,686	2,222,257	842,429

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

"Pup" Talks at Durham

Problems of Utility Frankly Set Forth in Series of Advertisements Addressed to Public

A novel and effective series of newspaper advertisements has recently been concluded by the Durham (N. C.) Traction Company in connection with its request to the city for a 6-cent fare and relief from certain franchise provisions which the company regards as unduly burdensome. The publicity program was in charge of J. Frank Johnson.

The Durham advertisements were run in fifteen consecutive issues of both the afternoon and morning newspapers, and were popularly known as the "Pup" series because each was headed by a picture of an agonized canine seated on a tub with forepaws in a begging attitude, while a huge chain bound him firmly to a large stake. The readers' wonderment as to this symbolism was permitted to continue for six advertisements, and the public learned that "Pup" meant "Public Utility Problems," and it was apparent the dog represented the Durham Traction Company, piteously begging for relief from the bonds of obsolete city regulations.

All the advertisements were instructive, frankly setting forth the company's difficulties in an abnormal period while operating and construction costs were often trebled and quadrupled. One of the best appeals was advertisement No. 4, published on Feb. 13. It is reproduced in full as follows:

"SO THAT PEOPLE MAY KNOW

"One of the principal benefits that a community derives from any company or industry which does business in it, is the amount of money which that company spends in the community.

"We are not in position to state definitely just how our figures of total expenditures, and expenditures within the city of Durham, compare with those of other industries.

"We want, however, to give our figures of expenditures in 1917.

"For the 312 business days during the year the Durham Traction Company spent an average of $1,794 a day during the year of 1917.

"Of this $1,794 a day, $917 was spent in the city of Durham, of which $360 was spent daily for material and miscellaneous expenses.

"These figures are not superficial or padded, but are taken directly from our check register.

"Furthermore, they must vary directly with the conditions of the company.

"Our prosperity, due to fare earnings, will increase both these items.

"If we are forced to seek economies we cannot be progressive and these items must be decreased.

"Which is better for you?

"Which is better for Durham?

"Efficient Utility service can be furnished to the public only by a successful company.

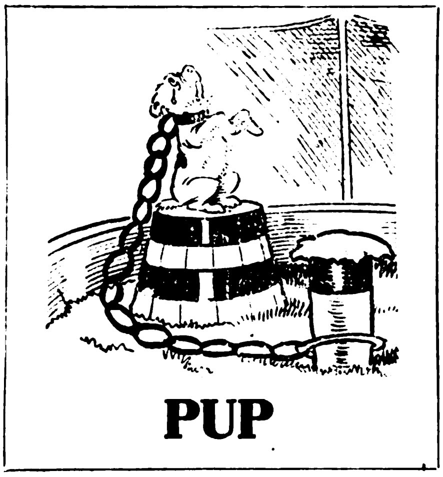
"Companies that barely earn enough to meet their expenses are constantly forced to seek economies, and service must suffer in consequence.

"History teaches that a city is best served by a utility that is prosperous; one that can expend; one that can make extensions; one that can, because of available funds, give service in every sense of the word; one that can employ men of sterling quality.

"Isn't it true that successful cities and successful utilities go hand in hand.

"A bankrupt or poorly paying public utility is one of the worst advertisements a city can have.

"Write us that criticism about which you have been thinking."



THE DURHAM APPEAL

Cleveland Fare Request In

President Stanley Wants Highest Rate Under Tayler Grant Put Into Effect

In a letter to Fielder Sanders, City Street Railway Commissioner, dated March 21, John J. Stanley, president of the Cleveland (Ohio) Railway, asked that the City Council assent to an increase in the rate of fare to the highest figure named in the Tayler grant, which is 4 cents cash and seven tickets for a quarter, with 1 cent for a transfer and no rebate. This is known as rate A in the franchise. If the increase is granted, rate B, which differs from rate A only in providing a rebate of the transfer charge, would be skipped entirely.

Mr. Stanley's letter stated that the receipts for February were $49,413 less than the cost of operation and that the interest fund, which should normally be somewhere between $300,000 and $500,000, is now only $120,846. Council will consider this matter, but under the franchise the rate could be raised automatically one step at a time until it reaches A, because the interest fund is below the prescribed $300,000. A question that is interesting most people is whether even this rate will be sufficient to restore the fund and keep the service at its present efficiency.

To complicate matters the motormen and conductors are talking of a large increase in wages when their contract expires on May 1.

Confer on Freight

Governor at Meeting in Ohio at Which Handling of Freight on Electric Railways Is Considered

A meeting of representatives of Ohio interurban railways was held in Columbus on March 21 for the purpose of discussing ways and means of handling more freight in less than carload lots and in short hauls in order to relieve the steam roads of a portion of the burden that has been placed upon them. Governor James M. Cox attended the meeting and made a brief address covering the possibilities of the electric lines in giving needed relief.

The greatest difficulty these roads will have in meeting the wishes of the government, according to some of the representatives present, is the lack of proper freight equipment and terminal facilities. It was also suggested that the carrying capacity would have to be greatly increased and that this would be almost impossible without government aid.

It was decided, however, to make a survey of the amount of freight handled last year by Ohio roads, the possible amount that can be handled this year, the requirements in the way of additional equipment needed to utilize all present available power and methods for physical connection with the steam roads. These data will be referred to Secretary McAdoo. The committee appointed to make the survey consists of the following:

F. W. Coen, president of the Central Electric Railway Association and vice-president and general manager of the Lake Shore Electric Railway, Cleveland; F. D. Carpenter, president the Western Ohio Railway, Lima; H. G. Gilpin, general manager the Ohio Electric Railway, Springfield; and E. F. Schneider, general manager the Cleveland, Southwestern & Columbus, Cleveland.

In Ohio there are 2607 miles of main line and 87 miles of branch and spur tracks. The meeting was held with J. B. Dugan, chief inspector of the Public Utilities Commission, who has given this matter much thought and attention.

Review of Six New York Fare Cases

A Summary Is Presented of the Testimony in Connection With Rate Applications Heard Recently by Up-State Commission

The Public Service Commission for the Second District of New York has held hearings recently on a number of applications by electric railways for increased fares. As a matter of convenience to its readers, the ELECTRIC RAILWAY JOURNAL has decided to summarize the results of the hearings under one head, but to keep the review of the proceedings in each case separate from the others.

SERVICE FIRST—FARES NEXT

The application of the Poughkeepsie & Wappingers Falls Railway for a 6-cent fare was heard on March 21. The railroad presented detailed figures to the commission in support of its application. Counsel for the city said that if the commission found from the evidence that it was necessary to increase the fare the city did not intend to object. The city claimed, however, that it had not received proper service and treatment from the railroad. If an increase was granted the city wanted proper service.

H. C. Hopson, for the company, said the application of the railroad was for a 6-cent fare in Poughkeepsie and a finding by the commission that it was entitled to a similar increase on the balance of its system. He said there were no franchise questions involved in the application. The railroad runs between Poughkeepsie and Wappingers Falls, operating over the Central New England Railway to the Poughkeepsie State Hospital.

H. R. Guernsey, representing Vassar College, read an agreement between the City Railroad, Poughkeepsie, and Vassar College covering the fare for passengers to that school. The agreement was dated June 17, 1893, when the motive power was changed to electricity. It provided for a 5-cent fare.

"Then if the city gets good service, it is willing to pay for it," asked Chairman Hill of the Public Service Commission after Corporation Counsel Worrall had made his statement in behalf of the city.

"Yes, sir," replied Alderman D'Arcy. "All we ask is good, fair service."

"There is nothing fairer than that," replied Chairman Hill.

THE CASE FOR THE COMPANY

The railway put in its evidence through Charles A. Brooks, local manager; J. A. Nilan, auditor; Joseph K. Choate, vice-president, and Charles A. Greenidge, chief engineer for J. G. White & Company, New York, operating managers of the railroad; and John M. Daly, New York, an expert accountant. It was shown that the company's net loss for 1917 was $5,970 and that it had paid no dividends.

The evidence of Mr. Brooks was to the effect that the service, as far as operation was concerned, was good, but that the roadbed and equipment of the company were not in good shape. He said that if the company was permitted to increase its rates there would be 1-cent increase in the fare zones outside of Poughkeepsie. Mr. Brooks also testified to increases in the cost of materials and wages paid conductors and motormen. The greater part of the evidence consisted of detailed statements of operating expenses, costs, etc., which were made a part of the record without objection.

There was no evidence given on the part of the city and the case was ordered closed by the commission.

COMMISSION ACTION ON OTHER APPLICATIONS

The rate applications of the Peekskill Lighting Company, and the Putnam & Westchester Traction Company, under a petition for a rehearing by the city of Peekskill, came up before the commission, on March 21. The city did not care to submit any evidence and the hearings were closed.

On March 21 the commission ordered closed the complaints against the Buffalo, Lockport & Rochester Railway protesting proposed increase in commutation passenger fares, the operation of which was ordered suspended by the commission, pending a hearing. The increase objected to was from 1 to 1½ cents a mile for commutation ticket books. The company filed a petition to withdraw the tariff, and this action was satisfactory to the complainants who consented to the withdrawal. The company, on not less than one day's notice to the public and under an effective date not later than April 15, is permitted to file a new tariff.

On March 19 the commission heard the application of the Fonda, Johnstown & Gloversville Railroad for permission to increase the fare charged passengers riding within the limits of a city or incorporated village, to 6 cents and a proportionate increase in rates for other transportation. City Attorney Wesley H. Maider of Gloversville, asked for a dismissal of the petition on the ground that there were certain franchise agreements. This was denied. Mr. Maider also asked for a postponement of the hearing until an adjudication by the Court of Appeals in the Rochester case. Chairman Hill said there would be no decision in rate cases until the Court of Appeals had rendered its decision. He said an early decision was expected. He said it was best to go ahead and permit the petitioner to put in its case. He thought that this course would be an advantage to those in opposition to the company's petition. The railroad then began the introduction of documentary evidence. This dealt largely with cost of operation and other statistics in support of the petition for an increased rate.

Another case heard recently by the commission was that of the Westchester Street Railway for permission to increase its rates.

Lucius S. Storrs, vice-president of the road, asserted that the company was unable to borrow in the open market because of the poor credit of the company and its poor earning condition. Unless the company was granted permission to increase its rates the company would have to stop operation or allow some one else to run the road. Mr. Storrs said that the petition for increased rates was to pay operating expenses and interest on bonds.

E. F. McKinley, who conducted the hearing for the company, said that the railway had never paid a dividend. In fact it had been a liability from the start. The deficit from 1910 to December 31, 1916, was $111,000. For 1917 the deficit was about $106,000. J. K. Funderford, general manager, and T. J. McGreevey, assistant auditor, also testified for the company.

The New York & Stamford Railway's application for permission to increase its fare to 6 cents was heard by the commission on March 15. Briefs will be filed later.

Philadelphia Service Order

Public Service Commission Directs Philadelphia Rapid Transit Company to Make Alterations

The Public Service Commission of Pennsylvania on March 25 ordered the Philadelphia Rapid Transit Company to make important improvements, alterations, additions and extension to its service and facilities. The order was made as a result of the hearings growing out of the complaints of the city of Philadelphia. William H. Robinson, Fox Chase Improvement Association, North Philadelphia Business Men's Association, Inc., and the United Business Men's Association of Philadelphia.

The commission orders the company to purchase on or before Dec. 1, 1919, 100 new cars of the larger type. Following the cessation of the war the company is directed to purchase new cars annually. On or before June 1, additional facilities for West Philadelphia must be provided, including new lines and double-tracking of several streets, additional cars on the Sixtieth Street line, a new line on Fifty-sixth Street, and resetting the Kensington tracks.

The company is directed to instruct its employees no longer to run past passengers, and it is suggested to the City Councils that an ordinance be passed to prevent the blocking of cars by vehicles unloading between the curb and the track.

The company made a statement in part as follows:

"The company will at once take steps to carry out the letter and spirit of the orders and recommendations therein contained. The company is gratified that the complaints against the service, to quote from the commission, 'relate almost entirely to the past few months,' during which period the commission states that it recognized 'to the full the difficulties under which all transportation companies of every kind are and have been laboring.'

"Government demands are bringing to the city a largely increased population which must be cared for. The same conditions which call for increased service have necessarily put a stop to the completion of the city's system of high-speed lines which was designed to meet the very material growth in industrial enterprise which Philadelphia is now experiencing.

COMPANY MUST HAVE CO-OPERATION

"The task thus presented to the company can be successfully met only if it secures the co-operation of the public, which the commission points out is so much to be desired and the further assistance of the administration in giving the company a clear track which the commission earnestly recommends to the Mayor and Councils. In this connection it is only fair to say that much of the improvement in service experienced during the past month has been due to the increased coöperation of the city's traffic squad in preventing unnecessary delays and dragging of cars by other conveyances and so enabling the company to maintain its schedules."

Service Order Issued

New York Commission Orders Changes in Service of Line Between Buffalo and Rochester

The Public Service Commission of the Second District of New York has passed upon the complaints of citizens of Brockport, Spencerport and vicinity against the Buffalo, Lockport & Rochester Railway. The order of the commission directs the railway:

1. To clean the inside of its cars thoroughly at least once each day and to sweep out its cars at the end of each trip.

2. To keep its tracks in a safe condition and to repair its road between Rochester and Brockport.

3. To prevent passengers from riding in the front vestibule of any car or in the compartment occupied by the motorman.

4. To run eastbound trains 4, 10 and 12 double each day of the week except Sunday between Brockport and Rochester, and westbound trains 25 and 29 double each day of the week except upon Saturday, between Rochester and Brockport.

5. To run trains Nos. 15, 17 and 19 double on Saturdays between Rochester and Brockport.

6. To substitute service equivalent to that hereinbefore directed to be furnished provided the character of such service shall be first approved by this commission.

State Controlled Utilities Trust Suggested

Federal Trustee of Rhode Island Company Suggests One Big Corporation to Run All the Public Service Businesses in the State

At the meeting of the legislative committee which is considering the Rhode Island Company situation, John O. Ames, one of the five federal trustees in charge of the property under the New Haven Railroad dissolution decree, declared it to be his personal opinion that the solution of the public service corporation problem lay in the formation of what might be called a State-controlled "public service trust." Mr. Ames said:

"It is my opinion that the public service question could best be settled by the formation of one big corporation to run all of the public service businesses, such as electric railways, gas and electric companies. This corporation should be a private concern, but all of its functions should be absolutely controlled by the State through a special commission of the best men obtainable. The capitalization, financing, and operation of the properties should be controlled by the State and the return permissible should be fixed."

John P. Farnsworth and Charles C. Mumford, other Federal trustees, subscribed to that proposal. Rathbone Gardner, another trustee, declared that he was an advocate of State ownership. Mr. Green, the fifth trustee, was not present.

Representative Jennings of the committee stated that the controversy appeared to have settled down to a question of whether the State should allow the company to establish the modified zone system recommended by the special commission, or establish a flat 6-cent fare, which the special commission declared unjust and not desirable.

Duff F. Sherman, former vice-president of the Rhode Island Company, stated that the capital stock of the Rhode Island Company was $9,685,500, all outstanding, and that to his knowledge all of the stock had been sold for cash.

NEW HAVEN COMPANY MILKED

John P. Farnsworth, discussing a question of "watered stock," said:

"The only graft was when the New Haven Railroad paid about $19,000,000 for the Rhode Island Company, at a time when it was worth very much less. This was milk taken from the New Haven Railroad, but it was not water added to the Rhode Island Company."

Mr. Ames presented figures to show that for 1918 the estimated deficit of the company would be between $700,000 and $750,000. At a previous meeting C. A. Babcock, the comptroller, had said that it would probably run more than $1,000,000. Mr. Ames said that Mr. Babcock based his figure on the deficit for January of this year, which was $90,000. The deficit in the summer months would probably be less than the deficit in January, and for that reason Mr. Ames believed $750,000 was a proper estimate.

Mr. Sherman, who promoted and constructed the Providence & Danielson Railway and sold it to the Rhode Island Company, stated that $30,000 a year should be credited to that line for business done on the city lines directly caused by the existence of the Danielson line. If this were done there would be a profit of $17,000 for 1917, instead of a deficit. This statement is contrary to the report of the engineering experts to the report of the special commission.

REPORT MUST BE IN BY APRIL 3

The General Assembly extended from March 26 to April 3 the time within which the legislative committee is directed to report a plan for aiding the electric railways, if such aid is found just.

The hearings that are now being held followed the action of the Legislature in preventing the Public Utilities Commission from carrying into effect the new fare rates established as just and equitable for the company by a special commission created a year ago for that particular purpose. That commission ordered the adoption of a system with 5-cent central areas and recommended taxation and franchise reforms.

A. L. Drum and H. H. Easterly Named

Organization Effected to Solve Transportation Difficulties Connected With Housing Problems

A. L. Drum, of A. L. Drum & Company, consulting and construction engineers, Chicago, Ill., has been retained by the Shipping Board, with H. H. Easterly, of the same company, as assistant, to solve some of the transportation difficulties of the housing problems in connection with the building of ships by the government.

Mr. Easterly has arrived in Washington to take up this work, and it was expected that Mr. Drum would reach Washington on April 1. Mr. Drum and Mr. Easterly will report to J. Rogers Flannery, director of housing for the Shipping Board, and work has already begun on solving some of the housing problems in connection with transportation on the Atlantic Coast. The scope of the work will be broadened later on, when the studies now being made are farther advanced, and when questions concerning appropriations are settled. At the office of Mr. Drum in Washington, it is stated that he has been "appointed to make investigations in regard to transportation by steam, electric railway and boat service."

The first investigations under way have been in the Hog Island and Newark Bay districts.

Compromise Likely

Public Service Commission and Brooklyn Rapid Transit Company May Agree on Schedule Order.

The basis of an agreement with reference to the acceptance by the Brooklyn Rapid Transit Company of the order requiring the posting of the schedules for all surface lines in Brooklyn, was reached between representatives of the company and the Public Service Commission at a conference on March 15 in the office of Public Service Commissioner F. J. H. Kracke.

The conference was requested by the railroad on March 6. The various phases of the order were thoroughly discussed. J. J. Dempsey, vice-president, speaking for the Brooklyn companies, assured the commission of his readiness to comply with any order which would serve to facilitate surface car operation. He asked further discussion on certain details of operation.

The suggestion upon which the agreement probably will be worked out was made by the commission. It intimated that the company could absorb the order gradually, applying it on certain specified lines first and then extending it to the entire system.

The order calls for the filing with the commission of definite schedules for the operation of each one of the seventy-five surface lines in Brooklyn. The company representatives declared several seasonal schedules were in use, and pointed out that a single schedule could not well cover the flexible operation necessary for vacation and holiday traffic.

The order of the commission was referred to in the ELECTRIC RAILWAY JOURNAL for March 9, page 481, and the protest of the company in the issue of March 16, page 543.

Helping the Seattle Shipyards

Increased transportation facilities for the shipbuilding and industrial districts at Seattle, Wash., have been assured through the efforts of the King County Council of Defense at Seattle. On petition of the Council, the United States Shipping Board has approved the plan for operation of steam trains along the waterfront and to the end of the East Marginal way trackage at the south city limits, and the director of railroads has been authorized to establish such a service. Steam service will be employed during hours when shipyard employees need it and, in addition, a new ferry service will be established. The Puget Sound Traction, Light & Power Company has adopted certain recommendations of the Council of Defense, and has made improvements to the service. It is stated that the electric railway service to this district is now as satisfactory as it can be made without the construction of extensions.

Six-Cent Fare Sought in Charleston

Six-cent fares are desired by the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., and a petition for the increase has been filed with the City Council. In addition to this the company has asked the City Council for an increase in the price of gas from $1 to $1.10 per 1000 cu. ft.

It was not the intention of the company to ask for an increase in fare at this time, but recently the trainmen made it plain that they could not work further for the company unless their wages were increased. The company took the position that it was conducting the railway business at a loss and could not afford to pay the men a higher scale. It was, therefore, decided to petition Council for permission to charge a 6-cent fare. This, the company figures, will actually yield about a 12½ per cent increase in gross income from the railway.

Transportation News Notes

Beeler Report on Staggered Hours Finished.—John A. Beeler has completed the section of his Washington report relating to staggered hours of business and copies have been submitted to the Senate and House Committees. It is expected that the report will be made public some time during the week commencing April 2.

Quebec Would Increase Fares.—The Quebec Railway, Light & Power Company, Quebec, Que., has applied to the City Council for permission to increase its railway fares. The company wishes to sell tickets as follows: Extra tickets for workers, five tickets for 25 cents, ten tickets for 25 cents for school children only, 1 cent for each transfer, children not in arms to pay. The company will also sell twenty-one tickets for $1.

Ohio Road Asks for Higher Fares.—On March 20 Attorney J. W. Heintzman filed with the Public Utilities Commission of Ohio an application asking for an increase in the rates of fare for the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio. The commission has held in the past that it is not authorized to interfere where franchise rates have been fixed and the application will probably be overruled for this reason.

Tacoma Jitneys Resume.—Jitney service inside the city limits of Tacoma, Wash., which was stopped about one year ago when a heavy State bond was placed on the owners of service cars, has been resumed. The cars are operating under the old city ordinance, which gives them the right to occupy the city streets with their "For Hire" vehicles. The cars will not be operated as "donation" cars, but will establish the old fare.

School Ticket Case Decided.—The application of the Board of Education of Middlesex Borough for a rehearing on its contest with the Public Service Railway, Newark, N. J., over the failure to accept school tickets on additional cars was acted upon adversely on March 13 by the Board of Public Utility Commissioners. The school board maintained that the railway was not meeting practical operating conditions for children traveling from Bound Brook to Plainfield when they could not reach school in time on the cars that honored the tickets.

Skip Stop in Jersey Up to Companies.—State Fuel Administrator Jenkinson, of New Jersey, acting upon the orders from P. B. Noyes, director of conservation of the United States Fuel Administration, has applied to the State Board of Public Utilities Commissioners for permission to put the skip-stop system into force on the electric railways operating throughout the State. The board announced that the laws of 1915 authorize the railways to act on their own initiative, but subject to ratification by the municipal authorites.

Automobile Rights Assumed in Purchase. — The Railroad Commission of California has consented to the transfer by the San Diego & South Eastern Railway to the San Diego & Arizona Railway, San Diego, Cal., of the right to conduct an automobile passenger and freight service between Lakeside, Ramona and Julian, San Diego County. The commission some time ago authorized the South Eastern company to operate on this route, but that company has now sold its properties to the Arizona company. The officials of the county of San Diego have approved the assignment of the franchise.

Interurban Seeks Fare Increase.—The Louisville & Southern Indiana Traction Company, New Albany, Ind., which operates between New Albany and Louisville by way of Jeffersonville, has filed with the Public Service Commission of Indiana a petition to double the fares on the line. By the proposed new schedule the fare from New Albany to Jeffersonville, which has been 5 cents, is increased to 10 cents, and the fare between Jeffersonville and Louisville, which now is 5 cents, is increased to 10 cents. This would increase the fare from New Albany to Louisville by way of Jeffersonville from 10 to 20 cents.

Six Cents Not Enough.—The Middlesex & Boston Street Railway, Boston, Mass., has filed with the Public Service Commission a new rate schedule, which if adopted will abolish the 6-cent fares on that road. At present the company has 6-cent, 7-cent and 8-cent fare zones, the first being largely operative in Waltham, Wellesley and Needham. According to the schedule filed on March 18, only the 7 and 8-cent fares would be operative, with charges of 1 cent on each transfer from a 7-cent to an 8-cent line, but there would be no charge on transfers from the 8 to the 7-cent zones. It is also proposed to abolish the present strip tickets of twenty rides for $1.20.

Personal Mention

Mr. Perkins Elected

President of Shore Line Electric Railway Made President of New England Street Railway Club

Robert W. Perkins, president of the Shore Line Electric Railway, Norwich, Conn., was elected president of the New England Street Railway Club at the meeting on March 28. Mr. Perkins was born at Norwich on Aug. 21, 1865. His preparation for the transportation industry was a general business training, including clerkship with Tiffany & Company in New York City, traveling salesman, manufacturer and banker.

In 1906, when the Norwich & Westerly Railway was projected, he became its treasurer, but a severe attack of typhoid, lasting several months, resulted in his severing his connection with that company in December of the same year. In 1909 the Norwich & Westerly Railway became financially embarrassed, and when the company was reorganized in 1912 as the Norwich & Westerly Traction Company, Mr. Perkins, on invitation of the bondholders' reorganization committee, became the treasurer of the new company. During the year 1912 he brought about the purchase of the Pawcatuck Valley Street Railway and the control of the Groton & Stonington Street Railway, through ownership of its common stock, these three properties thereafter being operated as one.

R. W. PERKINS

In 1913 Mr. Perkins was elected president of the Shore Line Electric Railway, which then consisted of a line from New Haven to Deep River, on the Connecticut River. In August, 1913, the Shore Line extended its tracks to Chester and became the lessee of the New London & East Lyme Street Railway and of the New London division of the Connecticut Company. By building about 10 miles of track a through line was completed from New Haven to New London, supplying the last link in a line along the shore from New York to Boston.

In 1916, appreciating the advantage that would result from consolidation, Mr. Perkins and those with whom he was associated brought about the purchase by the Shore Line of the property and franchises of the Ashaway & Westerly Railway, the Norwich & Westerly Traction Company, the Groton & Stonington Street Railway and the New London & East Lyme Street Railway, which with the local New London and Norwich properties gives it about 240 miles of trackage in eastern Connecticut and western Rhode Island.

Mr. Perkins is perhaps best known in the electric railway world in connection with the introduction in New England of the flexible zone system of collecting passenger fares, first used on the Shore line and its allied properties in 1915. He has also been very active in electric freight and express development, especially in connection with the shipment of agricultural products and supplies. The use of the zone system on the Shore Line has been described in the ELECTRIC RAILWAY JOURNAL and the results obtained was the subject of an article by Mr. Perkins which appeared in the issue of this paper for Jan. 12, 1918, page 86.

A. C. Colby, formerly master mechanic of the Berkshire Street Railway, Pittsfield, Mass., has been transferred to a similar position with the Connecticut Company at Bridgeport, Conn.

F. L. Rearden, auditor of the Alton, Granite & St. Louis Traction Company, East St. Louis, Ill., and the East St. Louis Railway, has entered military service and is now major of the 124th Field Artillery.

Capt. H. B. Hearn, former superintendent of the Vicksburg, Shreveport & Pacific Railway, with headquarters at Shreveport, La., has been elected president of the Shreveport Traction Company, vice W. F. Dillon, who died recently as the result of an accident.

George Dolezal has been appointed acting master mechanic at the Broadway shops of the Denver (Col.) Tramway to fill the vacancy caused by the resignation of W. H. McAloney. Mr. Dolezal entered the service of the company in 1891 as a machinist. After a short period he was promoted to foreman at the East division, a position which he held until 1894, when he returned as assistant foreman to Mr. Crosby in the motor and truck department at the shops, holding this position until the death of Mr. Crosby, when he was promoted to the foremanship. The title of the position to which Mr. Dolezal has been appointed has been changed from that of superintendent of rolling stock to the broader one of master mechanic.

President King Resigns

Head of Washington Railway & Electric Company Retires to Attend to His Personal Interests

Clarence P. King on March 31 retired as president of the Washington Railway & Electric Company System, including the Potomac Electric Power Company, Washington, D. C., and will make his headquarters in New York City for the present in order to give attention to personal interests. Until Mr. King's successor is named the affairs of the properties at Washington will be directed by William F. Ham, vice-president and comptroller of the company.

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C. P. KING

In tendering his resignation to the board of directors Mr. King stated that other interests have been demanding his entire attention for some time, but that he delayed severing his relations until many matters vital to the welfare of the company and its employees had been adjusted. The last of these was the raising of the pay of trainmen, which was effected just prior to his retirement from office, when the board of directors voted a flat increase of 3 cents an hour for motormen and conductors.

Mr. King has directed the affairs of the Washington Railway & Electric Company for about six and a half years. The gross earnings of the corporation for 1910 were $4,123,559. Mr. King became its president in the latter part of 1911, and by 1916 the gross earnings had jumped to $5,539,465. Last year the gross earnings were $5,492,358, the slight falling-off being due to the railway strike that occurred in that period. This strike was fought on the question of recognition of the union, and at the present time there are no union men in the employ of the company.

W. A. Carson, vice-president and general manager of the Evansville (Ind.) Railways, the Owensboro (Ky.) City Railroad and the Henderson (Ky.) Traction Company, with a number of associates, some of them interested with him in the Evansville Railways, has purchased the Schroeder Headlight Company, Evansville, manufacturers of locomotive oil and electric headlights and turbo-generators. A new company, known as the Schroeder Headlight & Generator Company, has been organized with Mr. Carson as active vice-president and general manager. Mr. Carson will retain his connection as vice-president and general manager of the Evansville Railways in an advisory capacity, but the operating details will be looked after by G. R. Millican. He will also continue as president of the Crescent Navigation Company. Mr. Carson has been connected with the Evansville Railways since July, 1908. He was assistant to the general superintendent of the Indianapolis & Cincinnati Traction Company from 1903 to 1906 and was assistant general manager of the Indianapolis, Columbus & Southern Traction Company from 1906 to 1908. Since Mr. Carson's connection with the Evansville Railways the company constructed a line in 1908 from Evansville to Newburg and built an extension from Rockport to Grandview in 1910. That same year a syndicate composed of officials of the Evansville Railways, of which Mr. Carson was a member, purchased the city lines in Henderson and Owensboro, Ky., and Mr. Carson was appointed general manager of both companies, which were taken over by the Evansville Railways in 1913. In 1912 a lease was secured on the line of the Illinois Central Railroad between Evansville and Henderson. This property was electrified by the Evansville Railways and a gasoline car ferry was installed to transport the interurban cars across the river. In 1913 the Crescent Navigation Company was incorporated with Mr. Carson as president, to operate on the Ohio River in connection with the railway properties.

W. A. CARSON

Col. Thomas F. Sullivan, roadmaster of the Boston (Mass.) Elevated Railway, in charge of engineering construction and maintenance, has been named to the Civil Service Commission by Mayor Peters of Boston for the position of Commissioner of Public Works. Colonel Sullivan was born in South Boston in 1878. He is a graduate of the Lincoln Grammar and the English High Schools. He worked up through the road department of the Boston Elevated Railway to the position of roadmaster of surface lines. He was responsible for the introduction and use of many modern road-building and road-repairing appliances. He has never held political office. He enlisted in Company I, Ninth Massachusetts Regiment at the outbreak of the Spanish War and served until the regiment was mustered out. Colonel Sullivan is a member of the American Electric Railway Engineering Association, the National Geographic Society and the Massachusetts Public Safety Committee.

E. C. Deal has been appointed general manager of the Springfield Gas & Electric Company and the Springfield Traction Company, Springfield, Mo., which are controlled by the Federal Light & Traction Company. Mr. Deal gained his early experience with the lighting company of Atlanta, Ga., which he served in various capacities from 1894 to 1898. He then entered the organization of Stone & Webster, Boston, where he filled positions on properties controlled by them in Baltimore, Md.; Seattle, Wash.; Brockton, Mass.; Terre Haute and Brazil, In. In 1904 he resigned from Stone & Webster to go with the Gas & Electric Company of Bergen County in New Jersey as chief engineer. When that company was absorbed by the Public Service Corporation of New Jersey, Mr. Deal became superintendent of the latter company's electric properties in central New Jersey. He severed his connection with the Public Service Corporation in 1908 to go with the firm of W. N. Coler Company, New York, as manager and engineer of public service properties owned by them. Following the acquisition of the property of the Augusta Railway & Electric Company and the Augusta-Aiken & Electric Company, by a syndicate in which J. G. White & Company, Inc., New York, were interested, Mr. Deal resigned from Coler & Company to become general manager of the Augusta-Aiken Railway & Electric Corporation, the successor company in Augusta. This was in April, 1911. In April, 1913, he was elected vice-president of the company in addition to general manager. He was also made vice-president and general manager of the Georgia-Carolina Power Company, controlled by the same interests. Mr. Deal resigned from these companies on March 1, 1914, to become connected again with the W. N. Coler & Company as vice-president and general manager of the public utility properties owned and operated by them. He resigned from this company in May, 1917, to join the organization of the Federal Light & Traction Company as general manager of the Trinidad Electric Transmission Railway & Gas Company operating utilities in Trinidad, Col., and other cities in the State.

H. M. Byllesby, president of H. M. Byllesby & Company, Chicago, Ill., who has devoted his time to government service since November, 1917, as a major in the aviation section of the Signal Corps, in charge of national recruiting, has been commissioned lieutenant colonel in this service.

G. R. Millican has been appointed general superintendent of the Evansville (Ind.) Railways, the Owensboro (Ky.) City Railroad, and the Henderson (Ky.) Traction Company. After leaving Purdue University in 1906 Mr. Millican became associated with the Tennis Construction Company, which was then building the electric railway between Newburg, Ind., and Rockport, Ind., and was with that company until the line was put in operation by the Evansville & Eastern Electric Railway in June, 1907. In the fall of 1907 Mr. Millican became connected with the office of the Evansville & Eastern Railway, now included in the system of the Evansville Railways, and in 1908 was made chief clerk to W. A. Carson, vice-president and general manager of the Evansville Railways, in which capacity he worked until August, 1910, when he was promoted to superintendent of the Owensboro City Railroad. He remained at Owensboro until Jan. 15, 1918, when he was made general superintendent of the Evansville Railways, the Henderson Traction Company and the Owensboro City Railroad. Mr. Millican will also be general superintendent of the Crescent Navigation Company, which operates a line of boats on the Ohio River from Rockport, Ind., to Owensboro, Ky., making connection with the cars of the Evansville Railway and another boat line operating from Grandview, Ind., to Tell City, Troy and Cannelton, Ind., connecting with cars of the Evansville Railways.

G. R. MILLICAN

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Franchises

Pasadena, Cal.—The City Commissioners of Pasadena have asked permission of the Federal Reserve Board to vote on an issue of bonds intended to provide money for the purchase of the proposed municipal railway right-of-way between Pasadena and Los Angeles.

Trenton, N. J.—The New Jersey & Pennsylvania Traction Company has asked the City Commission of Trenton for permission to construct an additional track on Calhoun Street from West Hanover Street to the Delaware River bridge. The commission will agree to the proposition if the company will build a new bridge over Sanhican Creek at the approach to the river bridge.

Waco, Tex.—The Texas Electric Railway has received a franchise from the City Commission for the construction of a number of switches, spur tracks and extensions of its lines in Waco.

Track and Roadway

Selma (Ala.) Traction Company.—The property of the Selma Street & Suburban Railway, recently sold at foreclosure sale to S. G. Adams, has been transferred to the Selma Traction Company, a new organization, which will now operate the property. Improvements will be made and an extension built. J. D. Woodward, Warren, Pa., president.

Tri-City Railway, Rock Island, Ill.—Work will soon be begun by the Tri-City Railway on the double-tracking of its line from Moline to East Moline. Material for the construction is on hand.

United Railways, St. Louis, Mo.—It is reported that the United Railways will construct an extension of its Hamilton Avenue line from Wydown Boulevard to Clayton Road.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the Second District of New York is advertising for bids to be opened on April 15 for a part of the construction of Section No. 3 of the Culver Rapid Transit Line, extending from a connection with a part of the line now under construction at Avenue X and Gravesend Avenue and extending over streets and private property to a connection with the Coney Island Terminal of the Brooklyn Rapid Transit Company below Sheepshead Bay Road. The commission also plans in the near future to let a contract for the construction of the necessary column foundations and supports for this elevated structure. There will be one station on Section No. 3 at Neptune Avenue, and known as the Van Sicklen Station. The commission once before attempted to let a contract for the construction of this line, but found it inadvisable owing to the high price of steel and other materials prevailing. The commission's experts have been watching the steel market, however, and have learned that it may be possible to obtain an advantageous price on the necessary steel within a short time.

Lake Shore Electric Railway, Cleveland, Ohio.—It is reported that as soon as the new franchises are passed by the City Council of Lorain, the Lake Shore Electric Railway and the Lorain Street Railway, a subsidiary, will spend about $500,000 in improving its property in Lorain, including the elimination of grade crossings by running out Broadway and through the Twenty-eighth Street subway, the elimination of the loop at the foot of Broadway, widening Twenty-eighth Street from Fulton Road to Pearl Street, installation of a Y in their private property on the north end of Broadway, construction of the line from Erie Avenue out Colorado Avenue to the Cromwell Steel Company, and the extension of service east and west of Erie Avenue.

Pennsylvania Railroad, Philadelphia, Pa.—The first electric train on the Chestnut Hill branch of the Pennsylvania Railroad was operated on March 22 to test the system. Regular operation is planned for May 1. The next portion of the system to be electrified, it is said, will be the Wilmington division.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—The Borough Council of West Chester has granted permission to the Philadelphia & West Chester Traction Company to extend its freight facilties and service in West Chester. An additional track will be laid by the company.

Seattle (Wash.) Municipal Railway.—A bill is being prepared by Oliver T. Erickson, a member of the City Council of Seattle, for submission to the Council authorizing the issuance of utility bonds and the adoption of a plan and system for the extension of the present municipal railway on Avalon Way, Thirty-fifth Avenue Southwest and Admiral Way and other streets in West Seattle. In connection with this, a bill will be prepared providing for the issuance of utility bonds for an extension of the proposed elevated railway on Washington Street from First Avenue South to Fourth Avenue South and condemnation proceedings for the right to proceed with such construction. The bonds voted at the recent city election provide for an elevated railway beginning at First Avenue South and extending to the bridge across the West Waterway on Washington Street, Railroad Avenue, Whatcom Avenue and Spokane Street. An extension on East Marginal Way from Spokane Street to the south city limits will probably be included in one of the bills that will be introduced in the Council. It is not expected that the extension work outlined will cost more than $100,000. Materials for the extension are on hand, and cars can be operated over the line within forty-five days after the franchise is granted.

Charlestown (W. Va.) Interurban Railway.—Plans are being made by the Charleston Interurban Railway for the construction of a 2-mile extension of its line. About $500,000 will be expended for this and other improvements.

Shops and Buildings

Lake Shore Electric Railway, Cleveland, Ohio.—The construction of a new passenger station at Lorain is being considered by the Lake Shore Electric Railway and the Lorain Street Railway, a subsidiary.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—A large freight building will be erected by the Philadelphia & West Chester Traction Company in West Chester.

Power Houses and Substations

Georgia Railway & Power Company, Atlanta, Ga.—A new substation has recently been completed and placed in operation by the Georgia Railway & Power Company at Camp Gordon.

Springfield (Mass.) Street Railway.—The Margaret Street power station of the Springfield Street Railway has been transformed into a substation of the Turners Falls Power Company, the old steam generating plant being abolished. The company will receive power from the Turners Falls Power Company. The change is expected to mean a great improvement through making possible a greater extension of peak loads and the elimination of the use of 100 tons of coal a day.

Charleston-Dunbar Traction Company, Charleston, W. Va.—A report from this company states that it will place contracts within the next week for the construction of a fireproof power station and for two new boilers.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Railway Appliance Exhibit

Number of New Track Appliances on Display at the National Railway Appliance Association Show

Track materials, tools, railway signals and the like made a good display in the exhibition held at the Coliseum, Chicago, by the National Railway Appliances Association in connection with the railway engineering convention, March 18 to 21. One noticeable feature was the absence of large machinery. With the present demand for machines of all kinds they cannot well be spared to stand idle for exhibition purposes, and there would be difficulty and cost of transportation. Nor was there the usual large area of floor space devoted to rails and switches.

In track appliances, besides the usual varied lines of rail joints, rerailers, rail anchors, tie-plates, etc., there were two designs of crossing frogs giving continuous rails for one or the other track, and a new frogless turnout in which a shifting rail takes the place of a frog. A gas-heating system to prevent the collection of snow and ice at switches was one of the specialties. Substitutes for wood ties were represented by a built-up steel substructure, as used mainly for track crossings and street-railway track, and a metal tie composed of two steel castings connected by a tie bar. Something new in track fastenings was a spike made of a piece of round iron with one end bent into a loop to form the head. The spikes are driven under the rail at an angle of about 45 deg., with the end of the loop resting on the rail base.

Steady Demand for Coal-Crushing Apparatus

Manufacturers Meet a Necessity Occasioned by the Acute Fuel Situation

Manufacturers report that coal-crushing apparatus is enjoying a steady demand of considerable volume. There are several reasons for this. First, attention has been called to the very serious waste of fuel unless it is properly sized to burn on ordinary stokers. Second, the acute coal situation has made it necessary for coal buyers to take any kind of coal they could get, whereas in the past they might demand some particular grade or size of coal. This makes it necessary to install crushing apparatus at the plant of the consumer. Third, the manufacturers of crushing apparatus have ceased to devote their energies to trying to convert the coal mines themselves to the necessity of crushing coal and have turned their energies toward the more fertile field of the coal user. All these factors have contributed to build up a healthy demand in the industry for coal-crushing apparatus.

Fussiness in Car Designs Not Tolerated By Builders

Specifications Must be Standard—Prompt Deliveries Mean Considerably Higher Cost

Railway men who are either in the market or are contemplating placing orders for new rolling stock are finding out a few things about the attitude of car builders during these strenuous days. The traffic operating manager of an important system, who inquired for specifications recently said he was rather surprised at the firmness with which the construction companies expressed themselves on so-called fussy designs. He found that anything outside of standard requirements would not be accepted excepting on long delivery. This meant, according to his statement, that the deliveries are postponed so long that by the time designated for shipment arrived the rolling stock was not needed. The traction official was frankly informed that fussiness in trim, furnishing and finishing of any cars these days would not be considered, unless on an indefinite future delivery. The cost would also be higher.

Another instance where delivery and cost figures related to the purchase of a milling machine for a traction road's car shop. One had been installed and operated with entire satisfaction for quite a period. A second was needed and the manager visited the manufacturer. At the close the railway man remarked that he supposed the price would be greater than the machine bought before. The maker declared no change had been made in prices. When it was mentioned that the milling machine was needed for immediate delivery the prospective buyer was blandly informed that under those circumstances the cost would be 75 per cent higher, otherwise it could not be shipped in three years. The railway official said he expected to pay an advance figure for the machine in question, but this was going it pretty strong. However, he declared this appeared to be the prevailing conditions everywhere and on everything. Urgency of deliveries was the controlling factor in determining price, the cost being a secondary consideration.

Buying at Low Ebb

Serious Condition of Delivery Situation on a Number of Electric Railway Staples Listed

Information secured from operating companies, manufacturer's representatives and jobbers indicates that the purchase of electric railway equipment and corresponding supply materials has certainly reached a low ebb in the Southeast. Compared with the same months of last year, the volume of sales shows a decided decrease. While it is true that a quantity of equipment has been bought by companies operating where military establishments have been located, requirements are pretty well provided for, and, on the whole, the present outlook is very quiet, with the possible exception of the activity now taking place at coastal cities or shipbuilding centers. Even at these points a degree of uncertainty exists, owing to the fact that nothing definite is known as to how far governmental assistance will extend. These operating companies are trying to handle the situation as they may arise, with existing equipment, together with certain additions readily available.

There is no doubt but that equipment from generating units and cars to rail bonds is badly needed, but the question is how to raise the funds, and if these are attainable, deliveries are the next potent factor. For those companies which have purchased fill-in and maintenance supplies to cover much-needed repairs and up-keep, the perverse transportation conditions, together with the fact that other essential industries are now calling on manufacturers for material of a similar nature, has further added to the difficulties at present experienced by operating officials.

Hydraulic jacks are promised in three to four months, geared ratchet and high-speed have been boosted to four to five months. The deliveries on gears and pinions show little change, holding at two to three months. One redeeming feature may be mentioned, and that is that lightning arresters can usually be obtained from stock. Trolley wire and feeder cable may be obtained anywhere from twenty to seventy days, depending on the factory conditions at the time of purchase. A very slight improvement is noticed in hangers and ears.

Rail bonds are reported to be coming along very well—thirty days being the average. The promise of shipment and deliveries on spikes is getting worse. It is almost impossible to get any date on rails and only in isolated instances can they be secured in a reasonable time, and then in small quantities. Ties are coming along fairly well in small lots, with extended delivery dates on large orders. The delivery of brake equipment is somewhat uncertain, running from thirty days on priority orders for quassi-government work, to three and four months on less essential orders.

Motor shipments are averaging from four to eight months. Controllers may be secured in five months, and car cable in a shorter time. On the whole, the above deliveries can be bettered if the equipment is to be used in serving military bases.

Supply of Raw Material Now in Fair Condition

Current Needs Difficult to Satisfy—Anticipating Requirements the Only Solution—Shipments and Deliveries Vexing

Broadly speaking, manufacturers appear to be in a fairly satisfactory position respecting the supply of raw material. Interviews with leading concerns in the various branches of the trade confirm this impression. Moreover, there is no indication of uneasiness regarding future requirements, despite the governmental restrictions on certain metals and other basic material. Deliveries, of course, are the bane of the industry, so much so that they are mentioned as affecting the ultimate selling price of the finishd product. On the matter of prices generally an authority said that the most important factor contributing to the increases are the intensification of demand for material, the disruption of distributing processes, a shortage of labor and the decrease in the production of various products. Manufacturers with expanding programs are obliged to buy material when the opportunity presents itself for the certain delivery of the goods, preparing against periods when cars are unavailable for shipments. In other words, manufacturers have to stock requirements for future operations on a far greater scale than they would if they could depend on deliveries when the supplies are needed.

As one producer stated, the demand for raw material in the steel, iron and copper lines appears to have no limit. To be sure, it was explained, the situation is badly mixed, but the supply of metal and other material entering into the manufacture of machinery, generators, motors, transformers and apparatus of every description is easing up and deliveries are slightly better. Concerning wire and cables it was learned that copper seems to be plentiful for other than government work and can easily be had if the producers have it, and they are not yet being reported as short of the metal. Prices remain at the official standards. Shipments from the smelters can be made, but the embargoes hold up the deliveries. Unless priority orders, to which all shipments of this kind are subject, are obtained from the freight traffic committee by the consignee, the delay may be indefinite. Cotton and rubber, indispensable in the production of certain wire, cable and other electrical products, are practically in the same class as copper.

In other lines where not only copper is an essential but brass, slate, steel castings and sheets are basic materials a representative of one of the largest manufacturers in either East or West said that his company had anticipated its requirements for the last two years and was therefore fully provided to meet every demand. In the fall of 1915 this concern carefully went over its inventories for the preceding year, and it based its requirements for 1916 on the aggregate plus 100 per cent. It was figured that this would represent the probable increase in the business, and material was placed on order on this basis. Of this stock of raw material 92 per cent was worked up into its finished products, representing only 8 per cent of overbuying. For 1917 the same plan was adopted, with a still further increase of 30 to 35 per cent, which will carry the plant up to September of this year.

By placing its orders far in advance this manufacturer—and there appear to be others following the same plan—provided against future inconvenience or shortage of material. The first question to be considered is the one of delivery, with price secondary, a rule which seems to prevail in every transaction. According to this concern, no contracts on copper can be made for future requirements. It is bought at the market—base price plus the cost of rolling or drawing. In order to be sure of a shipment of copper a manufacturer had three cars of the metal forwarded by express from Connecticut to a Western city at a cost of $6,000. The company in question, like three-fourths or more of the manufacturers, has government contracts, and therefore shipments of either raw material or the finished goods are granted the advantages of priority certificates, otherwise the embargoes interfere with deliveries to the regular trade.

An advance in steel castings is considered a probability by a number of manufacturers, although it is intimated that the official price, which remains in force until March 31, will remain at the present figure. The American Iron and Steel Institute, acting in conjunction with the War Industries Board on this question, declines to state its position one way or the other. As regards gears and pinions, a manufacturer of prominence said, shipments have been held up since Jan. 1, which has resulted in the delivery of only a quarter of the quantity usually sent out. All export business has been suspended for the time being. While government control is not affecting gear steel, forged gear blanks are almost impossible to obtain on reasonable delivery. Pinion material is costing more than ever before, but prices have not advanced recently. Malleable iron is easier. In plants of this description and those on parallel lines in the electrical field labor is the most trying problem. Skilled workmen are required, and they are scarce and of uncertain tenure on account of the abnormal wages.

Quotations on nearly if not quite all raw material for electrical goods are made f.o.b. plant, with shipment at convenience of mill or factory. As one of several manufacturers who volunteered the information said, shipments in the immediate neighborhood can be accomplished, but to reach points in the Middle West with either material or finished goods is difficult, often taking two or three months.

Rolling Stock

Aurora, Elgin & Chicago Railroad, Aurora, Ill., advises the ELECTRIC RAILWAY JOURNAL that the purchase of six new cars reported in this column on March 16 is unfounded.

Springfield (Mo.) Traction Company has on delivery twelve new one-man cars built by the American Car Company, St. Louis, Mo. The cars were ordered in July last and were en route last week.

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., has just received seven new one-man cars from the American Car Company. It has also bought five second-hand cars, which were rebuilt in its shops and are now in operation, replacing the rolling stock destroyed by fire in December last.

Chattahoochee Valley Railway, West Point, Ga., has put in commission on its system another new car, the second of the two reported as having been purchased.

New Jersey Transportation Company, a subsidiary of the Public Service Corporation of New Jersey, Newark, N. J., in order to temporarily furnish transportation facilities in advance of track construction, to new shipyards at Port Newark Terminal from the end of one of its lines, is reported to have purchased eighteen second-hand motor-buses.

Charleston Consolidated Railway & Light Company, Charleston, S. C., is reported as having placed an order for seven new passenger cars with the Cincinnati Car Company. Four are double-truck, center-entrance cars, automatic control and of the pay-as-you-enter type, seating fifty-two passengers. The remaining three will be light rolling stock, seating thirty-two, with automatic controls and also of the pay-as-you-enter model. Delivery is promised in five months.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill., mentioned in the ELECTRIC RAILWAY JOURNAL as having ordered new rolling stock, furnishes the following specifications:

Number of cars ordered	2
Name of road	Murphysboro & Southern Ill. Ry.
Builder of car body	American Car Co.
Type of Car	Closed Motor Passenger
Seating capacity	50
Bolster centers, length	23 ft. 0 in
Length over bumpers	46 ft. 0 in.
Length over vestibule	45 ft. 0 in.
Width over all	8 ft. 10 in.
Height, rail to trolley base	12 ft. 7 in.
Body	Semi-steel
Interior trim	Polish bronze
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse Traction Brake Co.
Axles	J. G. Brill Co.
Bumpers	American Car Co.
Car trimmings	J. G. Brill Co.
Control, type	H. L.
Couplers	Tomlinson M. C. B. (Radial)
Curtain fixtures	Curtain Supply Co.
Curtain material	Curtain Supply Co.
Fenders or wheelguards	Wood pilots
Gears and pinions	Westinghouse vertical staff with Pittsburg drop handle
Hand brakes	Giant perfected brake drum
Heaters	Peter Smith hot water
Headlights	Golden Glow S-M-95-9
Journal boxes	J. G. Brill Co.
Lightning arresters	Westinghouse
Motors	Westinghouse No. 523-B 4 per car
Motors	Inside hung
Sanders	Keystone air, E. S. S. Co.'s No. 18,575
Sash fixtures	Dayton Mfg. Co.
Seats, style	Brill Winner cressed steel reversible
Seating material	Rattan
Springs	J. G Brill Co.
Step treads	Feralun safety treads
Trolley retrievers	Knutson No. 2
Trolley base	Westinghouse
Trolley wheels or shoes	Westinghouse
Trucks type	Brill 27-M C. B. 2x
Ventilators	Brill exhaust
Wheels (type and size)	33 in. Davis cast steel M. C. B.

Toronto (Canada) Railway is reported as making specifications and queries on 100 new passenger cars. The company lost 130 cars by fire about a year ago, referred to previously in the ELECTRIC RAILWAY JOURNAL.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., is reported as contemplating the purchase of seventy-five new one-man cars, additional to the lot on which quotations were asked from car builders, reference to which was made in the ELECTRIC RAILWAY JOURNAL of March 23.

Cleveland (Ohio) Railway having ordered twenty-five cars, as reported in the ELECTRIC RAILWAY JOURNAL of March 16, the G. C. Kuhlman Car Co., builders, furnishes the specifications below:

Number of cars ordered	25
Name of road	Cleveland Ry.
Date order was placed	Jan. 16, 1917
Date of delivery	Already delivered
Builder of car body	G. C. Kuhlman Car Co.
Type of car	Center-entrance trailer
Seating capacity	59 in winter and 69 in summer
Bolster centers, length	26 ft. 0 in.
Length over bumpers	49 ft. 0 in.
Length over vestibule	48 ft. 0 in.
Width over all	8 ft. 4¾ in.
Height, rail to trolley base	11 ft. 3 7/16
Body	Semi-steel
Interior trim	Cherry
Headlining	Agasote
Roof	Plain arch
Air brakes	Westinghouse
Axles	Laclede Steel Co.
Bumpers	Channel type
Car trimmings	Railway Company's Standard
Couplers	Ohio Brass
Curtain fixtures	Curtain Supply Co.
Curtain material	Printed duck
Designation signs	Railway Company's Standard
Door operating mechanism	National Pneumatic
Hand brakes	Railway Company's Standard
Heaters	Peter Smith
Journal boxes	Symington Co.
Paint, varnish or enamel	Sherwin-Williams paint, Chicago outside varnish, Wright's inside varnish.
Sash fixtures	No fixtures, drop sash
Seats, style	Brill
Seating material	Rattan upholstered
Springs	Brill for seats
Step treads	Kass
Trucks, type	Brill 67-F Trail
Ventilators	Scullin type
Wheels	26-in. steel

Philadelphia Rapid Transit Company has been ordered by the Public Service Commission of Pennsylvania, as a result of the inquiry into service in that city, to purchase on or before Dec. 1, 1919, 100 new cars of the larger type. Following the cessation of the war, the company is directed to purchase new cars annually.

Portland Railway Light & Power Company, Portland, Ore.—Public Service Commissioner Buchtel, of Oregon, upon receipt of a report from Public Utilities Engineer Fred A. Rasch that the company would not be able to remodel nineteen cars to be used in relieving the congestion on its lines in the city until in the summer, stated that he would ask the company to increase the force employed in the remodeling work, and insist that the work be expedited. All of the nineteen cars are of the open type, and it will cost $25,000 to remodel them.

Trade Notes

Triangle Conduit Company, Brooklyn, N. Y., announces the appointment of Alva D. Stein, 156 Purchase Street, Boston, Mass., as its New England selling agent.

Permutit Company, New York, N. Y., manufacturer of water-softening and rectification apparatus, has removed from 30 East Forty-second Street to 440 Fourth Avenue, where the entire top floor will be occupied by its offices.

Captain Richard P. Henry, late of the United States Army, has joined the selling forces of the Square D Company of Detroit, manufacturer of steel-inclosed safety switches, and has been appointed to the Indiana territory, with headquarters at Indianapolis.

Frank J. Foley, formerly manager of the mining department of the Westinghouse Electric & Manufacturing Company, on Jan. 1 became connected with the Edison Storage Battery Company, Orange, N. J., as manager of the mining and traction department, with headquarters at the main office.

New Advertising Literature

Railway & Industrial Engineering Company, Pittsburgh, Pa.: Illustrated folder descriptive of its various Burke specialties and their installation.

Wells-Morris Manufacturing Company, San Francisco, Cal.: Leaflet descriptive of its Wells motor-starting switches, designed for low-voltage and overload protection.

Pass & Seymour, Solvay, N. Y.: Three leaflets descriptive of their P. & S. 60,020 medium-base brass-covered receptacle, P. & S. 299 pull-chain brass splicing link, P. & S. porcelain receptacles and P. & S. sign receptacles.

Keyes Products Company, New York, N. Y.: Illustrated catalog on "Nevasplit Panels—A Lumber Question Answered," descriptive of the company's products, how made, their various uses and the results.

RAILWAY MATERIALS

	March 20	March 27
Rubber-covered wire base, N. Y., cents lb.	27-30	27-30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 28.35	33.42 to 38.55½
Rails, heavy, Bessemer, Pittsburgh	$55.00	$55.00
Rails, heavy, O. H. Pittsburgh, per gross ton	$57.00	$57.00
Wire nails, Pittsburgh, per 100 lb	$3.50	$13.50
Railroad spikes, X in., Pittsburgh, 100 lb.	$3.90	$3.90
Steel bars, Pittsburgh, per 100 lb	$5.00	$5.00
Sheet iron, black (24 gage), Pittsburgh, per 100 lb	$4.90	$4.90
Sheet iron,fgalvanized (24 gage), Pittsburgh, per 100 lb	$5.80	$5.80
Galvanized barbed wire, Pittsburgh, cents per lb	$4.35	$14.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	$3.95	$3.95
Cement (carload lots), New York, per bbl.	$2.25	$2.65
Cement (carload lots), Chicago, per bbl	$2.31	$2.71
Cement (carload lots), Seattle, per bbl	$2.65	$4.1
Linseed oil (raw, 5 bbl. lots), N. Y., gal	$1.58	$1.57
Linseed oil (boiled, 5 bbl. lots), N. Y., gal.	$1.59	$1.59
White lead (100 lb. keg), N. Y., cents lb.	10	10
Turpentine (bbl. lots), N. Y., cents gal	44½	44½

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* Nominal. † Governmental price in 50-ton lots, f.o.b. plant.

NEW YORK METAL MARKET PRICES

	March 20	March 27
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26¾	26¼ to 26½
Lead, cents per lb	7¼	7½
Nickel, cents per lb	50	50
Spelter, cents per lb	7¾	7½
Tin, Straits, cents per lb	$85.00	$85.00
Aluminum, 98 to 99 per cent., cents per lb		†32

OLD METAL PRICES—NEW YORK

	March 20	March 27
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6.38	6 375
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$42.41	$42.41
Old car wheels, Chicago, per gross ton	$30.00	$30.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$35.00
Steel rails (relaying), Chicago, per gross ton	$60.00	$60 00
Machine shop turnings, Chicago, per net ton	$17.00	$17.00

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, April 6, 1918 *Number 14*

Opening the Discussion on Track Spiral Standardization

THERE is a disconcerting range in the practice of way departments in connection with the use of the transition or easement curve, commonly called the spiral. A similar condition exists in the practice of the several special-work manufacturers. Each railway company and each manufacturer has a standard spiral or system of spirals, with the result that the manufacturer is required to maintain a large stock of costly patterns and templates, and the purchasers of special work must pay the cost not only of their own patterns but also those of many other companies. Truly the way of the spiral seems to have about as many deviations as the paths of the whirling dervishes of the East, and there has heretofore been no common ground upon which to reconcile conflicting views, thus leading to the adoption and use of a uniform or standard system of spirals.

The work of the way committee of the American Electric Railway Engineering Association in standardizing special work specifications has shown that the state of affairs in regard to the adoption of standard spirals is not so difficult but that the seemingly insurmountable obstacles can be overcome. This was indicated by the committee in the proceedings of the Association for 1916, in which it was reported that the adoption of a standard spiral was desirable and that the manufacturers would be glad to accept such a standard provided the railways could agree upon one. Some interest in the subject was also displayed in the American Association question box in August and September, 1916. This gave evidence that the majority of those participating in the discussion believed that a standard system of spirals was both practicable and desirable.

The 1917 committee on way matters took up the matter again, but progress has been delayed through war conditions which have hindered active committee work generally. With the importance of the subject in mind and in order that it may have the wide discussion which is so desirable in matters of this character, the editors have placed the columns of this paper at the disposal of the committee, and in another part of this issue we print an important article by E. M. T. Ryder dealing with a proposed uniform system of spirals. This comprises a report prepared for the way committee.

It is our opinion that there is no reason why a standard system of spirals cannot be evolved to satisfy fully 90 per cent of the controlling conditions throughout the country. The various factors of street widths, car dimensions, track centers and other details which influence the selection of spirals do not differ so widely but that a system of spirals of reasonable flexibility and range can be made. From this standard component parts can be selected and assembled to meet almost any particular difficulty, such as dodging sewer manholes, water gates and elevated columns. Moreover, a standard system of spirals has been adopted by the American Railway Engineering Association for steam-road use and, although electric railway conditions prevent the use of the same spirals, the action of that association shows what can be done. Incidentally it is suggested that the system of notation used by that association should be used in conjunction with any system of spirals which may be adopted for electric railway use in order to secure uniformity of engineering data.

This is an era in which every possible step should be taken which will result in economical maintenance of tracks, and we believe there is no subject of greater importance to way engineers. We believe further that the adoption of a standard system of spirals by the American Electric Railway Engineering Association will lead to many economies both in first cost and in maintenance of special track work. Mr. Ryder's article represents a great deal of hard work and deserves to be carefully read. We hope that way engineers and managers will give it more than casual study with a view to bringing out profitable discussion and constructive criticism through the columns of this paper.

Don't Blame It All On the Boss

THERE are two tendencies with which many workers have to contend, both in themselves and in their subordinates—namely, to "knock" the management and to "soldier" on the job. These two faults go together, but our present purpose is to urge the "knockers" either to quit or co-operate. Our belief is that a man with the right spirit can work effectively and happily under any kind of a superior if he believes that superior to be able, well-intentioned and reasonable. With this confidence he can well afford to accommodate himself to the particular plans which are laid out for him, remembering that his first duty is to satisfy the man to whom he directly reports. If he cannot co-operate with his superior through lack of confidence or on account of general "cussedness," he ought to get out.

The late Fred W. Taylor, who did so much through systemization to improve working conditions in this country and elsewhere, put this whole matter in a nutshell. He said that as a worker he early learned that success comes through knowing what one's superior wants done and doing it in his way. He learned this only after some hard knocks, however.

Of course, it is immoral to do anything to please the "boss" if he wants something done that is not right, but granted that he meets the specifications outlined earlier, his wishes should be scrupulously met and every effort should be made to please him with good work. Loyalty, the opposite of "knocking," is essential to progress. Many of the conditions of which the worker is apt to complain are due to his own faults rather than to those of his employer.

Daylight Saving and Staggered Hour Crowd Out Rush Hour

THE immortal, and always practical, Franklin once calculated how many millions of costly candles were wasted annually through retiring and rising late. In this essay we have a forerunner of the saving-daylight agitation. As a matter of fact, daylight saving simply means that the inside worker is led to do by a doctored clock what the farmer is led to do by the sun, namely, to take maximum advantage of daylight. That, reform being established, we can well consider another.

Staggered Hour is younger brother to Saving Daylight. He, too, deserves to come into his own. His face is not new to the public. In fact, he is exactly as old as Rush Hour, alias Peak Load, who has always been the black sheep of the Time family. We have heard the virtues of the one and the vices of the other discussed by railway men these many years. Rush Hour was in power, and none could displace him. But the war which is to unseat so many tyrants now is after this one. He has been attacked courageously in many quarters, particularly at Rochester. Now comes the Beeler report, abstracted elsewhere in this issue, which threatens his sway in Washington. Should he be defeated there, his deposition in other communities is certain because if he can be driven out of the government department trenches he can be beaten everywhere!

Whether or not the Washington recommendations are adopted in full or in part, the lines of approach and analysis used in their preparation are worthy the consideration of him who wishes to unburden himself of the rush hour in his community. Mr. Beeler did not sit down in his office to evolve a theoretical chart of changes of comings and goings for the people of Washington. His men visited each large group—be it government department, store or office in turn—to determine what the travel actually was regardless of the supposed hours. They made it their business to find out how many people rode, how many walked and why. They determined if the necessary co-ordination of different departments really demanded non-overlapping hours. They did not ignore the fact that there is a relation between the hour of breakfast, the delivery of newspapers, milk and groceries and the prejudices of the domestic servant. They sought the counsel and co-operation of every group concerned, and finally, the consulting engineer did not come forward publicly with the schedule of changes until every objection raised in conference had been answered. Thus was worked out an approximation to the public's ideal of "A seat for every passenger" and the railway's ideal (so happily phrased by R. W. Perkins, the newly elected president of the New England Street Railway Club) of "A passenger for every seat."

Let us pray that the American people who have been progressive enough to appreciate Saving Daylight will extend the same cordial welcome to Staggered Hour and banish the extravagant, indecent Rush Hour forever!

The Value of the Report on Stresses in Track to Electric Railway Engineers

IN OUR issue for March 30 we gave a very brief summary report of the progress report of the special committee on stresses in railroad track. The subject of this report is one of the greatest importance not only to steam railroad engineers but also to those who are interested in electric railway tracks, whether on private right-of-way or in paved streets. It is quite well known that railroad track is a structure which has been evolved from previous practice and experience rather than from study and experimental data along scientific lines. It has remained for this committee to earn the enduring regard of the engineering profession through its demonstration that track is subject to known laws and scientific treatment in common with other engineering structures. The proof that track is an elastic structure acting in accordance with Hooke's law is of itself a material contribution to the sum of engineering knowledge.

The committee has yet to report upon the results of its investigations into the action of the tie and on the transmission of pressure through ballast and roadway When it shall have presented the data on these two details of the subject we may be sure that information of the utmost value will be available for use in extending the study of the subject of proper foundation for tracks in paved streets by the committee on way matters of the American Electric Railway Engineering Association. The latter committee was virtually forced to discontinue its studies on foundation matters for lack of just the sort of information which the committee on track stresses is developing in connection with the action of ties and transmission of pressures through ballast and roadway.

Meanwhile the progress report gives much information of practical value, and one of the important principles is to the effect that rigidity is of first importance as one of the qualities which good track should possess. It must, however, be remembered that the report covers open track conditions, and it will be of interest to note that the rigidity referred to has to do with tracks laid on various forms of ballast such as broken stone, cinders or gravel rather than the rigid form of construction common to tracks in streets where a form of concrete slab is depended upon to give the rigidity and transmit the load to the roadbed. In view of the different set of conditions created by the latter form of construction about which there is a dearth of scientific data as to its action, it seems in order to suggest that the Railway Engineering Association secure the co-operation of the American Railway Engineering Association in an investigation of the stresses in track in paved streets.

Back Up the Commissions by Persistent Publicity

PUBLIC service commissioners are only human, and electric railway companies, making an appeal for increased rates, cannot afford to make the mistake of expecting the commissioners to invite upon themselves torrents of popular—even if misinformed—abuse, if they can avoid it.

Commissions can grant higher fares, but it is no part of their duty to convince the public of the fairness of their decisions—at any rate, beyond such conviction as naturally follows with the few reasonable ones who read such decisions with care.

The task of educating the general public is strictly up to the companies—not because public service commissions, generally, lack moral courage to disregard hostile newspapers, adroit demagogues or unreasonable popular clamor, but because such people do not hesitate to threaten to go to the legislature for political relief and for commissioners' heads.

Without hearing the evidence in the case of the Public Service Corporation, whose appeal for increased fares is now before the commission, the Trenton (N. J.) *Times* has already denounced the appeal as an attempted robbery. And in the issue of Tuesday, March 26, the day the hearing opened, the *Times* brandished the editorial war club, under the significant caption "On Trial," in the following words:

> . . . There may be a demand that the commission be abolished in order that the people may have restored to them rights that appear to be gradually slipping away. The near future will probably enable them to decide whether they desire to retain the board.

In Oregon the decision by the Public Service Commission that the Portland Railway, Light & Power Company should be allowed to charge a 6-cent fare, has resulted in the introduction by the trolley car baiters of an "initiative" bill, to repeal the act establishing the commission. It comes to a vote next November.

The first thing to be accepted is the fact that you are talking to a hostile audience, if not a "packed jury." The educative process can never be speedy. The inertia of human conviction is too great. The company that waits until it wants something, before it speaks to the public, is suspected right from the start. Every argument is received coldly and with incredulity.

Electric railway men themselves were pretty slow in learning their own business. For example, it took them years to learn that depreciation must be provided for from current earnings. They cannot expect the public to learn even the basic facts of as complicated a thing as the electric railway business and to understand the true relationship between public and public utility in a minute, or a week, or a month. But until the public has that understanding and sympathetic attitude, it is perfectly hopeless to expect anything but opposition to fare increases.

And the issue is of an importance that cannot be overestimated. The *Saturday Evening Post* well says in its issue of March 31:

> If the American experiment of private ownership and public regulation fails, because regulating bodies have not the courage to face criticism, or because they are animated by hostility to capital, the only alternative is government ownership—to the great satisfaction of Tammany Hall and every like organization.
>
> The experiment will fail unless, on the whole, regulating bodies discover a more courageous and liberal temper.

And the publicity necessary to show the general public, upon whose will the public service commissions themselves exist, the true facts and their true interest cannot come from the commissions. It must come from the companies.

Co-ordinated Control for Any Properties Needed by Government

UNDER the act passed in August, 1916, the President has power to take over electric railways if he thinks such action necessary to the prosecution of the war. He is also empowered, under Senate bill No. 3388, introduced by Senator Fletcher, to take over any street or electric interurban railway which is considered by the government essential to the transportation of employees of shipyards or other work connected with the present ship construction policy of the government. While we believe that the electric railway companies of the country are not desirous of having their properties taken over by the government, they are prepared to accept such action if, in the opinion of the President, conditions arise which would make the control by the government of these properties either desirable or necessary. Railway men feel that if the electric railway facilities of this country are necessary to the winning of the war and can be put to more effective service by passing under the control of the government, they are ready to accept that condition.

A bill is now before Congress, however, which provides for quite a different arrangement and one out of accord with the better general plan of the co-ordination of our transportation resources. This bill was introduced in the House on Feb. 26 by Mr. Clark of Florida and was reported out on Feb. 28 from the committe on public buildings and grounds. Its main object is to provide for the housing of industrial workers who are engaged in industries connected with or essential to the national defense during the continuation of the war and as much authorizes the Secretary of Labor to acquire lands and build houses as he may determine necessary for such purpose. But coupled with this the bill gives to the Secretary of Labor the power to acquire by purchase or otherwise such local transportation and other community facilities or parts thereof as in his judgment may become necessary for the proper execution of the trust thus created.

The purpose of the bill, that of providing proper facilities for the housing of war workers, is commendable, but we think that it would be unfortunate if the authority for taking over urban and interurban trolley lines should be vested in various heads of departments according to their judgment. It would not only place the industry in a constant position of uncertainty, but it would lead or might lead to a great deal of confusion in case one department sought to take over a line for its use while the line might be serving a more important governmental function in the handling of troops, supplies, mail, etc., either as a local movement or in connection with through traffic. Again, it would result in different railways, possibly even different parts of the same railway, being administered under entirely different policies and methods. Centralized responsibility and direction, such as would follow the assumption of this control by the President or the Director of Railroads, would be much better.

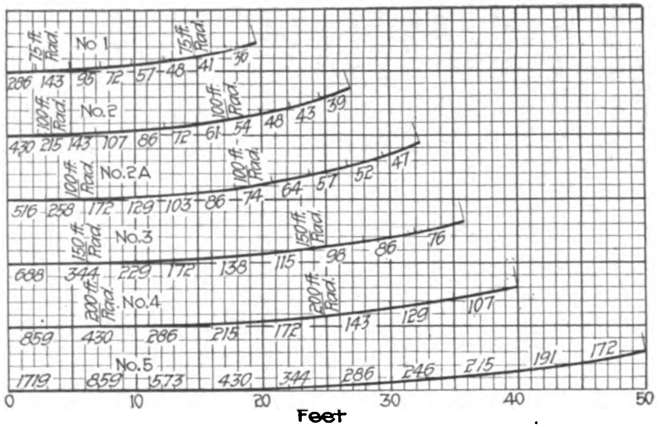


Fig. 1—Spiral standards of Lorain Steel Company (inner rail)

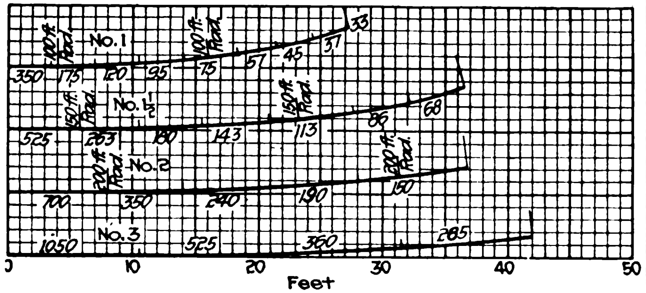


Fig. 2—Spiral standards of William Wharton, Jr., & Company (inner rail)

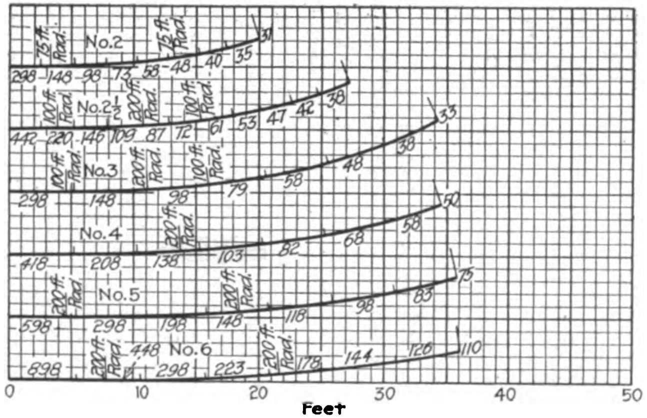


Fig. 3—Spiral standards of Pennsylvania Steel Company (inner rail)

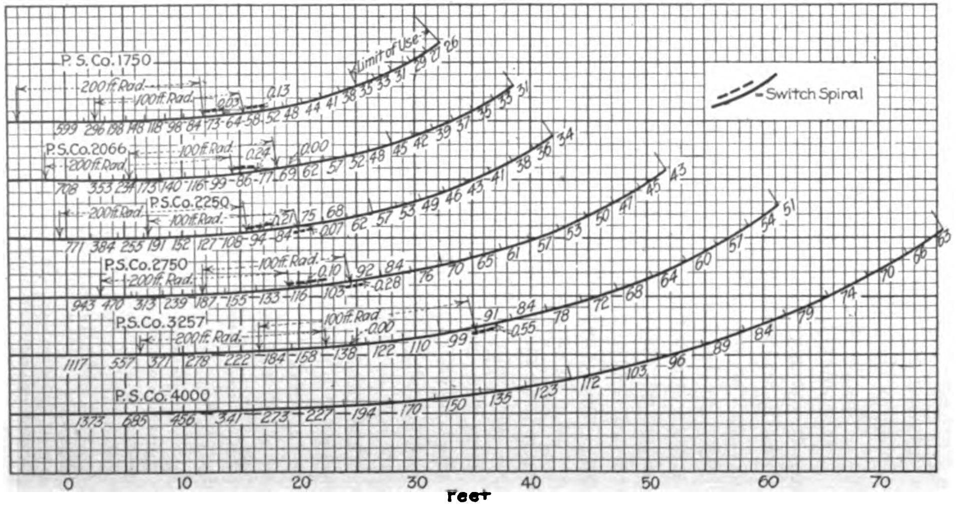


Fig. 4—Pennsylvania Steel Company's spirals proposed for standards in 1910 (inner rail)

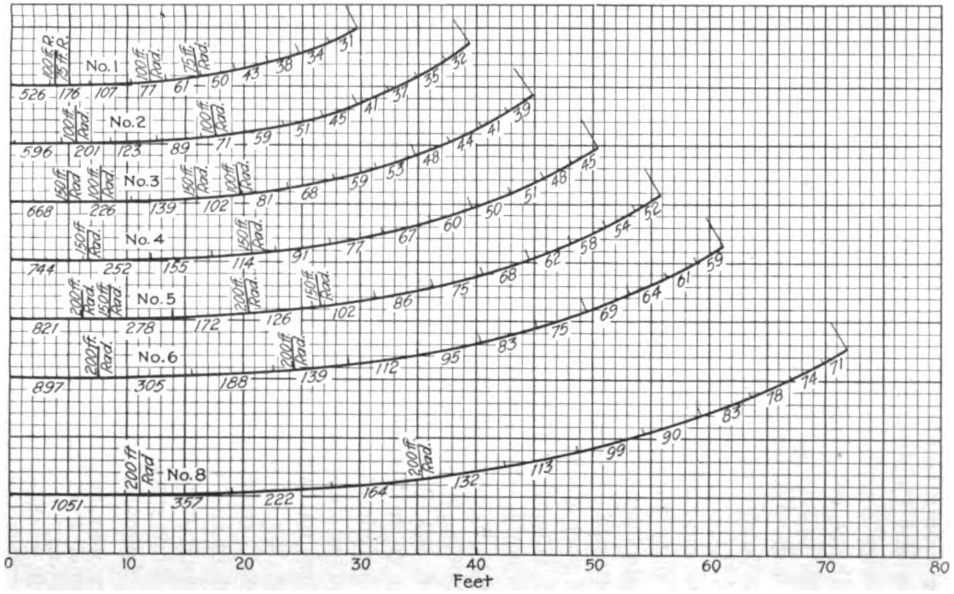


Fig. 5—William Wharton, Jr., & Company's spirals proposed for standards in 1910 (inner rail)

Present and Proposed Track Spirals of Several Manufacturers

(Each small space equals 1 ft. square)

Greater Uniformity in Track Spirals Will Conduce to Economy

The Author Shows that Co-operation Among Manufacturers and Users Could Bring About Great Simplification in This Element of Special Work

By E. M. T. RYDER
Engineer Maintenance of Way Third Avenue Railway, New York City

THE following article comprises a report by the author to the committee on way matters of the American Electric Railway Engineering Association. It is desirable to obtain all possible discussion on this most important subject, and as the war has caused a temporary cessation of committee activity in the association, it was thought advisable to give the article desirable publicity through the columns of this paper.

At the January, 1917, meeting of the way committee the writer submitted two drawings on the subject of uniform track spirals, blue-prints of which were furnished to each member of the committee. Drawing No. 1 showed a set of five spirals which were suggested as a possible basis for spiral standards to be adopted by the association. Drawing No. 2 showed the existing spirals of the Lorain, Wharton and Bethlehem companies. Since this meeting criticisms of the proposed spirals have been received from five members of the committee and from one former member. In four of the six cases blue-prints were submitted showing the spirals in use by the critic, with an argument to show their superiority over those suggested by the writer. It would have been interesting to know whether the other members were similarly minded and, if so, why they hid their light under a bushel.

Incidentally it may be noted that of the four schemes suggested one calls for a single spiral, one for twenty-two spirals, one for no spiral at all, but suggests using two simple sets of compound curves, and one for a special, long-radius approach curve, the data at hand being incomplete as to the corresponding switch curves.

DESIRABILITY OF STANDARDS

This marked difference in practice is in itself one of many good arguments for the necessity of having standards—and the difficulty of getting them. All way engineers, of course, know that the largest three manufacturers of special work use entirely different sets of spirals. It may not be so well known that some years ago they attempted to "bury the hatchet" and agree on new standards, but no common ground was found at that time. The present time is, for several reasons, a good one in which to attempt to establish standards for the entire trade. Practically none of the existing spirals is long enough to accommodate the A.E.R.E.A. standard switch pieces. Also, present business conditions are likely to result in curtailment of orders for special work, and therefore policies of co-operation, economy and efficiency are everywhere the order of the day.

The writer has been interested in working up the proposed uniform spirals in a little more detail and in comparing them with the standards of the various steel companies and of the railway companies whose engineers kindly furnished data of their own. Thirteen drawings are reproduced herewith, showing this information. The positions of cut-in points for switches have not been figured out for the proposed uniform spirals and, therefore, cannot be definitely assumed where shown. All comparisons shown on the accompanying drawings are based on curves for inside rail.

PROPOSED SPIRALS BASED ON STEAM RAILROAD STANDARDS

The proposed uniform spirals are based on Searle's spirals, commonly used by steam railroads, the fundamental principle of which is that the rate of curvature increases uniformly by a fixed amount per chord from zero to the curvature of the circular part of the curve. In steam railroad work the number of chords is generally kept constant and the length of the chord varied. In these proposed spirals the chord length is held uniformly at 5 ft. and the rate of curvature per chord is varied. Each spiral may be used with curves of various center radii by dropping off the appropriate number of chords from the sharp end of the spiral.

The proposed spirals can be laid out on the ground by transit if desired, the deflection angles to all points being given in the data in the accompanying table. This is chiefly of value in locating new lines, as correct stationing can be carried around all curves, thus preserving profile distances, etc.

The data for inside and outside rails have not been calculated, but they can be worked up later should the proposed spirals be considered worthy of further study. Co-ordinates for the center line are given in the table for convenience in plotting for comparison with other spirals. These figures were obtained by scaling from layouts plotted on a scale of 1 in. = 1 ft. by deflection angles and chords. The precise radii of these spirals can probably be modified slightly to advantage, as stated below, but the writer believes that the general scheme submitted deserves careful consideration both as to the fundamental basis of the individual spirals and their group relationship.

All the spirals are suitable for easements for plain curves and their number and relative proportions allow considerable variation to suit local conditions. In all cases circular arcs of the standard switch radii shown can be cut in without any change in the spiral and of sufficient length to take switch pieces of A. E. R. E. A. standard length.

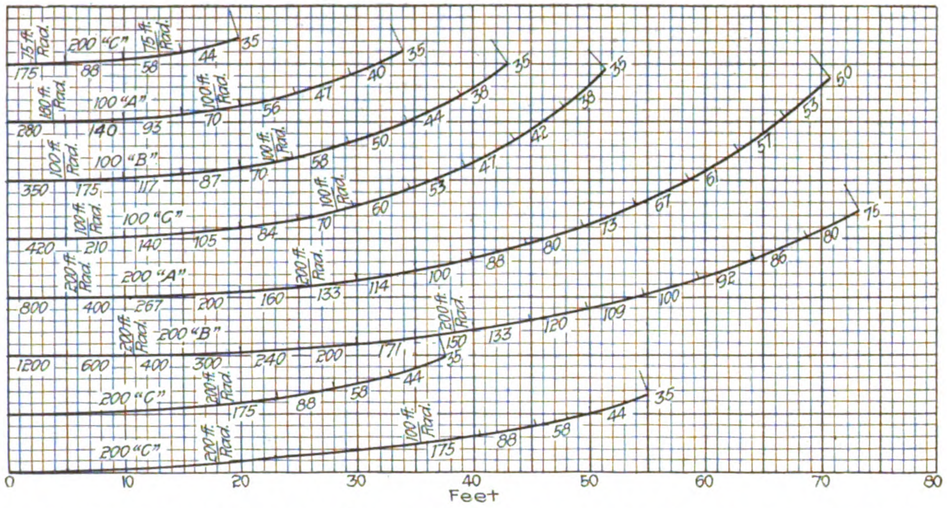


Fig. 6—Proposed uniform standard spirals (plotted for center line. For data see table)

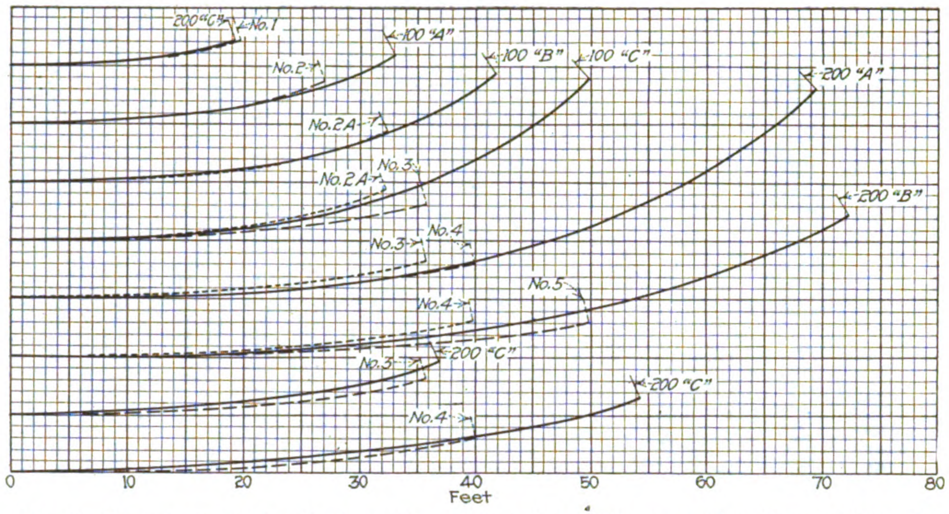


Fig. 7—Comparison of Lorain Steel Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive; dash line No. 1 to No. 5 inclusive; dotted line as above and No. 2-A.

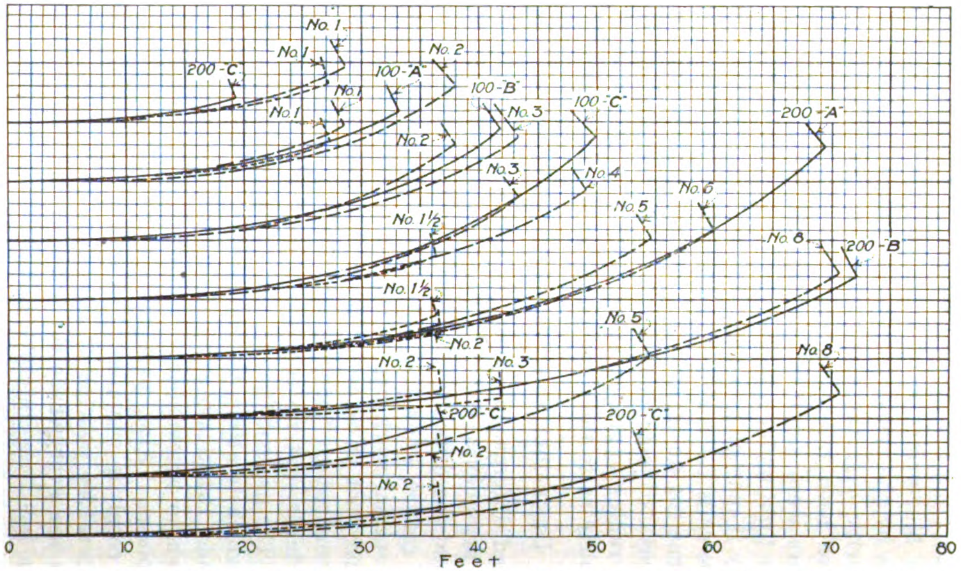


Fig. 8—Comparison of William Wharton, Jr., & Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-C inclusive; dash line No. 1 to No. 8 inclusive.

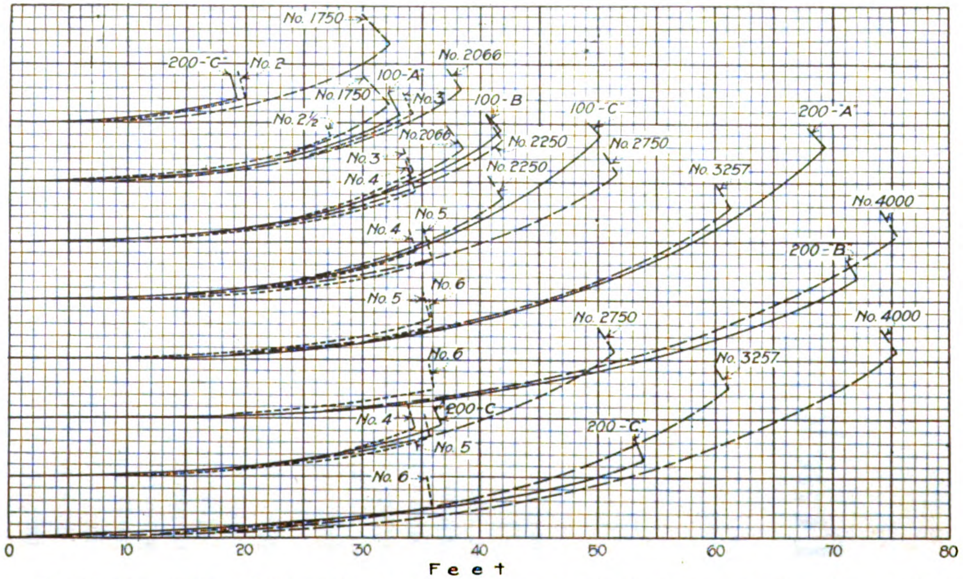


Fig. 9—Comparison of Pennsylvania Steel Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-C inclusive; dash line No. 1750 to No. 4000 inclusive; dotted line No. 2 to No. 6 inclusive.

Proposed A. E. R. E. A. Standard Spirals and Comparisons with Present Manufacturers' Standards

(Each small space equals 1 ft. square)

The proposed standards provide three spirals into which 100-ft. switches can be cut, two into which 200-ft. switches can be cut, and one spiral which can be used as an easement for a clearance curve for 200-ft. switches or as a short spiral into which a 75-ft. switch can be cut.

Spiral 100-A is intended to be the shortest spiral of the given type which will allow the cutting-in of a standard A. E. R. E. A. 100-ft. radius switch. As shown, it is a little longer than absolutely necessary and the radii can be figured down accordingly if desired. Spiral 100-B is of 25 per cent greater radius and spiral 100-C is of 50 per cent greater radius. The latter two can be used when local conditions permit or require. All designers who have tried to make special work layouts dodging sewer heads, water-gates and elevated columns, etc., know that a certain amount of flexibility is necessary if the engineers are to avoid insanity.

ENGINEERING DATA FOR PROPOSED UNIFORM SPIRALS

SPIRAL 200 "C"
$N=4$. $L=20$. $R=35$. $D=4°\ 6'$.
Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0	175	0° 00′	0° 00′	0	0.0	0.00
1	88	0° 49′	1° 38′	5	0.1	5.00
2	58	2° 03′	4° 55′	10	0.4	10.0
3	44	3° 50′	9° 50′	15	1.0	14.9
4	35	6° 09′	16° 24′	20	2.2	19.8

SPIRAL 100 "A"
$N=7$. $L=35$. $R=35$. $D=4°\ 6'$.
Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0	280	0° 00′	0° 00′	0	0.0	0.0
1	140	0° 31′	1° 02′	5	0.1	5.0
2	93	1° 17′	3° 05′	10	0.2	10.0
3	70	2° 24′	6° 09′	15	0.6	15.0
4	56	3° 51′	10° 15′	20	1.3	19.9
5	47	5° 38′	15° 23′	25	2.4	24.8
6	40	7° 46′	21° 32′	30	4.0	29.6
7	35	10° 15′	28° 42′	35	6.2	34.1

SPIRAL 100 "B"
$N=9$. $L=45$. $R=35$. $D=4°\ 6'$.
Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0	350	0° 00′	0° 00′	0	0.0	0.0
1	175	0° 25′	0° 49′	5	0.1	5.0
2	117	1° 02′	2° 28′	10	0.2	10.0
3	87	1° 55′	4° 55′	15	0.5	15.0
4	70	3° 05′	8° 12′	20	1.1	20.0
5	58	4° 31′	12° 18′	25	2.0	24.9
6	50	6° 13′	17° 13′	30	3.3	29.8
7	44	8° 12′	22° 58′	35	5.0	34.4
8	38	10° 27′	28° 31′	40	7.2	38.9
9	35	12° 59′	36° 54′	45	9.9	43.2

SPIRAL 100 "C"
$N=11$. $L=55$. $R=35$. $D=4°\ 6'$.
Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0	420	0° 00′	0° 00′	0	0.0	0.0
1	210	0° 20′	0° 41′	5	0.0	5.0
2	140	0° 51′	2° 03′	10	0.1	10.0
3	105	1° 36′	4° 06′	15	0.4	15.0
4	84	2° 34′	6° 50′	20	0.9	20.0
5	70	3° 46′	10° 15′	25	1.6	24.9
6	60	5° 11′	14° 21′	30	2.7	29.8
7	53	6° 50′	19° 08′	35	4.2	34.6
8	47	8° 43′	24° 36′	40	6.1	39.3
9	42	10° 49′	30° 45′	45	8.4	43.7
10	38	13° 09′	37° 35′	50	11.2	47.8
11	35	15° 43′	45° 06′	55	14.5	51.5

SPIRAL 200 "A"
$N=15$. $L=75$. $R=50$. $D=2°\ 52'$.
Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0	800	0° 00′	0° 00′	0	0.0	0.0
1	400	0° 11′	0° 22′	5	0.0	5.0
2	267	0° 27′	1° 05′	10	0.1	10.0
3	200	0° 50′	2° 09′	15	0.2	15.0
4	160	1° 20′	3° 35′	20	0.4	20.0
5	133	1° 58′	5° 23′	25	0.8	25.0
6	114	2° 43′	7° 31′	30	1.4	30.0
7	100	3° 35′	10° 02′	35	2.2	34.9
8	88	4° 34′	12° 54′	40	3.2	39.8
9	80	5° 40′	16° 08′	45	4.5	44.7
10	73	6° 54′	19° 43′	50	6.0	49.5
11	67	8° 15′	23° 39′	55	7.8	54.1
12	61	9° 43′	27° 57′	60	10.0	58.7
13	57	11° 18′	32° 37′	65	12.5	63.0
14	53	13° 00′	37° 38′	70	15.4	67.0
15	50	14° 49′	43° 00′	75	18.7	70.8

SPIRAL 200 "B"
$N=15$. $L=75$. $R=75$. $D=1°\ 53'$.
Co-ordinates.

P	R	Dp	Cp	Lp	X	Y
0	1200	0° 00′	0° 00′	0	0.0	0.0
1	600	0° 14′	0° 14′	5	0.0	5.0
2	400	0° 28′	0° 42′	10	0.1	10.0
3	300	0° 42′	1° 25′	15	0.2	15.0
4	240	0° 57′	2° 21′	20	0.3	20.0
5	200	1° 11′	3° 32′	25	0.6	25.0
6	171	1° 25′	4° 57′	30	1.0	30.0
7	150	1° 39′	6° 36′	35	1.5	35.0
8	133	1° 53′	8° 29′	40	2.2	39.9
9	120	2° 07′	10° 36′	45	3.0	44.9
10	109	2° 21′	12° 57′	50	4.0	49.8
11	100	2° 35′	15° 32′	55	5.2	54.6
12	92	2° 50′	18° 22′	60	6.6	59.4
13	86	3° 04′	21° 25′	65	8.3	64.1
14	80	3° 18′	24° 43′	70	10.2	68.7
15	75	3° 32′	28° 15′	75	12.4	73.2

PROPOSED UNIFORM SPIRALS

Spirals are similar to "Searles Spirals." Rate of increase of curvature per chord is constant and equals deflection angle for first chord.

All chords 5 ft. long on *Center Line* of track (as plotted).

Dc = Deflection angle for circular part of curve.
Dp = Deflection angle to any point on spiral.
Cp = Central angle to any point on spiral.
S = Central angle, total for spiral.
R = Radius circular part of curve in feet.
N = Number of chords in spiral.
L = Length of spiral = 5 N feet.
P = Number giving position of chord on spiral.

$Dp = \frac{a}{b}\,Dc$. Where $a = 2P^2 + 3\,P + 1$.

And $b = 6\ (N+1)$.

Central angles of chords of spirals form series $\frac{2\,Dc}{N+1}\,(1+2+3+\ldots\ldots+N)$. Sum $= S = N\,Dc$.

Radii of arcs of spiral form, approx. series (assuming angles proportionate to sine)

$(N+\ 1)R\ (1+\tfrac{1}{2}+\tfrac{1}{3}+\tfrac{1}{4}\ldots\ldots+\frac{1}{N})$

Spiral 200-A is intended to be the shortest spiral of the given type which will allow the cutting-in of a standard A. E. R. E. A. 200-ft. radius switch. This spiral, like 100-A, is a little longer than absolutely necessary, and the radii can be figured down in the same manner. Spiral 200-B is of 50 per cent greater radius. Spiral 200-C is intended to be used in combination with a 200-ft. radius plain branch-off curve of the necessary length to allow for the A. E. R. E. A. standard switch before reaching the spiral.

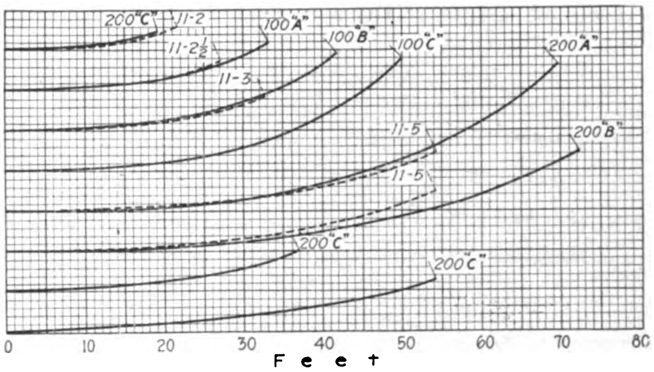


Fig. 10—Comparison of Cleveland Frog & Crossing Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive; dotted line 11-2 to 11-5 inclusive.

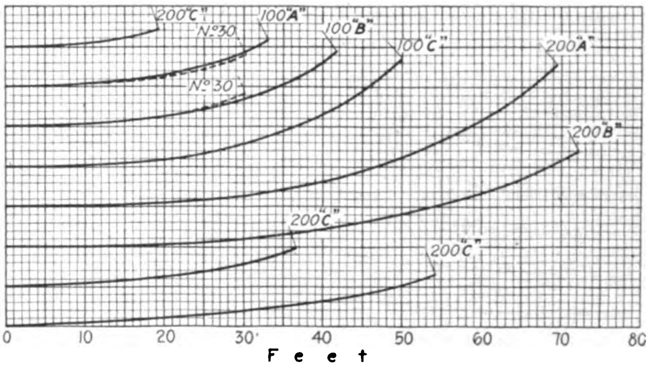


Fig. 11—Comparison of Montreal Tramways spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive.

COMPARISONS OF PROPOSED STANDARDS WITH STANDARDS OF ONE MANUFACTURER AND ONE RAILWAY COMPANY

(Each small space equals 1 ft. square)

To obtain car clearance it will generally be necessary to cut in a piece of long-radius plain curve between the switch and the spiral. As meeting ordinary conditions of distance between track and car dimensions, the writer suggests using 1 deg. of 1000-ft. radius as a standard. The chief use for the 200-ft. radius switch is in the inside curve of a double track branch-off where the above type of layout is generally essential in order to get car clearance. True spirals like 200-A and 200-B can be used for single-track branch-offs in wide streets or in acute-angle layouts.

Spiral 200-C can also be used in places where there is no room for standard 100-ft. switches, for 75-ft. switches must be used sometimes if we are to get out of the trenches.

The spirals proposed by the various manufacturers in 1910 differed materially from each other in principles and in details, but they showed a desire to increase the available range to choose from and to provide more adequately for plain ends. It is intended to cover this same field with the proposed uniform spirals presented herewith. No doubt other types and combinations could be designed and, if any simpler and more practicable ones can be found, so much the better.

COMPARISONS

Comparative sheets have been worked up for the spirals of four of the large manufacturing companies and three of the electric railway systems. Brooklyn and, of course, other of the large systems use the spirals of certain of the manufacturers shown. If desirable the comparative studies can be extended to cover any other systems. The writer hopes that these comparisons will be studied very carefully. They seem to him to indicate that the proposed uniform spirals come astonishingly near to being a satisfactory substitute for the various spirals in common use. There are very many instances where the variations from the proposed spirals are less than 6 in. throughout the whole length, and the range from sharp to easy curves is pretty well covered. In the reproductions the curves have been plotted on a scale such that the distances from the base lines can be read to one-fifth of a foot.

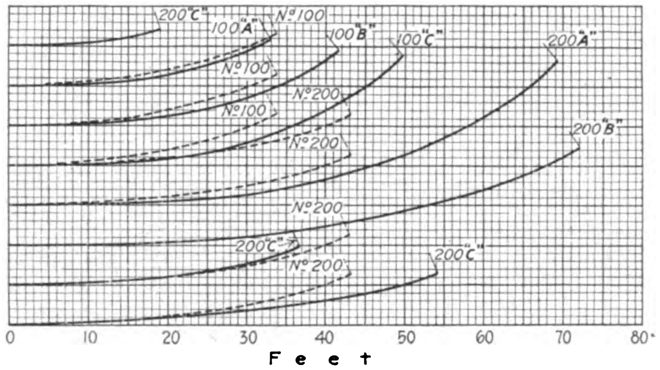


Fig. 12—Comparison of New York State Railways spirals with proposed uniform spirals (inner rail). Solid lines 200-C to 200-B inclusive.

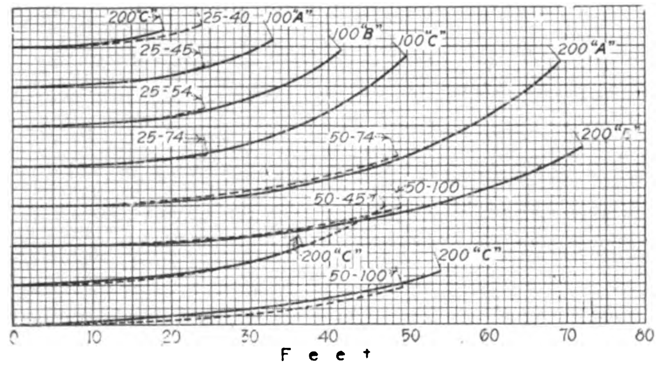


Fig. 13—Comparison of Connecticut Company's spirals with proposed uniform spirals (inner rail). Solid line 200-C to 200-B inclusive; dotted line 25-40 to 50-100 inclusive.

COMPARISON OF PROPOSED STANDARDS WITH STANDARDS OF TWO RAILWAY COMPANIES

(Each small space equals 1 ft. square)

The advice and suggestions of experts are needed to make these studies of value, and criticism will be thoroughly appreciated. The good points, if any, should also be pointed out, for an adoption of such standards should only be made in case they are such a marked advance over the old that the majority of manufacturers and customers will fall in step.

Electrification Progress in Scandanavia

IN A LECTURE recently delivered before the Royal Institute of Engineers, Holland, A. Groothoff reviewed the present electrification situation in Sweden and Norway. A summary of some of the points made by him are given in the following paragraphs. The weights mentioned are in metric tons.

The first electrification on a large scale in Sweden was the Kiruna-Riksgränsen line with its tonnage of iron ore of more than 3,000,000 per year, and this within the Arctic Circle. The line is 93 miles long. Single-phase current at 80,000 volts is sent from Porjus to four transformer stations along the line, of which the first is 87 miles and the last 160 miles distant from Porjus. The voltage is stepped down to 15,000, at which tension power is supplied to the contact device.

The freight locomotives weigh about 100 tons and the passenger locomotives 70 tons. A normal freight train consists of two electric locomotives and 40 ore cars of 46 tons each, the total weight being from 2000 to 2100 tons. Normal speed for freight is 18½ m.p.h., the maximum speed being 31 m.p.h. The maximum speed for passenger trains is 62½ m.p.h.

In the first year this road transported 1,104,000 tons of ore, which is barely one-third of its normal capacity. Despite this low traffic it showed a saving over steam operation, due partly to the high price of coal.

The continuation of the road southward to Svarton on the Baltic coast has been decided upon, and the cost of the extension, 143 miles long, has been figured at $7,800,000. With an annual ore transportation of 3,000,000 tons, electric traction can compare favorably with steam traction when coal is $6.70 per ton. The current for the whole road is to come from Porjus. Whether or not other State railroads in Sweden will be electrified is still an open question. The question is not an easy one, for while electrification would increase the capacity of the roads it cannot do very much because most Swedish railroads are single track. This limits the total traffic regardless of motive power.

In 1917 Norway had a total of 1970 miles of railroad track, of which 44½ miles were electrified. Plans are under way for the electrification of several short lines owned by the State. A comprehensive plan for the complete electrification of all the State railways has also been worked out, involving the expenditure of $14,000,000 for the power stations alone.

The New York *Evening Post* published its fifth annual "Public Utilities and Engineering Review" on March 30. Among those who contributed articles to the special issue were W. H. Dodge, of H. M. Byllesby & Company; O. B. Willcox, vice-president of Bonbright & Company, Inc.; E. G. Connette, president of the United Gas & Electric Corporation, W. B. Jackson, of the bond department of H. L. Doherty & Company, and Harlow C. Clark, of the American Electric Railway Association staff in New York.

Martial Note Dominates Banquet

Work of Electric Railway War Board and Other War Activities Described at Annual Meeting of New England Street Railway Club

LOYALTY to the cause of liberty, support of our allies, and a determination to see the war through to a victorious conclusion were voiced by the speakers and by 562 members and guests of the New England Street Railway Club at the eighteenth annual banquet of the organization in Boston on March 28. Appropriately in view of the war conditions the banquet was the most informal in the history of the club, the decorations being confined to the display of the national colors of the United States, Great Britain and France behind the speakers' dais. Patriotic themes were discussed by A. H. Ford of Portland, Me., retiring president of the club; R. W. Perkins of Norwich, Conn., president-elect; Hon. Guy A. Ham, Boston, Mass., toastmaster; Hon. John W. Weeks, United States Senator from Massachusetts; Hon. Andrew J. Peters, Mayor of Boston; Lucius S. Storrs, New Haven, Conn., of the Electric Railway War Board; and Major Guy C. Boyer, Twenty-second Battalion, Canadian Expeditionary Forces, who was received with tremendous enthusiasm.

PROBLEMS OF THE INDUSTRY AND WORK OF ELECTRIC RAILWAY WAR BOARD

Mr. Storrs pointed out that never in their history have electric railways been confronted with such acute conditions as at present. Rising costs have practically wiped out surplus. Some lines have been abandoned, others forced into receivership; others are tottering on the verge. Nearly all properties are nearly bankrupt. This condition is not confined to any local territory, but is nation-wide, and for that reason all the more readily understood.

The public as well as the public utility commissions are realizing the extreme needs and the publicity that has been given to the exchange of letters between President Wilson and Secretary McAdoo is having wide effect. The public has been taken into the confidence of the electric railways, and the slogan now is "Allow us to earn a fair return upon the value of the property which we have been invited to maintain for the public convenience," not that the industry may make large profits but in order that it may be an efficient agency in the successful conduct of the war. A hearing on the matter of increased rates is now orderly investigation and not the inquisition of former days. It is helpful to the community, to the commission and to the corporation.

"We are too apt to think of our problem," said Mr. Storrs, "our property and the public each of us serves in terms of local interest. Of course, we would not be worth-while employees if we did not have the interest of our particular corporation at heart, but we must realize that the little local problem with which we happen to be confronted is but one unit of the big problem, for the plight in which we each find ourselves is national in its scope. The average person never stops to think that if the services of the public utilities should stop throughout the country the whole war program would immediately collapse. It follows that in so far as the efficiency of the public utilities is impaired, the war program is proportionately delayed.

"The conditions with which this industry is confronted have gravely affected the efficiency of all, and collapse has been imminent. It was the full realization of this that led President Wilson to say, 'It is essential that these utilities should be maintained at their maximum efficiency and that everything reasonably possible should be done with that end in view.' Briefly there is an investment of $11,350,000,000 in the public utility business, with gross earnings of $1,500,000,000 a year and a coal consumption of 51,500,000 tons annually. There are maturing obligations during 1918 of $232,000,000 and during 1919 of $265,000,000. It is estimated that the 1918 earnings will increase by $228,000,000. Operating costs will increase $290,000,000, resulting in an income decrease of $62,000,000, coupled with which there is the need for an estimated increase in investment to meet the actual requirements of these times of $650,000,000. Certainly this is a dangerous condition and one requiring immediate relief from all sources."

Mr Storrs then described the organization of the Electric Railway War Board, with offices in Washington.

When the War Board began its work the problem seemed to be largely one of affording the various companies relief from some of the annoying restrictions placed upon certain branches of their work and of aiding in the delivery of materials, fuel and supplies. While fuel distribution will now be decentralized, there still remains the problem of obtaining shipments from contractors and this can only be handled through the National Fuel organization. The War Board has been successful in straightening out conflicting rulings of various collectors of the Internal Revenue Department. The board's traffic department is also doing what it can to co-operate with the Ordnance Department of the Army and other branches of the military and naval service to render electric railway transportation available.

SOME WAR BOARD ACCOMPLISHMENTS

There have been appearances before committees in an effort to have the war finance corporation bill so framed as to enable the industry to obtain assistance in financial matters. The board has secured the elimination of the electric railways from these so-called "short-line" provisions of the railroad bill. An effort has been made to amend the bill now pending which would give the Secretary of Labor power to take over electric lines. Misstatements regarding electric railways made before Congressional committees which would work to the detriment of the industry have been corrected. A large amount of work is on hand at present. Public opinion has changed and there is a greater realization of the co-partnership existing between the utility and the community than ever before. Maximum efficiency on the part of the War Board and of the recently organized conference committee of all the public utilities requires the active co-operation of each of the individuals in the industry with full interchange of suggestions and action thereon so far as feasible in the interest of the public welfare and the companies.

New Zones Authorized

Maine Public Utilities Commission Grants New Rate Schedule to Lewiston, Augusta & Waterville Street Railway

THE Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine, on March 1 put into effect a new rate schedule between Lewiston and Bath, in accordance with a recent decision of the Public Utilities Commission. This schedule supersedes that filed on July 1, 1917, but grants the same total fare of 50 cents for the entire distance of 28.28 miles. There are, however, some features of the decision which are of special interest.

The fare was originally 1¼ cents per mile for through travel, and much less than 1 cent per mile for some of the zones. This fare had been in effect since the line was built in 1898, with the same number of zones and only minor changes in their limits. The revised schedule was filed by the company because the old zones were not properly arranged, some being much longer than others without adequate reason.

In commenting on the situation the commission said:

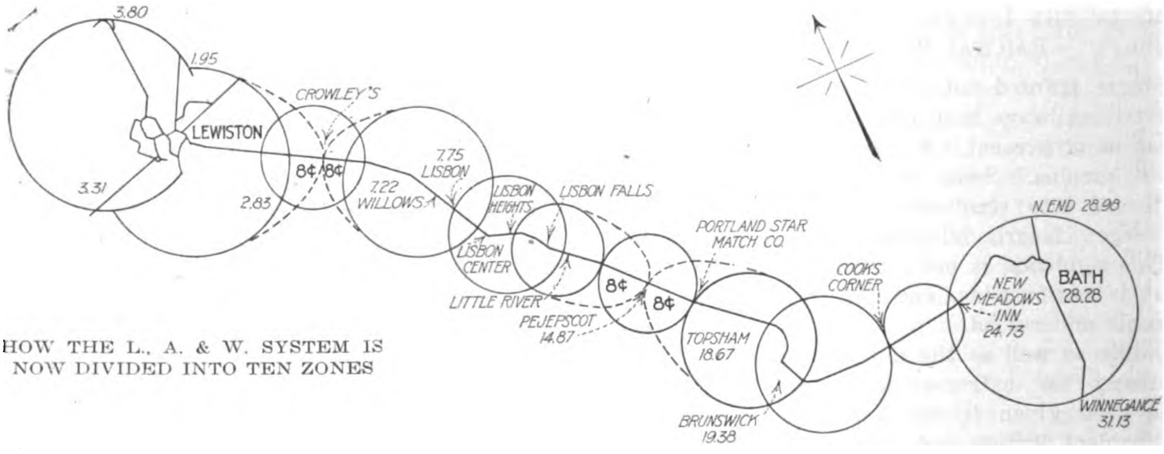
"The zone system of fixing electric railway fares is, at best, a compromise, and not absolutely equal in its results. Some persons must live just over the line, wherever it falls, and pay an extra fare for a short ride. Since this cannot be avoided, it is a strong argument for making the base fare as low as practicable, and is one of the considerations which has deterred us from retaining the original number of zones and making a corresponding increase per zone.

"There is now a tendency among electric railways toward the adoption of the copper zone system, which is practically a mileage rate, starting with a reasonably long zone at the usual base rate, and adding 2 cents, or whatever the rate may be, for each mile, or fraction thereof, in addition. Even this is only another step in reducing the base fare; it still recognizes the zone principle. It is preferable in theory, but we are not convinced that it is now practicable to apply this practice anywhere on respondent's system until it can be worked out for the entire system, and one of the attorneys for the complainants frankly so admitted, although he at first asked for it.

"The principal complaints were directed at the rates in what formerly constituted the Lewiston zone and those now charged persons going to and from Pejepscot, in either direction. While we find, and we do not understand that complainants seriously deny, that the proposed increase of fare from 35 to 50 cents is not more than just, we are satisfied that situations exist in both of these communities which demand special attention.

"Overlaps are confusing and should be avoided when possible, but so long as the zone system of fares is adhered to they will have to be tolerated where there is an otherwise irreconcilable clash between a reasonably exact division of distances and local conditions. We shall resort to this practice to remedy what otherwise would be an injustice to the travel between Lisbon Falls and Lisbon Village, and to remove minor hardships created by the new schedule at Lisbon Heights and at New Meadows Boat Landing."

Under the plan finally approved, shown in the accompanying diagram, ten 5-cent zones, some of which overlap, are required for the entire distance, the length of these zones varying from 2.45 to 3.70 miles. They provide an average rate of 1.765 cents per mile. To meet the special local conditions at Crowley's Junction, a suburban point near Lewiston, and at Pejepscot where a large pulp mill is located, special 3-cent zones are created. The extended zones, one of which is on each side of each of the above points, cover the 5-cent zone on which they are based but extend to the center of the next adjoining 5-cent zone, where they meet. This arrangement gives these two points, Crowley's Junction and Pejepscot, the advantage of a single 8-cent zone, in either direction.



HOW THE L., A. & W. SYSTEM IS NOW DIVIDED INTO TEN ZONES

Cars with Small Wheels for Cleveland

SEVERAL of the twenty-five all-steel cars ordered a year ago from the Cincinnati Car Company by the Cleveland (Ohio) Railway are now in operation. The new cars are of the Peter Witt type but differ from the original ones of this type in being mounted on smaller wheels and having motors of but 25 hp. instead of 40 hp. These cars weigh 32,000 lb. each, or 12,000 lb. less than the combination steel and wood cars. In these cars the roof is of steel with white enamel interior finish, and the seats are covered with leatherette. The floor is slightly ramped. A street sign is placed above the front vestibule and a side roof sign above the center exit.

Staggered Hours for 88,000 Washington Employees

Present Tremendous Crush in Capital City Due to General 9 O'Clock Opening Hour—John A. Beeler Proposes New Hours for 45,000 Employees—All Business Interests and Car Riders Will Be Benefited

THE latest report of John A. Beeler on the electric railway situation in Washington, D. C., submitted to the Public Utilities Commission on March 22, covers the subject of staggered hours for business. Mr. Beeler finds that with the continuance of the present hours the electric railway service will continue to suffer more or less from congestion, delays and overcrowding, especially during the morning rush hour. With the hours changed as he proposes, however, the service can be materially improved at once, and a foundation will be established upon which can be operated ultimately a system of urban transportation worthy of the capital city of America.

Washington is in no sense a usual city. Primarily it is governmental in character. On Jan. 1, 1918, the total number of government employees was close to 70,000; it has since increased by several thousands. The city is not a manufacturing center. Apart from the Washington Steel & Ordnance Company, located in the extreme southern corner of the District of Columbia, the few small factories are a negligible quantity as far as the transportation problem is concerned. The commercial enterprises which care for the local needs of the population, including department stores, offices and retail business of various sorts, while ample, are completely overshadowed by the great governmental activities.

The population in the older sections, as compared with the suburbs, is distributed in a remarkably even way. The result is that most of the people walk to and from their work, and many prefer to live within easy walking distance of their places of employment. At present others do so because of the electric railway congestion. Where the population extends farthest out, the greatest car congestion prevails. With the rapid and extensive growth brought about by the war, more people are forced to live in the outlying territory, thus accentuating the problem.

The primary cause of Washington's congested traffic situation, Mr. Beeler states, is the present hours of work, particularly the opening hour at 9 a.m., which is almost universally observed by the government, the private offices, schools and the big stores. The federal government years ago fixed the opening of most of the departments at this hour, and on account of the climatic conditions and the generally confining nature of the work created an apparently short day by establishing 4 p.m. as the closing hour. Private offices generally open at 9 a.m. and close between 5 and 5.30 p.m. The latter, however, usually allow an hour or more for lunch, while the government departments allow but thirty minutes. The schools also open at 9 a.m., but close earlier than the departments. The large stores open at 9 a.m. and close from 5.30 to 6 p.m.

They Cannot All Be Carried at Once

When it is remembered that the function of an electric railway system is to provide regularity and continuity of service at all reasonable hours for the regular and normal as well as the abnormal movements, for those outbound as well as those inbound, for the occasional rider, the stranger, and the entire community generally, the magnitude of the task of attempting to bring a large proportion of the population down town for a universal 9 a.m. opening hour is apparent. This task, long established by custom, has now unconsciously grown to proportions under which the community as well as the companies stagger.

—JOHN A. BEELER.

Within the last few months, in an effort to alleviate existing conditions, the Departments of Commerce and the Interior have changed their opening hours from 9 a.m. to 8.30 and 8.45 a.m. While this has aided to a certain degree, the number of employees involved is insufficient to make any great change in the general situation.

The three industrial offices, the Bureau of Engraving, the Government Printing Office and the Navy Yard, for years have had hours from 8 a.m. to 4 p.m. Recently it has been found necessary to put on additional help in two shifts—the first from 4 p.m. to midnight, and the second from midnight to 8 a.m.

Washington as a whole, Mr. Beeler says, goes to work promptly at 9 a.m. The result is that there is a tremendous demand for transportation to land the people at their places of business at this time. Counts of pedestrians were made at eight points far enough from the business section to secure those going to and from their work. The observations were made in January, when the weather was not particularly favorable for walking, so that few were doing it for pleasure.

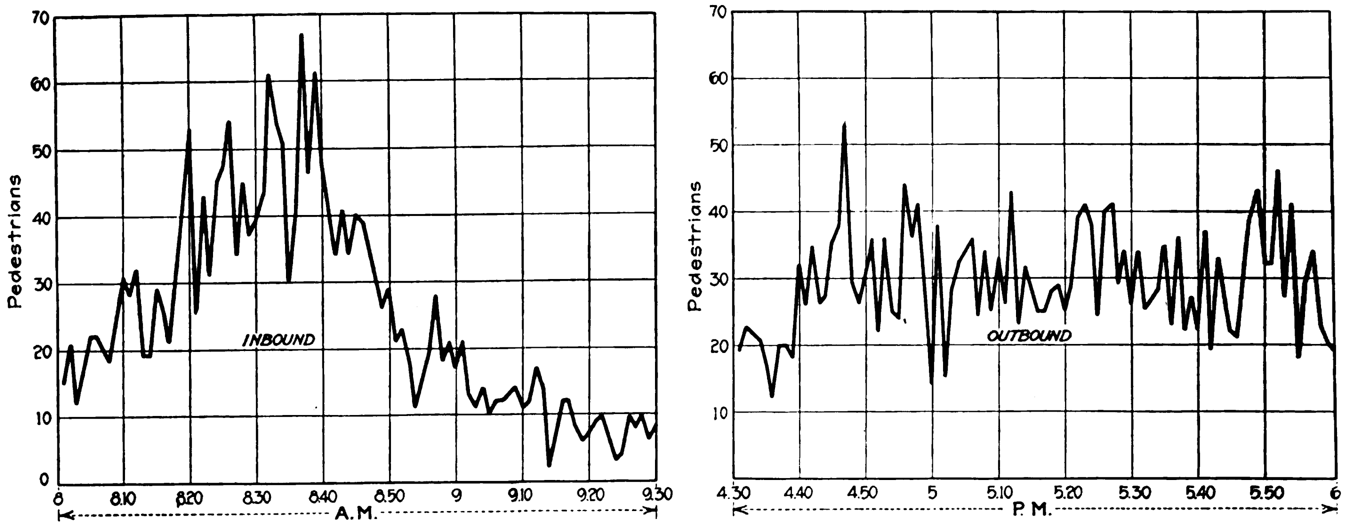
The result of combining the counts of incoming pedestrians in the morning is shown in Fig. 1. This shows that the maximum peak was reached at 8.37 a.m., which would on an average permit the walkers to reach the downtown section at or before 9 a.m. This clearly indicates that the walkers' peak downtown is at this hour.

The results in the afternoon, on the other hand, do not indicate any marked peak. The government offices close fairly early. Many employees prefer to shop before going home, while others proceed homeward immediately. The transients especially remain downtown for some time. Fig. 2, which is a summary of the evening counts outbound, indicates a nearly even distribution of walking from 4.30 to 6 p.m.

In addition to the walkers passing from the outer sections into that included within the eight count points, there are approximately 100,000 persons living in the territory inclosed within these limits. Most of these usually walk. Some of them would undoubtedly prefer to ride, especially if residing on one side of this area and working on the other, but on many lines they find the cars so packed at this hour that it is almost essential to cultivate the walking habit.

57,000 PEOPLE RUSH TO WORK AT ONCE

To determine the exact number of employees involved, a questionnaire was sent out by the Public Utilities Commission. The returns were summarized to show the number of employees and their hours of work for practically all the government employees, and for typical private organizations. The number of people and the hours at which they are due to commence and end their work are illustrated graphically in Fig. 3. Each block represents 1000 people.



FIGS. 1 AND 2—PEDESTRIANS ENTERING AND LEAVING DOWNTOWN DISTRICT IN WASHINGTON DURING MORNING AND AFTERNOON RUSH

At 9 a.m., Mr. Beeler states, the blocks are stacked too high in comparison with other hours. The government employees furnish 37,652 or considerably more than enough without the addition of about 20,000 going to private offices and stores at the same time.

The enforcement of such an hour has proved impracticable, and any close observer will note that this stack of blocks has literally toppled over. A considerable number come early; many others are late. Many who desire to ride are forced to walk through sheer inability to get on board the cars at this hour in the morning.

In the afternoon the problem is decidedly less acute. The blocks are stacked at various hours, and none of the piles is nearly so high.

COUNTS AT BUILDINGS PROVE CONGESTION

The times of arrival and departure of employees follow quite closely the regular opening and closing hours for the various buildings. To test this, counts were made of all the principal government and other offices. The employees of some departments are quite prompt in arriving; those of other departments, and in all cases many individuals, come away ahead of time. Some departments show clearly defined times for opening and closing, while others do not. Quite a number work late, especially in the departments vitally concerned in the conduct of the war.

The character of the demand on the city's transportation facilities is shown in Fig. 4 and Fig. 5. These show the number of persons entering and leaving the buildings within a radius of three-fourths of a mile from Fourteenth and G Streets. This includes nineteen of the most important places of business in the city. The maximum minute in the morning was that from 8.52 to 8.53, in which time 672 persons entered the buildings counted. In the afternoon the peak came from 4.31 to 4.32, when 689 persons were counted leaving these buildings. A secondary peak occurred in the afternoon from 5.03 to 5.04, with 472 persons counted.

WASHINGTON HAS PECULIAR RAILWAY PEAKS

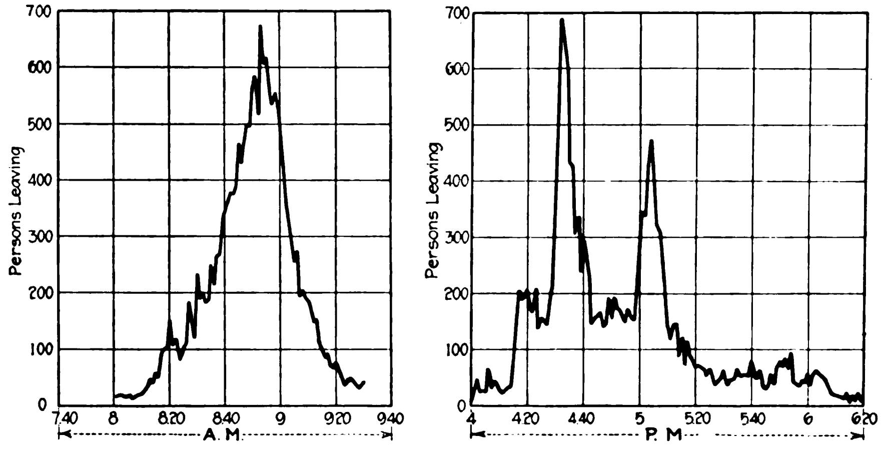
Counts made of the number of street car passengers, summarized in the curve in Fig. 6, show the morning peak inbound to be more than 25 per cent higher than the evening peak. It reaches its pinnacle with the cars due downtown slightly prior to 9 a.m., or in time for passengers to reach their offices at this time.

On the other hand, the afternoon peak of street car traffic is very different and much less severe. The peaks shown in Fig. 5 for persons leaving the buildings do not reappear in Fig. 6 for street car traffic. In the latter there is no sharp pinnacle. This is because the people do not all go home at once. The same is true of those who walk home after work, as may be seen in the chart of pedestrians leaving the downtown district (Fig. 2).

These peak loads, Mr. Beeler remarks, are different from those found in most other cities. Usually the morning peak occurs earlier and is not so sharp as in the evening. In Washington the reverse is true. It is much easier to care for a high evening peak, as the hours of the conductors and motormen can be so arranged as to permit the day runs to overlap the evening runs. With the high morning peak no such opportunity exists.

In order to provide for the tremendous morning load, the electric railway systems have found it necessary to work their resources to the limit. Were all the people shown in Fig. 3 to ride, the morning-peak problem would be even worse than it is. Each block of 1000 people would require about twelve street cars, each carrying eighty persons. To carry the entire load would therefore mean the operation of the cars so that 720 would arrive downtown just prior to 9 a.m. This is clearly an impossibility. If but half this number desired to ride, 360 cars would be required.

The greatest number of cars now arriving downtown in the morning by fifteen-minute periods is recorded between 8.30 and 8.45 a.m., when 161 cars are due. The normal number of cars required during the non-rush hour is at present less than eighty for each fifteen-minute period of the daily operation of the companies.



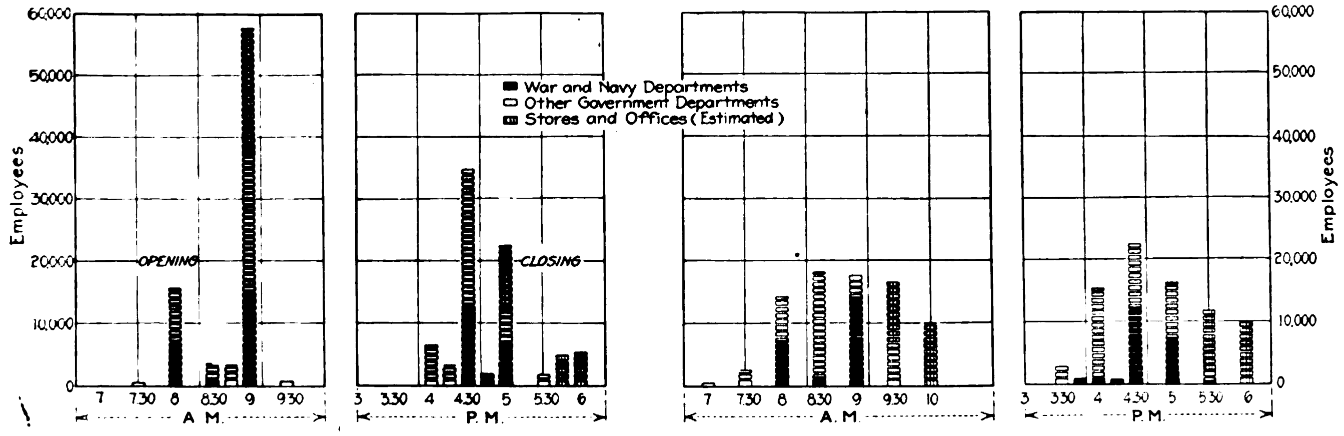
Total persons, 18,831 Total persons, 18,283

FIGS. 4 AND 5—COMPOSITE COUNT OF PERSONS ENTERING EIGHTEEN AND LEAVING NINETEEN PLACES OF EMPLOYMENT IN CONGESTED DISTRICT

Even with the lower and flatter evening peak both companies in Washington run more cars then, than during the morning peak. The maximum number of cars scheduled to operate during the rush hours are as follows:

	Cars Scheduled	
	A.M. Rush Hour	P.M. Rush Hour
Washington Railway & Electric Company...	298	354
Capital Traction Company................	217	231
Total..............................	515	585

These figures represent the schedule requirements, but frequently both companies fall below in the actual number of cars operated, the reason being the shortage of men. During the winter this has been occasioned largely on account of sickness.



Actual Hours on Jan. 1, 1918 Proposed Hours

FIGS. 3 AND 7—OPENING AND CLOSING HOURS IN GOVERNMENT DEPARTMENTS, STORES AND OFFICES

In order to alleviate existing conditions Mr. Beeler made a study to determine to what extent the usefulness of the electric railway facilities could be enlarged and employed to better advantage by a change of the hours of opening various offices, so that the employees would not all desire transportation at once. If the sharp morning peak could be modified, it appeared certain that the afternoon peak would be similarly changed. There would be little likelihood of congestion arising from any reasonable hour of closing the various offices, unless too great a number were set to close at a later hour.

Another point kept in mind was the fact that the hours of various buildings in the same territory must be changed so that the loads on the cars do not coincide. Otherwise the hours might be changed so that the totals would appear well balanced, while in reality the congestion at certain localities might be worse than before. These factors in a large measure dictated the proposed hours of opening.

Furthermore, it was realized that groups of offices having business in common should be accorded the same working hours as far as possible. For this reason it was not considered generally desirable to split the hours for the employees in a single building. Finally, since changes generally are disapproved by those with firmly established habits, the modifications in hours proposed were reduced to a minimum consistent with the purpose of obtaining the maximum degree of good service from the transportation system for the car rider.

In arranging the various proposed changes in opening hours, Mr. Beeler considered first the needs of the Army and the Navy. The United States is in the midst of the greatest war activity ever known. The Army and the Navy Departments have in hand all they should do without having any new problems raised for their consideration. For the present, at least, Mr. Beeler says, there need be no change in their hours, which are in fact already staggered to a greater extent than those of the other departments.

Since Washington is essentially a governmental city, other government business should rank second in importance. After the provision of a clear right-of-way for the Army and the Navy, the other departments should have their hours arranged so as to fit into the general scheme to permit a more even distribution of the opening and the closing hours, both the number of the employees and the locality of the buildings being considered. Some employees would be required to come earlier and some later than at present.

The private interests in Washington would be of third importance in fixing new opening hours. In Mr. Beeler's opinion, the private offices could readily open at 9.30 a.m. In fact, many of them are now opening after 9 a.m., and the change should not work hardship on anyone. All stores, including department stores (except those now opening at 8 a.m. or before), should be opened at 10 a.m. and closed at 6 p.m. This would enable the employees to ride both ways when there is plenty of room on the cars. It would give the employees a slightly shorter working day, and they in turn should become more efficient. For some people there might be less time for shopping, but there would be ample time for buying. Keeping the stores open until 6 p.m. would enable the government employees to do their shopping after hours and in more comfort than at present, as the time is quite limited.

At present little or no business is transacted in the stores prior to 10 a.m. The change in hours would undoubtedly prove beneficial to the proprietors, employees and the public. The big stores, Mr. Beeler says, have expressed a willingness to co-operate and have shown a most commendable spirit to further the efforts of the Public Utilities Commission in every way in the solution of this problem.

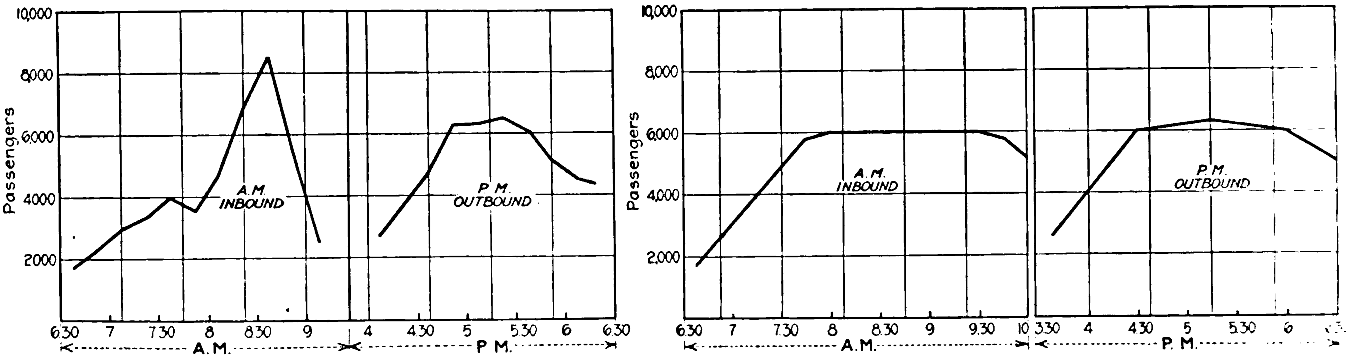
The high schools, which open at 9 a.m., add a considerable burden to the transportation system. They could be set back to 9.30 without difficulty, as the day is comparatively short, and the students are home before the evening rush begins. Other educational institutions do not in any considerable degree affect the morning peak.

The hours proposed for each of the government offices are shown in Mr. Beeler's report in detailed exhibits, which give respectively the times for opening and closing each office, and the number of employees involved. In general, the hour of opening has been advanced from thirty minutes to one hour, and the closing hour similarly changed. A brief summary of the new opening hours is as follows:

Government offices, non-war activities	8 00–8 30 a.m. and 9 30 a.m.
Government offices, war activities	9 00 a.m.
Private offices	9 30 a.m.
High schools	9 30 a.m.
Stores (except those now opening prior to 8.30 a.m.)	10 00 a.m.

A summary of the recommended changes in hours for the various government departments is shown in Table I, and the percentages of the employees affected are presented in Table II. The latter table shows that out of a total of 68,107 government employees, 42,870 or 63 per cent have their hours unchanged. Of the remaining 25,237, 4.4 per cent have their hours placed fifteen minutes ahead and 21.4 per cent thirty minutes earlier. Only 2.2 per cent have their working day as much as one hour earlier. The number whose hours are thirty minutes later is 9 per cent of the total.

The private offices being set back thirty minutes will take 10,000 persons off the 9 a.m. peak, and the stores similarly being changed to 10 a.m. will remove an additional 10,000 from the rush hour. The high schools, while contributing a relatively small number, do add considerably to the overloading and can materially aid the situation and benefit themselves by changing the opening hour to 9.30 a.m.



Present Peaks

Proposed Peaks

FIGS. 6 AND 8—ELECTRIC RAILWAY LOAD CURVES UNDER PRESENT CONDITIONS AND UNDER PROPOSED CHANGES IN OPENING HOURS OF BUSINESS

BETTER SERVICE AND LESS DYSPEPSIA

These proposed changes in working hours, Mr. Beeler believes, will result in a material improvement in the appearance of the load curves. Fig. 7 indicates how the load will be spread out provided these changes are adopted and become effective. The blocks are here stacked in several piles, and the danger of falling over is greatly lessened.

The probable resulting load that will come to the traction lines is forecast in Fig. 8. It is readily seen that the companies should not only be enabled to handle in comfort thousands who are now compelled to walk, but that seats will be available through both the morning and the evening rush hours for a much greater

TABLE I.—SUMMARY OF RECOMMENDED CHANGES IN GOVERNMENT OPENING HOURS IN WASHINGTON

Department	Opening From	Changed To	Number of Minutes Advanced	Number of Minutes Put Back	Number of Employees
Agriculture	9.00	8.30	30	..	3,143
Civil Service Commission	9.00	8.30	30	..	450
Commerce	8.45	8.30	15	..	600
District Building	9.00	8.30	30	..	1,000
Engraving, Bureau of	8.00	7.30	30	.	2,500
Food Administration	9.00	8.30	30	..	1,100
Fuel Administration	9.00	9.30	..	30	450
Interstate Commerce Commission	9.00	9.30	..	30	830
Interior	8.45	8.30	15	..	2,328
Labor	9.00	8.00	60	..	450
National War Savings Commission	9.00	9.30	..	30	120
National Defense, Council of	9.00	9.30	..	30	1,000
Patent Office	9.00	8.30	30	..	984
Pensions, Bureau of	9.00	9.30	..	30	963
Post Office Department	9.00	8.30	30	..	1,833
Public Information, Commission on	9.00	9.30	..	30	150
Reclamation Service	8.45	8.30	15	..	81
Red Cross, American	9.00	8.30	30	..	711
State	9.00	8.30	30	..	300
Trade Commission, Federal	9.00	8.30	30	..	400
Treasury	9.00	9.30	..	30	2,672
War Department, Army Medical Museum	9.00	8.30	30	..	140
War Department, Auditor	9.00	8.30	30	..	350
War Risk Insurance	9.00	8.00	60	..	1,050
War Risk Insurance	9.00	8.30	30	..	500
War Trade Board	9.00	8.30	30	..	1,100
Weather Bureau	9.00	8.30	30	..	32

proportion of the total passengers than ever before possible. There will be less danger of delay to the service, and hence less need for tardiness.

The spread in hours has been made sufficient for the cars to take down one load, return to the outer terminals and take down another. This can be repeated a number of times on practically all of the city lines. Short-line cars, or those which only run a portion of the way to the outer terminal, can also be used to better advantage. With the faster schedules possible by the use of the skip stop, the same number of cars now used will give a much improved service.

The time-tables will, of course, have to be readjusted to fit the new conditions. It should be possible, it is said, to rearrange the hours of work for the conductors and motormen so that they, too, will share in the benefit of the change in office hours. Since the cars will be in service longer during the rush hour, there should be fewer "trippers" and "split runs." This will remove one of the sources of complaint of the men.

An incidental advantage of the staggering of hours will be a more uniform distribution of the load on the power plants, which will permit more economical use of coal. The line voltage will be maintained more readily, which should insure an even operating speed throughout all periods of the day.

Suburbanites should be especially benefited by the improved car service. A regularity of headway on the long lines will be especially helpful instead of the flocks of cars which are now run in an effort to care for the excessive peak. This should result in opening up suburban territory to a larger number of workers, including those who are boarding, and so relieve the congestion of the downtown districts.

TABLE II.—PERCENTAGE OF WASHINGTON EMPLOYERS AFFECTED BY PROPOSED OPENING HOURS

	Number	Per Cent
Government employees with hours unchanged	42,870	62.9
Government employees with hours advanced fifteen minutes	3,009	4.4
Government employees with hours advanced thirty minutes	14,543	21.4
Government employees with hours advanced sixty minutes	1,500	2.2
Government employees with hours set back thirty minutes	6,185	9.1
Total of government employees with changed hours	25,237	37.1
Total government employees	68,107	100.0
Private offices set back thirty minutes	10,000	....
Private stores set back thirty minutes	10,000	....
Total employees considered	88,107	

The noon hour for lunch should be moved ahead or back to correspond with the opening hour. This will tend to spread out the peak load in the restaurants, so that conditions of crowding should not be so serious as at present. This should result in better service, less dyspepsia, and hence more efficient work for the government.

In short, Mr. Beeler avers, this staggering of the hours should be of great advantage to all business interests and the car riders themselves. The present tremendous crush that now occurs daily, due to nearly everyone in the city trying to observe the same hours, affects the entire commercial life of the community more or less. There is no really valid reason why anyone should insist on its continuance except that it is a long-established custom and difficult to change.

NEW OFFICE BUILDINGS SHOULD BE OUTSIDE

In conclusion Mr. Beeler mentioned the fact that the government is now building in Potomac Park two office buildings which will hold 15,000 employees. An extensive rerouting of the lines of both companies in Washington may be necessary to provide satisfactory transportation to this section. The hours for opening and closing for the new employees will also have considerable bearing upon the subject. This tremendous new development presents an acute problem which will be made the subject of a future section of this report.

If still further additions to the government offices are made, however, Mr. Beeler thinks that it would be well to consider locations near the outer ends of some of the existing car lines now operating a good, heavy service. This would at once render available a large amount of transportation facilities now idle, both during the opening and the closing hours. The cars are only very lightly loaded in the reverse direction of travel both morning and evening. This new traffic, being in the reverse direction, would make possible the utilization of the available capacity which is now wasted.

U. S. Chamber of Commerce Backs Peak-Flattening Movement

IN A BULLETIN issued recently by the Chamber of Commerce of the United States communities in which shipyards are located are urged to co-operate with the local electric railways in getting the shipbuilders to and from their work. The bulletin states:

"Of capital importance also is the question of carrying workmen to and from their work. The car lines in many communities are unable to meet the extra load which the influx of thousands of workers has put upon them. Some communities have had to solve the problem by changing the local business schedules by opening stores and offices a half hour later in order to have two peak loads and so give the workmen a rush hour of their own each morning."

Another very practical suggestion is that representative men of the communities "sit in" with the shipbuilders once a week and actually go over the problems of the latter to find out just how help can be given and then to give that help most urgently needed.

Boston Elevated Maintenance Practice Discussed by Officials

At Hearings Before Massachusetts Public Service Commission M. C. Brush, John Lindall and H. B. Potter Explain the Difficulties Involved in the Upkeep of Equipment Under Present Conditions

AN EXTENDED discussion of the operating and maintenance practices of the Boston Elevated Railway was recently begun before the Massachusetts Public Service Commission, which is reviewing the report of John A. Beeler to the board upon the company's methods, submitted in November, 1917. Before the hearings are concluded the commission expects to make a thorough inquiry into the possibility of effecting increased economies in operation, service improvements, etc., along the lines recommended in the report. The hearings are being attended by President M. C. Brush and department heads of the company.

POSSIBLE PAINTING SCHEDULE WILL NOT MEET REQUIREMENTS

The painting of semi-convertible cars was the first topic discussed. President Brush conceded that these cars have been insufficiently painted, but pointed out that they are in practically constant service and that the company lacks funds with which to paint rolling stock at the desirable intervals. From 40 to 50 per cent of these cars are stored out of doors, as the carhouses are not, in general, suitable to accommodate cars of these sizes. The posts and columns are usually suited to 25-ft. body cars of the type formerly standard on the system. Some rebuilding has been done, but at great expense.

The facilities for painting are limited, also, space being available for but forty-eight cars in the several paint shops at any one time. The cars are now being painted on an average of once in three years, taking the road as a whole. Mr. Brush favored an annual painting, where possible. In the East Boston tunnel the severe grades impose heavy use of brakeshoes, and the dust covers the outsides of the bodies to such an extent that after a month or six weeks, the cars do not show the benefits of painting. It has been necessary to paint the roofs of steel elevated cars yearly on account of the thin material used. The demand for rolling stock has been so great on the system that painting has had to be postponed in many instances, wholly apart from the physical needs of the cars. In addition to all of this, experienced painters have been extremely difficult to obtain, under the present labor conditions.

John Lindall, superintendent of rolling stock and shops, testified that the time required to paint a car averages from seventeen to twenty days, depending upon the condition of the seat mechanism and other body repairs which are undertaken during withdrawal from service for painting.

Mr. Brush said that detailed plans have been made by Mr. Lindall for a centralized modern repair shop plant in the Everett district, to supersede the existing scattered repair shops and to permit the work to be done at maximum efficiency. The raising of the money for the shops, however, is a problem. The company purchased a suitable site in connection with its right-of-way for the Everett elevated extension. All surface car and rapid transit line rolling stock repairs would be concentrated at this point.

Regarding the failure of cars in the recent extremely cold period. Mr. Brush said that the Boston company was in exactly the same position as other roads. It was impossible to get armatures fast enough to replace those which went out of commission. Seventy-four additional winders were employed at the Albany Street shops and the output was increased from a normal of seventy armatures wound per week to 166. The centralized shops would permit the simultaneous overhauling of bodies, motors and trucks, which is not at present feasible in view of the separation of shops for different classes of work at Boston. Mr. Brush said it is impossible to estimate accurately the amount which will be required for maintenance and reconstruction in any particular year because of the uncertainties which arise in railroading. Thus, in track and roadway, the sudden decision of a municipality to perform work on streets may throw a heavy and unexpected burden upon the operating company in connection with maintenance.

Mr. Lindall said that thorough inspection is done upon the semi-convertible surface cars on a basis of 800 miles operation. The mileage system of inspection has been in vogue at Boston since 1905. The company has made arrangements with the General Electric Company for the replacement of 100 GE-202 motors which have proved expensive to maintain; and has been delayed in spite of priority orders in securing the new type of motors expected under the replacement order. Most of the semi-convertible cars of the company are operated eighteen hours a day and every day in the year except Sundays.

MR. BRUSH DOES NOT FAVOR PUTTING MOTORS ON PRESENT TRAILERS

Regarding Mr. Beeler's recommendation that the company's 175 stepless, center-entrance trailers be modified and equipped as motor cars for all-day service, Mr. Brush said that this would be impracticable. These cars cost between $3,000 and $3,500, according to Mr. Lindall's recollection, and to equip them with motors would be very expensive. The trailers were designed for lightweight service during rush hours, and it is believed that the cars are the lightest per seat in the country. The company needs more trailers, in Mr. Brush's opinion. With their operation the public has been greatly pleased. New trucks would be required if the trailers were motorized, with new air-brake equipment, new control, reinforced underframing, changes in the hand-brake rigging, lining of the underside of the car with metal, construction of a cab on each end, with respacing of seats, rewiring, repiping and other changes which would cost $5,000 or $6,000.

These trailers, if equipped with motors, would not be strong enough to pull another trailer, while to make this change would take at least eighteen months. They are useful as trailers because 13 per cent of the company's traffic is handled between 7 and 9 a.m., and 26 per cent between 4.30 and 6.30 p.m. The additional weight of the equipment with motor-car service would undoubtedly shorten the life of the car, the weight increase being estimated at 9 tons, from a present weight of 13 tons. Mr. Brush said that if he had the funds for new equipment he would appeal to the Electric Railway War Board for priority deliveries, and expected that he would receive them in view of the recently expressed opinions of President Wilson and Secretary McAdoo upon the essentiality of public utilities. Mr. Lindall stated at this point that deliveries are now nine to twelve months on trail cars and eighteen to twenty-four months on motor cars.

NEW EQUIPMENT BEST FOR TRAIN OPERATION

Mr. Brush said that the company is paying 50 to 100 per cent more on practically all supplies and equipment than a few years ago. Brakeshoes have advanced 263 per cent. The estimated cost of equipping present semi-convertible cars for multiple-unit operation is from $2,500 to $3,000. Mr. Brush disapproved of the utilizing of the semi-convertible car in train service, running a two-entrance car with one man.

H. B. Potter, assistant to President Brush, said that he knew of no case where in two-car train operation the conductor of the forward car controls the operation of the rear door of the forward car and the front door of the second car. In general, the company favors the purchase of complete new equipment for train operation rather than the attempt to operate older types of semi-convertible cars in trains. In view of motor difficulties on the company's No. 3 semi-convertible cars, it had been suggested that the gear ratio be changed to reduce the maximum speed and reduce thereby the burden upon the motors, but the replacement of older-type motors with more modern equipment appears the better solution.

Mr. Potter said that the company's policy is in the direction of increasing the maximum speed of cars rather than the reverse, in order to render better service. The cost of changing the gear ratio might run from $250 per car against from $2,500 to $3,000 per car for new four-motor equipment, but the improved service of the later motors justifies the greater outlay. The company feels that it is cheaper to buy 100 new motors than to maintain the old ones (GE-202's). The manufacturers make an allowance per motor in the case of these older units which entered service about ten years ago, at the beginning of interpole motor design.

CARS INSPECTED EVERY 1000 MILES OR LESS

Cars on the rapid transit lines are divided into six lists for inspection, making a weekly inspection of such rolling stock. An investigation of the mileage of cars between inspections showed that the average was 707 miles per week; sixty-two cars averaged 850 miles each; thirty-one cars 950 miles; fourteen cars 1050 miles; three cars 1150 miles. It appeared doubtful if any cars ran as high as 2000 miles between inspections. An investigation was also made of pull-ins for defects which exceeded the average mileage, and it was found that cars pulled in were not in every respect cars which had been simply out a longer time than the others. A casual inspection is made of every car nightly. Inspection on a mileage basis is less practicable on the rapid-transit lines on account of the frequent shifting of cars in train make-ups, and temporary and special movements. The surface cars are inspected on a mileage basis, this being more easily arranged in view of the close control of car units there practised, including restricted schedules of service. The daily inspection includes an examination of equipment for condition of brakes, loose parts, condition of doors, seats, etc.

Wisconsin Convention Discusses Operating Problems

Metal Electrode Welding, Increasing Hydroelectric Plant Efficiency and Solution of War Problems Are Leading Topics—New Officers Elected

THE program of the first day's session of the convention of the Wisconsin Electrical Association at Milwaukee, held on March 27 and 28, included papers devoted mainly to rates and rate increases. The "War Convention Banquet" was held on the evening of the 27th and, aside from the menu, was devoted entirely to subjects concerning the great world conflict. The attendance at both the convention and the banquet was approximately that of previous years.

On the second day all papers except that of M. C. Ewing of Wausau dealt with operating problems. Dean Treat, manager of the Wisconsin Light & Power Company, LaCrosse, Wis., read a paper on "Metal Electrode Welding." Mr. Treat pointed out the many advantages and savings made possible by the use of electric welding both in track work and in the shop. Following this paper was a general discussion of railway problems during which the various speakers expressed themselves as being in favor of one-man operation, a charge for transfer and a reduction in taxes rather than a 6-cent fare. An abstract of Mr. Treat's paper appears elsewhere in this issue.

An illustrated talk on "Increasing the Efficiency of Hydroelectric Plants" was made by Daniel W. Mead, consulting engineer of Madison. George E. Wagner, superintendent of plant, Madison Gas & Electric Company, Madison, Wis., then gave an illustrated talk on "Three-Phase Four-Wire Distribution," pointing out the advantages of this system as compared with the ordinary 2300-volt delta-connected system.

M. C. Ewing, secretary-treasurer of the Wisconsin Valley Electric Company, Wausau, then delivered a paper on "Utilities and the War." He pointed out that the war found the railways bound by such laws that their rates could not be increased like those of private industrial companies, that economies could no longer provide the necessary revenue and that increases were essential. Emphasis was placed upon the need of closer co-operation between electric railway employers and employees and upon the fact that extensions should

Preventing Spontaneous Combustion of Coal in Storage

Knowledge of Fundamental Principles Is Necessary If Waste in the Pile Is To Be Prevented —Facts to Keep in Mind

AS MANY electric railways are planning to store as much coal this summer as they can obtain some suggestions just issued by the United States Bureau of Mines on the subject of spontaneous combustion of coal will be of immediate value. The bureau confines attention to the technical aspects of the problem, believing that the wisdom of establishing large storage piles is a matter to be determined from the facts in each case.

It is recommended that coal be stored in small quantities as near to the point of consumption as possible so as to avoid rehandling, extra transportation and the degradation of size which follows each rehandling.

If large storage piles are necessary these facts should be kept in mind: (1) The generation of heat is the result of slow oxidation of the coal surface. (2) This oxidation is much more rapid from freshly mined coal or from freshly broken surfaces. (3) The oxidation rate increases rapidly with increased temperature. (4) Different coals have different oxidizing rates.

LOW OXIDIZING RATES DESIRABLE

Where there is a choice of coal the bureau recommends that coal of the lowest oxidizing rates should be chosen, if known. Between two coals, that which is least friable should be selected and it should be so handled as to produce the least freshly broken surface. The coal should be as cool as possible when piled, it should be kept away from extraneous source of heat, and alternate wetting and drying during piling should be avoided.

As it is the fine coal or slack that furnishes the largest coal surface in the pile, lump coal should be piled where possible, the fine coal being removed and used immediately. Although there is a difference of opinion as to the effect on spontaneous combustion of the sulphur content in coal and of the piling of dissimilar coals together, it will be safer to use a low sulphur coal where possible and put only one kind of coal in a pile. In addition to these precautions the ground on which a coal pile is built should be dry.

Other suggestions made by the bureau are these: Coal piles should be well ventilated and the surfaces of the piles should be exposed to allow them to cool. If the latter is impossible air circulation within the pile should be restricted. Where good ventilation, such as is provided by piling lump coal, is not to be obtained, it is desirable to approximate the condition which would exist in airtight bins. For this purpose, in making a coal pile of mixed sizes, the coal should be so handled as to make a homogeneous pile and prevent the segregation of coarse and fine coal. It is common practice to limit the height of coal piles, first because the lower layers are crushed in a very high pile, second, because the larger the pile the smaller proportionately is the area of the heat dissipating surface. Twelve feet is a common limit of height.

RECOMMENDATIONS FOR TEMPERATURE CONTROL

Whatever precautions are taken in piling coal provision should be made for keeping track of temperature rise and for rapid rehandling of portions of a pile in case of excessive heating. The bureau recommends that half-inch iron pipes be driven vertically into the pile 15 or 20 ft. apart. Into these pipes a maximum thermometer can be lowered to different depths to indicate the temperature of the pile opposite the thermometer.

A survey of the pile and of the temperature of all parts of the pile should be made twice each week during the first three months after the pile is made, and once a week thereafter until it evidently has ceased to heat. As soon as any portion reaches a temperature of 150 deg. Fahr. provision should be made for removing that portion, but actual removal need not begin until the temperature has reached 180 deg. The object of rehandling the coal is to allow it to cool below a dangerous temperature. Any method of rehandling which does not allow of cooling will always transfer the difficulty from the old pile to the new one, and it is generally useless to employ water in any attempt to cool a coal pile.

(Concluded from page 661)

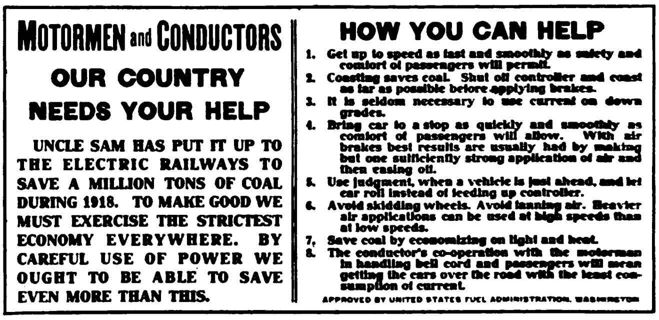
wait, but that maintenance must be kept at its highest efficiency.

L. M. Burch, president of the Electrical Supply Company, Madison, presented an explanation of the aims and purposes of the new association of Wisconsin electrical and contractors and dealers and solicited the cooperation of the electric utility executives in carrying out the plan. The committee on resolutions passed a resolution supporting President Wilson and the country at war.

The officers elected for the ensuing year were: President, John St. John, Madison; first vice-president, Raymond H. Smith, Oshkosh; second vice-president, W. C. Lownsberry; third vice-president, B. O. Watertown; secretary, A. P. Pulliam, Green Bay.

Trainmen's Poster Revised

THE United Railways & Electric Company of Baltimore has rearranged the "Motorman and Conductor" poster, issued by the National Fuel Administration.



MOTORMEN and CONDUCTORS

OUR COUNTRY NEEDS YOUR HELP

UNCLE SAM HAS PUT IT UP TO THE ELECTRIC RAILWAYS TO SAVE A MILLION TONS OF COAL DURING 1918. TO MAKE GOOD WE MUST EXERCISE THE STRICTEST ECONOMY EVERYWHERE. BY CAREFUL USE OF POWER WE OUGHT TO BE ABLE TO SAVE EVEN MORE THAN THIS.

HOW YOU CAN HELP

1. Get up to speed as fast and smoothly as safety and comfort of passengers will permit.
2. Coasting saves coal. Shut off controller and coast as far as possible before applying brakes.
3. It is seldom necessary to use current on down grades.
4. Bring car to a stop as quickly and smoothly as comfort of passengers will allow. With air brakes best results are usually had by making but one sufficiently strong application of air and then easing off.
5. Use judgment, when a vehicle is just ahead, and let car roll instead of feeding up controller.
6. Avoid skidding wheels. Avoid fanning air. Heavier air applications can be used at high speeds than at low speeds.
7. Save coal by economizing on light and heat.
8. The conductor's co-operation with the motorman in handling bell cord and passengers will mean getting the cars over the road with the least consumption of current.

APPROVED BY UNITED STATES FUEL ADMINISTRATION, WASHINGTON

TRAINMEN'S POSTER USED IN BALTIMORE

The revised form, which is on a card 6 in. high by 12 in. wide, is reproduced herewith. It is thought that the modifications improve the wording. The card is printed in red and blue inks and is designed for being posted in the motorman's cab.

Springfield (Mass.) to Have Zone Fares

Massachusetts Commission Recommends Two Five-cent Zones for Springfield, with Lower Fares When Tickets Are Purchased —Copper Zone System for Palmer and Westfield Districts

THE Massachusetts Public Service Commission on March 30 approved the establishment of a zone system on the Springfield Street Railway, modified, however, from the plan proposed by the company. The commission held that the company's zone plan provided for too abrupt an increase in placing the fare at 5 cents in the central urban area and at 10 cents to the adjoining zone points, without any intermediate gradations. For this reason it suggested special reduced-rate tickets for travel in the two zones. The company's application was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 4, 1917.

The commission recommended that the company take the following steps for the Springfield division:

1. Establish an inner zone, with the limits proposed in the schedule filed by the company.
2. Provide for a uniform cash fare of 5 cents in the inner zone, with free transfer privileges, and for a similar cash fare of 5 cents in the outer zone.
3. Provide for the sale of six tickets for 40 cents, or at the rate of 6⅔ cents each, good between any point in the inner zone and any point in the outer zone which is not more than 5 miles by rail from Court Square, Springfield. This will take in most of the city of Chicopee and Chicopee Falls, East Longmeadow, Longmeadow and Agawam, and the major portion of West Springfield, which is not within the inner zone. The limit for these tickets on each line need not be fixed at precisely the 5-mile mark, but may be placed, with the commission's approval, at any natural point of division which approximates that distance. Adjustment should be made on the lines to Chicopee Falls, which reach the same destination by routes of varying length, so that the fares to the common point shall in all cases be on the 6⅔-cent basis.
4. Provide for the sale of six tickets for 50 cents, or at the rate of 8⅓ cents each, good between any point in the inner zone and any point in the outer zone which is beyond the approximate 5-mile limit in which the 6⅔-cent tickets can be used.

For the Westfield and the Palmer divisions, the commission recommended the establishment of the copper-zone system upon the basis of a straight rate of 2 cents a mile, with a minimum charge of 6 cents for any ride covering not more than three zones and a uniform local fare of 6 cents in the heart of Westfield.

The company was organized as a horse railway in 1868. In the early days the cash fare was 8 cents, sixteen tickets being sold for $1. With the beginning of electrical operation in 1890 the fare was cut to 5 cents, with no reduced rate tickets. The company now owns and operates 187.5 miles of city, interurban and rural track. The Springfield division includes all of that city and the adjacent area within the present 5-cent fare limits, including the lines in the city of Chicopee. The Westfield division connects at West Springfield, its main line extending through Westfield and Russell into Huntington, and including the local lines in Westfield. The Palmer division connects on the east at Indian Orchard and takes in the local lines in Palmer, Monson and Ware, its main line extending through Wilbraham and Palmer into Brimfield. The distance by rail from the eastern to the western limits of the system is about 50 miles. Interurban service is also shared with other companies to and from the cities of Holyoke and Worcester, Mass., and Hartford, Conn.

The old 5-cent fare area (Springfield division) totaled 61.5 square miles, the longest direct ride being 8.37 miles. The company proposed to divide this 5-cent area into two separate zones. The limits of the inner zone were fixed at points varying from 2.3 to 3.6 miles from Court Square, and the included area of the inner zone was 18.6 square miles. The following table shows the distance in miles from Court Square to the various outlying points, and the portions of the distance to be included, in each case, within the inner and the outer zones:

Route from Court Square to:	Miles in Inner Zone	Miles in Outer Zone	Total
Chicopee Junction via Brightwood	2.309	1.953	4.262
Market Square, Chicopee, via Glenwood	2.807	1.328	4.135
Chicopee Falls via Liberty Street	3.155	1.440	4.595
Chicopee Falls via East Springfield	3.653	2.016	5.669
Ludlow	3.201	5.170	8.371
Wilbraham Town Line	3.201	4.314	7.515
East Longmeadow	3.155	1.926	5.081
Longmeadow	2.874	3.262	6.136
Agawam-Connecticut State Line	3.416	4.343	7.759
Agawam-Feeding Hills	3.416	4.378	7.794
Westfield Town Line	3.324	2.911	6.235
Holyoke City Line	3.504	2.758	6.262

Under the company's plan the limits of the outer zone would in all cases coincide with the present 5-cent fare limits, except on the Westfield line, where 1.3 miles would be added by extending the limit in West Springfield from Tatham to the Westfield boundary. On the lines to Chicopee, tickets would have been sold at the rate of 8 cents each, good to and from points in the inner zone in lieu of a 10-cent cash fare; but no similar privilege would have been given, under the new schedule as filed, on any of the other lines.

In the Palmer division there were twenty-two overlapping zones, varying from 7.42 miles to 1.70 miles in length and averaging 5.09 miles, in each of which the fare was 5 cents. The company proposed to eliminate all overlaps and introduce two new limits in Palmer, so that there would be thirteen separate zones, varying from 6.54 to 1.70 miles and averaging 3.82 miles in length, in each of which the fare would be 6 cents

In the Westfield division, to disregard certain short local lines in the thickly-settled portion of Westfield, there were thirteen zones, varying from 9.09 miles to 1.05 miles in length and averaging 4.14 miles, in each of which the fare was 5 cents. The company proposed to eliminate certain overlaps and to reduce the length of the first zone out of Westfield on the line to Springfield, so that there would be ten zones, varying from 7.79 to 1.05 miles and averaging 3.78 miles in length, in each of which a 6-cent fare would be charged.

In the opinion of the commission, the abolition of the overlaps in the Westfield and Palmer divisions would have undesirable results. In a few cases the fare would rise from 5 to 18 cents; in others, from 5 to

12 cents. Such increases, the board said, would be greatly resented by the population served and would lead to much walking or possible jitney patronage.

The commission concluded that the copper-zone system is far better adapted to these divisions. While such a system is still in the experimental stage, the outlook is promising. The commission stated that it could not determine the effects upon revenue, but suggested that new tariffs based upon 2 cents per mile be adopted. The average charge per mile for through traffic on the interurban line between Springfield and Brimfield would then be higher than the 1.74 cents proposed by the company, and on the Westfield-Huntington line there would also be some increase. On the other hand, the mileage plan would reduce the charge for many local rides, especially in Palmer, but less falling off in riding should be expected.

The commission held, however, that the town of Westfield is large enough to receive a uniform fare with free transfer privileges in a reasonably limited territory. It would be difficult to apply a mileage plan to the short local lines within the town. The commission recommended, therefore, that Westfield be given a uniform local fare of 6 cents, covering all short lines in the thickly settled district. Provision should be made in the tariff so that, in journeys between points in the Springfield division or the Westfield 6-cent zone and points in mileage territory, the minimum fare should not apply in the latter. Thus, in riding from a point in the center of Westfield to a point in the first mileage zone on the Huntington line, the fare should be 8 cents, instead of 6 cents plus the minimum mileage fare of 6 cents.

EASIEST FARE SYSTEM NOT ALWAYS THE BEST

In discussing the company's proposed inner and outer 5-cent zones for the Springfield division, the commission mentioned the argument of protestants that the suburban territory had been built up under the uniform fare system, with the understanding that this system was not likely to be disturbed, and that a departure from this system would be unjust and prejudicial to the inhabitants and especially to the owners of real estate. The fear that a zone system would have any substantial influence upon land values in these districts is not, the commission said, well-founded. But even if it should have such an effect, it is no doubt a fact that the extension of electric railway lines into this territory materially increased these values in the past, and that land owners enjoyed and profited by this unearned increment. If they should be deprived of some slight measure of this increment by an attempt to apportion the mounting cost of electric railway service more nearly in accordance with the service furnished, they would have no reasonable ground of complaint. There has, in this instance, been no contract that fares would continue for any period of time upon the uniform basis, such as has existed in the Boston district.

The substitution of a 6-cent fare for the present 5-cent fare in the Springfield division would undoubtedly be the easiest and simplest method of dealing with the situation, and it is quite possible that it might meet with less open and immediate criticism than any other. It is also true that there are difficulties in the application of a zone system, and that no practicable system of fares can be devised which will be entirely free from inconsistencies or minor discriminations. The easiest way is not always the best, and experience has shown clearly that there are serious objections to a straight increase in fare in urban territory, such as is included within the Springfield division.

Continuing, the commission said:

"Experience has seemed to demonstrate, and electric railway managers are very generally of the opinion, that an increase from 5 to 6 cents discourages short-haul riding, encourages competition and appreciably diminishes the kind of traffic which it is particularly desirable to attract. The importance to the public, as well as to the company, of doing everything that can be done to hold and increase this short-haul business is obvious. The best means of developing it is, clearly, to retain a low minimum fare. If a straight raise to 6 cents were made, and results did not prove satisfactory, the next step would be a 7-cent fare, which would have an even more unfavorable effect upon short-haul traffic. On the other hand, a 5-cent fare is convenient and popular, encourages riding and is an excellent weapon with which to meet jitney competition.

"The short-haul rider has been discriminated against, up to the present. A 5-cent fare is ample, in urban territory, to cover the cost of service, and if a readjustment should be made which would retain that fare for the shorter distances and require the long-haul rider to pay a charge more nearly proportional to the cost of carrying him, certainly no injustice would be done. Under the circumstances the commission is of the present opinion that some form of 'zone system' will, on the whole, produce better results for the community than the adoption of a uniform 6-cent fare. We realize the practical difficulties in the application and the operation of such a system. Experience as yet is so limited that no one can positively affirm that expectations will be realized. The theoretical advantages, however, warrant us in feeling that the experiments should be tried."

GRADATION OF FARES NEEDED BETWEEN ZONES

The plan contained in the schedule filed by the company was considered objectionable, however, for two reasons. In the first place, if the estimate of the company is correct, its plan would produce substantially more revenue than the amount shown to be reasonably required. The estimate is $477,762, and this was based on the traffic in the year ended June 30, 1916. For the calendar year 1917, the amount is increased to nearly $520,000—to be secured from the Springfield division. The commission's estimate of additional revenue required is $400,000 for the entire system. Of that $60,000 can be obtained from the outlying divisions. This makes the amount assessable against the Springfield division about $340,000.

In the second place, the board said, the zone plan proposed is not well considered. The fare jumps abruptly from 5 cents to 10 cents, without any intermediate gradations, creating the same undesirable conditions which led to the development of the overlapping zones in the Palmer and Westfield sections.

On the whole, the commission was not disposed, for the present, to disturb the inner zone limits as fixed by the company. Actual experience might develop valid reasons for making some adjustments in certain in-

Metal Electrode Welding*

How the Electric Welder Helped One Property to Keep Its Equipment in Repair

By Dean Treat
Manager Wisconsin Railway, Light & Power Company, La Crosse, Wis.

THREE important points in favor of this kind of welding are: (1) Direct current is easily available to railway operators; (2) only simple apparatus is used, and (3) various types of work are possible at a comparatively low cost. The type of machine selected by us consists of a four-wheeled hand-drawn set of resistors with circuit-breaker cables sufficient to secure proper electrical contacts. It can be operated by an ordinary track man without a great deal of instruction. The average time to weld 1 lb. of electrode is about fifteen minutes; the average cost of the current used, based on 1 cent per kilowatt-hour, is 15 cents, and of labor, based on 30 cents an hour is 7½ cents. This makes a total cost of 22½ cents per pound of melting.

Our first test made was the welding of plates on 80-lb. T-rail that was slightly battered at the joints due to working which had partially destroyed the concealed type of bonds. The plates were put on in the fall as a test and proved entirely satisfactory. The cost was about $4.50 per joint.

We have installed 230 pairs of these plates and after two winters not a joint failure has been found. Battered edges were built up and ground for a span of 9 in. on each side of the joint. On one stretch of track, 4000 ft. of 66-lb. rail had to be built up at practically every joint, ½ in. of metal being added in some cases. The special work in all parts of the city and badly worn railroad crossings were built up successfully, the former without removal or disturbing the paving, and apparently can be kept up until such time as defects develop that cannot be repaired by the electric welder. At one town on our system in 1916, electric welded plates were installed on a 70-lb. T-rail for about 3500 ft. during a concrete paving job, and they have proved entirely satisfactory, showing no breakage. We have also used the welder for repairing cupped joints and special work, car seat frames, gear and pinion seats, skids used during broken axle trouble, drawbar heads, motor casing breaks and gear cases. It has also been used for filling in worn-out holes in brake rigging and when plugging and redrilling axle bearings.

On two paving jobs welded plates on over a mile of single track were installed when the temperature was about 90 deg. Fahr. During this winter as low as 26 deg. below zero was recorded, giving a range of 116 deg. Fahr., yet not a single failure occurred at the joints or elsewhere in the rail section. From tests, over 150 per cent conductivity has been found at the joints and the joints are located with difficulty either with the eye or when riding over them in the cars.

Our costs for the welding of plates to serve as angle bars and bonds on 73-lb. T-rail were $4.73 per joint. On cupped joints the cost was from 25 cents to 75 cents per joint, although a very unsatisfactory hand grinder was used. On shop work repairs the cost was from 1 to 9 per cent of value of the article repaired.

In conjunction with the electric welder it is essential to have a satisfactory grinder to smooth the work and give it an even surface. The grinder first used by us did not prove entirely satisfactory due to the unequal hardness of the rail and the weld. There was a tendency for the adjoining portions of the rail to be worn away more than the weld. The experiment of grinding out the cup to make a gradual depression rather than of trying to build it up was tried and proved quite successful for a temporary arrangement.

A few tests have been made on 45-lb. T-rail in which the bolts were first tightened up, then the angle bars were welded to some of the bolts and also along the lower edge of the angle bar to the rail base. The cup at the joints was then built up and ground smooth. This work has passed through the winter entirely satisfactorily which would indicate that this rail can be kept in use until permanent paving is laid.

The sum of about 30 cents per day will pay for the overhead expense of an electric welder, and one railroad crossing saved will more than offset the expense of the machine for one year. Electrode welding has been rightly, though not completely, named "first aid to injured track and shop equipment."

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* Abstract of paper presented at meeting of Wisconsin Electrical Association, March 28, 1918.

(Concluded from page 664)

stances, it said, and the matter will be regarded as open for future consideration, without prejudice, after such experience has been secured.

In the case of the outer zone there are two different methods by which a gradation of fares can be established between the minimum and the maximum. Provision can be made for successive concentric sections, in each of which a small additional cash fare of 1 or 2 cents would be charged, or provision can be made for intermediate steps through the sale of tickets. The latter plan, which the commission recommended, has the advantage that it simplifies fare collections by eliminating the handling of pennies, and any person who rides with any frequency can easily obtain the advantage of the reduced rate. Those who ride very infrequently may prefer to pay the full cash fare rather than to invest in tickets. To the commission's mind, however, it is not unfair that riders of this class should be charged a higher rate, and by so doing the ticket rate can be kept lower than otherwise possible.

Operating economies, the commission thought, would be possible along certain lines, such as the prohibition of automobile parking in the congested territory; provision of safety zones and multiple-berth stops (the latter are now in use); increased street inspection, fewer stopping places, improved handling of cars, operation of turn-back cars, use of limited-stop cars, reduction of damages through improved operation, transfer changes and use of one-man car on some lines. The commission did not approve the suggestion of John P. Fox, the city's expert, that existing cars be quite generally operated by one man, by closing up the rear door and making other minor changes. In general, the commission favored the improved practises recommended by Prof. Albert S. Richey, Worcester, Mass., whose report was abstracted in the ELECTRIC RAILWAY JOURNAL of June 2, 1917.

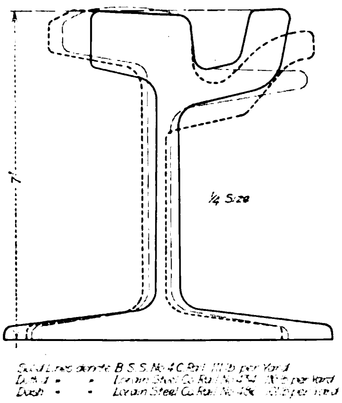
LETTERS TO THE EDITOR

British and American Rail Sections

EDGAR ALLEN & COMPANY, LTD.
SHEFFIELD, ENGLAND, Feb. 20, 1918.

To the Editors:

I was much interested in the article in your issue of Dec. 1, 1917, by Mr. Schreiber upon tramway rails and have since read the comments by American way engineers on page 1126 of your issue of Dec. 22. These have also been summarized in the February issue of the *Electric Railway & Tramway Journal*.


¼ Size
Solid Lines denote B. S. S. No. 4 C Rail per Yard
Dotted " " Lorain Steel Co. Rail per Yard
Dash " " Lorain Steel Co. Rail per Yard

COMPOUND SECTION SHOWING BRITISH STANDARD 4C RAIL WITH TWO POPULAR AMERICAN SECTIONS

The conditions under which tramways work in this country are, of course, widely different to the lines in the United States, and our Board of Trade would not permit the use in paved streets of any of the four rails mentioned by Mr. Schreiber. The use of only a grooved or Trilby rail, more severe than your Trilby, would be permitted. It is only of late years that wider grooves have been permitted. I inclose a compound section showing the British standard rails in combination with Lorain Steel Company's sections 116/434 and 101/486.

Personally, I do not like any of the four sections Mr. Schreiber selects, and I do not agree with the arguments put forward. I fail to follow how street vehicles can either cross or turn out of the tracks laid with what you call a tram head without damage to their axles, let alone damage of the permanent way which is admitted, and even if all vehicles had pneumatic tires, both tires and axles must deteriorate from this cause. That, however, is looking at the matter from an English point of view which, after all, is the only view to take under English regulations. Furthermore, the Lorain grooved section 116/434 could not be used here for reasons already given, and you will note that our standard sections have a narrower and, we consider, a more perfect groove. Consequently the objections to the Trilby section would be greatly increased from the American aspect.

There are, no doubt, advantages which can be claimed by all the sections in accordance with conditions under which they are used; for example, an easier gage and easier running for the car wheels with your tram rail as against the English grooved rail. However, I do not admit the "greater noise" or increased derailments even through "special work." If the track is properly laid such derailments should be very few.

Speaking as a manufacturer, I do not think that British tramway engineers, even if permitted, would willingly change their present type of rail for the American types. **FRED BLAND, M. I. Mech. E.**

Member Engineering Standards Committee.

Malleable Iron Overhead Fittings

EAST PITTSBURGH, PA., March 28, 1918.

To the Editors:

In regard to the article by Charles Rufus Harte, on "Overhead Line Economies," as published in your March 16 issue, your readers may be interested in the following comments of our engineers:

The Westinghouse Electric & Manufacturing Company has manufactured and recommends the use of malleable iron trolley frogs, section insulators, crossings, and mechanical ears, for the last six or seven years, and the material installed in each case has given satisfactory service.

Very few of the large electric railway systems are to-day using bronze trolley frogs and crossings. Malleable iron wears better, is no more liable to arc than bronze, and, if an arc is formed on the malleable iron frog, the injury to it would not be so great as it would be if the frog were of bronze.

Bronze approaches, of course, are used generally as the greatest wear is at the approach, and where a flexible removable approach is installed, unusually long life of the frog and crossing proper is obtained.

M. C. TURPIN,

Assistant to Manager, Department of Publicity.

Better Salaries for Technical Men

BOSTON, MASS., March 30, 1918.

To the Editors:

By way of introduction of such a subject, it is wise to start by giving a working definition of the phrase—technical men. All those who adapt the truths of science to the uses of industry may be included under this head.

Why do not engineers and chemists receive better compensation? The captains of industry immediately reply that supply and demand regulate the wage. The market is glutted with technical graduates who know nothing of adapting the truths of science to industry. They are mere possibilities of the future and need many years of experience. Our industrial captains few of whom have much acquaintance with technical subjects, allow these fledgling engineers and chemists to invade fields of endeavors at such low salaries as to drive out technical men of whose services the country is now in dire need.

That is the much mooted law of supply and demand. Much is thought of quantity but little of quality. The direct use of engineering brains is considered a necessary evil. It does not produce any immediate money return, as does the energy of a salesman. In Germany from thirty to one hundred times as many technical men are employed in industry as in this country. The press is full of the wonderful efficiency of the German "kultur." Much of it is due to the co-ordination of the financial and technical groups.

Heretofore, the truth-seeking ideal of the technical man has made him a class-less individual. There is a glimmering light of hope on the horizon—the rise of class consciousness. The power of the labor unions has undoubtedly helped the engineer, for many of the increases granted to technical men have been caused by the increased wages of labor.

TECHNICAL MAN.

Tremendous Demand for Motormen's Power-Saving Books

NEW HAVEN, CONN., April 1, 1918.

To the Editors:

The influence exerted by your journal in the electric railway field has recently been brought home to me in a very striking way. About a month ago you published a short note referring to the Connecticut Company's power-saving campaign, and mentioned that a small handbook on power saving, written specially for motormen and conductors and used by me in this campaign, could be had at cost by other companies for use on their own properties. The result of this brief mention has been astonishing. From all over the country, from the Atlantic to the Pacific and including Canada, has come a flood of requests for copies. Frequently our mail would contain requests from the widest possible diversity of ranks, *i.e.*, from motormen, chief motormen, shopmen, master mechanics, superintendents, managers, and railway presidents. I have had temporarily to engage additional help to take care of the added work.

In a great many cases, and following receipt of the sample copy sent, orders for additional copies varying from fifty to several thousand at a time were received, depending upon the size of the road.

Noting the interest aroused and the kind reception which has been accorded the handbook, I followed up the matter by sending a complimentary copy to the chief executive on every electric railway operating more than twenty cars. A further rain of orders followed, and with each mail they are still pouring in.

From present indications it looks as though most of the platform men in the country will soon have been supplied with copies of these books.

WILLIAM ARTHUR.

Investigation to Devise Means for Increasing Coal Output

The percentage of total available coal recovered in the process of mining is a factor of increasing importance under the present conditions when the demand for fuel is so abnormally high. Under the belief that the percentage of extraction at present is too low, especially in the mining of bituminous coal, the Engineering Experiment Station of the University of Illinois, in co-operation with the Illinois State Geological Survey and the United States Bureau of Mines, has undertaken an investigation of the subject. The results have just been published by the university and show that there is an excellent opportunity to improve conditions in the Middle West field by more systematic methods of mining.

On March 30 United States Fuel Administrator Garfield signed formal orders instituting the zone system of distribution for bituminous coal. Twelve general orders, imposing upon the movement of coal the limitations arranged by the Fuel Administrator and the Director General of Railroads were issued. They will be communicated at once to those charged with the enforcement of the zone system distribution plan.

AMERICAN ASSOCIATION NEWS

War Board Deprecates Making of Unnecessary Improvements

ON APRIL 2 the Electric Railway War Board sent out its fourteenth bulletin, devoted to the subject of "Unnecessary Improvements." The purpose of this was to call the attention of electric railways to a resolution of the recently organized War Industries Board, setting forth the necessity for the limitation of capital expenditures for either public or private undertakings not essential to, and not contributing either directly or indirectly toward, the winning of the war.

The Electric Railway War Board prefaces the resolution with a statement that "This imposes upon the management of railway lines a double patriotic obligation: (a) to forego for the duration of the war all expenditures which the management may have contemplated, no matter how advantageous they may seem for the company, unless the expenditures will directly help the government in the prosecution of the war; (b) to direct the attention of the proper local authorities to the position taken by the representatives of the national government to the end that the local authorities be induced to co-operate with the national government by foregoing, for the present, all public improvements which will not be helpful in the prosecution of the war, or which are not at this time absolutely essential to the welfare of the communities. This applies as forcefully to expenditures not connected with railway matters as to those affecting railway interests."

National Committee Sends Out Pamphlets

THE national committee on public utilities, of which the American Electric Railway Association is a member, has issued in pamphlet form a copy of an address made by P. H. Gadsden, president Charleston Consolidated Railway & Lighting Company, before the City Council of Charleston on March 11, on the question of higher rates. The reasons which oblige the electric railway companies at this time to ask for higher rates are put forward by Mr. Gadsden, and it is thought that the pamphlet will be of general interest to utilities as a whole.

Air Brakes Discussed at Portland

THE Cumberland County Power & Light Company section held its regular meeting on March 26, preceded by a supper. The principal speaker was George H. Martin, Westinghouse Traction Brake Company, who explained the operation of air brakes, particularly those of the type installed on one of the railway company's lines. The section orchestra played during the evening, and there was a patriotic talk on the income tax and the Liberty Loan by a local speaker. A commendable feature of the meeting was the discussion following Mr. Martin's talk. Numerous practical questions were to put the speaker, who in answering them was able to give just the information desired by his audience.

Eliminating Unnecessary Lighting and Heating in the Carhouse

Fire Risk and Energy Waste Are Considerably Reduced by Cutting Off the Power Supply from Stored Cars

BY T. F. MULLANEY
Former Chief Engineer Third Avenue Railway System, New York City

WE HAVE HAD a great awakening lately in regard to the waste of energy in the operation of cars over the line. Little thought has been given, however, to the waste of lighting and heating energy in cars standing in the carhouse. Crews are ordered, naturally, to cut off all power; but human beings are so forgetful or indifferent that thousands and thousands of tons of coal are burned up to no one's good except that of the coal dealer.

This subject was brought vividly to my attention some years ago in connection with the insurance of rehabilitated carhouses of the Third Avenue Railway System. The insurance companies wanted the fire risk reduced to a minimum, and this could be done only by cutting off power from the cars the moment they were stored. To meet this condition I invented an automatic time-limit circuit-breaker equipment, adjustable over a range of two to twenty minutes, now used by the New York Railways as well as the Third Avenue Railway System. The following figures give some idea of the power waste in the needless heating and lighting of stored cars.

It is assumed that cars stored between the hours of 6 p. m. and 6 a. m. have twenty 23-watt tungsten lamps per car burning during these hours. It is also assumed that cars stored during the day time or the night time will be consuming power in their heaters during such storage hours.

The number of points of heat used would vary, of course, with the temperature as follows: From 32 deg. Fahr. to 40 deg. Fahr., one point of heat, equivalent to 2.7 kw.-hr. per hour. From 25 deg. Fahr. to 32 deg. Fahr., two points of heat, equivalent to 4.2 kw.-hr. per hour. Less than 25 deg. Fahr., three points of heat, equivalent to 6.9 kw.-hr. per hour.

An investigation of the Weather Bureau reports at New York City, for the year 1914, disclosed the following facts: Number of days when one point of heat would be required, fifty-two; number of days when two points of heat would be required, forty-nine; number of days when three points of heat would be required, fifty-five.

An investigatiton of the operating reports of one of the large railways of New York City also disclosed the following: Between the hours of 6 a. m. and 6 p. m., the average car in regularly scheduled service is stored for 4.08 hours. Between the hours of 6 p. m. and 6 a.m. it is stored for 7.36 hours. Therefore the total storage time per car in each twenty-four hours is 11.44 hours.

Accordingly the yearly power consumption in lamps and heaters for each scheduled car in storage and not including any cars in dead storage or in the repair shop, is as follows:

The energy consumed in lights for one average car is 20 × 23 (watt) × 7.36 (hours) × 365 (days) = 1236 kw.-hr.

The energy consumed in the heaters is as follows:

One point of heat, 52 (days) × 11.44 (hours) × 2.7 (hours) =	1606.18 kw.-hr.
Two points of heat, 49 (days) × 11.44 (hours) × 4.2 (kw.-hr.) =	2354.35 kw.-hr.
Three points of heat, 55 (days) × 11.44 (hours) × 6.9 (kw.-hr.) =	4341.48 kw.-hr.
Total..........	8302.01 kw.-hr.

The total energy for lights and heaters for each car per annum equals 9538 kw.-hr. At ½ cent per kilowatt-hour, the cost of this energy is $47.69. This represents the amount which can be saved for energy alone where the proper devices are used for rendering dead the track circuits in the carhouses. Further, there is a substantial saving in lamp renewals where such devices are used, as follows:

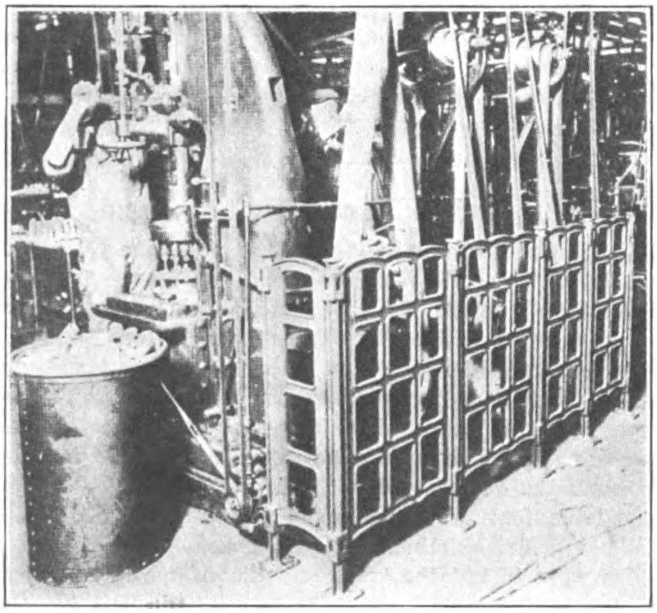
The total number hours of burning per annum per car while it is stored in the carhouse between 6 p. m. and 6 a. m. is 7.36 (hours) × 365 (days), or 2686 hours per annum.

On the basis of an average life per lamp of 1200 hours, this figure would represent a saving in renewals per car per annum of

$$20 \text{ lamps} \times \frac{2686}{1200} = 44.76 \text{ lamps.}$$

Sectional Guards for the Shop

THE subject of the National Safety Council Service Series No. 594 is "Guard Rails" for shop use. The guard advocated is sectional, as shown in the accompanying photograph, and is said to be the cheapest and most efficient known. The posts are fastened to the floor with screws and the sections are hooked into the posts in the same manner that a bed is put together. The sectional guard is especially desirable where changes are frequent, and once the patterns are made the cost is said to be very low.



GUARD FOR USE AT DANGER POINTS IN THE SHOP

The saving in the cost of such renewals, based on a lamp cost of 18 cents each, would be

44.76 × 18 cents =	$8.06
Energy saving, as above	47.69
Total	$55.75

The total saving in cost of energy and lamp renewals of $55.75 per car per annum is surely one saving worth striving for in such times as these.

Center Entrance and Exit, Pay-as-You-Pass Trailers for Dayton

People's Railway Handles Rush-Hour Travel with Light-weight Trailers Operated in Two or Three-Car Trains—Special Signaling Features

THE People's Railway, Dayton, Ohio, operated by the American Railways, Philadelphia, has recently received from the Cincinnati Car Company ten new trail cars for city service. These weigh, light, about 22,000 lb. and are serving admirably in two-car trains for carrying workers to and from the various factories during rush hours. The company has some heavy double-truck cars equipped with four GE-80, 40-hp. motors, which, by changing the air brakes and installing signals and automatic couplers, have been made quite suitable for handling a train of two or three of these new trailers.

The cars have Heywood-Wakefield rattan-covered seats to accommodate fifty-five persons. These extend across both ends and along both sides, except at the double entrance and exit door opening in the center of one side. The doors are of the sliding type, 2 ft. 6 in. wide, operated manually by the conductor. He must stand to operate them, but may remain seated at all other times. Fares are recorded on Ohmer registers, but no fare boxes are used. The car is both pay-as-you-enter and pay-as-you-leave, depending on whether the passenger goes to the front or rear of the car. The passengers enter at the left door and pay when they pass the conductor either to go to the front end of the car or to leave. Thus when the rear half of the car is not filled, it becomes a loading platform for large crowds and the fares are paid later. A horizontal wooden hand rail extends the full length of the car on both sides.

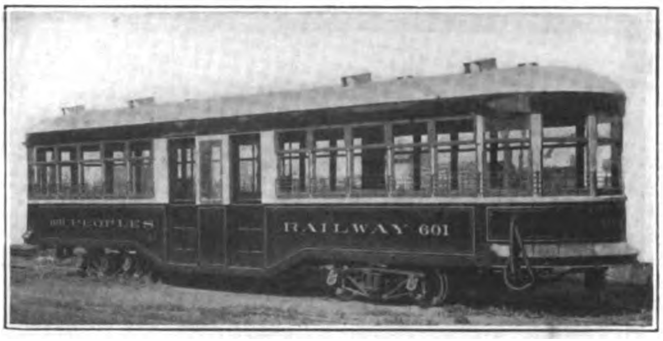


FIG. 3—DAYTON TRAIL CAR WITH CENTER ENTRANCE AND EXIT DOORS

Steel construction is used throughout, with stiffening on the dummy side furnished by two pier panels placed opposite the door posts. Between the sheet-steel roof and its canvas covering and below the window rails is a 1-in. layer of cork, which serves as a heat insulator. Four Peerless ventilators are provided on each side. There are Westinghouse automatic air brakes and Cincinnati arch-bar trucks with a 5-ft. wheelbase, the distance between truck centers being 21 ft. 8 in. Cast-iron wheels 24 in. in diameter, made by the National Car Wheel Company, are used, making the height of the step 16½ in. The step up to the car floor is 11½ in., with a 1-in. ramp in the entrance well.

An outstanding feature of these cars is the provision for signaling. The air and electrical connections, the latter including heating, lighting and signal circuits, are made by a Tomlinson automatic coupler, furnished by the Ohio Brass Company. There are three separate signal circuits, one to give the motorman a clear indication when all doors are closed, another to signal the motorman direct from the passenger's buzzers and a third, with buttons inaccessible to the passengers, to permit the members of the crew to signal each other.

The lighting system consists of three circuits of 20-watt lamps, and there are twenty-four 500-watt electric heaters per car, with Gold thermostatic control. The heating equipment and passenger buzzers were furnished by the Consolidated Car-Heating Company.

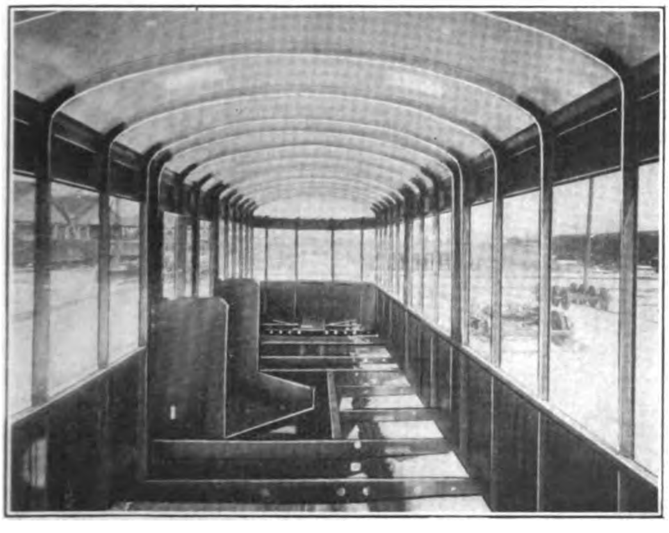


FIG. 1—STEEL FRAMEWORK OF THE NEW TRAIL CAR OPERATED IN DAYTON

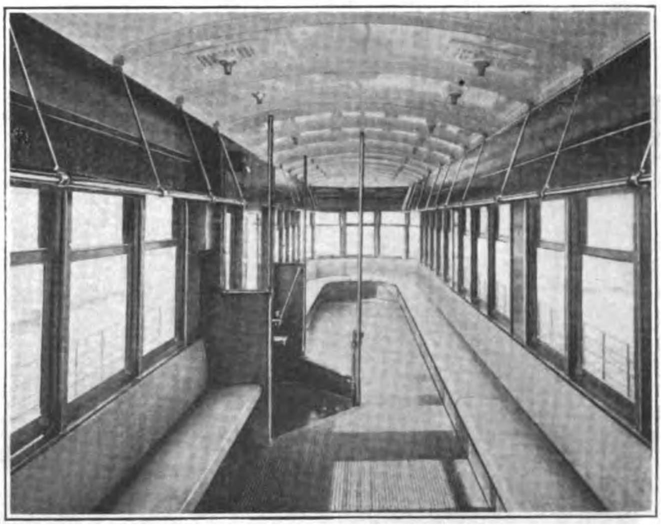
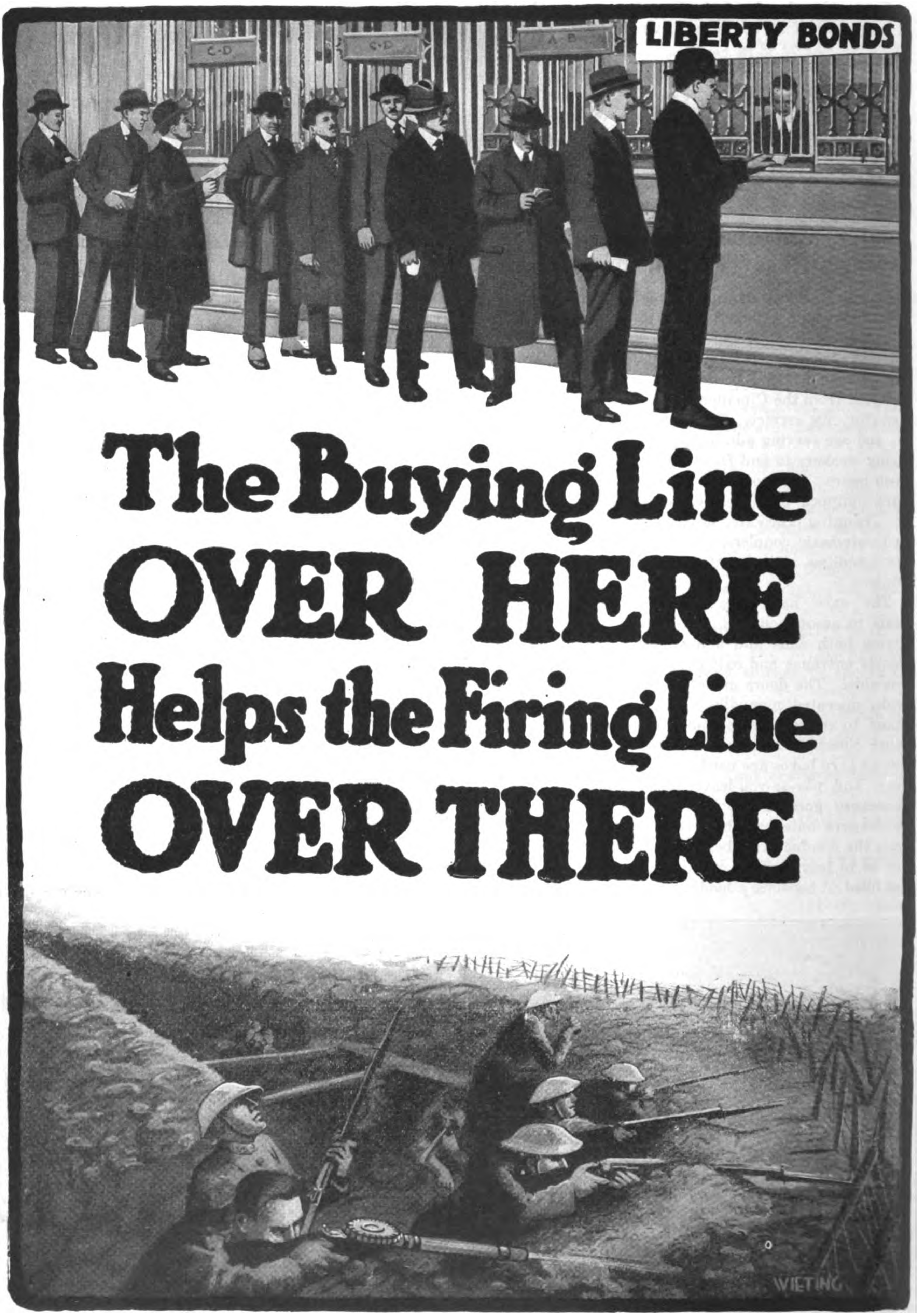


FIG. 2—INTERIOR OF TRAIL CAR SHOWING CONDUCTOR'S POSITION


LIBERTY BONDS
C-D
C-D
A-B
The Buying Line
OVER HERE
Helps the Firing Line
OVER THERE
WIETING

Recent Happenings in Great Britain

Latest News Again Emphasizes Striking Similarity Between War Problems Affecting English and American Companies —Tramways Divided into Nine Areas

(From Our Regular Correspondent)

Conferences have been held recently between representatives of the tramway undertakings of the country and the tramways committee of the Board of Trade appointed to consider the difficulties of the various systems and to devise means to facilitate the continuance of tramway undertakings regarded as essential to the prosecution of the war. The committee has divided the country into nine areas, which have been placed in four groups under subcommittees, termed "area sub-committees." The nine areas are as follows: (1) Metropolitan and east coast; (2) Southeast and south to Bournemouth; (3) Southwest and south, excluding Bournemouth; (4) Midlands; (5) Lancashire, Cheshire and Wales (north); (6) Yorkshire and Lincolnshire; (7) Northern; (8) Scotland; (9) Wales (south). To assist the area subcommittees in carrying out their investigations there will be local advisory committees composed of representatives of the tramway undertakings in each area, who will consult with the area sub-committees.

When presiding at the conferences which have been held in the various areas, James Devonshire, chairman of the Board of Trade committee, said it was not the intention of the Board of Trade to control tramway undertakings, but to relieve them of as many of their difficulties and perplexities as possible. Each of the areas was to be in charge of an advisory committee elected by the undertakings themselves, and to have supervision over such questions as labor, rails, permanent way, rolling stock and car equipment, and priority for material.

On the question of more efficient car service, Mr. Devonshire suggested that local authorities should endeavor to arrange to have large employers of labor open at varying times, say, one at 6 a.m., another at 6.10, another at 6.20, and another at 6.30, instead of four at 6 o'clock. That system had been adopted around London with very good results.

Another way in which relief might be obtained was to ask ladies to do their shopping at times when the cars were not used by the workers. The chairman also dealt with the question of increased fares, rates for the conveyance of parcels and goods, the better utilization of cars in the distribution of food, the labor problem, and the transference of material and equipment.

He said it was possible that the Board of Trade would have to determine which undertakings should be wholly or partly discontinued in order that material might be transferred to other undertakings of greater importance. In regard to non-essential routes the Ministry of Munitions had already made a complete survey of the tramways of the country, and if it became necessary to declare any nonessential he hoped the tramways owners would render assistance so as to avoid waste of time.

One of the functions of the advisory committee will be to advise as to the amount of compensation payable in respect of loss of revenue involved by reduction of service or closing of routes. For the advisory committee, he suggested the appointment of one member, perhaps the manager, of each tramway concern in the area.

For some time now the tube railways associated with the Underground Electric Railways, London, and the London General Omnibus Company, have been working together, and their receipts less working expenses, prior charges, reserves and other items, are pooled, and distributed in certain proportions. The five companies concerned are the Metropolitan District Railway, the Central London Railway, the City & South London Railway, the London Electric Railway, and the London General Omnibus Company.

HOW LONDON RAILWAY POOL WORKS

The gross receipts of the five undertakings were £6,661,000 for the past year, an increase of £623,000 over 1916. As the revenue liabilities were £610,000 higher, the increase in the common fund to be divided was £13,000, the amount of that fund being £520,337. Of this sum of £520,337 the London General Omnibus Company receives £166,508, the Central London £104,067, the Metropolitan District £62,440, the London Electric Railway £156,101, and the City & South London £31,220.

At the annual meeting of the London Electric Railway the chairman said the difficulties which the war had caused in connection with the operation of the railway had increased during the year. The amount of business done and the number of passengers carried by all of the underground railways had increased, due mainly to the limitation and alteration of services by the tramways and omnibus undertakings, particularly the latter, and to the abnormal conditions of London. Nearly one-half of the increase of £610,000 in the expenses of the common fund companies had been due to increased war bonus to the staff. The increase in gross receipts, while due mainly to the increase of passengers booked, had also been affected to some extent by the increased rates of fare put in effect on creased rates of fare put in effect in August, 1017.

The board in control of the London properties did not believe in high fares for an urban transportation service, such as that supplied by this group of companies, nor did it believe under ordinary circumstances that the way to increase revenue was to increase fares. The present conditions, however, were so abnormal and the purchasing power of money so reduced that the effect to the company had been the same as if the rates of fare had actually been decreased. On this account it was very probable that further increases of fare would have to be made. There was no intention, however, of increasing the rates above the level which might be necessary to maintain the position of the undertakings and to provide for the maintenance of the property, but in so far as required for this purpose fares would be readjusted.

Over the Top to the Third Line Trenches!

EDINBURGH HAS TRYING YEAR

At the annual meeting of the Edinburgh & District Tramways the chairman said that in many respects the past year had been by far the most trying through which the company had gone. Never had the company been beset with such constant trouble through shortage of materials, government restrictions and difficulties in finding suitable employees. Until well on in the year, the company was in a serious condition, as the system was being operated at a loss. The company was forced to approach the Corporation of Edinburgh to assist it by reducing the rent, pointing out that the only alternative was an increase of fares. The corporation could not see its way to meet this request, and immediate steps were taken to abolish the 1½d. and 2½d. fares.

The chairman thought that the agreement entered into by the company with the corporation after protracted negotiations was the fairest that could have been arranged. It was quite impossible with the depleted staff to give adequate service on all routes. The increase of fares had produced satisfactory results, and the number of passengers carried showed a steady increase. During the year the company carried a total of 70,687,146 passengers, which meant, assuming the population of the city to be 320,000, that the lines had carried the entire population 220.9 times throughout the year.

The general manager of the Edinburgh & District Tramways has drawn attention to the difficulties with which the company is at present contending, and has given warning of the possibilities of serious interruption of the tramway service. He has pointed out that the company cannot get new cables, and that the limited quantity for which it has priority terms from the Ministry of Munitions is insufficient to keep the system going. In normal times the company had spare cables, but now it had none, and those in use had been so patched and spliced that they were not reliable. Representation of the urgent need for maintaining the efficiency of the tramway service will be made to the ministry. A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Electricity to Chestnut Hill

Service on Another Branch of Pennsylvania Railroad Established on April 1

Electric operation of the Germantown and Chestnut Hill Branch of the Pennsylvania Railroad from Broad Street Station, Philadelphia, to Chestnut Hill station, on the outskirts of the city, was commenced on April 1. This followed the electrification of the main-line suburban section from Philadelphia to Paoli two years ago.

Electrification of the Chestnut Hill branch was authorized by the directors of the company in 1913. The estimated cost at that time was $1,250,000. Owing to war conditions, the commencement of the work was delayed until the fall of 1915, and many subsequent delays have been experienced through inability to obtain material and labor. The actual cost has been approximately $1,500,000.

The first experimental train was operated on March 22. It consisted of three multiple-unit cars. The party that made the trip was composed of R. L. O'Donnel, assistant general manager, members of his staff and other operating and traffic officials.

Twenty-two multiple-unit cars are required in the operation of the service on the Germantown and Chestnut Hill branch, which carries a very heavy commutation traffic. The cars are of the standard suburban type adopted by the Pennsylvania Railroad, are of solid steel construction, and were built in the Pennsylvania Railroad shops at Altoona, Pa. They are equipped with Westinghouse motors, electrical apparatus and air brakes. Twenty-four trains are operated daily in each direction between Broad Street station and Chestnut Hill on weekdays and sixteen on Sundays. There are ten stations on the branch, in addition to Broad Street station, West Philadelphia and North Philadelphia, which are main-line stations. The branch proper begins at North Philadelphia station.

In electrifying the Germantown and Chestnut Hill branch, 150 miles of wire was used, 232 poles were erected and twenty automatic block signal bridges constructed. At present trains are being operated on the steam schedule in use at the time the change was made. It is expected that ultimately the running time under electrical operation can be slightly reduced in both directions.

FIRST ELECTRIC TRAIN TO CHESTNUT HILL

New Cincinnati Lease Likely

Members of the Rapid Transit Commission of Cincinnati, Ohio, and the committee on street railroads of the Council met with Mayor Galvin on March 29 to discuss the reopening of negotiations with the Cincinnati Traction Company for a new rapid transit loop lease ordinance. This was made necessary by the fact that the Supreme Court of Ohio recently held that the provision in the original lease relating to the distribution of earnings was illegal.

Back those Bayonets with Bonds

Should the city and the company be able to agree upon the embodiment of the valid sections of the old ordinance into a new instrument, the disposition of the earnings will be the only question to determine. A 5-cent fare and universal transfers were provided in the original agreement. Mayor Galvin said that neither an increase in the rate of fare nor a departure from the custom of collecting a franchise tax would appeal to him.

Senate Passes Railway Bill

Measure to Insure Transit to Shipbuilding Sites Amended and Sent to the House

The Senate has passed a measure introduced by Mr. Fletcher of the commerce committee, to amend the emergency shipping fund provisions of the present urgent deficiency act, the result of which is to empower the President and his designated agents—in this case the Shipping Board—to take over, if necessary or desirable, transportation systems for the transformation of shipyards and plant employees. The bill "empowers," but does not "require."

The amendment to the deficiency act makes Paragraph F read as follows:

> To take possession of lease, or assume control of any street railroad, interurban railroad, or part thereof wherever operated, and all cars, appurtenances, and franchises or parts thereof commonly used in connection with the operation thereof necessary for the transfer and transportation of employees of shipyards or plants engaged or that may be hereafter engaged in the construction of ships or equipment therfor for the United States.

Section 3 of Paragraph F of the act was amended as follows:

> Sec. 3. That upon taking possession of such property, or leasing or assuming control thereof, just compensation shall be made therefor to be determined by the President, and if the amount thereof so determined by the President is unsatisfactory to the person entitled to receive the same, such person shall be paid 75 per cent of the amount so determined by the President and shall be entitled to sue the United States of America to recover such further sums as added to 75 per cent will make up such amount as will be just compensation therefor, in the manner provided for by section 24, paragraph 20, and section 145 of the Judicial Code.
>
> The President may exercise the power and authority hereby vested in him through the several departments of the government, and through such agency or agencies as he shall determine from time to time.

Senator Calder, who objected to the measure some weeks ago, said:

"The one danger, Mr. President, is that in case the Shipping Board are not exceedingly careful, they may have imposed upon them worthless railways at an exorbitant figure. I have had some doubt of the wisdom of the measure, but I do know that something must be done to relieve the situation in some of the out-of-the-way shipyards, which have been constructed during the past year or so. I have talked with the Shipping Board officials about the matter, and have expressed the hope to them that they will exercise the greatest possible care to avoid the danger of the government being imposed upon."

Senator Fletcher read a telegram from Admiral Bowles, for the Emergency Fleet Corporation, urging the passage of the bill.

The proposed amendments will now be laid before the House of Representatives.

National Labor Policy Recommended

National Board to Act in All Labor Disputes Where Production Necessary to Conduct of War Is Concerned—Principles that Govern Relations Between Workers and Employers

The War Labor Conference Board appointed at the suggestion of Secretary of Labor Wilson to aid in the formation of a national labor program for the period of the war has made a report. The committee, whose appointment was mentioned in the ELECTRIC RAILWAY JOURNAL for Feb. 23, page 381, was made up of five employers, five labor men and two representatives of the public. L. A. Osborne and L. F. Loree, New York, were in the first group and Ex-President William H. Taft was one of the representatives of the public. The board recommends, among other things:

WAR LABOR BOARD TO BE CREATED

"That there be created, for the period of the war, a National War Labor Board of the same number and to be selected in the same manner and by the same agencies as the commission making this recommendation:

"That the functions and powers of the National Board shall be as follows:

"1. To bring about a settlement, by mediation and conciliation, of every controversy arising between employers and workers in the field of production necessary for the effective conduct of the war.

"2. To do the same thing in similar controversies in other fields of national activity, delays and observations which may, in the opinion of the National Board, detrimentally affect such production.

"3. To provide such machinery by direct appointment, or otherwise, for selection of committees or boards to sit in various parts of the country where controversies arise, to secure settlement by local mediation and conciliation.

"4. To summon the parties to the controversy for hearing and action by the National Board in case of failure to secure settlement by local mediation and conciliation.

"If the sincere and determined effort of the National Board shall fail to bring about a voluntary settlement, and the members of the board shall be unable unanimously to agree upon a decision, then and in that case and only as a last resort, an umpire appointed in the manner provided in the next paragraph shall hear and finally decide the controversy under simple rules of procedure prescribed by the National Board.

"The members of the National Board shall choose the umpire by unanimous vote. Failing such choice, the name of the umpire shall be drawn by lot from a list of ten suitable and disinterested persons to be nominated for the purpose by the President of the United States.

"The National Board shall refuse to take cognizance of a controversy between employer and workers in any field of industrial or other activity where there is by agreement or federal law a means of settlement which has not been invoked.

"The action of the National Board may be invoked in respect to controversies within its jurisdiction, by the Secretary of Labor or by either side in a controversy or its duly authorized representative. The board, after summary consideration, may refuse further hearing if the case is not of such character or importance to justify it.

PRINCIPLES AND POLICIES TO GOVERN

"The Board in its mediating and conciliatory action, and the umpire in his consideration of a controversy, shall be governed by the following principles:

THERE SHOULD BE NO STRIKES OR LOCKOUTS DURING THE WAR

Right to Organize

"1. The right of workers to organize in trade unions and to bargain collectively, through chosen representatives, is recognized and affirmed. This right shall not be denied, abridged or interfered with by the employers in any manner whatsoever.

"2. The right of employers to organize in associations of groups and to bargain collectively, through chosen representatives, is recognized and affirmed. This right shall not be denied, abridged or interfered with by the workers in any manner whatsoever.

"3. Employers should not discharge workers for membership in trade unions, nor for legitimate trade union activities.

"4. The workers, in the exercise of their right to organize, shall not use coercive measures of any kind to induce persons to join their organizations, nor to induce employers to bargain or deal therewith.

Existing Conditions

"1. In establishments where the union shop exists the same shall continue and the union standards as to wages, hours of labor and other conditions of employment shall be maintained.

"2. In establishments where union and non-union men and women now work together, and the employer meets only with employees or representatives engaged in said establishments, the continuance of such condition shall not be deemed a grievance. This declaration, however, is not intended in any manner to deny the right, or discourage the practice of the formation of labor unions, or the joining of the same by the workers in said establishments, as guaranteed in the last paragraph, nor to prevent the War Labor Board from urging, or any umpire from granting, under the machinery herein provided, improvement of their situation in the matter of wages, hours of labor, or other conditions, as shall be found desirable from time to time.

"3. Established safeguards and regulations for the protection of the health and safety of workers shall not be relaxed.

Women in Industry

"If it shall become necessary to employ women on work ordinarily performed by men, they must be allowed equal pay for equal work and must not be allotted tasks disproportionate to their strength.

Hours of Labor

"The basic eight-hour day is recognized as applying in all cases in which existing law requires it. In all other cases the question of hours of labor shall be settled with due regard to governmental necessities and the welfare, health and proper comfort of the workers.

Maximum Production

"The maximum production of all war industries should be maintained and methods of work and operation on the part of employers or workers which operate to delay or limit production, or which have a tendency to increase the cost thereof artificially, should be discouraged.

Mobilization of Labor

"For the purpose of mobilizing the labor supply with a view to its rapid and effective distribution, a permanent list of the number of skilled and other workers available in different parts of the nation shall be kept on file by the Department of Labor, the information to be constantly furnished: (1) By the trade unions; (2) by state employment bureaus and federal agencies of like character; (3) by the managers and operators of industrial establishments throughout the country. These agencies should be given opportunity to aid in the distribution of labor, as necessity demands.

Custom of Localities

"In fixing wages, hours and conditions of labor regard should always be had to the labor standards, wage scales, and other conditions, prevailing in the localities affected.

The Living Wage

"1. The right of all workers, including common laborers, to a living wage is hereby declared.

"2. In fixing wages, minimum rates of pay shall be established which will insure the subsistence of the worker and his family in health and reasonable comfort."

Final Philadelphia Hearing

The Public Service Commission of Pennsylvania on March 27 opened the hearing on the proposed lease of the Philadelphia high-speed transit facilities to the Philadelphia Rapid Transit Company. Mayor Smith representing the city was the first to take the stand. He presented the proposed contract and stated that he believed the agreement represented as fair and equitable a business understanding as is possible to draft.

The Mayor was succeeded by William Draper Lewis, his counsel, representing the transit department of the city, who proceeded to discuss for the commission the meaning and intent of the contract, article by article.

The present hearing before the commission is the last move looking toward the validation of the agreement. Both branches of Councils passed the ordinance some time ago and it was promptly signed by the Mayor. The agreement was then approved by the stockholders and the directors of the company.

When Is Steel Not Steel?

Chairman Straus of the New York Public Service Commission Answers: "When It Is Agasote"

New York's new Mayor, John F. Hylan, continues on his discovery-making way. First he discovered the Brooklyn Rapid Transit; then he discovered the Public Service Commission, including Commissioners Straus and Whitney, with whom he had an animated correspondence; then he discovered Palm Beach and Mr. Hearst; then he came back to New York and discovered that the municipal employees, who of course couldn't go to Palm Beach, could loaf pretty near as well in New York, and now he has discovered the use of pasteboard trimmings in some supposedly all-steel cars in the Fourth Avenue Subway. Anent his latest discovery the Mayor wrote to Chairman Straus of the Public Service Commission:

"I wish you would examine the inclosed strip of interior finish and decoration of the steel cars of the Fourth Avenue Subway and let me know what you have to say about these cars being partly made of paper or pasteboard and not all steel, as the public are led to believe they are. The inclosure may be a new species of Public Service steel which I am not familiar with."

Said Mr. Straus to the Mayor:

"The term 'all-steel car' or 'car of all steel construction' as understood by all those who know anything about the subject, does not imply that all the materials in the car are of steel. To-day 85 per cent of the steel cars operating on the trunk lines in the United States are either partially or wholly lined with heat insulating material of the same or similar manufacture as the sample you have sent me.

"This particular material is known as 'Agasote,' and is not used as an interior lining for the purpose of reinforcing or adding strength to the car structure. The strength of the car is obtained by the steel frame, wall and roof, thus constituting an all-steel car from a construction standpoint, and the car is then lined with a material such as above stated, and which renders it less pervious to moisture, etc. I am sure you can find confirmation of these facts by consulting any expert upon 'all-steel car construction.'"

Kansas City Strike Settled

Sympathetic Strike That Set the Whole Nation to Talking Extended to Kansas City Railways, but Service Was Quickly Restored Under Protection

The Kansas City (Mo.) Railways had to suspend service on March 28 although the employees of the company, who are members of the union, had voted not to join the sympathetic strike in progress in that city. It was understood also that instructions had come from the headquarters of the national organization that the Kansas City men should not join the sympathetic movement.

The sympathetic strike was settled on the night of April 2. The workers returned to work under the former contracts. Many of those engaged in the building trades, however, were still out at that time, pending the adjustment of questions that were under discussion previous to the general strike. The order of the Kansas City Railways that the men should not display the union buttons caused a delay of an hour on April 3 in the full resumption of service, but the new agreement permits the men to wear the buttons, the union agreeing not to discriminate against trainmen without buttons. The agreement also provides that all differences shall be submitted to arbitration and that even at the renewal of the annual agreement, which expires in August, there shall be no strike. W. D. Mahon, international president of the Amalgamated Association, signed for the carmen.

At noon on March 28, despite the previous announcements of the president of the local car men's union that the men would not quit work, persons claiming to represent the sympathetic strikers announced that the cars would be stopped. During the afternoon the cars were brought into the carhouses and by evening no cars were running in Kansas City, Mo. Cars ran between Kansas City, Kan., and the downtown district of Kansas City, Mo., until eight o'clock.

Mr. Kealy the afternoon of March 28 issued a statement to employees which was published in display space on Friday morning. In this statement Mr. Kealy said:

"Those of you who are willing to return to your work are asked to report at once. You will be protected. You will earn the thanks of a public outraged by this blow at a service so necessary to its comfort and convenience. You have been forced out of work and your contract broken by these men. Isn't it time to stand for ourselves and our city against outside interference? We urge all to return to work."

President Kealy also sent to W. D. Mahon, international president of the Amalgamated Association of Street & Electric Railway Employees, a telegram notifying him that the Kansas City local had broken its contract.

Very few of the trainmen seemed to know when the orders to quit had come. They merely knew that their committee men had transmitted the order to them.

Meanwhile the police had taken a more vigorous hold of the situation and arrangements were made for the guard to help in the protection of street railway property and for policemen to ride on cars with the trainmen. On the afternoon of March 29 twenty-five cars, the maximum for which police guards were provided, started out. On the morning of March 30 the National Guard provided more help, and with an increased number of policemen, the railway was enabled during the day to operate about half of its normal number of cars.

The union employees who returned to run the cars continued to wear their union buttons. The number of men who returned was about equally divided between members of the union and non-members.

Last fall, when the men on the railway struck, an agreement was reached under which differences between the company and men were to be settled by arbitration. This agreement was between the company and an accredited committee of employees; the agreement itself made no mention of unions, or of the Amalgamated Association of Street & Electric Railway Employees. It was signed by E. F. Michael and several other employees. After its signing, a representative of the national order is said to have expressed his appreciation of the manner in which the company had met the men, and declared that he wanted to indicate the willingness of the national union to back up the agreement of the employees. At his request, therefore, he was allowed to indorse the agreement.

As stated previously the attention of President Mahon of the Amalgamated was called to the fact that this contract had been broken. He responded that this was true, but that the situation was peculiar. He was not ready to order the men back to work, alleging, it is said, that by so doing he would cause the railway men to abandon their fellow union workers in the midst of battle.

You Don't Need a Bank Account
to Buy LIBERTY BONDS

Toledo Results on April 10

At a meeting in the office of Mayor Cornell Schreiber on April 10, Federal Mediator Faulkner will announce the results of the examination of the books of the Toledo Railways & Light Company and the Toledo Traction, Light & Power Company, Toledo, Ohio, and explain their relation to the demand of the car men and electrical workers in the employ of the company for an increase in wages.

St. Louis Measure Passed

Ordinance for Settlement of Differences Between City and United Railways Before Mayor for Signature

The Board of Aldermen of St. Louis, Mo., on March 22 adopted the amendments suggested by the Board of Public Service to the proposed United Railways settlement ordinance.

SUMMARY OF PROVISION OF MEASURE

The adoption of the amendments means that:

1. The mill tax and franchise tax will be eliminated, and the United Railways will be required to pay to the city, in lieu thereof, one-half of 1 per cent of its gross receipts annually. This tax later may be increased not to exceed 3 per cent of the company's gross annual receipts.
2. The franchises of the United Railways subsidiaries will be validated and extended until 1948.
3. The United Railways will be permitted to earn for the present not to exceed 6 per cent annually on a valuation of $60,000,000, and 7 per cent on money put into the property hereafter.
4. The temporary valuation of $60,000,000 is fixed on the company's holdings as a basis of its earning power, with a proviso that the physical valuation of the properties made by the Missouri Public Service Commission within two years shall be substituted for the temporary valuation.
5. The company will be permitted to pay the accrued mill tax of $2,300,000 to the city in ten annual installments, without interest.
6. The fare must remain at 5 cents, and universal transfers must be given, until the jurisdiction of the Missouri Public Service Commission to make a change is established and the commission has legally ordered a change.
7. The company must reorganize and accept the terms of the ordinance within twelve months, or within six months after peace is declared in the European war.

Two amendments submitted by President Aloe of the Aldermen were adopted. They require the United Railways to install a bookkeeping system in accordance with the orders of the Missouri Public Service Commission, and authorize the Judges of the Circuit Court to appoint the third member of the Board of Control to settle mooted problems if the St. Louis Court of Appeals fails to do so.

MEASURE UP TO MAYOR AND COMPANY

Subsequently the Board of Public Service approved the settlement ordinance as amended by the Board of Aldermen and adopted a report recommending its passage.

On March 29 the Board of Aldermen passed the settlement bill and Mayor Kiel may affix his signature after ten days or by April 8.

The Mayor has said that he will sign the measure, as he has studied its terms as the ordinance was developed and approves it.

The ordinance will not become effective, however, unless the United Railways accepts it and formally notifies the city of such acceptance within twelve months, or in the event the war with Germany continues beyond that, within six months after the war is over.

Liberty Bonds Speak Louder than Words

News Notes

Minneapolis Investigation Continued.—Congressman C. C. Vandyke, labor leader, is investigating the labor situation on the lines of the Twin City Rapid Transit Company, Minneapolis, Minn., but has not yet reported. He is said to represent President Wilson in a further consideration of the railway company's attitude toward taking back former strikers.

Wage Advance in Sherman.—The Texas Electric Railway on April 1 advanced the wages of trainmen employed on the local lines in Sherman and the men on the interurban lines out of that city. Hereafter the wages will be from 24 cents to 30 cents an hour, depending on the length of service. This is an advance of 2 cents an hour over the former schedule.

Local Transportation Bill Passed by House.—The bill authorizing the expenditure of $50,000,000 through the Secretary of Labor for the purpose of providing housing, local transportation and other facilities for war needs, known as the Clark bill, has been passed by the House. An editorial discussing some features of this bill and put to press before its passage by the House appears elsewhere in this issue. This measure was also referred to in the ELECTRIC RAILWAY JOURNAL for March 9, page 471.

Programs of Meetings

National Lumber Manufacturers' Association

The postponement to a date in May of the sixteenth annual meeting of the National Lumber Manufacturers' Association, originally scheduled for April 8-9, has been announced. Last week in Washington, prominent lumbermen were asked to return to that city for a conference early in April on an important government matter. As there was a conflict in dates the executive committee of the National Association felt there was only one thing to do, and hence the annual meeting will be held some time in May, the exact dates to be announced.

United States Chamber of Commerce

On April 10, 11 and 12 the sixth annual meeting of the United States Chamber of Commerce will be held at the Auditorium, Chicago. There will be four chief objective points: (1) financing the war; (2) railroads and highway transportation; (3) ships and shipping; (4) organized control of industry. Prominent among those who will deliver addresses are: The Earl of Reading; Secretary of the Navy Daniels; Secretary of the Interior Lane; Alva B. Johnson, president of the Baldwin Locomotive Works; John F. Wallace, chairman of the Chicago Terminal Commission; T. N. Vail, president of the American Telephone & Telegraph Company, New York: Thomas N. McCarter, president of the Public Service Corporation, Newark, N. J., and Philip H. Gadsden, who is in charge of the work of the War Board of the American Electric Railway Association.

Although the annual meeting will not open until Wednesday morning, a number of committee reports will be read on Tuesday afternoon at the meeting of the National Councillors in the Congress Hotel. At the meeting on Wednesday morning the delegates will be welcomed, President Rhett will address those in attendance and the committees will be announced. In the afternoon high government officials will outline the government's position in regard to (1) government organization in relation to war; (2) railroads; (3) finance; (4) shipping. The National Chamber's activities in relation to the foregoing will also be presented in ten-minute addresses by different speakers.

On Thursday discussions will be held in group sessions on the subjects suggested in Wednesday afternoon and evening. One group will discuss government organization in relation to business in war. Finance will be taken up by the group under the leadership of Charles A. Hinsch, president of the American Bankers' Association. The discussion will be divided between trade acceptances and the effect of government financing on industry. Thomas N. McCarter and David Forgan, president of the National City Bank, Chicago, Ill., will be the speakers on the effect of government financing on industry. The group discussion of railroads and highway transportation will be under the leadership of Harry A. Wheeler. President Johnson of the Baldwin Locomotive Works will speak on motor power, and John F. Wallace will discuss terminals. Mr. Gadsden will outline some of the difficulties which confront the electric railways as a result of the war. On Friday morning, following the election of officers and a report of the committee on resolutions, there will be a general discussion leading to action upon the resolutions presented.

A Better Investment Than a Liberty Bond—Two Liberty Bonds

Financial and Corporate

Piedmont Earnings Gain

1916 Returns of Piedmont & Northern Line Show Net Increase of 30 Per Cent

According to the 1916 report of the Piedmont & Northern Railway, Charlotte, N. C., just now available, the company during that calendar year showed marked increases in operating results. The operating revenues, as shown in the accompanying table, increased $213,612 or 21 per cent. The operating expenses rose $81,844 or 14 per cent, with the result that the net operating revenue showed a gain of $131,768 or 30 per cent. The net income for the year was $182,224 as compared to $62,611 in 1915.

INCOME STATEMENT OF PIEDMONT & NORTHERN RAILWAY

	1916		1915	
	Amount	Per Cent.	Amount	Per Cent
Passenger revenue	$401,293	32.8	$341,877	33.8
Freight revenue	750,988	61.3	610,803	60.4
Miscellaneous revenue	71,878	5.9	57,868	5.8
Total operating revenue	$1,224,159	100.0	$1,010,547	100.0
Way and structures	$76,344	6.2	$66,434	6.6
Equipment	58,658	4.8	50,985	5.0
Power	129,047	10.5	129,049	12.8
Transportation	170,722	13.9	158,320	15.7
Traffic	28,811	2.4	22,711	12.2
General	193,135	15.8	147,374	14.6
Total operating expenses	$656,717	53.6	$574,873	56.9
Net operating revenue	$567,442	46.4	$435,674	43.1
Taxes	48,847	3.9	37,388	3.7
Operating income	$518,595	42.5	$398,287	39.4
Non-operating income	9,653	0.8	11,073	1.1
Gross income	$528,248	43.3	$409,360	40.5
Interest on funded debt	$316,746	25.9	$316,710	31.3
Other interest	27,901	2.3	28,860	2.9
Miscellaneous debts	1,376	0.1	1,179	0.1
Total deductions	$346,023	28.3	$346,749	34.3
Net income	$182,224	15.0	$62,611	6.2

Calendar Years	Gross Revenue	Operating Income	Operating Ratio (Taxes Included)	Average Miles Operated	Gross Revenue per Mile of Road	Operating Expense per Mile of Road	Operating Income per Mile of Road
1916	$1,224,159	$518,595	57.6	127.4	$9,608	$5,538	$4,070
1915	1,010,547	398,287	60.6	124.7	8,103	4,909	3,193
1914	949,914	324,344	65.8	121.0	7,850	5,170	2,680
1913	659,552	257,384	60.9	95.5	6,906	4,211	2,695
1912	160,345	53,596	53.6	42.9	3,737	2,488	1,249

The total number of passengers carried was 1,467,358 in 1916, as compared to 1,221,284 in 1915. The revenue tons of freight in 1916 totaled 717,296 and in 1915 572,809. The gross revenue per mile of road was $9,609 in 1916 and $8,104 in 1915. Further comparative statistics are reproduced above.

Northern Electric Ordered Sold

The Northern Electric Railway, which operates in the Sacramento Valley in California, between Chico and Woodland, has been ordered sold in foreclosure proceedings in the United States District Court, San Francisco. The date of sale will probably be fixed between May 15 and June 1.

The property will most likely be bought in by a reorganization committee formed by the bondholders. This committee plans to organize a new company to be bonded for approximately $5,500,000, of which some $2,000,000 will bear interest from July 1, 1917, $950,000 from July 1, 1919, $1,275,000 from July 1, 1922, and $1,275,000 from July 1, 1927.

In 1915 gross earnings were $801,478; in 1916 they were $870,492, and in 1917 they were $1,000,792. The net earnings in 1915 were approximately $150,000; in 1916, $170,000, and in 1917, $200,000. Earnings for 1918 to date show a substantial increase over 1917.

It was shown during the foreclosure proceedings that the Northern Electric System represented a book investment in excess of $12,000,000, and that the California Railroad Commission had fixed its reproduction cost, less depreciation, at approximately $10,000,000.

The system, which includes a belt freight line around the city of Sacramento, is 215 miles in length, is operated by a third-rail, and has connecting tracks at various points with the Southern Pacific and Western Pacific Railroads, and through the Central California Traction Company and Oakland, Antioch & Eastern Railway with the Santa Fé System. Its principal freight business is in grain, rice, beans, fruit and other farm products.

Since Oct. 5, 1914, the system has been operated by John P. Coghlan, a San Francisco attorney, as receiver. The receiver has put all the earnings back into the property and now reports that he is prepared to turn the system over to the reorganized company in excellent condition. Betterments made under the receiver include a number of grain, rice and bean warehouses, spurs into new industries, new freight equipment, and additions to the motive power.

In 1917 the Western Pacific Railroad made an offer of $3,682,000 for the system. This was refused by the reorganization committee. That this offer had been made was disclosed during the foreclosure proceedings.

Agree on War Finance Bill

The conference agreement on the war finance corporation bill as presented to Congress was adopted in the Senate on April 1. This is regarded as representing the bill as it will finally pass Congress, for the House is expected to agree to the conference report.

According to the report, the corporation, as soon as the bill becomes a law, will be allowed to issue a total of $3,000,000,000 in bonds instead of the $4,000,000,000 provided for in the Senate bill and instead of the $2,000,000,000 provided for in the House bill.

The conference report provides that the security to be required for advances shall be 125 per cent, the adequacy of the 125 per cent security on the loan to be determined by the capital issues committee. The conferees agreed that the capital issues committee shall be composed of seven members to be appointed by the President, by and with the advice and consent of the Senate. The conferees refused to agree to the House idea that not more than four members of the same political party shall be members of the capital issues committee.

$500,000 of Bonds Authorized

The California Railroad Commission has authorized the Tidewater Southern Railway, Stockton, Cal., to issue $500,000 of first mortgage 5 per cent bonds, payable in 1942, to be sold at not less than 80 per cent of face value, and the proceeds to pay in part for the completion of its present operated line of railroad from Stockton to Turlock and Hilmar, to finish a branch from a station on its main line at Small to Manteca, and to extend its main line from Hilmar to Stevenson.

The company is operating from Stockton to Modesto by way of Escalon, about 33 miles, a branch line from Small, 8 miles; from Stockton to Manteca, 3½ miles, and also the main line from Modesto to Hilmar, a distance of 17 miles, and a branch from Hatch to Turlock, 6 miles. The work still to be done consists of grading, ballasting, fencing, laying rails, etc.

The Western Pacific Railroad controls the Tidewater company through stock ownership. It has agreed to buy the $500,000 of bonds at 80 per cent.

Tax Question Up Soon

Chairman of House Ways and Means Committee Says Congress Must Consider Further Taxation

Representative Kitchin, chairman of the House ways and means committee, during a debate in the House of Representatives, announced that Congress must soon consider whether further taxes are to be imposed in the near future or heavy taxation and big bond issues resorted to for several years after the war to produce revenue.

The ways and means committee is charged by statute with the duty of initiating revenue producing legislation, and Mr. Kitchin was asked by members of the House when Congress will begin to tax those who are making profits out of the war and arrange to impose less taxation upon the next generation. Mr. Kitchin said he believed taxes should be increased 25 per cent, and that in any case heavy taxation and big bond issues may be expected for several years after the war, as was the case after the Civil War.

Revenue officials in Washington are stating informally that they believe the income taxes and the excess profits taxes will greatly exceed the estimated figures of return. These estimates are as follows: From excess profits $1,226,000,000; from corporation incomes, $535,000,000; and from individual incomes, $666,000,000.

We're in It—Let's Win It
BUY LIBERTY BONDS

Northern Texas Earnings in 1917

The report of the Northern Texas Traction Company for the calendar year 1917 has been filed with the City Commission of Dallas, Tex., and has been formally approved by that body. The report shows a gross income of $2,389,242 and expenditures of $1,802,730, leaving a net of $586,512. The revenue from passengers amounted to the sum of $2,245,901.

Frontier Purchase Allowed

The Public Service Commission for the Second District of New York has granted the petition of the Pennsylvania Railroad and the Delaware, Lackawanna & Western Railroad to acquire jointly the capital stock of the Frontier Electric Railway. The order granted provides that the companies shall acquire the outstanding capital stock, $25,000 at par, with the provision that the two roads shall not ask for an increase in the capital stock or issue any bonds of the Frontier company under the authority conferred in an order entered on Dec. 5, 1906, and that the companies shall submit to authority of the commission as to any issue of stock or bonds which may hereafter be required for construction. The companies are to comply with the provisions of the company's order within thirty days.

The Frontier company was incorporated in August, 1906, to operate an electric road from Buffalo to Niagara Falls, a distance of 75 miles. The periods within which the company was required to begin and complete construction have been extended several times by statute and by the force of such statutes have not yet expired. The company is alive and has the requisite legal capacity to carry out the purpose of its incorporation. Financially the company has never yet been able to fulfill the object of its existence.

BUY LIBERTY BONDS
Buy—BUY—BUY—till it hurts!

Selma Road Sold Under Foreclosure

The property of the Selma Street & Suburban Railway, Selma, Ala., has been sold under foreclosure by L. L. Gerould, trustee, to S. G. Adams, and by him has been reconveyed to the Selma Traction Company, a new company organized for the purpose of operating the property. The purchase price was $50,000, the amount of the first mortgage bonds, which are owned by Mrs. F. M. Abbott, wife of Colonel F. M. Abbott, founder of the road, and Mrs. C. L. Waters, his sister.

The majority of the stock of the Selma Traction Company is owned by J. D. Woodard, Warren, Pa. The new company will issue first mortgage bonds for $50,000 which will be taken and held by Mrs. Abbott and Mrs. Waters. Hugh Mallory, attorney for the company, made the following statement after the sale:

"Mr. Woodard has had considerable experience in the railway business. He will extend the lines toward the property of the Selma Manufacturing Company. Another improvement which he fully expects to make, and which, with the proper co-operation on the part of the public, he will undoubtedly make is to extend the line to the Municipal swimming pool."

New Tax for Jersey Railways

Under a bill which has just been signed by Governor Edge of New Jersey, a tax at the average tax rate of the State on the gross receipts of electric railways, gas and electric utilities is substituted for the personal property tax on the property of such corporations. The new tax does not affect the franchise tax or the tax on real property.

Under the existing law every electric railway of New Jersey is now subject to a franchise tax of 5 per cent on the gross receipts. The new law provides that in addition to this franchise tax there shall be placed on the gross receipts an annual tax at the average rate of taxation in the State as computed by the State Board of Taxes and Assessments. This additional tax is to be levied upon the same gross receipts upon which the franchise tax is levied, and it is to be imposed in lieu of all State, county, school and local taxation of personal property, including machinery, apparatus and equipment held by the corporations. The act takes effect on Oct. 1, 1918, but it is provided that its clauses shall not be applicable to taxes which are assessed for 1918.

Lend Him a Hand—BUY LIBERTY BONDS

Washington Unification

Committees Appointed from Two Local Railway Companies at Capital to Consider Closer Co-operation

The movement toward the unification of the railway systems in the District of Columbia has been accelerated by the appointment of committees from both the Washington Railway & Electric Company and the Capital Traction Company to confer with a view of devising a plan of closer co-operation or unified or single management to be submitted to the Public Utilities Commission of the District and to the boards of directors of the respective companies as promptly as possible. The committee for the Washington Railway & Electric Company is composed of directors M. E. Ailes, George Truesdell and W. F. Ham, and that for the Capital Traction Company of directors George E. Hamilton, John H. Hanna and Benjamin W. Guy.

Money means Munitions—BUY LIBERTY BONDS

The resolution of the directors of the Washington Railway & Electric Company appointing the committee expresses the opinion that more efficient service could be rendered the public by the company if, with the approval of the Public Utilities Commission of the District, some plan of close co-operation, unified operation or single management could be effected between that company and the Capital Traction Company. The resolution of the Capital Traction Company is along the same general lines.

This effort by the companies toward unified operation is an indirect outcome of the inquiry of the Public Utilities Commission into the railway service in Washington. At one of the recent hearings before the commission, representatives of the Washington Railway & Electric Company said that the proper development of the public utility facilities of the District depended upon two things: first, the authorization by Congress of a comprehensive and reasonable plan of financing, and, second, the consolidation of the two principal electric railway systems operating in the District. Officers of the company also said that to the above should also be added a higher rate of fare.

Financial News Notes

Mr. Bernd a Director.—At the annual meeting of the Des Moines (Ia.) City Railway and the Inter Urban Railway, held on March 20, O. G. Bernd, auditor, was elected to the directorates of these companies. Mr. Bernd succeeds E. P. Smith.

Receiver's Certificates Authorized.—W. E. Glasscock, receiver of the Morgantown & Wheeling Railway, Morgantown, W. Va., has been authorized by the court to issue 60,000 of receiver's certificates on account of repairs and betterments.

Sale Under Foreclosure Postponed.—The sale of the property of the St. Joseph Valley Railway, Elkhart, Ind., under foreclosure, which was set for March 20, has been postponed until April 8. The company operates 8 miles of line.

Short Iowa Road Would Quit.—The Sioux City, Crystal Lake & Home Electric Railway, Sioux City, Iowa, has applied to the Railroad Commission of Iowa for permission to abandon its 4 miles of line between South Sioux City and the park on Crystal Lake.

Extra Common Dividend.—The directors of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., have declared an extra dividend of 2 per cent on the common stock, payable on April 15 to stock of record of March 30.

Will Not Abandon Operation.—The Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., brands as erroneous the statement made in the daily press recently to the effect that the company is to abandon its right-of-way and junk the property.

No Common Stock Dividend.—In view of the increased operating costs of the past winter and in order to conserve cash resources in the interest of essential construction, the board of directors of the Northern States Power Company, Chicago, Ill., has decided not to declare a dividend on the common stock at this time. Dividends have been paid on the common stock since July, 1916. The regular quarterly dividend of 1¾ per cent has been declared on the preferred stock, payable on April 20. Dividends on the preferred stock have been paid continuously since the organization of the company in 1910. The net earnings after the payment of fixed charges for the year 1917 were 1.83 times the preferred stock dividend requirements.

Action to Collect Seattle Tax.—The city of Seattle, Wash., on March 23 brought suit in the King County Superior Court to recover from the Puget Sound Traction, Light & Power Company the sum of $72,443, representing 2 per cent of the gross earnings of the company in 1917, which the company is obligated to pay the city under the terms of its franchises. More than two years ago, the company petitioned the Public Service Commission to be relieved of this obligation, and the matter is now in the Supreme Court awaiting final decision. The city obtained a judgment of $64,387, representing 2 per cent of the earnings for 1916. The company appealed to the Supreme Court, where the case will be argued in the near future.

Sale at Auction on April 22.—The property of the Ware & Brookfield Street Railway, Ware, Mass., will be offered for sale at foreclosure on April 22 by the American Trust Company, Boston, Mass., trustee, under a mortgage securing $135,000 of 5 per cent bonds authorized in 1901 by the Hampshire & Worcester Street Railway. The Ware & Brookfield Street Railway abandoned operation on Feb. 3. The road was organized in 1900 as the Hampshire & Worcester Street Railway. It went into the hands of a receiver in 1905 and was sold under the decree of the court to the present owners. No dividends have ever been paid and the bond interest has not been met since the reorganization. The affairs of the company were reviewed briefly in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 336.

Confirmation of Sale Put Off.—Action in regard to confirming the sale under foreclosure of part of the Dan Patch line, the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn., has been postponed in the federal court to April 6. A reorganization is being attempted to save the line from Auto Junction to the Luce or Electric Short Line Junction from being scrapped. For this purpose protective association has been formed among the citizens along the line and they have agreed to indemnify the present owners against any loss that may be caused to them by the delay in case the attempt fails that is now being made by the local interests to reclaim the road. The part of the road previously mentioned was sold on Dec. 18 to representatives of the committee acting for the bondholders.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Revenue Operating	Expenses Operating	Income Operating	Charges Fixed	Income Net
1m., Jan., '18	$77,776	*$50,169	$27,607	$19,659	$7,948
1m., Jan., '17	74,684	*42,912	31,772	18,725	13,047
12m., Jan., '18	889,212	*509,310	379,902	229,376	150,526
12m., Jan., '17	838,388	*469,141	369,247	215,924	153,323
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.					
1m., Jan., '18	$133,002	*$110,805	$22,197	30,698	†$8,501
1m., Jan., '17	107,049	*75,444	31,605	32,660	†1,055
12m., Jan., '18	1,384,980	*1,174,262	210,718	360,510	†149,792
12m., Jan., '17	1,241,252	*835,578	405,674	360,129	45,545
COLUMBUS RAILWAY POWER & LIGHT COMPANY, COLUMBUS, OHIO					
1m., Jan., '18	$367,662	*$301,949	$65,713	$52,744	$12,969
1m., Jan., '17	337,571	*228,524	109,047	44,269	64,778
12m., Jan., '18	4,054,277	*3,017,355	1,036,922	567,063	469,859
12m., Jan., '17	3,577,554	*2,160,729	1,416,825	519,521	897,304
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., Jan., '18	$1,700,470	*$1,310,849	$389,621	$475,933	†$86,312
1m., Jan., '17	1,617,719	*931,056	686,663	430,359	256,304
12m., Jan., '18	19,806,488	*12,664,798	7,141,690	5,334,681	1,807,009
12m., Jan., '17	17,172,773	*9,480,594	7,692,179	5,053,816	2,638,363
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL					
1m., Jan., '18	$299,688	*$263,009	$36,679	$65,730	†$29,051
1m., Jan., '17	292,607	*194,800	97,807	64,065	33,742
12m., Jan., '18	3,699,552	*2,549,728	1,149,824	787,047	362,777
12m., Jan., '17	3,090,938	*1,877,592	1,213,346	757,245	456,101
GRAND RAPIDS (MICH.) RAILWAY					
1m., Jan., '18	$107,648	*$79,155	$28,493	$20,444	$8,049
1m., Jan., '17	113,108	*74,464	38,644	18,051	20,593
12m., Jan., '18	1,298,400	*914,867	383,533	220,608	162,925
12m., Jan., '17	1,304,878	*837,827	467,051	190,436	276,615

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$3,256,310	*$1,812,533	$1,443,777	$1,171,141	‡b$627,676
1m., Feb., '17	3,240,154	*1,645,070	1,595,084	1,006,995	‡b645,997
8m., Feb., '18	26,494,347	*14,871,566	11,622,781	8,823,332	‡b4,888,255
8m., Feb., '17	25,893,871	*12,530,598	13,363,273	7,985,983	‡b5,842,827
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.					
1m., Jan., '18	$47,120	*$73,004	†$25,884	$15,911	†$41,795
1m., Jan., '17	61,703	*54,188	7,515	15,308	†7,793
12m., Jan., '18	883,790	*702,500	181,290	187,292	†6,002
12m., Jan., '17	812,480	*567,134	245,346	187,118	58,228
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.					
1m., Jan., '18	$204,521	*$131,562	$72,959	$41,037	$31,922
1m., Jan., '17	209,869	*133,275	76,594	41,238	35,356
12m., Jan., '18	2,452,973	*1,587,706	865,267	489,869	375,398
12m., Jan., '17	2,396,326	*1,470,109	926,217	507,127	419,090
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1m., Feb., '18	$526,542	$356,184	$170,358	$92,282	$78,076
1m., Feb., '17	477,004	297,208	179,796	82,680	97,116
2m., Feb., '18	1,068,843	727,043	341,801	186,947	154,854
2m., Feb., '17	967,385	580,050	387,334	166,687	220,646
NEW YORK (N. Y.) RAILWAYS					
1m., Jan., '18	$865,377	*$720,601	$144,776	287,627	†‡$92,933
1m., Jan., '17	997,075	*879,132	117,943	281,846	†‡118,821
7m., Jan., '18	7,171,482	*5,418,664	1,752,818	1,978,796	‡132,634
7m., Jan., '17	6,390,636	*5,065,026	1,325,610	1,971,945	421,684
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., Dec., '17	$594,020	*$339,178	$254,842	$179,036	$75,806
1m., Dec., '16	512,594	*257,702	254,892	183,084	71,808
12m., Dec., '17	6,023,510	*a3,576,593	2,446,917	2,152,052	294,865
12m., Dec., '16	5,483,110	*3,038,254	2,444,856	2,178,258	266,598

* Includes taxes. † Deficit. ‡ Includes non-operating income. b Includes accruals under rapid transit contracts with city payable from future earnings.

Traffic and Transportation

New Bay State Fares

Rate Has Been Filed Calling for Short Six-Cent Initial Zone with Eight Cents Outside

A new schedule of fares has been filed with the Public Service Commission of Massachusetts by Receiver Wallace B. Donham of the Bay State Railway, covering city and suburban fares, and linking up the cities and country on the zone system. This schedule will go into effect on April 26. City patrons will pay 6 cents within a new city zone, which covers about a 3-mile area in the middle of each city. For those riding beyond the city zone into the fringe adjacent the fare will be 7½ cents, in tickets of six for 45 cents, and beyond this territory, in the country section, will be from 2 cents to 3 cents a mile, depending on the density of traffic. Mr. Donham says:

"The financial condition which brought about the receivership is even worse now than it was when the receiver was appointed.

"The amount of money paid to the men has recently been increased substantially and, under the contract, will be increased again on May 1. The plan for co-operative savings, in which I have great confidence, is of course only just starting, so that at present, under the 2-cent an hour guaranty, we are paying substantially increased amounts.

Count that day lost—whose low descending sun
Sees in your hand no Liberty Bond or Gun
Fight—or BUY BONDS

"The probable cost of coal for the system for the calendar year 1918 will be approximately $1,000,000 more than for the year before the war, and, in the meantime, the cost of everything else has gone up.

"The result of all these things is that at the present time the Bay State Street Railway is not earning its operating expenses, to say nothing of earning any return on the investment, and our estimate for the year, on the basis of present rates of fare, indicates that we would just break even on the operating costs, even including summer business.

"In order to straighten things out we need something over $2,000,000 more revenue, and we have to-day (March 28) filed a schedule of fares which, with the other schedules that are now pending before the commission, will, we estimate, result in an increase in income about this amount.

"In nearly every city we are making an inner 'city zone,' which in general is 3 miles across. The fare under this new schedule will be 6 cents, without tickets. Then we are separating the balance of the city from the country district as accurately as we can, and we are going on a basis of 7½-cent fares within the city for the area outside the so-called 'city zone' or 3-mile area, which I have just mentioned. In order to collect this 7½-cent fare we will sell tickets at the rate of six for 45 cents, and anyone not having a ticket will be charged 8 cents. Outside these two zones in the cities the whole country district is being zoned, under the schedules which were filed some months ago, so that all the system outside of the cities will be on the basis of 2, 2½ or 3 cents a mile, depending on the traffic density of the different lines.

"Workingmen's tickets are continued on the basis of 70 per cent of the regular fare wherever workingmen's tickets or transfers are now in force."

City Fights Fare Increase

Mr. Connette Fixes Present Value of Third Avenue System at $56,000,000 on Five-Year Average Prices

The Third Avenue Railway fare increase hearing on March 26 before the Public Service Commission for the First District, New York, N. Y., was featured by another move on the part of Assistant Corporation Counsel John P. O'Brien to secure a ruling in regard to the jurisdiction of the commission. Mr. O'Brien made an argument for the dismissal of the application for a 2-cent transfer charge upon the ground that the commission has no power to authorize such an increase in view of 5-cent fare franchises granted by the city. He asked that the commission rule upon this point immediately, in order that in the event of an adverse opinion the city might take the matter to court and have the point finally settled before going to the expense of fighting the rate case further. The commission reserved decision and instructed the company to proceed with its case.

On April 1 the company presented appraisal figures for its entire property actually in public service on July 1, 1917. The appraisal was made by E. G. Connette, president United Gas & Electric Engineering Corporation, New York, N. Y., who was once on the staff of the commission and in 1909 made an appraisal of seven of the fifteen parts of the company's system.

Mr. Connette based his appraisal figures on the average unit prices prevailing in the last five, the last eight and the last ten years as to materials which would be utilized in reproducing the properties of the system. He fixd the net value of the property, after including development charges and current assets, and deducting depreciation, obsolescence and inadequacy as follows: Five years' average, $56,364,852; eight years' average, $53,465,703; ten years' average, $52,520,885.

Mr. Connette found the total appraisal value on the basis of the five years' average unit prices to be $66,449,051, from which he subtracted $10,084,199 estimated for depreciation, obsolescence and inadequacy. On the eight years' average unit prices he found a total value of $62,920,599, from which he subtracted an estimate for depreciation, obsolescence and inadequacy, amounting to $9,454,856. On an average of ten years' prices, he found the total value to be $61,749,715. He made a subtraction of $9,228,830 from this item for estimated depreciation, obsolescence and inadequacy.

Six-Cent Fare for Providence

Committee Now Recommends Relief for Rhode Island Company by Flat Fare Instead of Zone System

The special legislative committee considering the Rhode Island Company situation voted on April 2 to recommend a 6-cent fare with eighteen tickets for $1 to be in effect until one year after the signing a treaty of peace in the present war.

By vote of five to one the committee defeated a resolution to report in favor of State ownership and by a vote of five to two the committee defeated a motion to report in favor of the zone system as recommended by the special commission in its report presented a month ago.

A Good Return on your Money
A Quick Return for our Men
BUY LIBERTY BONDS

The resolution as provided by the committee by vote of four to three is as follows:

"Resolved, that this committee recommend that temporary relief be granted the Rhode Island Company by increasing the flat 5-cent fare to 6 cents with the issue of tickets at the rate of eighteen for $1, such relief to be effective May 1, 1918, and to continue in operation during the present war and one year from the date of signing the treaty of peace."

On April 3 the report of the special committee, together with the minority reports, was presented to the Legislature. At the same time an act was introduced in the House authorizing the Public Utilities Commission to carry into effect the recommendations in the majority report. It will be considered April 10.

Some time ago a special commission appointed by the Legislature early in 1917, ordered the adoption of a system of 5-cent central areas, with 2-cent intermediate zones, and recommended taxation and franchise reforms as measures of relief for the company. The Legislature prevented the Public Utilities Commission from putting these changes into effect. It then began the inquiry which has now resulted in the recommendation of the 6-cent fare.

Fare Dispute in Cleveland

Much Heralded Low-Fare City a Victim of High-Cost Epidemic—City Replies to Fare Request With an Injunction

Common Pleas Judge Pearson, in a decision rendered on the afternoon of March 30, granted an injunction to the city of Cleveland, Ohio, restraining the Cleveland Railway from raising the fare, as had been planned. The suit was filed in the forenoon of the same day by City Law Director FitzGerald. Notice of appeal was given by the company's attorneys.

On April 2 the Court of Appeals reversed the decision of Common Pleas Judge Pearson and the company put into operation the next higher rate the following day. This is 4 cents cash or seven tickets for a quarter, with a charge of 1 cent for transfers which is rebated. The city gave notice of an appeal to the Supreme Court and attorneys for both sides will appear before that tribunal on April 16.

The Tayler grant, under which the railway operates, provides for an automatic increase in the rate of fare whenever the interest fund falls below $300,000. This point was passed some time ago and the fare was advanced to three tickets for 10 cents with a charge of 1 cent for transfers with no rebate. The next higher rate provided in the Tayler franchise is 4 cents cash fare and seven tickets for 25 cents.

At the hearing before Judge Pearson City Law Director FitzGerald argued that the present rate of fare in force since Dec. 26, 1917, had not received a trial sufficient to determine whether it will replenish the interest fund. Attorney Harry Crawford, representing the company, said that the condition of the interest fund was now such that the city owed the company $380,000.

Fielder Sanders, Street Railway Commissioner, said that the failure of the present rate of fare to increase the interest fund was due to the unusual weather conditions in January and to the fact that the number of patrons decreased 1,200,000. He concluded that the $380,000 could be made up at the present rate of fare under operating conditions such as existed in 1916. It would require five years to accomplish this under present conditions.

In a letter to John J. Stanley, president of the company, on March 28 Mr. Sanders suggested that the question of rate of fare be submitted to arbitration. On the following day Mr. Sanders received a reply in which Mr. Stanley said he could see nothing to arbitrate. Among other things Mr. Stanley said:

PAY AS YOU GO

"The rate of fare ought to have been raised to the maximum last year, as you well know. I know the present rate of fare will not bring enough income to restore the interest fund while wages and prices continue as high as they are now and while the city requires of the company the present service. So do you.

"You can reduce the service; we can put up the fare. One thing or the other must be done and done now. Present cost of operation ought to be paid by present car riders, not by their sons.

"Neither you nor any Councilman should hesitate to assent to the increase in fare. Nor should any attempt be made by Republicans to shift the duty to Democrats or by Democrats to force it upon Republicans.

"You say that on the figures for January and February the city is of the opinion that the present rate of fare has not had a fair trial. What is your own opinion?

"Weather conditions were certainly bad in January. But they were much better in February. Yet the interest fund decreased $49,413 in that short month. It will continue to decrease so long as the present service is furnished at the present rate of fare.

"If you prefer to reduce the service so that the present fare will give us a surplus every month until the interest fund climbs to $700,000, send us new schedules and we will put them into effect."

Mr. Sanders claims that the right of arbitration of the necessity of raising the rate of fare is not excluded by the Tayler franchise and that the public must be considered. He did not reply to Mr. Stanley's letter, but instead proceeded with the injunction case.

Platformmen in the employ of the company have decided to demand an increase of 25 cents an hour on May 1. This would make the maximum hourly wage 60 cents. In addition they will ask that 40 per cent of all runs be completed in eleven hours, 40 per cent in twelve hours and 20 per cent in thirteen hours, with a minimum work-day of eight hours. The minimum day for some time past has been five hours.

Officers of the company say that if these demands were granted a straight 7-cent rate of fare would be necessary.

Public Service Hearings Continued

Other Witnesses Follow President McCarter in Explaining Need of Higher Fares for New Jersey System

During the past week the Public Service Railway, Newark, N. J., continued to present its case for increased fares before the Board of Public Utility Commissioners of New Jersey. The general statement of the situation made by President T. N. McCarter, as noted in the ELECTRIC RAILWAY JOURNAL of March 30, has been supplemented by the testimony of others in regard to various phases of the company's need.

At a hearing on March 27 the chief witnesses were F. H. Sillick, comptroller of the Hudson & Manhattan Railroad, New York, N. Y.; Prof. Albert S. Richey, of the Worcester (Mass.) Polytechnic Institute; and Joseph K. Choate, vice-president of the J. G. White Management Corporation, New York, N. Y. Other witnesses were half a dozen employees from various parts of the State, called to explain the wage situation to-day and the need of an increase in pay.

Mr. Sillick expressed the opinion that the increase to 7 cents desired by the company would result in an increased revenue of about 15 per cent. His opinion was based on the experience of his company following the increase in the tube rate to uptown points in New York City. Professor Richey expressed a similar opinion. In regard to a zone system, the latter witness stated that such a system would require several months of preparation. Theoretically it was worthy of consideration, but the difficulty of fare collection, especially in densely populated territories, was an obstacle to practical application.

Mr. Choate explained to the commission how the electric railways of the whole country have approached the point where a 5-cent fare is insufficient. As to the desirability of a zone system, Mr. Choate said that in theory the distance tariff or zone system as adopted in Europe is a correct one, but in this country it is almost an impossibility in city service.

On March 28 Prof. Roswell McCrea, Columbia University, New York, N. Y., showed how labor costs have increased in the last few years. In his opinion there will be a further increase, owing to the scarcity of workers, increased living costs and the growing "competitive power" of workers.

R. E. Danforth, vice-president and general manager of the company, gave the detailed figures of increased operating costs in 1917. He said that tales of high wages in other industries were attracting men away from the railway, and other employees are necessary.

At a hearing on April 1 Dr. Thomas Conway, Jr., University of Pennsylvania, Philadelphia, Pa., testified in regard to how electric railways have been carrying passengers for less than the cost of service. In his opinion, these utilities have suffered more than other public service companies from the present increased cost, because their expenses are more largely composed of the cost of labor.

Various associated municipalities of New Jersey, which are opposing the company's application for financial relief, have retained the services of Delos F. Wilcox, New York, and Peter Witt, Cleveland, Ohio. Mr. Wilcox has charge of the preparation of the proof to be submitted on behalf of the municipalities. The municipalities contend that the 5-cent fare has afforded more than a reasonable return upon the actual investment and is still sufficient to afford such a return.

Portland Appeals Fare Case

The city of Portland, Ore., has filed notice of appeal to the State Supreme Court from the decision of the six circuit judges of Multnomah County, who, after hearing arguments *en banc*, decreed that the Public Service Commission had legal authority to increase fares for the Portland Railway, Light & Power Company from 5 cents to 6 cents. The appeal is directed against both the commission and the company. The city has filed a bond guaranteeing to pay whatever costs may be assessed against it in the higher court. The decision of the court in this case was reviewed in the ELECTRIC RAILWAY JOURNAL for March 30, page 617.

New Transfer System in Trenton

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has put into effect a new transfer system designed to prevent the abuses of the transfer privilege which grew up under the system previously in force. This change is in line with the suggestion made by Peter Witt, Cleveland, in his study of traffic conditions in Trenton. Mr. Witt's recommendations were reviewed in the ELECTRIC RAILWAY JOURNAL of Jan. 19, page 138.

Transportation News Notes

Fare Complaint Withdrawn.—The complaint filed last July by the Commuters' Association against the Philadelphia & Western Railway, upper Darby, Pa., operating between Sixty-ninth Street, Philadelphia, and Norristown, has been withdrawn.

Suggest Higher Fares in Newport.—W. W. Freeman, president, and Polk Laffoon, secretary of the South Covington & Cincinnati Street Railway, on March 25 suggested to the city officials of Newport, Ky., an increase in the rate of fare from 5 cents to 6 cents.

Railway Will Run Three Buses.—The Winnipeg (Man.) Electric Railway proposes to install a service of three buses in connection with a section of the city not now served by its electric railway lines. There will be an exchange of transfer privileges between the railway and the buses.

Trans-Bay Fare Cases Put Over.—The hearing of the Southern Pacific Company and Key Route trans-bay fare cases, which was set for April 1, has been changed to April 17. The postponement was made necessary owing to the inability of the Railroad Commission to finish by April 1 the hearing on the Spring Valley Water case.

Automobiles Cause Half the Injuries.—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., reports that in 1917 automobile accidents were responsible for more than one-half of all injuries. In 1917 there were 1088 injuries as compared to 1063 in 1916. A total of 121 persons were injured while getting on and off cars.

Don't put off till to-morrow the Bond you can buy to-day

One-Man Cars and Fare Boxes for Houston.—The Houston (Tex.) Electric Company has received ten new one-man cars which have been put into service as an experiment on some of the most congested lines of the city. The company has also received a shipment of fare boxes. All cars will be equipped with the boxes as soon as they are received.

Seven-Cent Fare in Keene. — The Keene (N. H.) Electric Railway has increased its fares under authority of the Public Service Commission of New Hampshire from 6 cents to 7 cents. The appeal of the company to the commission was noted in the ELECTRIC RAILWAY JOURNAL of March 23, page 591. The commission held no hearing as no objection was made to the new rate.

Six-Cent Fare for Oklahoma Road.—The Corporation Commission of Oklahoma has issued an order authorizing the Chickasha (Okla.) Street Railway to charge a regular passenger fare of 6 cents in that city. Campbell Russell, a member of the commission, said that electric railways in cities and towns of 10,000 to 15,000 population will continue to experience great difficulty in meeting expenses.

Skip Stops for New Jersey.—The Public Service Railway, Newark, N. J., will adopt the skip-stop on its Essex division on April 8. The territory affected comprises Essex County and the West Hudson towns. Stops will average about eight to the mile, except in the business section, where they will be more frequent. Stopping places will be designated by white bands on the trolley poles.

Cleveland & Eastern Wins Fare Case.—On March 19 the Supreme Court of Ohio dismissed an appeal from a decision of the Public Utilities Commission made by the Commissioners of Cuyahoga County in the case of the Cleveland & Eastern Traction Company. The commission had granted the company authority to increase its rate of fare between Cleveland and South Euclid from 5 to 10 cents.

New Jitney Measure Proposed.—The proposed jitney ordinance filed recently with the City Council of Portland, Ore., has been approved by a committee of jitney men. The ordinance provides that drivers of jitneys shall furnish a bond of $1,000 instead of $2,500 as now required. The Council has been requested to pass the measure, and then refer it to the voters for consideration at the special city election to be held May 17.

Hoboken Wants Action.—The Board of Public Utility Commissioners of New Jersey has been requested by Corporation Counsel John J. Fallon of Hoboken, to hand down a decision on Hoboken's application for a 3-cent fare over the lines of the Public Service Railway in that city prior to the decision of the board on the 7-cent fare asked by the company. Three years ago the city of Hoboken applied for a 3-cent fare. The claim was made that Hoboken was only a mile square in size and that the company should charge only 3 cents in that city.

"For Humanity's Sake."—An appeal to automobilists for safety, with this title, has been published by J. H. Handlon, claims agent United Railroads of San Francisco. It is a pamphlet of forty-eight pages, showing on each right-hand page a different kind of automobile accident. The accident is illustrated by a picture diagram, and a brief description is given to explain how the accident might have been avoided. The general principle or moral is then stated in epigrammatic form. On each left-hand page is a quotation or maxim on the necessity for care.

Walla Walla Feels the War Pinch.—According to E. G. Miller, traffic manager of the Walla Walla (Wash.) Valley Railway, the deficit of the company is about $40,000. The company has announced in a bulletin to the public that it will abandon the East Walla Walla line, 1⅛ line long; that city fares must be raised to 7 cents; and, interurban fares must be advanced to a basis of 2½ cents a mile. The company also asks the elimination of the franchise tax, protection from jitney competition and relief from paving assessments.

Winnipeg to Issue Paper.—The Winnipeg (Man.) Electric Railway has established a publicity department which will be under the direction of H. C. Howard, formerly on the staff of the Winnipeg *Free Press*. In connection with the publicity department it is the intention of the company to issue a publication which will take the form of a pamphlet to be distributed regularly on the cars. In it matters of public interest will be discussed in frank talks from time to time, with the hope that a greater degree of confidence and goodwill may be attained between the company, its employees, and the public.

Indiana Interurban Seeks Increase.—A petition for an increase in passenger rates has been filed by the Winona Interurban Railway, Warsaw, Ind., through its receiver, with the Public Service Commission of Indiana. The petition asks that the company be allowed to change its rates from 2 cents per mile to a rate basis of 2½ cents per mile, with a minimum charge of 10 cents. The petition states that operating expenses have increased so abnormally during the past few years that in order to continue operations relief is necessary. The date for the hearing has not yet been set by the commission.

Personal Mention

W. C. Twomey, formerly auditor of the Chicago & West Towns Railway, Oak Park, Ill., has joined the army.

J. E. Lawless, former master mechanic of the Paducah (Ky.) Traction Company, has been transferred to Fort Worth, Tex.

W. H. Bennett, formerly master mechanic of the Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., is now connected with the Brown Show Company, Dixon.

H. C. Howard, formerly of the staff of the Winnipeg *Free Press* has been placed in charge of the publicity department of the Winnipeg (Man.) Electric Railway, which has been established by the company in its desire to promote better relations with the public.

Neal Funk has been appointed to succeed his father, the late J. T. Funk, as head of the claim department of the Louisville (Ky.) Railway. Neal Funk has been with the company for a number of years and for some time past had been assistant to his father.

M. Skouden, who has been connected with the Union Traction Company, Anderson, Ind., for seventeen years in various capacities, has been appointed superintendent of motive power to succeed R. N. Hemming, whose appointment to the Fort Wayne & Northern Indiana Traction Company is noted elsewhere in this department.

Lee J. Wells has been appointed acting superintendent of the St. Petersburg & Gulf Railway, St. Petersburg, Fla., to succeed Edward Morton, Jr., who has become connected with the Philadelphia Iron & Steel Company. Mr. Wells worked as a conductor for many years for the company and in 1915 was promoted to dispatcher.

Joseph H. Alexander, formerly assistant to the president of the Cleveland (Ohio) Railway, has been promoted to the rank of colonel in the quartermaster's department. He was called to Washington last fall and given the rank of major. Colonel Alexander is engaged in the cantonment and construction division.

P. W. Gerhardt has been appointed railway superintendent of the Savannah (Ga.) Electric Company. Mr. Gerhardt was for many years superintendent of transportation of the Dallas Consolidated Electric Street Railway, the Metropolitan Electric Street Railway and the Rapid Transit Railway, Dallas, all included now in the Dallas Railway, under the service-at-cost franchise. Before going to Dallas Mr. Gerhardt was connected with the Twin City Rapid Transit Company, Minneapolis, Minn.

J. Frank Johnson, railway engineer, who was in charge of the publicity campaign of the Dunham (N. C.) Traction Company in connection with its request to the city for a 6-cent fare, has been transferred to the Bartlesville (Okla.) Interurban Railway in a similar capacity. The conduct of the campaign at Durham was referred to in the ELECTRIC RAILWAY JOURNAL for March 30, page 635.

R. N. Hemming has resigned as superintendent of motive power of the Union Traction Company of Indiana, Anderson, Ind., to become connected with the Fort Wayne & Northern Indiana Traction Company as superintendent of transportation, with headquarters at Fort Wayne. Mr. Hemming has been connected with the Union Traction Company of Indiana as superintendent of motive power since Oct. 1, 1911. Prior to his employment with that company he was with the diversified holdings of the Dr. S. B. Hartman interests for seven years as chief engineer. In 1907 Mr. Hemming built and managed the Ohio & Southern Traction Company. Three years prior to that he was electrical engineer for the Buckeye Steel Castings Company, Columbus, Ohio. He was also chief electrician for the municipal light plant at Columbus, Ohio. Mr. Hemming has served on the standardization committee of the Central Electric Railway Association for seven years and for three years was chairman of that committee. He also served on the equipment committee and other joint and sub-committees of the American Electric Railway Association for three years and was co-chairman of the committee on transportation appointed by that association.

R. N. HEMMING

M. E. Foley, attorney for the Indianapolis Traction & Terminal Company, Indianapolis, Ind., has been appointed by Governor Goodrich as chairman of the State Council of Defense of Indiana.

Arthur Preger, assistant treasurer of the Springfield Railway & Light Company and the Springfield (Mo.) Traction Company, has been appointed manager of the Albuquerque Electric Light & Power Company, Albuquerque, N. M., to succeed W. P. Southard, made general manager of the Trinidad Electric Transmission, Railway & Gas Company. Both properties are controlled by the Federal Light & Traction Company.

Winthrop M. Daniels has been elected chairman of the Interstate Commerce Commission for one year dating from March 17, to succeed Henry C. Hall. The election of Mr. Daniels as chairman is in pursuance of the policy adopted in 1911, that the term of office of the chairman of the commission shall be for one year, and that the office shall be filled from year to year in the order of seniority of service.

E. H. Thomas, a former newspaper man of Seattle and Bellingham, Wash., has been appointed to the position of publicity agent of the Puget Sound Traction, Light & Power Company, Seattle, Wash., created in the executive offices. He will co-operate with the publicity agents of the local companies of Seattle, Tacoma, Everett and Bellingham in standardizing advertising and publicity in which the several companies are interested.

Harry H. Reigel has resigned as purchasing agent of the Reading Transit & Light Company and Metropolitan Edison Company, Reading, Pa., after seventeen years of continuous service. He has held positions of authority and trust during almost the entire period of his service with the company, having been transitman, timekeeper, paymaster, cashier, chief clerk and treasurer until the retirement some time ago of John A. Rigg, former president of the company.

Joseph F. Elward has been appointed assistant master mechanic of the Indianapolis Traction & Terminal and Terre Haute, Indianapolis & Eastern Traction Companies, in charge of the West Washington Street Shops, Indianapolis, Ind., during the absence of L. M. Clark, who is serving with the colors as major in the ordnance department. Mr. Elward entered the service of the Indianapolis Traction & Terminal Company as car inspector in 1902, and was promoted to carhouse foreman in 1905. On May 1, 1910, he was appointed to the position of chief car inspector.

W. L. Davis, until recently a traveling auditor on the staff of the American Power & Light Company, New York, N. Y., has been appointed auditor of the Lehigh Valley Transit Company, Lehigh Valley Light & Power Company and affiliated companies, at Allentown, Pa. Mr. Davis was formerly connected with the firm of Ernst & Ernst, certified public accountants, Cincinnati, Ohio. Mr. Davis began his work in the railway field in 1906 with the Ohio Electric Railway and was appointed statistician of the company in 1909, serving in this work until 1912, when he joined the organization of the Texas Power & Light Company, Dallas, Tex., first as traveling auditor and later as assistant secretary-treasurer. From 1914 to 1915 Mr. Davis was auditor for the Southern Traction Company and the Texas Traction Company, both of Dallas.

W. P. Southard, manager of the Albuquerque Electric Light & Power Company, Albuquerque, N. M., and the City Electric Company for three years, will be transferred to Trinidad, Col., to become general manager of the Trinidad Electric Transmission, Railway & Gas Company. Previously Mr. Southard was manager of the Las Vegas Light & Power Company, Las Vegas, N. M., and the Las Vegas Transit Company. Mr. Southard succeeds at Trinidad E. C. Deal, who, as noted in the ELECTRIC RAILWAY JOURNAL for March 30, has been transferred to Springfield, Mo., as manager of the Springfield Railway & Light Company and the Springfield Traction Company. All of the properties are controlled by the Federal Light & Traction Company.

Sam W. Greenland, general manager of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has been selected to supervise the construction of a government power plant at Baltimore, Md., to be used in connection with a munition factory. This task will require at least six months before it is completed, and Mr. Greenland will remove with his family to Baltimore, remaining there until the job is finished when he will return to Fort Wayne. Since the beginning of the war Mr. Greenland has taken an active part in patriotic work. In the Liberty Loan drives, Red Cross campaigns, Y. M. C. A., and boys working reserve activities, he has been very prominent. During his absence in Baltimore, Mr. Greenland's duties as general manager will be carried on by other department heads.

D. P. Falconer has resigned as engineer of maintenance of way of the New York State Railways, Rochester lines, to manage the sales and develop a market for magnesium, a new metal, for the Shawinigan Electro-Metals Company, and has opened an office for the company at Cleveland, Ohio. Mr. Falconer's first railroad work was done for the Pennsylvania Railroad, by which he was employed in various capacities in the maintenance of way department of the lines west of Pittsburgh. He entered electric railway work with the New York State Railways in April, 1919, as assistant engineer of maintenance of way, and in 1912 was promoted to engineer of maintenance of way of the company. Since that time Mr. Falconer has had charge of track, pavement, bridge and similar work for the lines in Rochester and the Rochester & Eastern Railway. His activities have covered the construction, maintenance and design of work done by the maintenance of way department.

A. Merrit Taylor to Go to Washington

Will Be Manager of Passenger Transportation for Emergency Fleet Corporation and Shipping Board—Was Transit Commissioner of Philadelphia

Charles Piez, vice-president and general manager of the Emergency Fleet Corporation, announced in Washington on April 2 the appointment and acceptance of A. Merritt Taylor as manager of passenger transportation for the corporation and the Shipping Board, with offices at Washington. The creation of this position means a new division of work in the shipbuilding scheme of the government, as the new branch will not be a part of the housing division, which has heretofore had charge of transportation problems. The work of passenger transportation is one of the most important of the government, when it is considered that the building of ships is dependent upon the arrangements made to transport shipyard workers to and from the yards.

A. M. TAYLOR

Mr. Taylor has arrived in Washington and has entered upon his work. In discussing his plans with the Washington representative of the ELECTRIC RAILWAY JOURNAL, he said he hoped to bring to Washington a number of engineers to assist in the work, as there are 145 shipyards on the Atlantic, Pacific and Gulf coasts, and in many of them transportation questions will have to be solved.

APPOINTS A STAFF

Mr. Piez said he welcomed the opportunity to work in conjunction with Mr. Taylor, and that the latter is now selecting his own staff of engineers. Among the appointments so far made of assistants by Mr. Taylor are the following: A. B. Maine, formerly chief clerk in the Department of City Transit, Philadelphia; Charles C. Cooke, Jr., member of the firm of Kelly, Cooke & Company, engineers, Philadelphia; Howard S. Hipwell, John A. Renshaw and Walter C. Solly, who were formerly assistant engineers in the Department of City Transit, Philadelphia. Mr. Solly was recently with the New Chester Water Company, Chester, Pa.

Born in 1874 near Burlington, N. J., Mr. Taylor, at the age of fifteen, became an indentured apprentice in the machine shops of William Sellers & Company, of Philadelphia. After reaching his twenty-first year he engaged in the handling of investment securities, largely real estate mortgages, railway stocks and bonds, and during this time he became interested in the Philadelphia & West Chester Traction Company. He was elected president of this company in January 1899 at the age of twenty-four years, in which office he has since continuously served. Under his administration the company has been developed from a struggling organization, operating only about 8 miles of track, to its present prosperous condition with about 50 miles of track, most up-to-date equipment and method of operation. In 1902 he became interested in the company operating the old Fort Lee Ferry from 130th Street, New York, to Edgewater, N. J., and the electric railway from Edgewater to Englewood. In that year he and his associates incorporated the New Jersey & Hudson River Railway & Ferry Company, which acquired these properties, and Mr. Taylor was elected president. Under the new management modern double-deck ferryboats were put into service, a new commodious ferry-house was constructed on the New York City side, and the railway was extended through Hackensack and on to Paterson, N. J. An additional line was also acquired, extending from Hackensack to Newark. The company prospered from the outset. After the sale of this property to the Public Service Corporation Mr. Taylor resigned as president.

BECOMES TRANSIT COMMISSIONER

In May, 1912, Mr. Taylor was appointed by the Mayor of Philadelphia transit commissioner to investigate the problems of improved transit facilities in Philadelphia. Within thirteen months Mr. Taylor completed his report, which was a most exhaustive analysis of the problems involved. He then advised with eminent counsel as to what legislation was needed to establish and finance this system and appeared before the Legislature at Harrisburg urging the passage of the necessary bills, all of which passed, and later accepted by the people of Philadelphia by an overwhelming vote. In performing this important work Mr. Taylor declined to accept pecuniary compensation for his services. Mr. Taylor was then appointed by the Mayor director of the newly created Department of City Transit. He held office until January, 1916, and during this time had the satisfaction of seeing actual construction begun on the city's new subway and elevated lines according to the "Taylor Plan."

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporations

***Cumberland Power Company, Wilmington, Del.**—The Cumberland Power Company has filed its certificate of incorporation with the Secretary of State of Tennessee. This concern is incorporated under the laws of Delaware, with its principal office at Wilmington. The purposes of the company are to purchase or otherwise acquire, construct, and operate electric railways and power plants. Capital stock, $100,000. Incorporators: F. D. Buck, M. L. Horty, and K. E. Longfield.

Chatham County Traction Company, Savannah, Ga.—Application for a charter will be made by the Chatham County Traction Company for the construction of an electric line from the intersection of Augusta Avenue with Lathrop Avenue, Savannah, to Port Wentworth, about 6 miles. The company also desires to own and operate electric plants and furnish electric light and power. Capital stock, $150,000. Among the incorporators are H. C. Foss, secretary of the Savannah Electric Company; W. W. Osborne, A. A. Lawrence, David S. Atkinson and Edmund H. Abrahams, all of Savannah. [March 9, '18.]

***St. Clair Central Railway, Belleville, Ill.**—Incorporated to construct a line from East St. Louis to Benton. Capital stock, $5,000. Incorporators: John T. Taylor, Belleville, Ill.; John Henderson, St. Louis, Mo.; L. E. Fischer, St. Louis, Mo., and W. C. Wolf and P. K. Johnson, Belleville, Ill.

Franchises

Coronado, Cal.—The San Diego, South Eastern Railway has received a franchise from the City Council for an extension on First Street to K Avenue, thence over private property to Fourth Street and the shore of Spanish Bight, where a bridge is being erected by the government.

Los Angeles, Cal.—The Pacific Electric Railway has been denied authority by the California Railroad Commission to build a line from Anaheim through Tustin to the town of Irvine, a distance of about 11 miles, and also a line from Glendora to Lone Hill, about 4 miles.

New York, N. Y.—The Public Service Commission for the First District of New York has granted the application of the Union Railway for permission to construct an extension of its Fordham Road-207th Street Crosstown Line, so as to provide street car access to and from the Dyckman Street Ferry. The Board of Estimate & Apportionment has already granted a franchise for this extension.

Marietta, Ohio—The Kanawha Traction & Electric Company will ask the City Council of Marietta for a new franchise. As a number of improvements in their lines and service are being planned by the company, the new franchise is sought to secure them against loss. The franchise under which they are now operating, expires within about three years.

Track and Roadway

Alabama Interurban Railway, Birmingham, Ala.—The proposed line of the Alabama Interurban Railway will extend from Birmingham to Lock No. 17 on the Warrior River, about 20 miles, with branches to Patton Ferry, 5 miles, and to Shoal Creek, 15 miles. Another branch to Taylor's Ferry and an extension to Lock No. 16 and Davis Creek are contemplated. Thomas L. Cannon, Birmingham, president. [March 16, '18.]

Pacific Electric Railway, Los Angeles, Cal.—Los Angeles County and the Pacific Electric Railway plan to erect a steel and concrete bridge over Vergugo Wash on Brand Boulevard, North Glendale. The cost is estimated at $50,000.

Municipal Railway, San Francisco, Cal.—Plans are being made to extend the Municipal Railway beyond the Twin Peaks tunnel. At a recent conference in the Mayor's office a resolution was adopted by the Public Utilities Committee directing the Board of Works to prepare plans and specifications for the construction of two extensions and appropriating $10,000 for this work.

Tampa (Fla.) Electric Company.—This company will construct an extension on Twenty-second Street and also on Chapin Street.

Orleans-Kenner Traction Company, New Orleans, La.—The Orleans-Kenner Electric Railway has been reorganized under the name of the Orleans-Kenner Traction Company. The property of the company was recently sold under foreclosure to J. Blanc Moore for $225,000.

***Eastern Maine Railroad, Bangor, Me.**—A report from George W. Maxfield, president of the Eastern Maine Railroad, states that the company proposes to construct either a steam or electric railway from Bangor, crossing the Penobscot River to Brewer, thence in an easterly direction through the vast timber-lands of eastern Maine through to Holton, a distance of 112 miles. Right-of-way has been purchased for about 32 miles. The company will reach amusement parks and will be able to furnish power for lighting. No contracts have as yet been awarded for the construction of the line. The officers of the company are: George W. Maxfield, Bangor, president and general manager, and Charles L. Andrews, Augusta, secretary and treasurer.

Minneapolis (Minn.) Street Railway.—Mayor Thomas Van Lear of Minneapolis has asked the City Council to compel the Minneapolis Street Railway to construct seven extensions in outlying districts as ordered eleven months ago.

Hudson & Manhattan Railroad, New York, N. Y.—The Hudson & Manhattan Railroad will extend its rapid transit system from its terminal in Newark to the Newark Bay section to provide better transportation facilities for the 250,000 workers to be employed in the shipyards filling the contracts of the United States Emergency Fleet Corporation. The plans have been approved by the shipping board.

Interborough Rapid Transit Company, New York, N. Y.—Bids will be received by the Public Service Commission for the First District of New York on April 17, for laying tracks and for materials for finishing the Eastern Parkway and Nostrand Avenue subway extensions of the Interborough Rapid Transit Company in Brooklyn. At the same time bids will be opened for completing the Brighton Beach connection between the Brighton Beach line and the Fourth Avenue subway.

Long Island Electric Railway, New York, N. Y.—After an inquiry lasting several years, the Public Service Commission for the First District of New York has ordered the Long Island Electric Railway to abandon a part of its present route between Rockaway Road and Grant Avenue, Queens, and to build a double-track line in Liberty Avenue.

Cincinnati (Ohio) Traction Company.—C. W. Culkins, director of street railroads, will ask the City Planning Commission to approve the construction of a loop on Warner Street to provide a turning point for cars operating on a new line to be known as the Fairview line, running between Fairview Heights and Fountain Square. Mr. Culkins is also considering the extension of one of the city lines to the village of California and the extension of the Madison Road line to Delta Avenue.

Mansfield Railway, Light & Power Company, Mansfield, Ohio.—It is reported that Henry L. Doherty & Company, who operate the Mansfield Railway, Light & Power Company, plan extensive improvements and changes in Casino Park.

***Miami, Okla.**—It is reported that business interests have subscribed $200,000 toward the construction of the proposed electric railway from Miami to Picher and other towns in the mineral district. H. B. Cobban, president Miami Business Men's League, may be able to give information.

Portland, Ore.—A survey of all streets in the city of Portland has been ordered by Commissioner Barbur of the Department of Public Works, to determine the extent of the maintenance and repair work necessary, with particular attention to the condition of the tracks of the Portland Railway, Light & Power Company, which are in bad condition on many lines. It is expected an expenditure of $500,000 will be required.

Valley Railways, Lemoyne, Pa.—It is reported that if the government quartermaster depot is placed at Marsh Run the Valley Railways will construct an extension from New Cumberland to New Market.

Carbon Transit Company, Mauch Chunk, Pa.—Plans are being considered by the Carbon Transit Company for the construction of an extension from Packertown to Jamestown, about 1 mile.

Philadelphia (Pa.) Railways.—Negotiations are under way between the Emergency Fleet Corporation and the Philadelphia Railways for the rehabilitation of its line and an extension of double-track service over the Penrose Ferry Road to the shipyard at Hog Island.

Philadelphia (Pa.) Rapid Transit Company.—Negotiations have been completed by the Philadelphia Rapid Transit Company with the Emergency Fleet Corporation, and the railway will soon begin the extension of its line on Island Avenue at Eastwick to the shipbuilding works of the American International Company at Hog Island.

Pittsburgh (Pa.) Railways.—The Public Service Commission of Pennsylvania has issued an order to the Pittsburgh Railways to construct a new line on Wheatland Street.

***Grand'Mere, Que.**—Plans are being considered by business men of Grand'Mere and Shawinigan Falls for the construction of an electric railway, costing approximately $100,000, from Grand'Mere to Shawinigan Falls.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C.—It is reported that the Charleston Consolidated Railway & Lighting Company is considering the construction of some track extensions.

Virginia Railway & Power Company, Richmond, Va.—A new roller coaster will be erected by the Virginia Railway & Power Company at Forest Hill Park at a cost of $6,000.

Seattle (Wash.) Municipal Railway.—City Engineer A. H. Dimock, Seattle, has submitted to Councilman Oliver T. Erickson, chairman of the city utilities committee, tentative plans for an elevated railway on Washington Street, extending from the Seattle & Rainier Valley Railway's line at Fourth Avenue South to the city's proposed elevated line at First Avenue South, with a terminal station on Third Avenue South, between Washington Street and Yesler Way. The cost is estimated at $85,770, exclusive of any condemnation judgments that may be awarded as damage to property along Washington Street and Third Avenue South. By extending the elevated line in Third Avenue South from Washington Street to Yesler Way, it is stated a terminal can be made from which twenty street car lines can be reached within half a dozen blocks.

Puget Sound Electric Railway, Tacoma, Wash.—Louis H. Bean, president of the Puget Sound Electric Railway, recently conferred with the Pierce County Commissioners in an effort to reach an understanding as to improvements for the company's short line bridge over the Puyallup River, which was wrecked in December by floods. W. J. Roberts, engineer of the Inter-County River Commission, which is in charge of river improvements, will go over the proposed plans with one of the company's engineers and report to the commission. Mr. Bean agrees that the bridge should have two spans, one 200 ft. in length and the other 100 ft. over the river, but wants to pay only one-fourth of the cost of a 600-ft. jetty that must be built to protect the pierheads.

Morgantown & Wheeling Railway, Morgantown, W. Va.—This company has been authorized by the court to issue $60,000 of receiver's certificates for repairs and betterments on its line.

Wheeling (W. Va.) Traction Company.—Negotiations are being carried on between the Wheeling Traction Company and the County Court of Marshall County for improving the "Narrows" road south of McMechen, between the McMechen carhouse and Glendale. At a recent meeting of Marshall County Court, officials of the company fully discussed the situation and submitted plans whereby the highway can be made much safer with the erection of guard rails.

Shops and Buildings

Peoples Traction Company, Galesburg, Ill.—The old carhouse of the Peoples Traction Company located in the southwest outskirts of the city was recently totally destroyed by fire. The loss is estimated at about $10,000.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York recently received bids for the construction of station finish on seven stations of the Nostrand Avenue branch of the Eastern Parkway subway in Brooklyn. The lowest bidder was A. W. King, New York, at $249,639.

Lehigh Traction Company, Hazleton, Pa.—Plans are being made by the Lehigh Traction Company for the remodeling of its old carhouse and sheds back of its terminal at Wyoming and Spruce Streets into a big amusement hall for dances, basket ball, roller skating and public meetings. The cost is estimated at about $7,000.

Power Houses and Substations

Fort Smith Light & Traction Company, Fort Smith, Ark.—A 33,000-volt transmission line from Fort Smith to serve Alma and a number of other communities, has been completed and the Citizens' Service Company, which distributes electricity in Alma and other communities, is now receiving its electrical energy supply from the Fort Smith Light & Traction Company. The Citizen's Service Company is completing a line from Alma to Ozark, the electrical requirements of which will also be served by the Fort Smith Company. With the completion of these transmission lines the Fort Smith Company will serve all the electrical requirements for a distance of 45 miles west and south of the city.

Pacific Electric Railway, Los Angeles, Cal.—For the purpose of increasing its supply of power for the traffic on the Long Beach—San Pedro and San Pedro—Los Angeles lines, the Pacific Electric Railway has begun the construction of a concrete and brick substation at East Wilmington.

Decatur Railway & Light Company, Decatur, Ill.—The Illinois Public Utilities Commission has granted permission to the Decatur Railway & Light Company to operate an electric lighting plant at Dawson and to take over the plant of the Consolidated Light Company of that town.

Interborough Rapid Transit Company, New York, N. Y.—Plans are being made by the Interborough Rapid Transit Company for the construction of a new one and three-story transformer station on Seventy-fourth Street near Avenue A, to cost about $12,000.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Work will be begun at once by the Mahoning & Shenango Railway & Light Company on the erection of a transmission line from Lowellville to McDonald. The line will furnish power to the Youngstown & Niles Railway, a subsidiary company now under construction.

Reading Transit & Light Company, Reading, Pa.—The power station of the Reading Transit & Light Company at Collegeville has been dismantled, and the property will be converted into a substation. The best of the machinery and equipment is being utilized elsewhere and the remainder has been sold.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Differential Basis on Copper Wire Products

Reason Why Manufacturers with Accumulated Copper Stock Are Quoting Lower Prices

Lower prices have been looked for by the trade on all copper-wire products for some time. This belief was founded on the quotations for base, which have been gradually receding, to present quotations of 27 to 30 cents. When a large wire manufacturer was asked why the price was growing lower in the face of the government or officially established selling figures of 23.50 cents for car lots and 27.67½ cents for less than car load—prices which still prevail and have been extended by the War Industries Board to June 1—he said that the causes were various.

First, quite a stock of copper had been accumulating in the hands of primary buyers, and the market was therefore softening. Then commercial manufacturers who had a stock of high-price copper on hand had gradually worked it off. Conditions had been about equalized. Therefore it was possible on special business to sell wire on a 27-cent base.

Small sizes of wire and cable were still figured and sold on a 30-cent base. Where 27 cents was quoted it was either to meet competition or because of a desire to secure business. In transactions of this kind the credit standing of the customer is the principal factor. On some contracts taken at 27 cents base it is a matter of discounts. Orders at this figure have been accepted at 60 per cent; others at 60 and 5, and again still others at 60 and 10 to large buyers. Orders for more than $10,000 are figured from cost and a margin of profit ranging from 10 to 25 per cent. Purchasers of large quantities of signal wire, like the prominent railroads, buy on a 23-cent base.

The general average, however, to quote this and other authorities, is a 30-cent base. This figure is quoted to jobbers buying from manufacturers, with a discount of 60 per cent. On orders under $2,500 the usual discount is 50 per cent. It depends very much upon the commercial rating of the buyer. Sometimes an additional profit may be added for carrying the customer. Rubber-covered, lead, varnish, cambric and paper-insulated materials are sold on a cost basis plus a profit, which, of course, varies with the customer. There is no regular or hard and fast rule. Weatherproof is selling on an established pound basis, which is now 27 cents. One manufacturer states that all list prices are based on lengths of 250 ft. of one size and kind. For shorter lengths add to list price 20 per cent on lengths up to 100 ft., 10 per cent on 100 ft. to 250 ft.

Large sizes of wire are now selling almost to the exclusion of the small sizes. The sale of the latter has fallen off on account of the almost total suspension of building operations. The government is taking the greater portion of every manufacturer's output. Originally these purchases were made by the wire cable committee of the Committee of National Defense. Within the last five months the shipyards have been buying direct on a competitive basis. They are now the most important outlet for wire products.

Changes in Carnegie Sales Organization

Colonel Bope Resigns—He Is Succeeded by William Clyde—Other Changes

Effective as of April 1, 1918, Col. Henry P. Bope has resigned his position as vice-president and general manager of sales with Carnegie Steel Company to devote his time to private interests. Colonel Bope became connected with Carnegie Brothers & Company in November, 1879, and has remained continuously in the sales work of that company and its successors up to the present time.

He has been succeeded in his office with Carnegie Steel Company by William G. Clyde, whose connection with the United States Steel Corporation and its subsidiaries dates from 1894, when he became superintendent of the plate mills of the Illinois Steel Company at South Chicago. Later Mr. Clyde became connected with the sales organization of the American Steel Hoop Company as salesman for that company in Chicago, and after the merger of that company with Carnegie Steel Company was traveling salesman for the latter company at Cleveland for three years. In September, 1905, he was made assistant general manager of sales at Pittsburgh in charge of the Bureau of Bars and Hoops, which office he retained until his present promotion. Charles L. Wood, long assistant to Mr. Clyde, has been promoted to be assistant general manager of sales in charge of the Bureau of Bars and Hoops.

H. W. Johns-Manville Company announces that its Memphis, Tenn., office has been moved to new quarters at 804-805 Exchange Building.

Track Materials Prices

Why Tie Plates and Other Specialties Are Quoted on Another Scale Than Government List

When the table in this department of the ELECTRIC RAILWAY JOURNAL is consulted for prices on "Railway Materials," it will be noted that on tie plates, (flat type) and tie plates (brace type) the quotation given is 3¼ cents a pound which is the official or government fixed scale. The same quotations apply to fish plates, angle plates and angle bars. The purchasing agent, however, when coming into the market for tie plates will find a difference in price. According to one of the principal manufacturers these goods are nearly if not quite all special, and instead of being quoted a flat 3¼ cents a pound the figures will be higher for this grade and finish of steel (carbon and hot pressed), being around 3.40 cents a pound in lots of 25 gross tons or more; 4.40 cents a pound for less than 25 gross tons. Higher prices also apply to specifications covering different sizes and lengths as well as the finish. These quotations are f.o.b. mill.

On tie rods and screw spikes, with 8 cents a pound Pittsburgh base, the average price quotations ranging from 6 to 10 cents a pound will be made, according to size and weight. One large mill states it has a heavy stock of rail spikes, on which it is quoting 6 cents a pound. Rail bolts and nuts while on a 4.90 cents per pound, Pittsburgh base, vary in price also as to size, weight and special purpose. Miscellaneous sizes, 5 to 6 cents a pound is named; 7 to 8 cents a pound for short and 8 and 9 cents a pound for special size. High T-rails (Shanghai) and girder rail (grooved) are manufactured by only two steel companies, and while quoted at 4¼ cents a pound are reported as being out of the market.

So far there is less call for rails this year than in 1917. In other words the requirements for 1918 are already provided for and traction companies are asking quotations and making reservations, when possible, for the first and second quarters of 1919. On stock shipments $70 to $80 a ton is being quoted, the average being $75 for T-rails (A. S. C. E. standard). For what is known as Russian rails, made up by the Bethlehem Steel Products Company, Carnegie Steel Company, Lackawanna Steel Company and the United States Steel Corporation, and not deliverable, $60 a ton is figured. Present deliveries are fifteen months, and the consignee is obliged to obtain a priority order for transportation facilities.

Acute Tin Shortage May Cause Higher Prices

Manufacturers of Apparatus, Wire and Cable Express Uneasiness—Cost of the Metal Advancing

A sharp shortage of tin is not only freely acknowledged now but it has been in evidence for several months. The supply at the present time is less than ever. Prices have been climbing in harmony with the depleted stocks of the metal in this market. A number of manufacturers were waited upon by the ELECTRIC RAILWAY JOURNAL to ascertain the true state of affairs in so far as tin and its various alloys and amalgams affected the output and prices on electric railway products. At the office of one prominent concern the acute curtailment in tin stocks was frankly admitted and it was stated that the condition of the market is giving rise to a feeling of uneasiness.

Reserve supplies of tin in the hands of manufacturers of electrical apparatus, wire, cable, dry batteries and other lines are not large. One wire and cable producer said his company had recently bought 5000 lb. of Straits tin at 84 cents, or approximately four times the pre-war normal price.

Tin plays a very important part in the electrical and allied supplies market. Condensers are either coated with tin or they are made of an amalgam of tin and copper. Boiler tubes are also tin-lined, and if a substitute equally good were not made this would cause a serious predicament for central stations. All copper wire to be rubber-covered is first coated with pure tin. If this metal continues to be scarce and high, an early advance in the price of rubber-covered wire must naturally follow, in the opinion of a prominent manufacturer. At present, to use the statement of the same authority, the extra cost to the producers is from 3 to 5 per cent.

Were tin to become still more expensive or to be unattainable, a coat of pure Para rubber, said an expert, could be used on the copper wire, but this process would increase the price of rubber-covered fully 50 per cent. As yet that branch of the industry has not been called upon to meet this emergency. The concern in question supplies a majority of the rubber-covering factories with tinned wire. For lack of sufficient tinned stock a number of these plants have already been obliged to close down. Tin is also extensively used in certain grades of trolley wire. For weatherproof wire employed in the neighborhood of acid or other factories, where the presence of sulphur fumes corrodes and destroys the insulation, the core is likewise submitted to a tinning bath.

Wherever solder is utilized tin is an important element. The metal is also employed in everything of brass, bronze, phosphor-bronze, babbitt metal for journal bearings, and in other alloys known to power-house plants and in the traction railway activities trade. It is the general belief, therefore, among producers of merchandise in which tin is a factor that, while current prices have not yet been revised on account of the shortage, discussion along these lines is arousing unusual interest and serious attention.

Transportation Checks Pole Deliveries

Shortage in East of 35-ft. Size—Advance Reported on Pins and Brackets

Reports this week on the market condition of wood poles and crossarms reveal marked differences in different parts of the country.

In the East sizes of about 35 ft., which is the popular length, of chestnut are difficult to obtain. The demand is steady but shipments are checked by embargoes. Utilities are in the market for their spring requirements in replacement and maintenance work.

From the Pacific Coast, however, there is a different report. There the pole business is reported to be in a most abnormal and unsettled state, suffering from the rather unusual combination of slack demand and difficult deliveries. This situation may be explained by the shortage of available power and the present high cost of construction material. On the other hand, the pole yards are situated in the Pacific Northwest, where a great deal of government lumber is requisitioned. Cars and boats are difficult to get and labor is almost impossible to secure, and then only at high wages. One of the large pole companies states that when it is fortunate enough to secure a boat for deliveries along the Pacific Coast it is customary to load it with everything available, instead of proportioned stocks, and thus pole stocks are spotty and poorly distributed. Crossarms, of course, are affected by the conditions noted above, with the addition that the forests in which they are cut contain lumber that is valuable for governmental purposes and demands the attention of all available labor, making slow deliveries.

An advance of about 10 per cent on pins and brackets, it is reported from the Middle West, has been scheduled Shortage of material is given as the cause for the increase.

Steel As Related to Galvanizing

The Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued a report on a "Metallurgical Study of the Steel Base as related to Galvanizing," by G. A. White, metallurgical engineer. Some of the conclusions reached by this treatise are that steels containing a large amount of oxide and high in manganese or manganese sulphide will galvanize with a large number of small spangles, whereas steels high in manganese, manganese sulphide, sulphur and phosphorus but free from disolved gases and oxides will galvanize with bright spangles; also that the factors active in the production of small granular spangles have their origin in the open-hearth process and these causes can be eliminated only when sufficient care is taken to produce a steel substantially free from oxide. The steel on which Mr. White's tests were made was from three of a total of twenty heats, on each case the heat was tapped into two ladles, the steel in one ladle being treated with ferro-carbon-titanium, while the other received the standard open-hearth process.

New Iron and Steel Prices

Dating from April 1 the new iron and steel prices, established by the War Industries Board, with the approval of the President, went into effect. The changes to miners in force for three months, were comparatively few, now making basic pig iron $32 per ton and $32.50 for Bessemer. Foundry is left at $33, while malleable remains at $33.50. A reduction of $1 a gross ton is made on all prices of scrap, both base grade and differentials. Heavy steel melting scrap is thus quoted at $29.

Rolling Stock

Brooklyn (N. Y.) Rapid Transit Company, which intended opening bids for 50 new center-entrance train cars on April 1, as referred to in the ELECTRIC RAILWAY JOURNAL of March 23, has postponed action until April 11.

Monroe (La.) Street Railway, municipally owned, is reported as about to buy four rebuilt cars from the Shreveport (La.) Railways. They are of the one man type, with two seating twenty-eight passengers, offered at $3,000 each, and two of thirty-two seating capacity at $3,500 each. It is stated that new cars of this kind will now cost $6,250.

Trenton & Mercer County Traction Corporation, Trenton, N. J., is having expert mechanics from the J. G. Brill Company rebuild the cars damaged by fire on Dec. 15 last, as mentioned in the ELECTRIC RAILWAY JOURNAL at the time. They will soon be ready for service. The company has scrapped and sold several of its old cars.

Hudson & Manhattan Railroad, New York, N. Y., operating the Hudson River tubes and connecting systems, according to advices from Washington appearing in the daily newspapers, will extend its lines to the Port Newark Terminal, N. J. Plans to that end were announced on Tuesday by A. L. Drum, transportation engineer of the United States Shipping Board. The cost of the work is estimated at $3,500,000, and it will begin at once and be seeped up so that trains will be running within three months. Specifications for sixty new all-steel cars are in the hands of the company.

Trade Notes

Westinghouse Air Brake Company this week posted a notice at its Swissvale and Wilmerding plants that an increase of 12½ per cent. has been given the employees.

Gurney Ball Bearing Company, Jamestown, N. Y., is equipping the entire rolling stock of the Third Avenue Railway, New York, N. Y., with its ball-bearing car journal boxes. The work is now under way.

American Chamber of Commerce, City of Mexico, Mexico, has issued the first number of the **Journal of the American Chamber of Commerce.** It is illustrated and contains information of interest to manufacturers desiring to market their products or better their trade connections in Mexico.

Vulcan Soot Cleaner Sales Company, Chicago, Ill, has transferred to Dubois, Pa., its general sales office, with G. L. Simonds in charge. This is only a change in location to bring the sales, factories and engineers in immediate touch, with the idea of giving better service to all; the personnel remains as before.

W. O. Duntley, president of the Chicago, (Ill.) Pneumatic Tool Company, announced his resignation on March 29, to take place the same date. Mr. Duntley gave as a reason for his resignation a desire to be relieved of the work of actively managing the concern and to devote more time to private business.

Homestead (Pa.) Valve Manufacturing Company has opened a branch office at 1 Franklin Street, New York City.

Charles Remilius has become connected with R. R. Nelson & Co., Newark, N. J., as consulting engineer for them on electric railway equipment and railway properties. Mr. Remilius has had an extended experience with operating properties in Brooklyn and other cities.

Cutler-Hammer Manufacturing Company, Milwaukee, Wis., to insure service and every possible assistance to the various departments of the United States government, has arranged to station H. W. Knowles of its New York office permanently in Washington for the period of the war. The Washington branch will be at the Bradford, Eighteenth and K Streets.

National Conduit & Cable Company, New York, N. Y., at a meeting of the directors recently elected George J. Jackson president, to succeed Edward S. Perot, and Norton A. Howard, formerly secretary, was chosen vice-president, to take the place of Edward S. Perot, Jr. H. J. Pritchard, formerly treasurer, was elected secretary and treasurer to succeed Mr. Howard.

Economy Electric Devices Company of Chicago has received from the Chicago, North Shore & Milwaukee Railroad an order for Sangamo Economy railway meters with which to equip all of its motor cars. This railway property, which operates a high-speed double-track line between Milwaukee and the north limits of Chicago, is controlled by the officials of the Chicago Elevated Railways.

New Advertising Literature

W. N. Matthews & Brother, Inc., St. Louis, Mo.: One-page circular entitled "Labor Conservation." The circular explains the use and shows illustrations of the Matthews wire and cable clamps.

General Electric Company, Schenectady, N. Y.: Index to the company's descriptive bulletins and sheets, also a separate index to supply part bulletins brought up to Jan. 1, 1918. Both of these publications deal with railway equipment, machinery, apparatus and specialties.

C. H. Wheeler Manufacturing Company, Philadelphia, Pa.: Booklet entitled the "Radojet Air Pump." The bulletin is well illustrated, giving the outside views of various size injector-type pumps and showing the application of the so-called air "pump" in a power plant. The general arrangement of the piping system for air removal from condenser, etc., is also shown. Steam tables are included.

Joseph Dixon Crucible Company, Jersey City, N. J.: "Brushes for Your Motor," a new electrical booklet, which tells the story of graphite brushes. The two center pages are devoted to an arrangement of prices and sizes so that the cost of any size brush may be found in a minute. There are also rules as to how to order graphite brushes. Other graphite electrical specialties such as resistance rods and lubricating rods are shown and described.

NEW YORK METAL MARKET PRICES

	March 27	April 3
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26½	26¼ to 26½
Lead, cents per lb	7¼	7.20
Nickel, cents per lb	50	50
Spelter, cents per lb	7½	7¼
Tin, Straits, cents per lb	*85	*85
Aluminum, 98 to 99 per cent., cents per lb	*32.10	*32.10

* Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	March 27	April
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6.375	6¼
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	42.41	42.41
Old carwheels, Chicago, per gross ton	30.00	30.00
Steel rails (scrap), Chicago, per gross ton	35.00	35.00
Steel rails (relaying), Chicago, gross ton	60.00	60.00
Machine shop turnings, Chicago, net ton	17.00	17.00

ELECTRIC RAILWAY MATERIAL PRICES

	March 27	April 3
Rubber-covered wire Base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T rails (A. S. C. E. Standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (ground), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh, base cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	8	8
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95

	March 27	April 3
Car window glass (single strength), first three brackets, A quality, New York, discount	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount	79%	79%
Car window glass (double strength, all sizes AA quality), New York discount	80%	80%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb	12½ to 13	12½ to 13
Asphalt, hot (150 tons minimum), per ton delivered	$38	$38
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Warner, N. J.), per ton	$42	$42
Asphalt, filler, per ton	$45	$45
Cement (carload lots), New York, per bbl	$2.65	$2.65
Cement (carload lots), Chicago, per bbl	$2.71	$2.71
Cement (carload lots), Seattle, per bbl	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.57	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.59	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	44½	42½

* Government price.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, April 13, 1918 *Number 15*

Union Leaders Should Prevent Sympathetic Strikes

THIS is no time for radical action on the part of either capital or labor. We believe that both employers and employees are in general endeavoring to avoid conflict. Here and there, however, trouble arises, and then one of the most important questions is—what attitude should fellow employers or labor men take?

Recently in Kansas City, as a result of a general sympathetic strike order following a disagreement between a number of laundry drivers and their employers, the union employees of the Kansas City Railways took a strike vote, which was unanimously opposed to suspension of service. After the strike was called, however, the men were ordered out by "business agents" and the local president under threat of physical interference. The men obeyed in spite of their August, 1917, agreement with the company to arbitrate all grievances. Eventually the sympathetic strike fizzled out, but the occurrence demands warning to union leaders.

Electric railways are public servants; they must perform their duty at all times. When public thought has advanced so far that serious consideration has been given to the problem of preventing strikes among railway employees, union leaders ought to realize that the public will not tolerate any interruption of service because of disputes in other fields. Furthermore, the breaking of arbitration agreements will only do great injury to the contractual reliability of union bodies.

Labor leaders, therefore, should keep a firm hand on disorders of this sort. Merely to urge employees to keep their agreements is not enough. If local bodies refuse to follow the arbitration policy proclaimed by the Amalgamated Association, their charters should be cancelled. The association should punish swiftly and surely all breaches of faith.

High Time for the Automatic Substation

WHEN Milton wrote "He also serves who only stands and waits," he must have foreseen the railway substation attendant. "Attendant" he is rightly named, for standing and waiting is his main job. Since Satan always finds some mischief for idle hands to do, those substation attendants who do not improve each shining hour in the study of electricity, Harold Bell Wright or the uplift of the potato have ample time to brood over their lot in life. They have little more to do than manipulate switches in accordance with the vacillations of the voltmeter. To be sure, this is important work, but it hardly calls for heavy remuneration. At best the cost of substation attendance is an appreciable item, even on city roads; but in these times the burden is heavier than many a railway can bear. Regardless of that fact, substation operators have not hesitated to demand wages in proportion to the increased cost of living or even in inverse proportion to the scarcity of electrical workers. When the railways have been unable to comply, the substation men have gone on strike and greatly embarrassed the service.

However, it is axiomatic that every evil finds a cure. Happily this is already true of the substation. Several years ago automatically operated equipment for railway substations was introduced with much diffidence. Today, it has become a matter of course. The pioneers, particularly, have reason to congratulate themselves on their foresight, for they are saving copper as well as labor. When we consider the necessarily diffusive character of railway management, it is a matter of wonder that this particular kind of dependence upon human fallibility was not abolished long ago. No other public utility is so handicapped by the excess of wage over material costs; yet the electric railway has lagged lamentably behind its possibilities in the development and use of substitutes for human labor.

The Time Has Come to Resume Committee Activities

THERE has been a great deal of favorable comment upon the action of the American Electric Railway Association in deciding to hold a convention this year even though the exhibits be omitted. The recent annual meeting of the Central Electric Railway Association demonstrated the value of the active continuation of association work, even to the extent of holding conventions. The still more recent annual meeting of the American Railway Engineering Association is another case in point. The latter association did not curtail its committee activities. As a result, progress has been continued and some valuable reports were presented.

The committee work of the American Electric Railway Association and its allied associations has been held in abeyance for a year as the result of the unsettled conditions caused by the entry of the country into the war. There was some adverse comment at the time it was decided to postpone all committee work. This thought was based on the sincere belief of many that there is no time like the present for active committees to accomplish great results, particularly along maintenance engineering and operating lines. The concerted action of committees should be directed toward the collection of data and the dissemination of information for the solution of the many new problems in economical maintenance created by war conditions.

We are inclined to the belief that the Engineering Association could accomplish a great work for the industry if its important technical committees were instructed to disregard assigned subjects to whatever extent might be necessary and devote their time to the study and preparation of reports dealing with such subjects as power station operation in war time, maintenance of equipment under war conditions, wartime track maintenance methods, etc.

Complaints of Poor Service Have Very Great Potential Value

THE newspaper offices in many cities, during the past winter months, have been flooded with complaints of the poor service being furnished by the electric railways of the country. This has been due, first, to the terrific operating conditions which have obtained and, second, to the unexpected demands which have been caused by the expansion of war activities. Many of the complaints are unjust but not a few have a legitimate basis. But whether the complaints are just or unjust, electric railway managers should study these criticisms because they can be utilized.

Let us consider first the complaints which are based on misapprehension. Every reasonable complaint of this kind gives an opportunity for explanation. The public knows, as a matter of personal experience, how severe the past winter has been. It would seem that if in some way this personal experience could be connected up with the difficulty of operating an electric railway a telling argument could be advanced. Not only were operating conditions severe but it was impossible to secure labor and material for proper maintenance. People generally ought to appreciate this fact also if it is suitably emphasized in publicity campaigns, because it has a counterpart in their own domestic arrangements. In this connection it does no harm to acknowledge that railway service is not perfect, and probably would not be even if conditions were much more favorable. However, the management can explain that it is trying to give good service and must be judged by intention as well as performance. Again, the public believes many things about electric railway operation which are not true. These beliefs become apparent only through complaints, and in answering these an excellent chance is given to dispel popular illusions.

But, after all, the greatest value of complaints is in pointing out the real weakness in the service. Ultimately it is the patron who must be the judge of quality of service, which cannot be tested by arbitrary standards set up by the interested parties, the electric railway managers. After all possible and permissible explanations have been made, the fact still remains that people will ride either because they want to or because they must, or both. The more people that we can get to ride because they want to, the more substantial will be the transportation business.

In the past it has often been necessary to invite complaints in order to draw out the public point of view. This has not been necessary on most roads during the past few months. Now that the weather is better complaints are less numerous and there is an opportunity to digest them along the lines suggested.

Getting Together on the Lightning Arrester Problem

THE changing seasonal conditions in this country give variety, if not relief, to the troubles of the master mechanic and superintendent of power. The snow and sleet of winter are never safely past before the lightning troubles of spring and summer arrive. Surely if there is any place in the maintenance of the equipment of a railway where "a stitch in time saves nine" it is in connection with the lightning protection problem. Of course, no arrester yet built can take care of a direct stroke-to-line case of trouble. It is singularly fortunate from a protection standpoint, however, that such strokes constitute only a small percentage of the so-called lightning troubles. At the present stage of the art good protection from the majority of such troubles can be secured at a very reasonable cost.

But to secure good protection much co-operative work is necessary. The equipment must be suited to the service; it must be properly installed, and last, but most emphatically not least, it must be carefully maintained. Good arresters will fail when improperly applied or installed, and run-down-at-the-heel protective equipment is bound to give protection of a similar character. In application, in installation and in maintenance methods the wide experience of protective equipment manufacturers should be of much value to the railway operating officials, and the best results will be secured only when the experience of the manufacturer is correlated with the work of the operator. Above all things the operator must not forget about the maintenance part of the work. It is always important that protective equipment receive a general overhauling before the advent of the heavy thunderstorm season, and this year the scarcity of shop labor considerably augments the importance of such overhauling and of continued care in arrester maintenance.

Inasmuch as good protection in the overhead systems lessens the hazards to car propulsion equipment and good car protection lessens lightning troubles in the substation, it is immediately apparent that there must also be active co-operation between the shop and power departments. Each department must do its share. Carelessness on the part of one endangers the equipment and reduces the efficiency of the work of the other. With a given amount of protective equipment best results will always be secured when this equipment is installed and maintained according to a plan, and this plan should be based on the correlated action of the two departments concerned.

That the results of carefully worked out and executed protection plans are worth while a number of articles printed in the ELECTRIC RAILWAY JOURNAL within the last few years bear witness. Some of these reports have shown that fully 90 per cent of the motor and other apparatus troubles due to lightning can be averted by proper protection. On many railroads the saving resulting from such trouble elimination would more than pay the annual charges on the protecting system in normal times. Under the present conditions of high repair material costs and a very limited labor supply a well-planned scheme of protective equipment installation and maintenance should return worth-while results.

Justice to Railways Is Removed Another Step

IN THE twinkling of an eye New York has been turned back to the Stone Age of regulation. Instead of influential bodies, exercising in a broad-minded way the delegated paramount rate-making power of the State and dispensing even-handed justice to electric railways as well as the public, the First and Second District Commissions have become worthless boards, powerless to control local railways except with the permission of the municipalities.

This is not an overdrawn picture. The change described may be the necessary outcome of the decision of the Court of Appeals in the Rochester fare case, mentioned on another page. That such a result is certain will undoubtedly be denied by the Public Service Commission for the First District, whose reasoning the court followed. Nevertheless, we have only to take the comments made by a representative of this commission to point out the bearing of the decision in the great number of cases where fares are stipulated in franchise grants.

The finding of the court seems to be based on two fundamentals. The first is that it is impossible to find a word in the public service commission law which discloses the legislative intent to deal with a matter of rates fixed by agreement with local authorities. The second is that, while it is unnecessary and therefore improper to decide at this time what the limits of legislative power are in this conection, the consent of local authorities required by the New York Constitution for railway installation recognizes the cities as *pro tanto* independent of legislative control, and a franchise grant, once accepted, becomes a contract which neither the State nor its agencies can alter.

Hence, according to W. L. Ransom, counsel for the commissioners, it becomes the settled rule that, to increase a franchise rate, the consent of the municipality is necessary before the ordinary regulative power of the commission can be made effective. But what ordinary power would the commission possess in such a case, unless the city waived its right to stipulate the terms of modification? It is a ten-to-one shot that no city would do that. Mr. Ransom himself seems to appreciate how the city would feel, for in an interview he talks about the maintenance of a uniform, low fare being one of the most important benefits secured by a city in granting a franchise, and about the seriousness of depriving a city of the right to protect itself, by imposing suitable conditions and safeguards, upon any modification of fare.

In other words, if a railway is on the road to receivership because of a fixed 5-cent fare, as many are, let it beg the city for relief! When the dickering is over, what will the commission have to say about it? If the board has no power over the original franchise provisions, on account of the constitutional right of the city to contract, it certainly has none over the modified grant.

So hurrah for the good old days of bargaining in New York State! Mr. Ransom says that the decision of the Court of Appeals is in accordance with a commonsense concept of justice and a sound municipal policy. He is wrong. The decision is based on a narrow-minded legalism. As far as sound municipal policy is concerned, the court naturally took no account of such a question, for its opinion relates entirely to the legal interpretation of constitutional and statutory phrases. To follow Mr. Ransom's example, however, and interpret the decision from the point of view of policy, we can only say that it opens the way to the worst sort of municipal policy—that which postulates community prosperity upon utility oppression.

The State and its utilities are now left in a quandary, from which both in their common interest should endeavor to extricate themselves. What can they do? From the first reports of the decision it seems that an appeal to the United States Supreme Court for a different interpretation can be made, or legislative action and a popular vote for a constitutional change can be invoked to secure amendments to the law, or the cities individually can act to provide relief. Something must be done, for the railways cannot operate below cost. They need relief, and they need it now.

Make It Easy for the Short-Haul Rider to Use Your Cars

AN OLD and very important fact of railroad history is emphasized in a report recently made on the methods and practices of the Boston Elevated Railway Company. "One of the most valuable assets of any street railway system," it says "is the short-haul rider. In fact, it has enabled many of the railways in this country to maintain a flat rate of fare, and to carry many a long-haul rider at a loss."

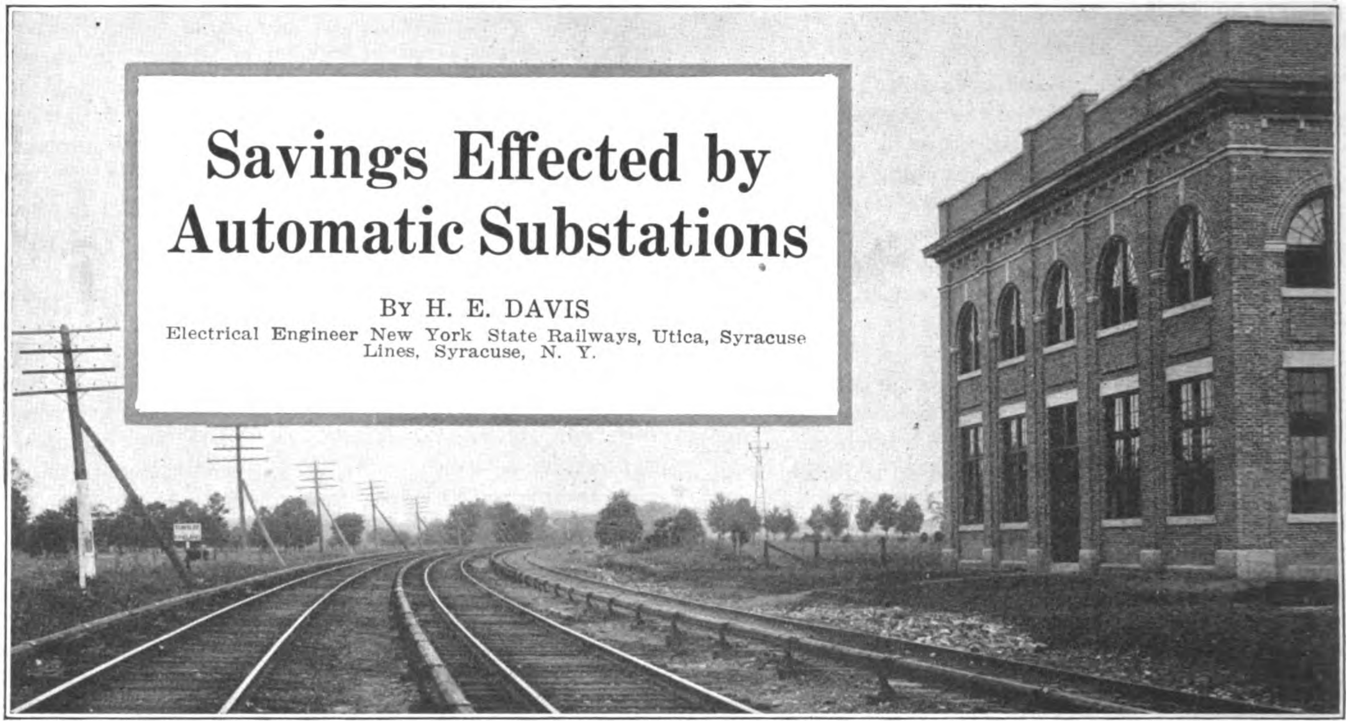
This report points out that when the Boston company abandoned some of its surface lines in the business district and went below the street into subways it paved the way for improved service but at the same time "it lost much that it may never in all probability be compensated for." By this is meant the short-haul rider—the cream of the traction business.

This truth must be faced in every city where the clamor arises for rapid transit. The arrangement of streets in Boston—like that of London—undoubtedly called for relief which could only be had by placing a large number of cars underground in the congested territory. However, the subway habit grew beyond bounds and the story is best told in the figures which show for twenty years a tremendous increase in permanent investment accompanied by only a slight increase in gross earnings.

People who have to ride long distances like to cover the ground rapidly, and for this reason the demand for elevated and subway lines grows. It must always be kept in mind, however, that neither a subway nor an elevated structure is as accessible as a surface line, and the person who wishes to go a few blocks is more readily attracted by the car into which he can step without difficulty. The same point holds good with reference to rerouting of cars or extension of lines. Lack of proper judgment in changes of service may easily result in loss of patronage of short-haul riders. The dividends are not in the straps, although a railway man was quoted to that effect some years ago. The dividends—if there are any—may be found rather in the number of short-haul riders using the cars.

Savings Effected by Automatic Substations

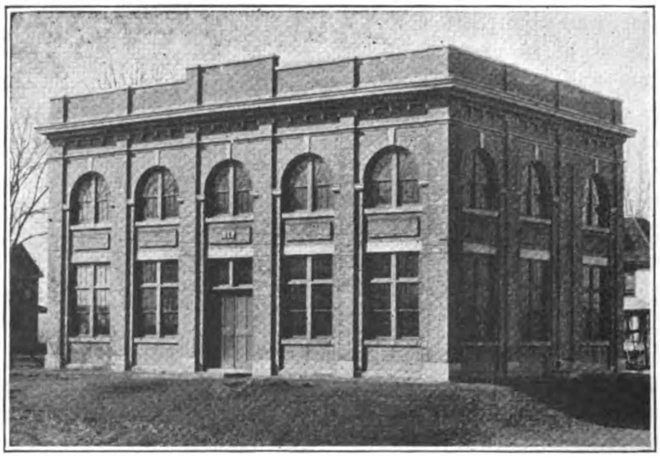
By H. E. DAVIS
Electrical Engineer New York State Railways, Utica, Syracuse Lines, Syracuse, N. Y.



TYPICAL VIEW OF ONEIDA LINE OF NEW YORK STATE RAILWAYS

The New York State Railways, Utica-Syracuse lines, has purchased automatic control for its Manlius Center substation on the Oneida line, a third-rail system operating over the electrified division of the West Shore Railroad between the Utica and Syracuse city lines. This division is 44 miles in length, of which 30.5 miles are double-tracked, 8.8 miles are laid with three tracks and 4.7 miles have four tracks. The running rails are 80 lb., bonded with No. 0000 compressed terminal bonds. The third-rail is 70 lb., with 500,000-circ. mil ribbon bonds soldered to the head of the rail, and is of sufficient area to carry the current without additional feeders.

There are four substations, located 10.75 miles apart and having capacities as shown in Fig. 1. Clark Mills substation (No. 1) is 6.2 miles from the Utica city line, and Manlius Center substation (No. 4) is 6.1 miles from the city line of Syracuse. Vernon substation (No. 2) and Canastota substation (No. 3) are the intermediate substations. The original capacity of the substations was 600 kw., each containing two 300-kw. units. In 1916 one unit was transferred from Manlius Center substation to Vernon substation to take care of the additional load at the latter point. It was possible to remove one of the units from Manlius Center as the Syracuse lines help feed this section. Also the automatic feature was taken into consideration as the current-limiting resistance of the automatic substation will allow three-car trains to pass this station without overloading the machine.



EXTERIOR OF MANLIUS CENTER SUBSTATION WHICH IS BEING MADE AUTOMATIC

The service required of the substations on this line is very favorable to the use of automatic control. The headway permits the shutting down of the converters a considerable part of the time, thus making a distinct saving in the light-load losses. This is especially true of Manlius Center substation, for many of the trains pass at this point, the headway between local and limited trains is less in this section, and the substation is located considerably nearer one of the substations in Syracuse than the distance between substations on the Oneida lines. The busbar voltage at Syracuse is 650, whereas on the Oneida line it is 620. This allows the Syracuse lines to feed considerable power to the Oneida line through a connection at the junction of these lines.

Probably the most interesting feature of this installation is that, of the four substations on the Oneida line, three of which were considered as automatic substation possibilities, the net saving effected by making one of them automatic is greater than by operating two or three automatically. This is true with conditions as they now exist, but a change in the hours of labor, wage rate of substation operators, schedule, capacity of the substations, transmission line voltage or a combination of these might make automatic operation of more than one substation more economical. The substation operating force works in two shifts. There are eight substation operators, one chief operator and one shift operator, the latter devoting only part of his time to the Oneida lines and the remainder to the Syracuse lines.

Power is supplied from the Adirondack Electric Power Corporation's 6000-kw. steam turbine plant at Utica. It is transmitted at 60,000 volts. The transformers are Y-connected on the high-tension side, and the neutral is grounded. This connection has proved very satisfactory, as in case of a ground on the high-tension line the affected leg is cut out and the transformers operate open delta, using two wires and the ground.

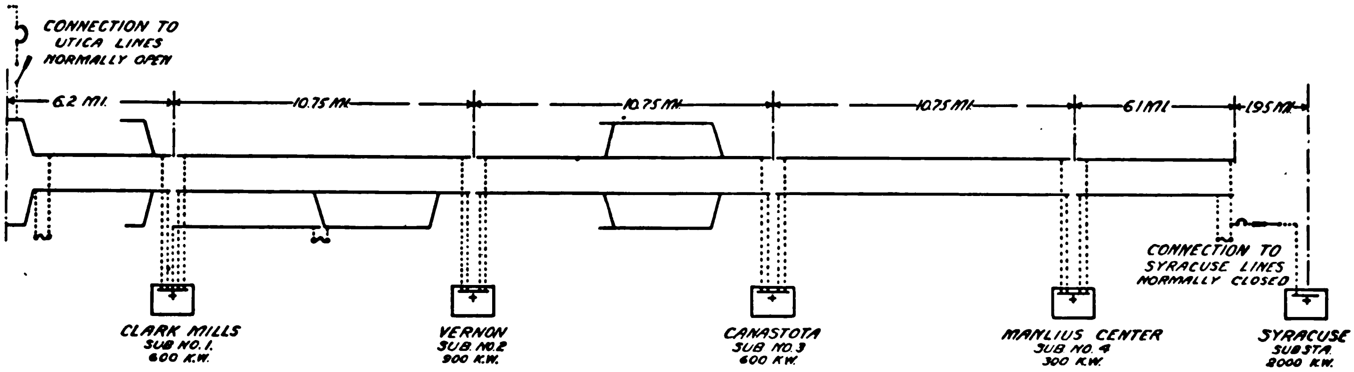


FIG. 1—LOCATION OF SUBSTATIONS AND THIRD-RAIL LAYOUT ON THE ONEIDA LINE, NEW YORK STATE RAILWAYS

The car equipment consists of sixteen 40-ton passenger cars equipped with four GE-72 (75 hp.) motors with type M control, two 38-ton passenger cars equipped with four G E-201 (60 hp.) motors and two 45-ton express cars equipped with G E-73 motors. Cars are operated singly and in two, three and four-car trains. Trains of three cars are operated over the entire length of the road and four-car trains are operated only in the vicinity of Vernon substation. Trains of more than two cars are operated with one motor car used as a trailer. The starting current is approximately 325 amp. per motor car, and is practically the same for trains of three motor cars and one trailer. The average headway is thirty minutes in each direction, but this varies throughout the length of the road on account of the local and limited service. This is shown by the train sheet reproduced in Fig 2 on page 694.

In considering the economics of automatic control equipment as applied to the existing substations of this line the five items of importance were the saving in labor, the saving in light load losses, the transmission line voltage, the number of units in each station and the reliability of automatic equipment. Three possible plans were considered:

Plan A	Substation No. 4	One 300-kw. unit automatic
Plan B	Substations Nos. 3 & 4	Three 300-kw. units automatic
Plan C	Substations Nos. 2, 3 & 4	Six 300-kw. units automatic

Substation No. 1 was not considered for automatic operation as power is purchased at this point, and it was considered necessary to have a man continuously on duty in charge of transmission lines and other details.

It will be noted that the number of operators released is not proportional to the number of substations made automatic. Under Plan A, the operating force is reduced by two men; under Plan B, by three men, and under Plan C, by five men. The reason for this is that under Plan A the chief operator can look after Manlius Center substation without neglecting his regular duties. If two substations were made automatic, as under Plan B, the services of an extra man would be required. Under Plan C the same man who was retained to take care of substations No. 3 and No. 4 of Plan B with the help of the chief operator could take care of substations Nos. 2, 3 and 4 of Plan C.

PLAN A

Cost of automatic control equipment, one 300-kw. unit installed	$4,000
Cost of building changes (bars for windows, etc.)	300
Total cost	$4,300
Labor, two men	$1,800
Light load losses	400
Coal for heating	150
Gross annual saving	$2,350
Repairs to automatic equipment	$100
Fixed charges at 15 per cent	645
Total additional annual expense	$745
Net annual saving	$1,605

PLAN B

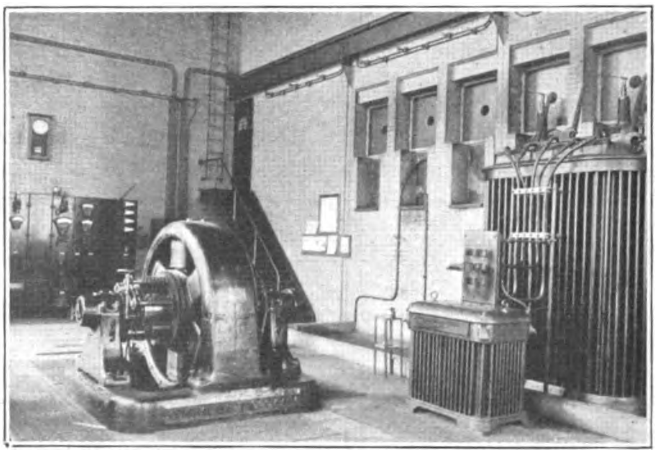
Cost of automatic control equipment, three 300-kw. units installed	$12,000
Cost of building changes (bars for windows, etc.)	600
Total cost	$12,600
Labor, three men	$2,700
Light load losses	735
Coal for heating	300
Gross annual saving	$3,735
Repairs to automatic equipment	$250
Fixed charges at 15 per cent	1,890
Additional line loss	500
Total additional annual expense	$2,640
Net annual saving	$1,095

PLAN C

Cost of automatic control equipment, six 300-kw. units installed	$24,000
Cost of building changes (bars for windows, etc.)	900
Total cost	$24,900
Labor, five men	$4,500
Light load losses	1,135
Coal for heating	450
Gross annual saving	$6,085
Repairs to automatic equipment	$450
Fixed charges at 15 per cent	3,735
Additional line loss	500
Total additional annual expense	$4,685
Net annual saving	$1,400

SUMMARY

	Total Cost	Net Annual Saving
Plan A	$4,300	$1,605
Plan B	12,600	1,095
Plan C	24,900	1,400



INTERIOR OF MANLIUS SUBSTATION, NEAR SYRACUSE, N. Y., SELECTED FOR AUTOMATIC OPERATION

The coal saved in heating the substations does not include all the coal used, as some heat would be required with automatic operation for the men who would have to work in the stations part of the time. Electric heaters would probably be substituted for coal, but the net saving would be as given. The light load losses vary with the location of the substations. This can be seen from the train sheet. The time that substation No. 4 would be shut down with automatic operation can be found also from the voltage chart, Fig. 4. This is a voltage record taken with substation No. 4 shut down. The light load losses for the additional units in substations Nos. 2 and 3 are, of course, less than those of the first unit, as more than one machine are operated for only a small part of the day.

The item of additional line loss under Plans B and C requires some explanation. As given in the description of the system, the transmission line is now operated at 60,000 volts with Y-connected transformers. In case one leg is grounded, the affected leg is cut out by the operators. To do this automatically would require additional apparatus. Another and better solution would be to operate the line at 34,000 volts with transformers connected in delta. This would increase the line losses by $500 annually, as given under Plans B and C. This is unnecessary under Plan A, as the voltage is not seriously affected with Manlius Center shut down. It should be understood, however, that there are other conditions which were considered. The 60,000-volt insulators have been in use since 1907 and develop considerable trouble during the lightning season. Removing the grounds from the system and operating at the reduced voltage would be of considerable advantage. However, the change is not now contemplated and the entire line loss is charged up to the change to automatic substations. However, if this item were replaced by the fixed charges for additional automatic equipment it would not materially affect the result.

After determining that it is more economical to operate under Plan A than under Plans B or C, it is

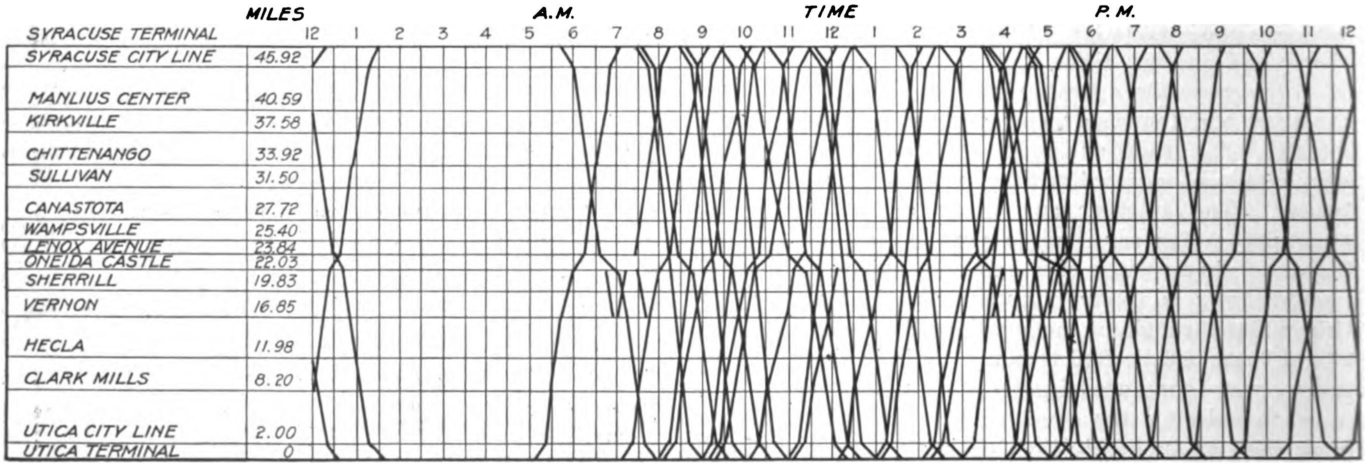


FIG. 2—TRAIN SHEET, UTICA TO SYRACUSE, NEW YORK STATE RAILWAYS

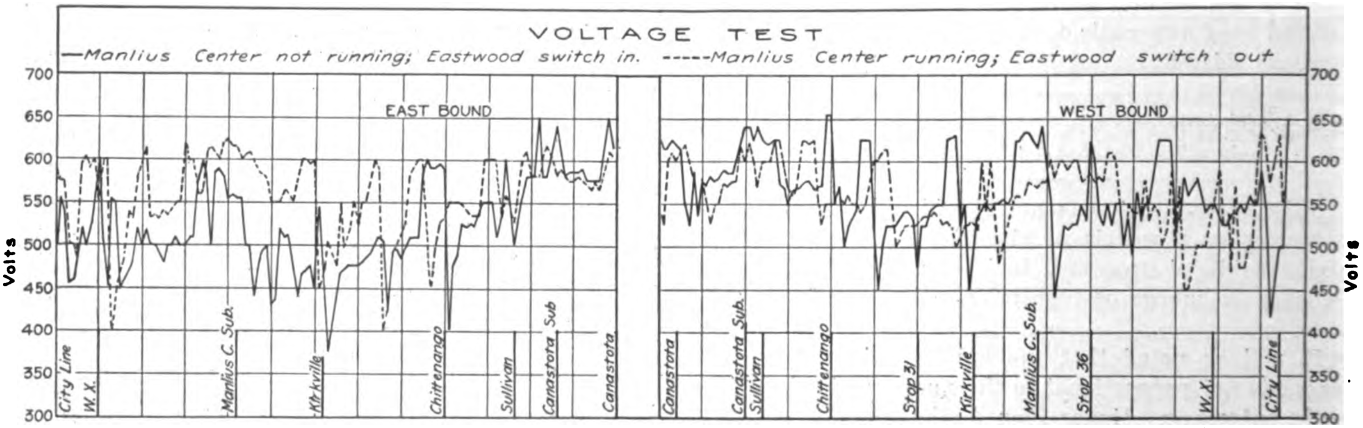


FIG. 3—RESULTS OF VOLTAGE TESTS ON ONEIDA LINE, NEW YORK STATE RAILWAYS

necessary to consider the reliability of automatic equipment for Plan A only. Considering this equipment in itself to be as reliable as the single converter and transformer unit, and that it adds to the reliability of the station as a whole due to the limitation of the load through the use of current-limiting resistances, it is still necessary to consider that this station might be shut down due to the failure of automatic equipment or to the converter itself.

Fig. 3 shows the voltage with Manlius Center running and Eastwood switch open, and vice versa, the Eastwood switch being the connection between the Syracuse lines and the Oneida lines. Previous to 1915 this switch was normally left open. The graphs in the figure show that the average voltage is not greatly reduced with Manlius Center shut down. The loss of time to trains is approximately two minutes.

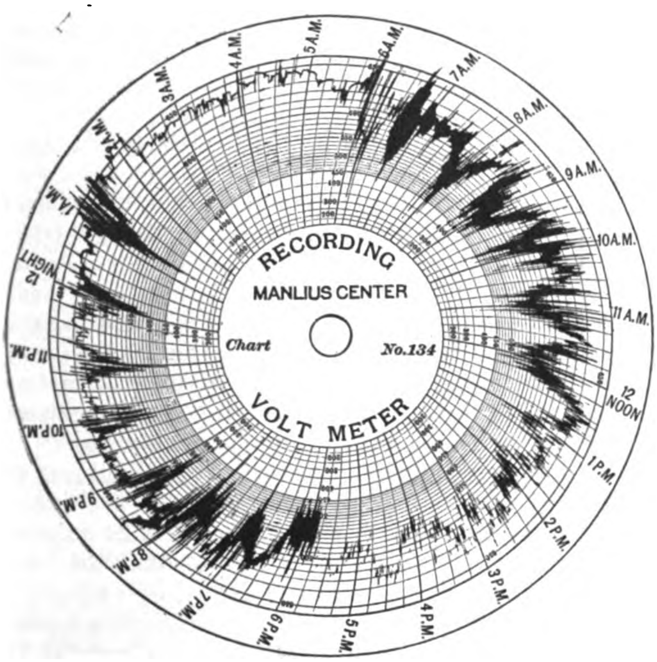


FIG. 4. VOLTAGE CHART, MANLIUS CENTER SUBSTATION IDLE

The shutting down of substation No. 2 or No. 3 would delay trains considerably. If this were a new proposition, it would permit ready solution. The distance between substations could be reduced so that an interruption to one station would not seriously cripple service. On account of the reduced cost of automatic substation buildings and the fact that, due to load-limiting resistances, the shifting center of load could be taken care of by practically the same substation capacity as is now installed, the proposition of making all but one substation automatic could be made financially attractive.

The March issue of *The Annals* of the American Academy of Political and Social Science discusses "War Adjustments in Railroad Regulation." The contributors are authorities in the railroad world, public life and academic circles. The articles cover various phases of the steam railroad situation, such as the trial of railroad regulation, war pressure for adequate service, present effects of war control, plans for adjustment after the war and the continuing problems of public policy.

Up-to-the Minute Information on Class-T Locomotives

An Amplification of the Statements Regarding New York Central Locomotives, Made by E. B. Katte at Recent New York Railroad Club Meeting

AT THE LAST electrical night of the New York Railroad Club, papers were presented on late locomotive design. In speaking of the last electric passenger locomotives received by the New York Central Railroad, E. B. Katté, chief engineer of electric traction, referred to some minor modifications and improvements made from the earlier Class-T locomotives purchased by this road, but no details were given. These changes were of a most trivial nature, consisting chiefly of small mechanical alterations made to provide better construction, to standardize parts and to give increased safety to the operators. They had no bearing on the performance of the locomotive in service.

The following list of some of the more important changes will give an idea as to their nature:

Ventilating louvres changed slightly and baffle plates added to keep out snow and rain.
Blower and its motor assembled on one base.
Magnetic screen under main motors constructed with more sections to make handling easier.
Sand-box seams welded to make box moisture-proof.
Sanding pipes arranged with straight runs.
Better method provided for lubricating center pin.
Movable section provided in hand rail at center of cab for easier access.
Better support and armor provided for motor leads.
More convenient clasps and handles for doors provided.
Rubber stops placed on sliding windows.
Tool box arranged with fuse compartment to make fuses more accessible and prevent them from rattling around.
Contact-shoe paddle holders provided with felt to prevent rattling.

The data for power consumption, maintenance cost and the average mileage obtained per locomotive detention as given by Mr. Katté in his remarks at the Railroad Club and published in the ELECTRIC RAILWAY JOURNAL of March 23 show the excellent results being obtained from this class of locomotives. These figures were for the year 1917 and the costs were somewhat higher than previous records, due to the advance in the prices of labor and materials.

A performance test with one of these locomotives was made on March 24. Four trips arranged to represent the most severe service requirements were made between the Grand Central Terminal and Harmon, with one stop at Yonkers. This service consisted of hauling a thirteen-car train weighing 1022 tons for three trips and a fourteen-car train of 1100 tons on the fourth trip from Harmon to Grand Central with a thirty-minute layover at the end of each of the runs. A maximum average schedule speed of 62 m.p.h. was made.

By means of an exploring coil installed in one of the motor windings, readings were obtained to indicate the temperature of the motors, and other readings of temperature were made at the end of the runs with thermometers. The maximum temperature rise in the motors with forced ventilation was well within the specification limits, which is 75 deg. C. measured by thermometer and 100 deg. C. measured with an exploring coil. Considering the severe character of the service, the results obtained were very gratifying.

Fare Increases Blocked in New York

Highest State Court Rules that Commission Law Does Not Provide for Regulation of Rates Fixed in Franchises—Moreover, Constitutional Consent Requirement Makes Grants Unalterable Except with Municipal Permission

THE control of public service commissions over electric railway rates has been sadly reduced in New York. Under a decision just rendered by the leading court of the State, the Court of Appeals, the power of the commissions to grant higher fares to deserving railways is in general restricted to those cases where the rates are not fixed in franchises.

In interpreting the existing New York law, the court finds that the public service commission act does not disclose any intent to provide for the regulation of franchise rates, although it permits the revision of rates fixed by old statutes. Moreover, although it is said to be unnecessary and therefore improper to decide now the limits of legislative power over franchise rates, the court states that such rates fixed in accordance with the constitutional requirement of municipal consent for electric railway operation are not subject to legislative alteration.

DECISION IS OF WIDE IMPORTANCE

This decision of the Court of Appeals was handed down on April 5 in the case of Quinby *vs.* the City of Rochester. The case arose through the denial by lower courts of a writ of prohibition to prevent the Public Service Commission for the Second District from exercising jurisdiction over the petition of the New York State Railways for a 6-cent fare.

It will be recalled that the Second District Commission last autumn, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 24, 1917, ruled in the Huntington Railroad case that it had power to increase franchise rates, in accordance with a preceding decision of the New York Appellate Division for the Third Department. Last January, however, the First District or New York City Commission (E. R. J. Jan. 19) took a diametrically opposed stand in the New York & North Shore Traction Company case.

It was expected that the latter case might be appealed, but the Rochester case was speedily carried to the Court of Appeals on the legal questions involved, and parties interested in the North Shore decision were allowed to intervene therein. Consequently the parties heard in the Rochester case included the city of Rochester, the New York State Railways, the Second District Commission, the city of New York, the New York Railways and the First District Commission.

The Court of Appeals decided that the Second District Commission is without jurisdiction in the Rochester case, and that an absolute writ of prohibition should be awarded. The decision was written by Judge Pound, with Judges Cuddeback, Cardozo and Andrews concurring. Judge Crane concurred in the opinion in so far as it stated that the Legislature has not in this instance given to the commissions the power of regulation, but he thought that the reserve police power of the Legislature had not been contracted away. Chief Justice Hiscock and Judge Collin dissented.

The decision of the court, in unrevised form, has been available for consultation, but the finding has not been released for full publication. Consequently the ELECTRIC RAILWAY JOURNAL is not able to present a detailed abstract this week. An idea of the contents of the decision, however, can be secured from summaries given out for newspaper publication and from comments by counsel of the First District Commission.

COMMISSIONS HAVE NO JURISDICTION OVER FRANCHISE RATES

According to published quotations, the three basic points covered by the decision seem to be as follows:

1. *Statutory Rates*

"The purpose of the Legislature was to prescribe for the regulation of statutory fares by a board which may be expected to pass equitably upon conflicting claims with the single purpose of the common good, even where a maximum rate had been fixed by the Legislature.

"Rates so fixed by special statute are still subject to regulation by the public service commission. The jurisdiction of that body over such rates is not to be reduced by implication. The legislature merely fixed the rate *pro tempore.*"

2. *Constitutional Barrier*

"The consent of the local authorities being obtained, what jurisdiction has the Legislature conferred upon the public service commission to regulate rates by increasing the rate agreed upon?

"It has been held invariably and in a legion of cases that the power to establish rates is not essential to the consent of local authorities and will not be implied, and that the Legislature is at all times supreme in the matter. In all such cases, however, the question was one of unrestricted legislative power, policy and discretion over a city or town where the local authorities were held to be mere instrumentalities through which the State exercised its sovereign power. The paramount power of the Legislature over the subject of fares was upheld in the absence of a constitutional limitation.

"But the consent of the local authorities required by our Constitution recognizes our municipalities as *pro tanto* independent of legislative control, exercising some fragment of power, otherwise legislative in character, which has been thus irrevocably transferred by the fundamental law from the Legislature to the locality.

"The grant by the municipality of authority to use the streets is not a mere privilege or gratuity. Once accepted, it becomes a contract which neither the State nor its agencies can impair.

3. *No Power Granted to Commission*

"It is, however, unnecessary and, therefore, improper to decide at this time what the limits of legislative power are in this connection. In the absence of clear and definite language we should not unnecessarily hold that the Legislature has intended to delegate any of its powers in the matter, whatever its powers may be. It is impossible to find a word in the statutes which discloses the legislative intent to deal with the matter of rates fixed by agreement with the local authorities."

HOW COUNSEL INTERPRETS THE DECISION

W. L. Ransom, counsel for the First District Commission, interprets the decision as follows:

"The Court of Appeals has definitely sustained the view of this commission that where a rate of fare has been fixed by the terms of franchise agreement between an electric railway corporation and the city, the commissions do not possess power, in the absence of the city's consent to such a modification of the franchise contract, to advance the fare above the franchise maximum. The court has likewise held that the authorities of a municipality may validly, under the Constitution of the State, require an electric railway to agree to maintain a stipulated rate of fare, as a condition of granting the city's consent to the construction of the railway along public streets, and the court has ruled that the grant by the municipality, once accepted, becomes a contract which neither the State nor its agencies can impair.

"The court has even gone farther than this commission and has ruled that as to electric railway franchises antedating the constitutional amendment of 1875, and other franchise contracts not entered into in pursuance of the constitutional provision and so under its protection, the commission has not been vested by the Legislature with power to advance the rates fixed in such franchises, although the court makes it clear that as to franchises outside the constitutional protection, the Legislature could confer such power on the commission if it saw fit.

"It thus becomes the settled rule that power to advance electric railway fares, directly or indirectly, above a figure fixed in a franchise, does not repose in this commission alone, and those who seek to accomplish, directly or indirectly, such a variance from the franchise terms must seek consent or modification from the municipality with which they made their solemn contract, rather than from the commission. To increase a franchise rate above the franchise figure, the consent of the municipality is necessary before the ordinary regulative power of the commission can be made effective."

DECISION AGREES WITH SOUND CITY POLICY

In commenting further upon the meaning of the finding, Mr. Ransom says:

"The decision is in accord with a common-sense concept of justice and a sound municipal policy. It only means that the city, which granted the franchise, is left with power to protect its citizens, in imposing terms and conditions of modification. The maintenance of a uniform, low rate of fare is one of the most important benefits secured by the city in granting a franchise. The First District Commission has felt as a matter of law and policy, and the Court of Appeals now agrees as a matter of law, that the company may not take away this important consideration as to fare, without the city's having the right, power and opportunity to require other concessions, perhaps of equivalent benefit to the public, as a condition of consenting to an increase in fare, even temporarily.

"No one will question that the surface railways of New York ought to be empowered to charge more than 5 cents, if that rate of fare is found to be inadequate. But there is a serious question whether, in order to bring this about, the Constitution and the law should be so construed as by judicial decision to deprive the city of New York of power to protect itself and its people, through imposing suitable conditions and safeguards, upon any modification of the rate provisions of the franchise contracts."

The Situation is Grave

IN THE matter of the Court of Appeals decision, Joseph K. Choate, chairman of the committee on increased revenues of the New York Electric Railway Association, has issued a statement in part as follows:

"The decision of the Court of Appeals is a matter of as grave concern to the United States government and to the communities themselves as it is to the electric railways. It means, unless the condition thus produced is immediately corrected, that the transportation utilities of the State cannot render that assistance to the nation's war program which recent pronouncements of President Wilson, Secretary McAdoo and Comptroller Williams declares to be urgent and necessary.

"It means that these utilities will no longer be able to furnish to the public the kind and extent of service needed to further the growth and prosperity of the communities in which they operate, for properly to provide for the convenience and comfort of their patrons.

"It means decided interference with the plans of the national government, under which the war finance corporation was to provide means to enable railways to secure the absolutely necessary new capital for refunding maturing obligations, since the co-operation of the states and communities in securing to the borrowing companies a rate of return which would give stability to the securities pledged with the war finance corporation was a fundamental of the plan.

"The need of relief is as imminent and pressing as ever. The Court of Appeals decision simply means that the theory of regulation as applied in New York State has broken down in an emergency, and that some other method must be adopted to meet conditions which threaten to hamper the usefulness of transportation utilities at a time when their increased efficiency is vital to the nation and to the public."

Fare Cases Are Held Up

THE foregoing decision of the Court of Appeals will not, of course, help the progress of the fare relief movement in New York State. The Second District Commission has already granted higher rates in about ten cases, and at least three authorizations are now nullified because of franchise provisions. Hearings have been almost completed in six other cases, some of which involve franchises. Several other companies have petitioned for relief from fixed rates. In many cases, therefore, the Second District Commission now finds itself

Prepare Your Commission Cases Thoroughly*

Regulating Bodies Must Have Carefully Prepared Exhibits and Full Statements of Facts—The Function of Public Service Commissions Is to Check, Not Originate, Utility Data

BY HAROLD L. GEISSE
Secretary Wisconsin Railroad Commission, Madison, Wis.

ONE of the most frequent criticisms of the Wisconsin Railroad Commission, perhaps the most frequent one, is that of delay in rendering decisions. The commission itself is ready to admit that it is often unable to dispose of matters with that dispatch which would best subserve the interests of the public and the utilities. The delay in a large percentage of cases is due to inability to arrive at a conclusion as to the merits of the controversy from the evidence introduced. If a better understanding of the method of preparing and presenting a case could be given, a much greater volume of business could be handled in a much reduced time.

In a great majority of cases after the hearing and upon review of the transcript of testimony, the commission is obliged to resort to an inquiry into the books of the company and a statistical analysis of the operating performance for some years back or lengthy service investigations to secure the facts upon which to determine whether or not the relief sought is justified. Moreover, in a fair percentage of the cases the record of the hearing is incumbered with a mass of irrelevant testimony, inexpert opinions and even vituperation, to which the commission has been obliged to sit patiently and listen.

One of the recurring incidents in the holding of hearings is the attempt to influence the judgment of the commission by the introduction of prejudicial matter. The tendency of attorneys to avail themselves of any advantage in this method does not fail to appear in the trial of cases before the commission. It is a method to be deplored, totally ineffective and unworthy of notice by opposing counsel.

The commission is not a court of law. It is an administrative body concerned in accounts, in operating statistics, in unit costs, in prices of materials and supplies, in coal costs, in values of property, in measurements and surveys, in traffic counts and in the opinions of experts.

One cannot attempt to outline a procedure for each

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*Abstract of address delivered before Wisconsin Electrical Association at Milwaukee on March 27.

(*Concluded from page 697*)

powerless to grant the needed aid, unless the cities give their consent.

The First District Commission has not granted any higher fare, for in the first case decided, that of the New York & North Shore Traction Company, it announced its lack of power to give the relief proved necessary. Two applications are now before it for a higher unit fare, in the case of the Staten Island Midland Railway and the Richmond Light & Railroad Company. Hearings for these were scheduled to begin on April 8, but at that time Mr. Ransom read into the record a statement that hearings should not be initiated at all, even if the applications were not withdrawn by the companies, until the city consented to franchise modifications.

Hearings on the application of the Third Avenue Railway and other systems in New York City for a 2-cent transfer charge were to have been continued the next day, but Mr. Ransom stated his views in regard to the transfer cases as follows:

"It would seem that the ruling of the Court of Appeals stands in the way of granting an additional charge for transfers between different lines of a single company, such as, for example, the New York Railways, for that would be to sanction a charge of 7 cents where the company has apparently agreed with the city not to charge more than 5 cents. The ruling would seem likewise to deter the prosecution of any application by a surface railway system, to obtain an extra charge for transfers on a system basis, as a means of obtaining an increase in fare.

"To be concrete—as to the various operating companies of the Third Avenue Railway system, I do not now believe that, in the absence of the city's acquiescence or suitable modification of the contract on agreed terms, a charge for transfers could be granted the Third Avenue system, on the basis of a 'lump' valuation of the system property and a 'lump' statement of the system earnings and expenditures.

"As to certain points where transfers are exchanged between different companies of the Third Avenue system, and where the obligation for such exchange does not arise from common use of tracks or similar necessity, I am not now sure that, upon a proper showing as to the properties and financial operations of the individual companies concerned, a new joint rate might not be established by order of the commission, as to such points, and an additional charge for transfers at such points approved, if the facts warranted it. Upon that question I would prefer to withhold opinion until the question has been more fully considered and argued."

Mr. Ransom suggested that the companies be allowed to study the Court of Appeals decision for two weeks and then present oral argument as to any relief which in their opinion the commission might still grant. He also suggested that each company be directed to file a detailed statement showing each transfer point to which the pending application is deemed to relate, and the precise way in which the present exchange of transfers at that point is deemed to have arisen—*i. e.*, through a trackage agreement, an order establishing a joint rate and through route at the point of intersection, voluntary action of the railway or otherwise. Accordingly the commission set April 17 for the submission of data and April 22 for the oral argument.

kind of case that may come before the commission. A service case will differ much in its method of presentation from a rate case. To illustrate how plain and matter-of-fact a case may be made, however, take in its simplest form a typical rate case.

The elemental question with which the commission is concerned in a rate case is the determination of the value of the property used and useful in the service of the public. In determining the ultimate fair value, the physical value of the tangible property, the amount of going value and the necessary working capital must all be considered.

The opportunity to affect the judgment of the commission commences with the engineering appraisal of the physical value. The engineers of the commission have returned their report upon the physical value, and copies have been submitted to both sides. It is possible that the engineers have overlooked some element of the property, have failed to allow for construction mishaps which increased the expenditures or have allowed too liberal a value for the land or other elements. On any of these points the commission would be glad to have enlightening testimony. Possibly a contention would be in point at this juncture that the amount allowed for engineering and superintendence during construction is excessive or inadequate, and the testimony of experts or persons who are familiar with the history of the plant during the period of its construction would be of material assistance.

With the testimony on the physical valuation concluded, the amount to be allowed for going value and working capital are proper subjects for consideration. The various theories of computing going value as discussed in text-books, prior decisions and monographs of experts furnish a fertile field of inquiry for persons preparing to present a case before a commission. Similarly the amount of working capital necessary to conduct any particular business is sufficiently vague and uncertain to give the litigants opportunity to present very helpful testimony.

ANALYSIS OF OPERATING COSTS IS NECESSARY

After the inquiry into the value of the property, an analysis of the operating expenses becomes necessary to determine that no improper charges are being included and whether or not the property is being fairly economically managed. If the case arises through a public attack on the rates charged, the representatives of the public will probably be able to present little testimony of any considerable assistance. Frequently testimony is introduced showing that the rates charged are in excess of those charged by other plants similarly situated in communities of approximately the same size. Such testimony is usually of little significance, because of the factors that make the amount of the investment and the operating costs vary in different communities.

If, on the other hand, the case arises through an application for authority to increase rates, the company should be able to present a thorough analysis of its operating costs and earnings. Prepared with sufficient care, such a statement can be of material assistance to the commission. Data relative to the degree of saturation, showing the kilowatt-hour sales and the gross earnings per capita, can frequently be shown with considerable effect. An interesting disclosure of the tendency of the business in general can be made by drafting lines showing the course of the gross revenue, the net earnings, the operating expenses, the kilowatt-hours sold, the car-miles run and other elements or activities of the business.

If it is desired to show the comparative course of the figures for such items, they may be reduced to their logarithmic equivalents and the lines drawn from the data thus produced. A system of logarithms being a system of ratios, the relation of the lines to one another may thus be made to appear very graphically. Run through a series of years, a chart of this character would show definitely the proportionate increase or decrease of the earnings or expenses. Many modifications of charts of this character may be designed to assist the commission in its studies of the facts presented. In placing these data in evidence an officer of the company should be prepared to explain them in detail, answering any questions relating thereto that may be propounded either by the commission or by representatives of the public.

Similar data should be provided for presentation in any service case, the object being held constantly in mind to cut down the amount of inquiry that the commission must make independently after the hearing before decision can be rendered. With the figures carefully compiled and explained at the hearing, only such investigation would be required as would satisfy the commission of the fairness with which they had been compiled, their completeness and the safety with which conclusions might be drawn from them.

COMPANY SHOULD PREPARE ITS OWN CASE

It is true that the commission has a more or less complete mechanism for the ascertainment of the facts. This is necessary in order that the evidence introduced in a case may be tested out by subsequent independent investigation, and that accounting and engineering assistance may be rendered to utilities and municipalities operating utilities. It is taking an advantage of the commission, however, for a utility to presume that the possession of a staff of engineers, accountants and investigators makes the commission an available agency for the investigation of the utility's affairs when the utility feels itself in need of higher rates or relief from service requirements. The utility, having full access to its own books, should prepare itself, before seeking relief, to draw its own conclusions as to its needs and the reasons therefor, and be in a position to convince the commission of the fairness of its cause.

A somewhat different situation exists when the public invokes the jurisdiction of the commission in securing relief from high rates or inadequate service. Then the complainant has not the machinery at hand to conduct its own inquiry, but is obliged to depend to a greater or less degree on the inquiries made by the commission after the fundamentals of its case are presented at the initial hearing. Even here, however, the person in charge of the case, be he city attorney or private counselor, should have a sufficiently well-prepared outline to present clearly the issues he wishes to draw and the grounds for the public belief that the relief asked for is justifiable.

Designing and Operating the Substation for Maximum Efficiency

The Cedar Avenue Substation of the Cleveland (Ohio) Railway Was Furnished With a Large Number of Units to Permit the Operating Capacity to Be Varied to Meet Load Demands

LATEST POWER SUBSTATION OF THE CLEVELAND (OHIO) RAILWAY

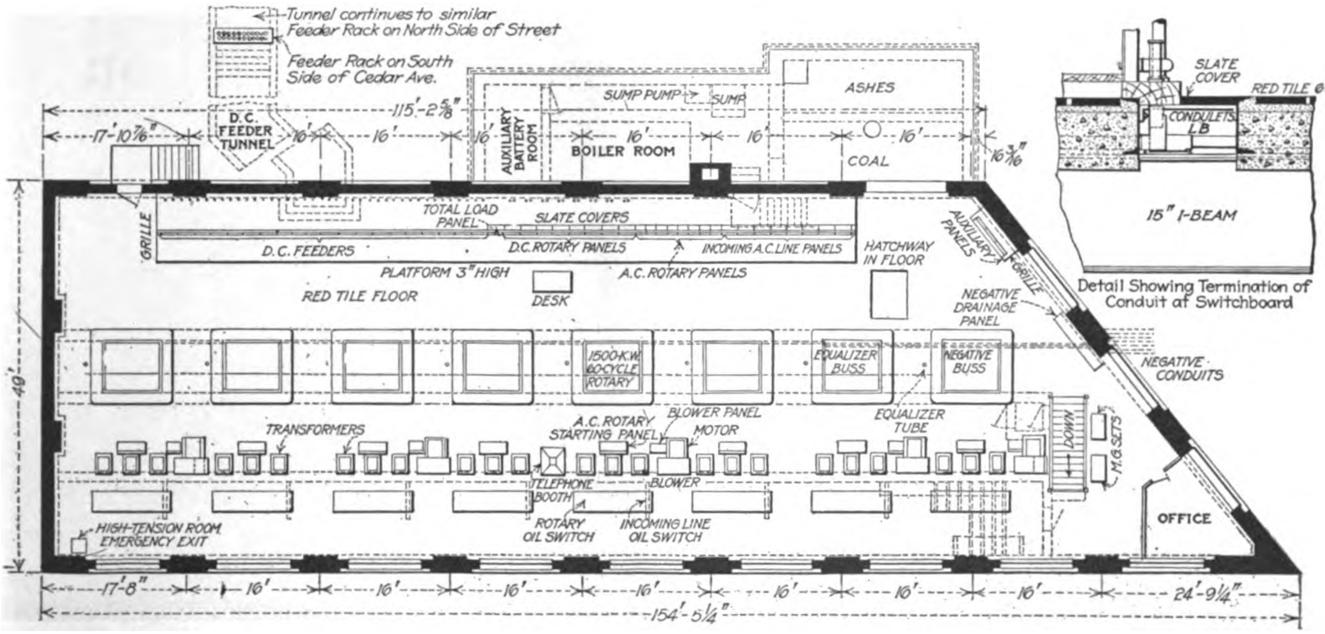
THE Cleveland Railway has recently added to its distribution equipment an eight-rotary substation on Cedar Avenue. This substation is located at one of the principal distribution points in the city, and in view of its large capacity and its importance the question will arise at once as to why so large a number of converter units were installed rather than a small number of larger capacity units. L. P. Crecelius, superintendent of power of the company, the designer of the substation, answers this question by stating his belief that much better economy could be secured in this substation by putting in a large number of small units (1500-kw. capacity) and cutting them in and out to follow the load line as closely as possible.

The governing idea in the layout of equipment in this station has been to simplify the construction and standardize apparatus, eliminating everything not necessary to safe operation. In standardization the substation is an integral part of the whole distribution system, the idea being to have all the substations so planned that a relief operator can step into any one of them and feel perfectly at home without special instruction. In other words, all operations are identical in all of the company's substations. This makes it possible, in "breaking in" new men, to start them in the smaller stations with lower pay and to work them up through larger stations. Thus in the course of promotion all that a man has to learn as he is transferred from one substation to another is the special feeder section layout.

The eight 1500-kw. units in the Cedar Avenue substation are 60-cycle, 514-r.p.m. Westinghouse machines, with characteristics practically identical with those installed several years ago at Windermere substation. These machines were described in an article on "Electric Power in Cleveland" printed in the issue of the ELECTRIC RAILWAY JOURNAL for April 5, 1913. At that time the design of the rotaries was considered quite novel. With this article was a map showing the power distribution system of the railway, a steam power station being indicated on the map at the site now occupied by the substation.

With the new installation the company now has twenty rotaries of 1500-kw. capacity each and two 1000-kw. machines. The controlling apparatus used with all of this is General Electric manufacture. The transformers are air-cooled Westinghouse 550-kva., 11,000/410-volt single-phase units installed without the shells. The oil switches, meters, switchboard equipment, etc., are for the most part of the standard types which have heretofore been used by the Cleveland Railway.

In the selection of eight 1500-kw. units the idea of following the load requirements closely by cutting in and out the machines, as mentioned above, was one of the principal considerations. Another was the fact that if four 3000-kw. units had been used instead of eight 1500-kw. units, 25 per cent of the total station capacity would have been lost if one machine had gone out of commission. Thus a serious overload might


Tunnel continues to similar Feeder Rack on North Side of Street
Feeder Rack on South Side of Cedar Ave.
115'-2 5/8"
17'-10 7/16"
D.C. FEEDER TUNNEL
16'
16'
16'
AUXILIARY BATTERY ROOM
SUMP PUMP
SUMP
BOILER ROOM
16'
16'
ASHES
16'
COAL
16 3/16"
GRILLE
TOTAL LOAD PANEL
SLATE COVERS
D.C. FEEDERS
D.C. ROTARY PANELS
INCOMING A.C. LINE PANELS
HATCHWAY IN FLOOR
AUXILIARY PANELS
GRILLE
PLATFORM 3" HIGH
A.C. ROTARY PANELS
RED TILE FLOOR
DESK
NEGATIVE DRAINAGE PANEL
49'
1500-K.W. 60-CYCLE ROTARY
EQUALIZER BUSS
NEGATIVE BUSS
NEGATIVE CONDUITS
TRANSFORMERS
A.C. ROTARY STARTING PANEL
BLOWER PANEL
MOTOR
EQUALIZER TUBE
DOWN
M.G. SETS
TELEPHONE BOOTH
BLOWER
ROTARY OIL SWITCH
INCOMING LINE OIL SWITCH
HIGH-TENSION ROOM EMERGENCY EXIT
OFFICE
17'-8"
16'
16'
16'
16'
16'
16'
16'
24'-9 1/4"
154'-5 1/4"
SLATE COVER
RED TILE 6"x6"
CONDULETS LB
15" I-BEAM
Detail Showing Termination of Conduit at Switchboard

GENERAL PLAN OF CEDAR AVENUE SUBSTATION, CLEVELAND RAILWAY

have been imposed upon the other three machines. A load of only 1500 kw., however, spread over seven other units would overload each unit very slightly.

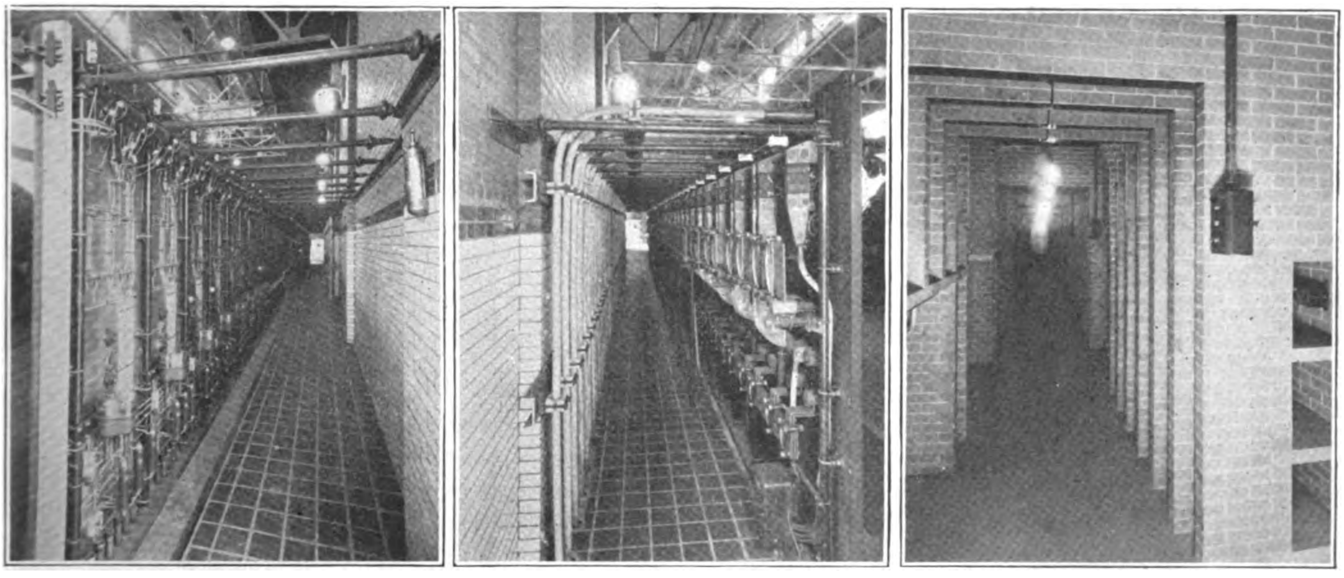
The efficiency of the 1500-kw. unit is practically as high as that of the 3000-kw. unit, and the cost of two 1500-kw. machines is not much if any higher than that of one 3000-kw. machine. The slightly larger building required for eight of the smaller rotaries was not a factor for consideration in this case, as the length of building was practically controlled by the number of feeder panels necessary. The form of the particular lot used, also, was such that the building, built to fit the lot, gave a trapezoidal shape in which the longest side was used for the line of rotary converters.

The station is designed at present to take care of the full requirements of the territory over which it was intended to distribute from this point. It is laid out simply to take care of the increase in traffic which may occur within the area served, for a certain period ahead, and not for any which develops outside of this area. When more power capacity is needed additional stations will be put in. At present one of the rotaries really serves as a "spare."

BUILDING DESIGNED TO INSURE DRY INTERIOR

The substation building itself is set on a concrete foundation, both the basement floor and the main floor also being of concrete. The latter, however, is covered with a tile finish. The roof is of concrete supported on steel girders. Pressed brick is used for the front wall and the building is ornamented with cut stone trimmings throughout. The interior and side walls are of shale brick laid in cement mortar.

In connection with the design of the monitor sash, which like all other sash and doors are of steel, special provision was made to prevent leakage which might cause deterioration of machine insulation. In ordinary construction water is apt to drive into the building



Rear of Alternating-Current Section of Main Control Board

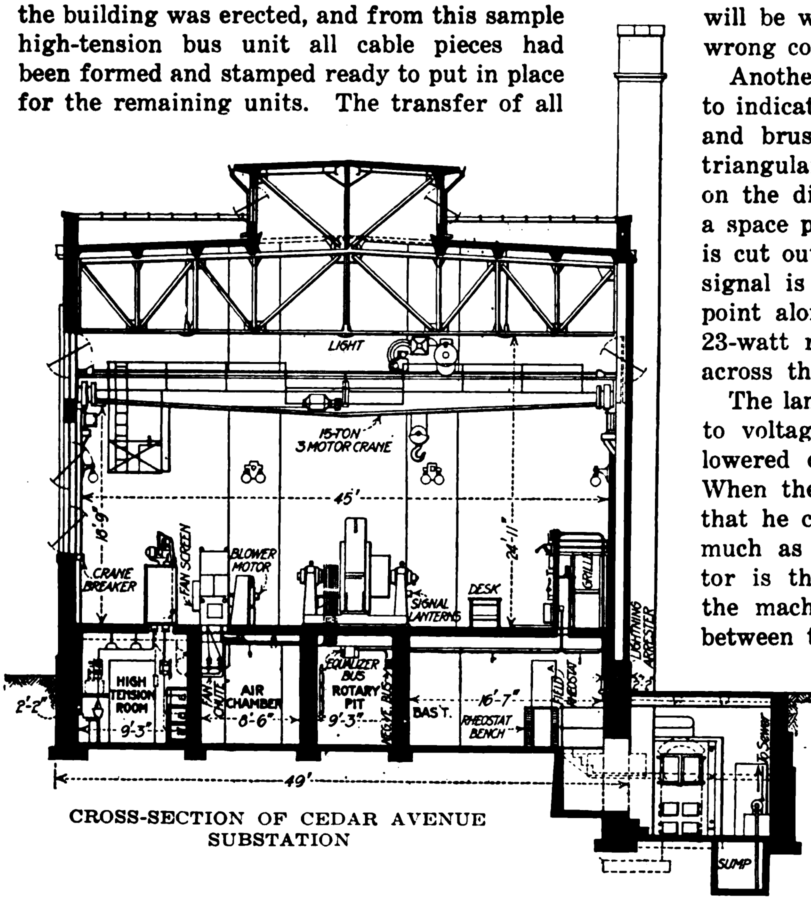
Rear of Direct-Current Section of Main Control Board

Busbar and Disconnect Switch Compartments With Lamp Indicators

VIEWS IN THE CONTROL SECTION OF CEDAR AVENUE SUBSTATION during a storm through the cracks which are produced by the warping of sash. A certain amount of condensation also forms due to the difference of temperature inside and outside the monitor glass. This causes a dripping inside the station. In the present case to avoid this condition the concrete has been extended out from the girder and the copper flashing extended from the roof outside, up against the monitor wall, in under the steel sash and down inside the monitor wall, being bent up to form an interior gutter. The interior gutter can be distinguished at the base of the monitor walls in the accompanying cross-section. At certain intervals small copper outlets, 1 in. in diameter, are provided to drain the gutter, which takes care of all dripping from the monitor roof and sash.

SOME RAPID CONSTRUCTION WORK

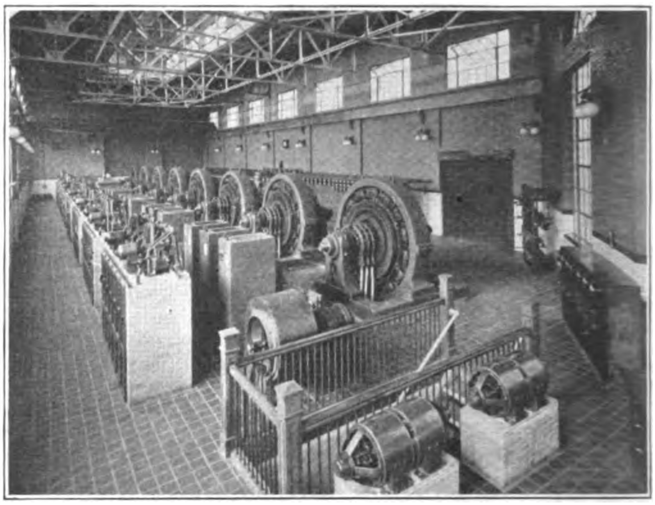
After the substation building was completed and turned over to the electrical department all of the electrical apparatus, including rotaries, switchboards, etc., was put in by this department in a period of five weeks. It was possible to do this partly because a sample bus structure had been made up complete before the building was erected, and from this sample high-tension bus unit all cable pieces had been formed and stamped ready to put in place for the remaining units. The transfer of all feeders from the generating plant to the substation, and the testing out of lines and rotaries took but six hours.



CROSS-SECTION OF CEDAR AVENUE SUBSTATION

SIGNALS OF VARIOUS KINDS A FEATURE

One interesting safety feature in the Cedar Avenue substation is an equipment of red and green switchboard lights in the basement along the aisle in front of the oil-switch and bus-structure compartments. These give either a red or green indication depending upon whether or not the bus compartment or switch is alive. The indicators have been provided as a protection to the men when they run downstairs from the switchboard to throw out a set of disconnect switches. If they forget which unit they intended to cut out they will be warned by the red right indicator in case the wrong compartment is opened up.



ALTERNATING-CURRENT ENDS OF THE ROTARY CONVERTERS AND ROWS OF CONTROL APPARATUS

Another valuable indicator is one used on each rotary to indicate when it is up to speed, with voltage normal and brushes down. Attached to each machine is a triangular-shaped aluminum box bolted to the pedestal on the direct-current side. On either side of this, in a space provided for the purpose, the machine number is cut out and a ground glass is inserted inside. The signal is in view of the operator or helper from any point along the switchboard. Inside the box are two 23-watt ruby lamps, each in series with a resistance across the 600-volt terminals of the rotary converter.

The lamps are so wired that when the machine is up to voltage and the direct-current brushes have been lowered onto the commutator the lamps are lighted. When the operator sees the number in red he knows that he can throw in his main circuit breaker. Inasmuch as putting the brushes down on the commutator is the last step in the operation of starting up the machine, the light signals form a perfect check between the operator and the helper.

Still another valuable signal is one used in making certain that the operator gets the telephone signal when there is a call. It is always possible that on account of the noise of the rotaries the telephone bell may not be heard. A large lamp has, therefore, been placed on top of the telephone booth and a light signal in the base of the desk lamp on the operator's desk also. An ordinary drop relay on the telephone circuit closes a 110-volt battery circuit through the bell and the lamps located on the booth and on the operator's desk. An office is later to be placed in the oblique corner of the substation for the use of the chief operator. This will be equipped with a telephone and a direct connection with the load dispatcher.

The plan followed by the Cleveland Railway in starting up rotaries is about as follows, the machines being always started up from the alternating-current side: The operator first throws in the oil switch and inserts the potential plug for the voltmeter, turning the face of this instrument so that the helper can see it and bring up his field in the right direction. A check meter and a differential meter are both noted, these being duplicate in their functions and serving as a check against meter failure. The helper cuts in the machine by closing the field switch, equalizer and alternating-current starting switch, lowering the brushes last. When he does this the signal lanterns are cut into circuit as previously explained.

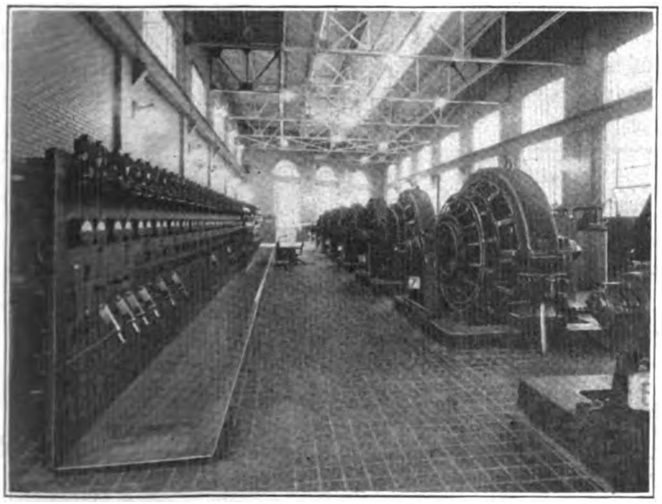
When the operator sees the lights he knows that the machine is up to speed and ready to go on the line. He then equalizes the voltage and for this purpose turns the voltmeter around so that he can see it while a second man checks on the correct potential. The machine is then brought up 10 or 15 volts above bus voltage and the machine is thrown on the direct-current line. The over-voltage prevents any reverse current flow into the machines which might act to operate the reverse-current relay on the direct-current side should the machine voltage be equal to or very slightly below the bus voltage.

INSURING RELIABILITY IN SWITCHING AND DISTRIBUTING THE SUBSTATION ENERGY

The bus construction in the substation is arranged to care for the incoming line, oil switch, etc., for each unit, grouping them together, and separating them from the compartments provided for the adjacent machines.

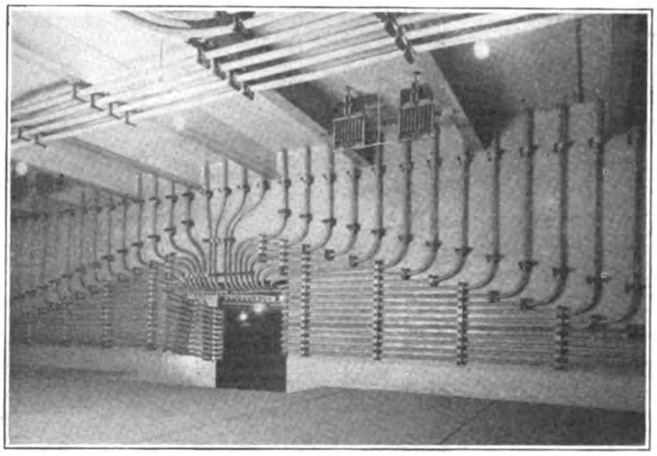
The incoming cables are No. 0000, grounded-neutral, 11,000-volt, 60-cycle, alternating-current feeders. Disconnect switches are installed in the alternating-current buses between adjacent groups so that an interchange can be cut onto any line, or any line can be killed. Under ordinary operating all incoming lines are paralleled. No protection against surges is provided from group to group, but the inverse-power relay on each line prevents the feeding back of energy into any short-circuit from the bus.

Protection is afforded the incoming alternating-current lines by inverse-power relays. These are essentially three single-phase watt-meters having each a rotating disk which tends to rotate against stops when the current is in the right direction. When any reversal of current takes place the disk rotates in the opposite direction and closes contact through a relay which opens the alternating-current oil switch. This gives protection to the cables between the substation and the lines of the generating company, a better protection than would be provided by the ordinary overload relay. The latter, in case of a short-circuit, would allow a very heavy current to build up before the overload relays would operate. The reverse power relay operates instantaneously with the reversal of power.



DIRECT-CURRENT ENDS OF ROTARY CONVERTERS AND FRONT OF MAIN CONTROL SWITCHBOARD

The outgoing feeder cables leave the substation through a tunnel extending underneath the street to terminal poles on both sides. The cables are extended up through iron pipes from the tunnel to the overhead line. For this purpose 1,000,000-circ. mil rubber-covered cable is used and a fiber duct is placed inside the pipe. The magnetic induction in the iron pipe serves as a choke coil and in five years' experience with this type of connection with the overhead line the company has not lost a single meter.



MOUNTING OF FEEDER CABLES IN SUBSTATION BASEMENT AND SUBWAY

On the overhead a General Electric lightning arrester is installed in each feeder before it enters the iron pipe. Across each rotary terminal an aluminum cell arrester is connected also. Finally, between each bus and the ground is a multi-gap arrester, two being provided for each bus.

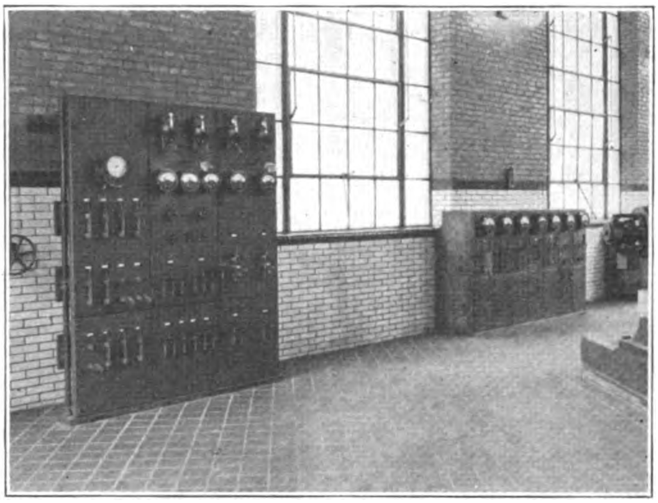
UNUSUALLY COMPLETE METERING EQUIPMENT WAS PROVIDED

The alternating-current line panels are equipped with plugs for cutting in test meters (potential and current) in order to make it convenient to check the board meters against the standard. This is necessary because the company is buying power and consequently requires that the meters be tested frequently.

A Thomson watt-hour meter is placed on the direct-current side of each rotary and, inasmuch as the machines are put on or taken off the line to follow the load curve very closely and thus keep the rotaries loaded to full capacity so that they are operating at best efficiency, the meters are also thus kept loaded at practically full capacity and good meter efficiency is obtained. In other words, the machine and its meter are either on the line and carrying a good load or they are off the line entirely.

A special switchboard was provided in the substation for measuring the return currents in a negative drainage system installed to drain the underground structures of other utility companies. A direct line was run from the nearest manhole of each utility company to connect with the switchboard. Here the circuit passes through a meter and is connected through a switch to the main negative bus. The size of the cable used depends upon the nature of the utility company's structure.

After the station was put into commission and tests had been made, in the neighborhood, of the drop between the utility company's structures and the railway company's track, a suitable resistance was calculated and a resistor was installed in the manhole. The circuit was calculated so that the utility company's system could be drained a sufficient amount to prevent deterioration and to keep that system negative to the railway company's structure, or at as low a negative potential as necessary. This plan makes it possible to determine the condition on each drain system at any time, the meters being labelled so as to indicate the name of the company whose structure is being protected.


SPECIAL SWITCHBOARDS IN CEDAR AVENUE SUBSTATION—AT RIGHT AMMETER BOARD FOR USE IN MEASURING DRAINAGE TABLES. AT LEFT HOUSE-SERVICE BOARD

A test is also provided on the semi-insulated return circuits which extend out to the several parts of the track system from the substation. It sometimes happens that the track department in doing construction work cuts these drain feeders and neglects to connect them up again so that there is no way of indicating whether the feeder is functioning or not. By installing a single ammeter with a selective switch, which will connect this meter with the shunt in the circuit of any of the return feeders, it has been made possible to test out periodically to see that all of the feeders are actually connected and doing the work for which they were installed.

The substation which has been described in this article replaces the old Cedar Avenue power house which was probably the largest non-condensing direct-current plant in the country. This plant was operated non-condensing because the exhaust steam was sold to a salt company adjacent at a price which made it very difficult for the central station companies in Cleveland to compete with the railway company's old power house on cost per kilowatt-hour output. When the question of the rehabilitation of the plant came up the railway company discussed with the central station companies the question of a rate for power which if possible should be better than the cost of producing it in the old station rehabilitated to modern form in many essentials. Readers of the ELECTRIC RAILWAY JOURNAL will remember the extended investigations of the subject before the conclusion to purchase the power from the Cleveland Illuminating Company was reached. The situation was clearly outlined in an article appearing in the Jan. 6, 1917, issue of this paper, page 49. It was only by agreeing to set aside a certain amount each year to amortize the investment in the plant that the conclusion to abandon the old plant was reached.

In the testimony presented at the hearings the reproduction value of the Cedar Avenue power house was placed at $1,265,565, and this, less the salvage of machinery and equipment estimated at $115,565, was to be placed in a suspense account and paid off at the rate of $20,000 a month. According to estimates which were presented by the engineers at the hearing on this matter, the cost of energy under the contract with the Illuminating Company will be less than 6 mills per kilowatt-hour. The cost of energy production in the old plant was said to have been about 1 cent per kilowatt-hour.

As stated at the outset, Mr. Crecelius is a firm believer in the necessity for close watching of the apparatus in service to insure that no more will be in use than is necessary. To this end he has the operators keep graphical logs of the load and the capacity of machines in operation. Thus they are impelled to operate their stations at high efficiency.

An Old Fable Modernized

By THOMAS DREIER

I WAS THINKING the other day about big business institutions that attempt to influence public opinion by paying money to editors and newspaper men, instead of coming out frankly in the open and telling their story to the public over their own signature, either in advertisements or direct-by-mail printed matter.

Business men who indulge in that foolish pastime should read that famous old fable which tells about a man, torn by the bite of a savage dog, who threw a piece of bread dipped in his blood to the offender, saying that he had heard it was a remedy for the wound.

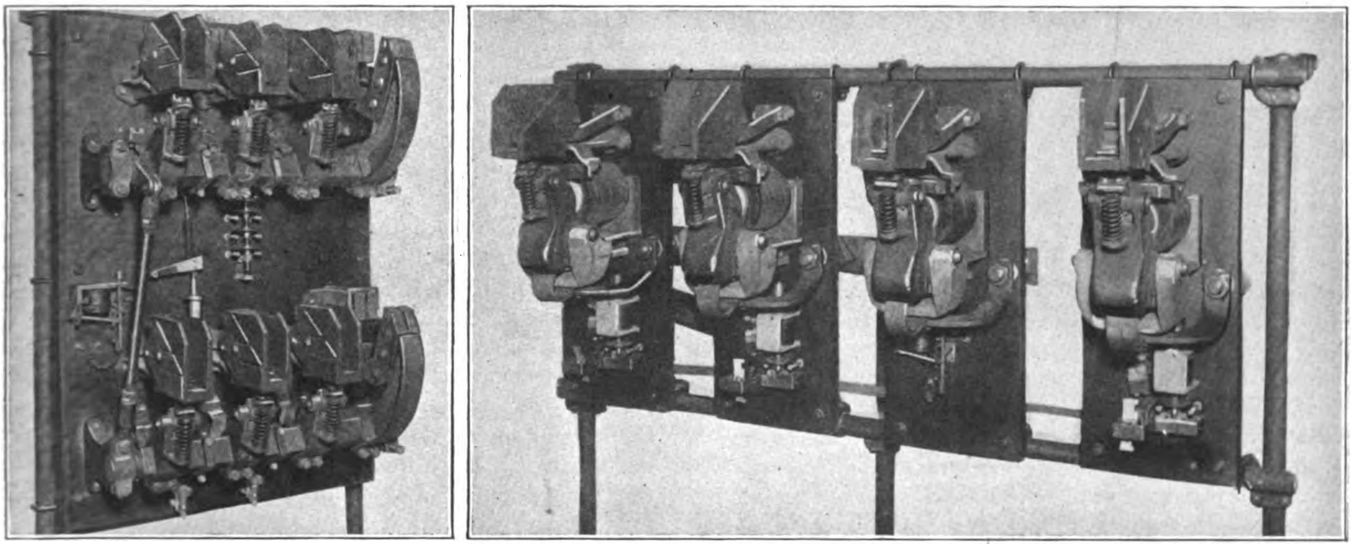
"Then," said Æsop, "don't do this before many dogs, lest they devour us alive when they know that such is the reward of biting us."

Why the Automatic Substation Saves Materials and Labor

The Author Analyzes the Advantages and Disadvantages of Automatic Substations and Mentions Some of the Details of a Type of Equipment Which Has Recently Been Developed

By CHARLES F. LLOYD
Manager Substation Section Power Department, Westinghouse Electric & Manufacturing Company

THE automatic railway substation may be defined as one in which the functions of starting and putting the machines on the line, when there is a demand for power, and later shutting them down when the demand for power is not in evidence, are performed automatically. All of the switching operations are carried out in the proper sequence without the assistance of an operator. Obviously the converting apparatus must be protected from every conceivable abnormal condition, even though such conditions may be expected to arise only infrequently.



STARTING PANEL FOR AUTOMATIC SUBSTATIONS, AND DIRECT-CURRENT CONTRACTOR PANEL FORMING PART OF AUTOMATIC CONTROL

Upon first thought automatic control seems to afford only a means of reducing labor charges, but it has been demonstrated that there are many other and important advantages to be derived from its use.

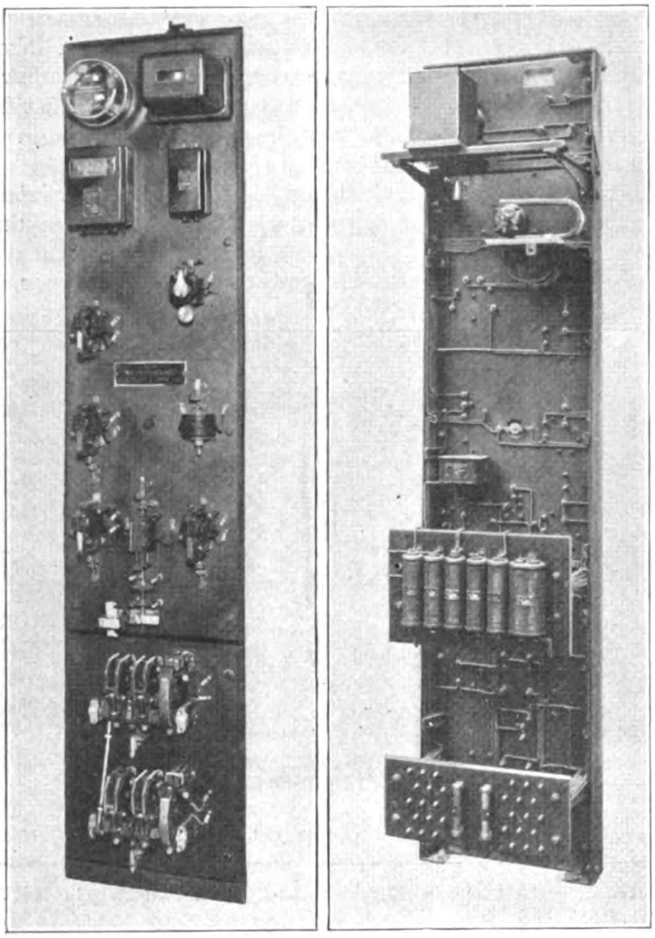
In general the principal advantages to be derived from the use of automatic substations are reduction in operating labor charges, reduction in labor difficulties, saving of energy, saving in feeder copper and reduction in the stray current from the railway return.

In the matter of labor the saving becomes important especially where three operating shifts are required under manual operation and where a number of substations are made automatic. In estimating the saving, however, error should not be made through the assumption that all operators can be eliminated. The automatic switching equipment as well as the other substation apparatus must be well maintained. Furthermore, with the present shortage in labor and general labor unrest the reduction in necessary labor in the substations is a feature to which full consideration must be given even though it may be difficult to assign a monetary value to it.

Reduction in energy consumption, especially on interurban lines, will amount to a considerable item due to the elimination of no-load losses. The automatic switching shuts down the substation when power is not required, thereby eliminating these losses which constitute a large proportion of the total in synchronous converter outfits.

Feeder copper can usually be reduced, or voltage conditions improved, by the use of automatic control. This follows from the possibility of relocating substations or increasing their number, or both, as no consideration need be given to expense for operators. There are no doubt many locations to-day where sufficient copper could be taken down practically to pay for the automatic switching equipment. Not only can copper be saved over head but the return circuit is improved due to the reduced length of return circuits and the reduction in return voltage drops.

The features which have been enumerated are in the credit column of the balance sheet. Necessarily there are some items which must appear on the debit side. The first of these is the cost of the automatic switching equipment. Interest, depreciation or obsolescence, and maintenance must be figured. In making old substations automatic practically all of the switching equipment must be discarded. Another item is the substation buildings required in excess of those used for non-automatic equipments. These constitute an additional capital charge, and interest, depreciation, maintenance, etc., must be allowed. It is true, however, that substation buildings for automatic equipment can be built very cheaply, as no provision need be made for the comfort of the operator. It is necessary only to provide a building that will protect the equipment from the weather, provide suitable ventilation and be large enough to give suitable clearances around the apparatus.



FRONT AND REAR VIEWS OF AUTOMATIC SUBSTATION RELAY PANEL

Obviously even if we grant that the statements already made are correct as to the value of attendantless substations, the validity of these arguments must be based upon the reliability of the automatic switching apparatus. The switching must be done by the use of apparatus which has proved its reliability in actual service.

With this idea in mind the Westinghouse Electric & Manufacturing Company has developed an equipment which is illustrated in the accompanying photographs. The apparatus shown is that required to control a self-starting synchronous converter outfit having one feeder only. The illustrations show all of the equipment with the exception of the bank of direct-current resistance grids controlled by the main direct-current contactor panel. It is understood, of course, that an electrically-operated alternating-current circuit breaker forms a part of the equipment, to eliminate transformer losses when the substation is inactive.

Where more than one feeder is required, feeder panels are supplied with suitable contactors similar to those shown and with a suitable resistance bank.

Two of the illustrations show the relay panel, front and rear views respectively, which carries the greater part of the relays for insuring proper operation of the switching contactors. The starting panel illustrated is similar to the familiar starting panel for hand-operated outfits. A direct-current contactor panel replaces the usual direct-current panel used in switching non-automatically.

The same scheme of switching is used regardless of the capacity of the converting apparatus, it being only necessary to change the main current-carrying contactors to correspond to the different ratings.

The operating features of this equipment can be briefly summarized as follows: In the first place it duplicates in every way the manual operation of substation apparatus, and each switching operation is a direct function of the electrical condition of the converting apparatus at that particular moment. Further, each switching operation is dependant upon the proper functioning of the preceding operations. At no time is any switching operation dependant upon any mechanical time element or mechanical sequence of operation.

The time elements used with the various relays are especially designed to be unaffected by wide variations in temperature, none of them being of the oil dashpot type. Most of the magnet switches and relays which are used have demonstrated their quality in steel-mill control work, where they have given evidence of ruggedness and reliability.

As stated earlier the matter of protection even under very unusual conditions is a prime consideration in this type of equipment. In the present design, should trouble develop between the high tension of the transformers and the direct-current limiting resistance, alternating-current overload relays will trip the alternating-current high-tension breaker. To provide against the occurrence of low voltage a relay is installed to prevent the substation from starting should the alternating-current voltage be too low or should it drop below a predetermined value. Under the control of this relay the low-voltage coil on the alternating-current circuit breaker will shut down the substation.

To protect the station against direct-current overloads various sections of current-limiting resistance are inserted in the machine circuit by suitable contactors when the load exceeds the setting of the overload trip on the contactors. These contactors close, cutting out the resistance when the currents fall below their settings. Protection against overheat is provided through thermostats placed in the machine bearings and in each resistance section. These operate to trip the alternating-current circuit breaker. If for any possible reason the converter and the direct-current line should be of opposite polarity the direct-current line contactor will not close due to the action of a suitable relay. If current is still demanded from the substation it will immediately restart. Similarly the equipment is protected against reverse current by means of a reverse-current relay. Finally protection against over-speed is furnished through the usual speed-limit device.

Automatic Substation of New Type on Ohio Electric

Details Are Given of a New Type of Equipment in Which Contactor Switches Controlled by Relays Are Employed to Start and Stop Rotary Converters in Attendantless Substations

By R. J. WENSLEY
Switchboard Engineering Division, Westinghouse Electric & Manufacturing Company

THE Ohio Electric Railway has recently installed in its 500-kw. substation at Columbus Grove, Ohio, an automatic control of a type developed by the Westinghouse Electric & Manufacturing Company. This is shown in Fig. 1. The single unit in this substation is fed through transformers from a 33,000-volt transmission system. The switchboard is of the usual type having three panels, one for the alternating-current starting switch, one for the main direct-current switch and circuit breaker, and one for two outgoing feeders. The automatic equipment was installed without disturbing the existing board, all connections being paralleled with the old equipment.

A simplified schematic diagram of connections is given in Fig. 2, showing the control connections with only enough of the main circuits to provide a clear understanding of the sequence of operations. The alternating-current control circuit is fed from a transformer connected to the high-tension line ahead of the circuit breaker.

The contacts of the contact-making voltmeter 1 which governs the starting of the station, close when the trolley voltage falls below the point at which the station is to be started. In practice this will usually be at from 60 to 80 per cent of the normal trolley potential. The contacts of 1 complete a circuit through the operating coil of potential relay 2. This is an induction-type voltage relay which will not close its contacts unless the alternating potential is sufficiently high to insure the starting of the converter and the satisfactory operation of the various switches.

Contacts of 2 complete a circuit through timing relay 27 and in turn through the operating coil of master relay switch 3. This switch energizes the operating bus *auxiliary A*, from which all the various switch operating circuits are supplied. When this bus is energized three switches are closed at once: (*a*) The closing coil of the circuit breaker; (*b*) the field switch 5 which connects the shunt field across the converter brushes; and (*c*) the relay switch 4, which in turn closes starting switch 6, thereby applying starting potential to the converter slip rings. Interlock contacts operated by 6 connect the field and armature circuits of polarized motor relay 7, to the trolley and to the converter brushes respectively. These circuits are not shown on the diagram.

The polarized motor consists of a small shunt motor with a permanent magnetic field circuit on which is added a shunt coil energized from the trolley during the starting operation. The permanent magnet provides against the contingency of the station having to start when the trolley is not energized. The armature is connected across the converter commutator brushes during starting. When the converter is first connected across the starting taps, this applies an alternating potential across the relay armature which causes it to oscillate only. As the converter approaches synchronism, the frequency decreases until when it locks into step, a unidirectional potential is applied across the relay armature causing it to revolve in a clockwise direction, if the polarity is correct. A reducing gear is built into the motor frame which drives a revolving brush inside the molded contact block below the relay base. This revolving brush and its four contacts are shown as 7 in Fig. 2. Assuming that the polarity is incorrect, the brush will pass contact *A*, thereby closing relay 8 which will lock itself closed through its own contacts. The brush will next pass contact *D*, thus closing a circuit from the negative converter brush (which is permanently grounded) through one of the contacts of 8, through the coils of relays 9 and 32, and thence to the positive converter brush. Relay 9 is provided with a holding contact which connects its coil directly across the converter, thus causing it to remain in after the brush has passed point *D* of 7.

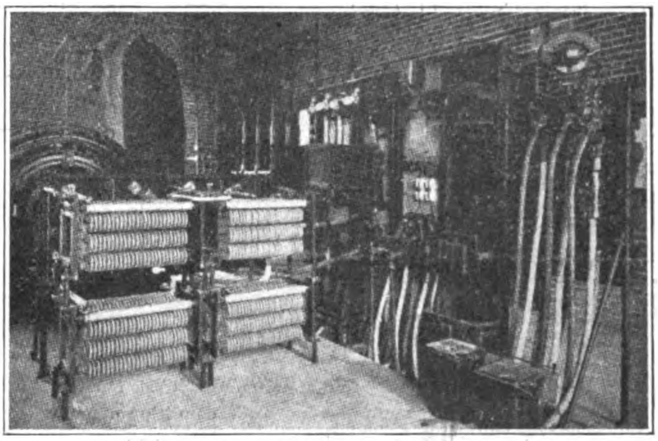


FIG. 1—AUTOMATIC SUBSTATION OF OHIO ELECTRIC RAILWAY, COLUMBUS GROVE, OHIO

The contacts of 9 cause field switch 5 to open and field switch 10 to close. Switch 10 connects the shunt field across the converter brushes in the reverse direction, which causes the converter potential to die away nearly to zero. This causes 7 to slow down and stop somewhere near *C;* it also allows the armature of 9 to be released, which in turn causes the field switches 5 and 10 to resume their original positions. This will normally cause the converter to slip a pole and build up in the reverse direction.

If the converter fails to reverse its polarity, the polarized motor will start again in the same direction, causing the field to be reversed again and will continue to do so until correct polarity is obtained or field reversal limiting relay 32 operates. Relay 32 guards against the times when, for some reason, the converter refuses to be reversed by the field. It is a step-by-step device, which after a predetermined number of trials will open the starting switch and allow the converter to drop out of step. After a few seconds it will allow the starting switch to close again and possibly catch the converter in such a manner as to bring it up in the correct direction. This sequence of operations closely imitates the method used in the ordinary hand-operated station for securing correct polarity, except that it is much more likely to secure the desired result at the first trial because the field reversal is obtained at exactly the proper time in every case, which is not true when the human element is introduced.

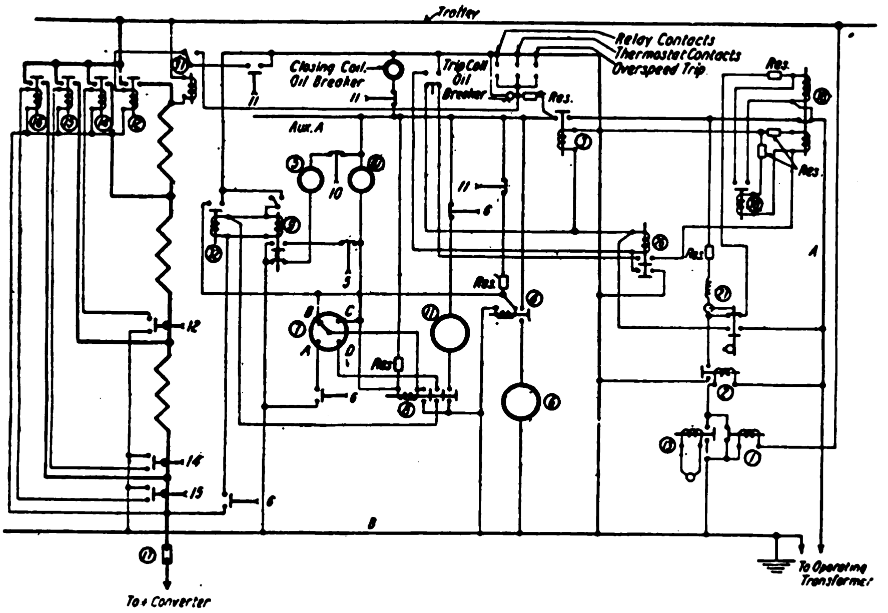


FIG. 2—SIMPLIFIED CONNECTION DIAGRAM FOR AUTOMATIC SUBSTATION

All switches are shown for de-energized condition of switch operating coils: 1—contact-making voltmeter. 2—Low voltage relay. 3—Alternating-current shunt relay. 4—Alternating-current shunt relay. 5—Shunt field switch. 6—Starting switch. 7—Polarized motor relay. 8—Alternating current shunt relay. 9—Field reversing relay. 10—Shunt field reversing switch. 11—Running switch. 12—Line switch. 13—Holding relay. 14, 15 and 16—Line resistance switches. 17—Ammeter shunt. 18—Reset relay. 26—Alternating-current shunt relay. 27—Torque-motor operated time delay relay. 30—Resetting lockout relay. 31—Over-voltage safety relay. 32—Field reversal-limiting relay.

The contact on 9 short-circuits the coil of 8 and causes it to open when the field is first reversed. As the converter builds up in the right direction, relay 7 begins to revolve in a clockwise direction. As that brush passes *D*, no circuit is set up because 8 is open. In passing *A*, 8 is again closed. When the brush reaches *B* the coil of 4 is short-circuited, thus causing starting switch 6 to be opened. A circuit through an interlock on 6 and through the main contacts of 8 closes running switch 11, thus applying full running potential to the converter rings.

It will be seen that with this system it is not necessary to wait even a short time after reaching synchronism before the transfer to running potential is effected. On the other hand, the transfer cannot be made until the converter is definitely locked into step and with the right polarity. While the descripton of the operation takes a relatively long time, the actual operation is carried out in a very brief interval. With a 300-kw., 25-cycle, 750-r.p.m. converter, starting on 28 per cent taps, the first direct-current line switch was closed ten seconds after the starting impulse was received; except that when field reversal was necessary, an additional four seconds was required. A 500-kw., 500-r.p.m. machine took four seconds longer. When commutating-pole machines are used an additional time of approximately five seconds is required to allow the brushes to be lowered.

The interlock on running switch 11 completes a circuit through the contacts of safety relay 31 to the closing coil of the main direct-current line switch 12. The coil of 31 is connected across the contacts of 12 and is calibrated to operate at 750 volts. As the normally negative converter brush is grounded, there will be a potential of 1200 volts across the coil of 31, if by any accident the converter should reach this stage of the operation with inverted polarity. If 31 operates it will open the circuit-breaker of 12, while at the same time tripping the circuit breaker and causing the station to start over again.

Switch 12 connects the converter to the line through the current- limiting resistance, thus preventing the sudden surge frequently caused in manually-operated substations when the switch is first closed. Switches 14, 15 and 16 are then successively closed through current-limit relays which prevent the short-circuiting of the resistance if the load exceeds their setting. These relays also serve as overload relays to open switches 14, 15 and 1; in case of overload or short-circuit on the direct-current system.

As soon as 12 is closed and the converter is supplying current to the line, the load relay 13 operates. This relay closes its contacts at approximately 15 per cent of the normal station load or any other value that may be found necessary on the individual application. The contacts of 13 are in parallel with those of 1 and serve to keep the station in operation as long as the demand justifies.

The motor-operated time relay 27 holds the station on the line during periods of coasting or when the cars are stopped to receive or discharge passengers. It can be set for any period (from three to eighteen minutes) that may be found desirable after installation. This relay will open switch 3 if no demand in excess of the setting of 13 is made on the station within the time setting.

Thermostats are provided over the current-limiting resistance grids to cut the station out of service if an overload or short-circuit continues sufficiently long to overheat them. The station will continue to come back into service indefinitely after overheating of the grids if the demand is present.

Thermostats are also provided for the bearings but after these once operate the station is cut out of service until inspected. The bearing thermostat consists of a copper bulb inserted in the bearing and located so that one side of the bulb is in contact with the bearing metal. The bulb is connected to an external metallic bellows and is filled with a volatile fluid which vaporizes at the maximum desirable bearing temperature, thus expanding the bellows and operating a contact that disconnects the converter from the line. After the bearing has cooled, all that is necessary to reset the thermostat is to press down on the contact rod, thus opening the contacts and restoring the device to its original condition.

An auxiliary switch on the circuit breaker, together with relay 26, resetting relay 18, and repeating lockout device 30 is arranged to cause one or more attempts to start after the station has been tripped by the alternating-current overload relays. This is to take care of restarting after a plain overload of sufficient magnitude to affect the alternating-current relays or a short-circuit due to a flashover or some other self-clearing source of trouble. If the tripping still persists, relay 18 is electrically locked open by 30, which is a step-by-step device capable of being set to perform from one to four operations.

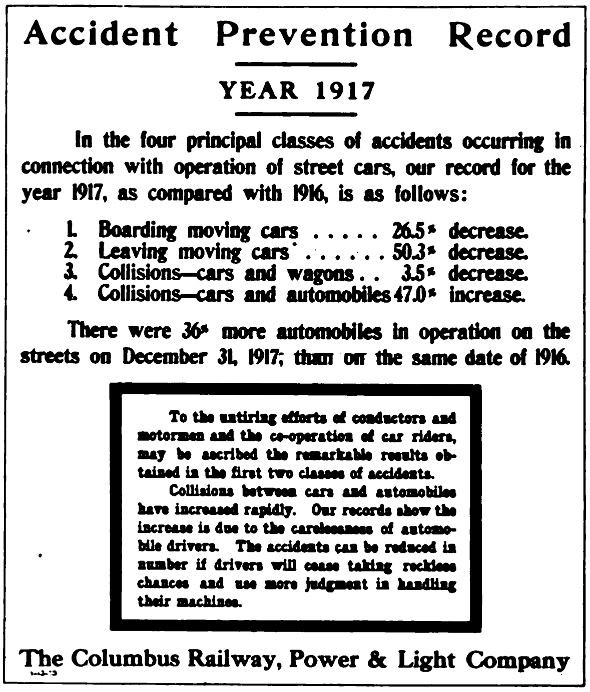
An extra device can be connected to 18 that will signal the dispatcher over the telephone line that the station has been locked out due to trouble. This will also indicate the number of the station when there are more than one on the line. When this scheme of control is to be applied to converters having interpoles, which this one has not, it is necessary to provide a brush lifting and lowering device. This is arranged with limit switches and interlocks so that the converter cannot be connected to the starting taps unless the brushes are lifted, nor can the direct-current line switch be closed until the brushes are fully lowered. The brushes are arranged to raise immediately after the station is shut down, if the alternating current service has not been interrupted. If the shut down is caused by failure of the source of supply, then the brushes will be raised when the supply is restored. The lowering operation occurs when the low-tension running contactor closes, taking place in the sequence of operations between the closing of this switch and the closing of the direct-current line switch 12.

Public Utility Situation Improving

The public utility situation, according to the Chicago *Tribune*, is gradually turning for the better. A compilation of the annual report of ninety-three of the principal corporations for the year ended Dec. 31, shows aggregate net earnings of $207,761,420 as compared with $192,761,420 for the previous year. The improvement in the aggregate, according to this paper, is largely due to the fact that state and municipal boards having the power of rate regulation have adopted a new policy toward the utilities and recognized the fact that the welfare of the nation at war depends in a large measure on the good credit and operating efficiency of public utilities.

Safety Reminder Used at Columbus

THE Columbus Railway, Light & Power Company has been very active in campaigns to reduce accidents. Some of this work was described by H. W. Clapp, general superintendent, in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 8, 1917, page 395.



Accident Prevention Record

YEAR 1917

In the four principal classes of accidents occurring in connection with operation of street cars, our record for the year 1917, as compared with 1916, is as follows:

1. Boarding moving cars ..... 26.5% decrease.
2. Leaving moving cars ...... 50.3% decrease.
3. Collisions—cars and wagons .. 3.5% decrease.
4. Collisions—cars and automobiles 47.0% increase.

There were 36% more automobiles in operation on the streets on December 31, 1917, than on the same date of 1916.

To the untiring efforts of conductors and motormen and the co-operation of car riders, may be ascribed the remarkable results obtained in the first two classes of accidents.

Collisions between cars and automobiles have increased rapidly. Our records show the increase is due to the carelessness of automobile drivers. The accidents can be reduced in number if drivers will cease taking reckless chances and use more judgment in handling their machines.

The Columbus Railway, Power & Light Company

ACCIDENT POSTER RECENTLY ISSUED BY C. RY., L. & P. COMPANY, COLUMBUS, OHIO

One of the latest features in the safety movement was the printing of a large poster giving the results of an analysis of accident reduction, or the reverse, for the year 1917. The poster, which tells its own story, is reproduced herewith.

Car With Raised Motors for Service in Flooded Streets

The Brooklyn (N. Y.) Rapid Transit System has added navigation to its already broad field of transportation service. This comes in the nature of a car with the motor built above the floor and which is used to operate through flooded streets.

At one point in particular in Brooklyn, the houses along both sides of the street are built at a much higher elevation than the street and whenever there is a heavy rain or a melt from a heavy fall of snow, the drainage is so inadequate that the street becomes a veritable canal. As the result of melting snow such a flood recently reached a maximum depth of 3 ft. and the deep-sea transport car known as the "Canarsie Ferry" was pressed into service, carrying passengers across the deep to safety on the dry land on either side of the young flood.

Before the "Canarsie Ferry" was built for ocean voyages this line has several times been compelled to discontinue operation for periods of twenty to thirty-six hours.

Six-Cent Fare Turned Down

Rhode Island House Votes in Favor of Adopting Zone System Recommended by Special Investigators

A ZONE system of fares for the Rhode Island Company, Providence, R. I., system was adopted by the House on April 10 by a vote of 49 to 43. Action by the Senate has not yet been taken. The present situation is, therefore, that the General Assembly has half repudiated the report of a committee of legislators favoring a 6-cent fare. This constitutes an overruling of previous action, when the House blocked the installation of a zone system recommended by special investigators.

ACTION TAKEN BY HOUSE

The vote taken by the House was on a bill reading in part as follows:

"The Public Utilities Commission is hereby directed to order the Rhode Island Company to make such modifications in its system of fares and transfers as the special investigating commission has so determined and certified [in its zone system recommendations]. Such modifications shall be subject to change from time to time by the Public Utilities Commission whenever in its opinion the public interest shall so demand and the affairs of the Rhode Island Company shall warrant.

"New schedules shall become effective on or before May 1, 1918, upon at least five days' notice to the Public Utilities Commission and the public, provided that the Public Utilities Commission may, for cause shown by the Rhode Island Company, extend the date upon which such new schedules shall become effective.

"The schedules of rates of fare and transfer regulations herein ratified and confirmed shall continue in force during the remainder of the war with the Imperial German Government and for a further period of one year after a treaty of peace shall have been signed by the warring nations, unless sooner abrogated or changed by the Public Utilities Commission in accordance with law."

It will be recalled that the Rhode Island Legislature in January, 1917, passed a bill providing for the appointment of a special investigating commission to inquire into the advisibility of granting financial relief to the Rhode Island Company. This commission reported in March, 1918, in favor of the adoption of a zone system of fares, as described in the ELECTRIC RAILWAY JOURNAL of March 23. The Legislature, however, blocked this method of relief by passing a special bill ordering the Public Service Commission not to put the recommendation into effect, as the previous bill had provided, and appointing a specal committee of legislators to look into the affairs of the company and to consider the report of the special commission.

LEGISLATIVE COMMITTEE WANTED HIGHER UNIT FARE

This committee of legislators held numerous meetings and finally reported back to the Legislature, on April 3, in favor of a 6-cent fare. Tickets were provided at the rate of eighteen for $1. It was proposed that the increase should go into operation on May 1, and continue until one year after the signing of a treaty of peace.

The committee stated that if further temporary relief were needed, it could be obtained by a reduction of the franchise tax and the paving charges paid to the city of Providence.

SPECIAL COMMISSION DID ITS DUTY

In discussing the recommendations of the special investigating commission, the legislative committee said in its report that the former body fully met its duty of determining whether or not the company was securing a fair return on the property used in the public service. While there might be a difference of opinion in regard to the value as fixed by experts of the commission and also as to the means recommended for securing increased revenue, there could be no question that the commission had rendered a valuable service to the State by the comprehensive work shown in the report. The legislators believed that the information would be most pertinent and helpful in the consideration of the question of revising the fares to conform with a fair return. In their opinion, however, such a question must give way for the present to one more pressing—the problem of finding funds sufficient to enable the system to keep in operation.

The legislators noted that according to the report of the investigating commission the rentals, interest, taxes and operating expenses of the company exceeded its income by $512,849 for the calendar year, 1917. The comptroller of the company stated to them that during January and February of 1918 the company had run behind $182,000, and one of the trustees said that a fair estimate of the deficit during 1918 would be from $700,000 to $750,000. Public utilities throughout the country, the committee said, are facing similar problems, and public authorities are granting relief in the form of increased rates. It was believed, therefore, that a similar attitude on the part of the authorities of Rhode Island was warranted by the conditions.

WHY A SIX-CENT FARE WAS FAVORED

The legislative committee tried to learn what additional revenue would result from the operation of a zone system or a 6-cent fare, but it found that in each case this was largely a matter of opinion. The estimate of increased revenue obtainable from the 6-cent fare ranged from $440,000 to $500,000; and from the proposed zone system, from $400,000 to $550,000.

In recommending a 6-cent fare instead of a zone system to supersede the present 5-cent rate, the legislators stated their reasons as follows:

1. The increase to 6 cents has been the mode of relief granted during the last few months in most of the places where fares have been increased.
2. It does not appear that the zone system as proposed by the special investigating commission has been applied to any other community, at least not to any of the size of Providence and its suburbs.
3. The 6-cent fare is simpler in operation and easier to carry into effect as a measure of temporary relief and it will not result in a disturbance of community life or of property and rental values.
4. The increased fare is required because of war conditions and constitutes a burden that should be shared by all patrons.

Business Men Can Help Win the War

Patriotic Addresses at Convention of United States Chamber of Commerce Urge Co-operation in War-Financing, Transportation, Shipbuilding and Maximum Production—Utilities Must Be Preserved and Expanded

FOUR questions of supreme importance to the nation as a whole and to the American business world formed the nucleus around which the sixth annual convention of the Chamber of Commerce of the United States, held on April 9-12 in Chicago, Ill., centered. These were government organization in relation to business in war, transportation, war financing and ship building. It was said that business men can do much to assure a speedy victory, a solution of the labor problem, and the preservation and the expansion of utilities and other essential industries. During the entire convention, which was well attended, patriotic enthusiasm was so expressed as to leave no doubt of the unselfish and devoted loyalty of business.

MAXIMUM PRODUCTION MUST BE ASSURED

The meetings began informally on Tuesday afternoon with the presentation of several committee reports. In one of these the committee on industrial relations set forth the progress that is being made toward a plan for assuring maximum production. The committee pointed out that the difficulties of obtaining war materials have been increased by questions of wages, hours and conditions of labor, transportation for workers, and housing, each of them of the highest importance to the maintenance of vital production. The constructive plans suggested by the committee include agreements that there shall be no cessation of production, that these agreements shall be supported and enforced by executive authority, that there shall be control of causes leading to unrest, and that there shall be provision for conclusive arbitral decisions regarding differences that arise in spite of preventive measures.

The formal sessions began Wednesday morning with an address of welcome by Lucius Teter, president of the Chicago Association of Commerce. After reports of the board of directors and the National Council, the Chamber's activities in relation to government organization, shipping and finance were described in brief addresses by Waddill Catchings, Edward A. Filene and Wallace D. Simmons, chairmen of the respective war committees. A ringing challenge to American business men that they bestir themselves to speed the structure of ships was the keynote of Mr. Filene's remarks. He emphasized the responsibility that rests upon the community and the individual business man, and said:

HELP SPEED THE BUILDING OF SHIPS

"First, we can see to it that our local business organizations in every community where ships or ship parts are being turned out shall make it their first business to organize themselves into an effective aid to shipbuilding. Second, we can help organize the community behind the shipbuilding in as definite a manner as we can organize the business forces back of shipbuilding."

At the Wednesday afternoon session R. Goodwyn Rhett, president of the National Chamber of Commerce, gave his presidential address. He developed the idea that the great growth of this country and of its resources has been due in large part to the energy, the enterprise and the genius of the American business men, and that further development depends on the continued idealism of business men. In Mr. Rhett's opinion the Chamber of Commerce has a wonderful mission in putting a soul into business.

Mr. Rhett also made a plea for co-operation. He explained that under the original interpretation of the Sherman Law, two manufacturers engaged in the same line of work feared to act in unison, although actual consolidations were not forbidden. This led to the organization of trusts. The decisions in the Standard Oil and American Tobacco cases reversed this idea, and undoubtedly were of great help to business. Manufacturers now may co-operate and should do so, for the benefit of not only themselves, but also the public. The war is teaching this country the necessity of co-operation and stronger fellowship among all classes.

On Wednesday evening the auditorium was filled to capacity for addresses by Josephus Daniels, Secretary of the Navy, and Franklin K. Lane, Secretary of the Interior. Secretary Daniels devoted the major portion of his speech to a recital of the achievements of the American Navy in convoying troops to France and in patrolling the seas in conjunction with the fleets of the Allies. He said that ships are vitally necessary in winning the war and urged business men to give up skilled mechanics so that the ship-building program can be carried through without delay. Secretary Lane, in a very patriotic speech, outlined a scheme of caring for the returning armies of the United States when the war is over. He said that the government could let each man have 40 acres of irrigated land in Colorado, house and stock, payment being made in labor by constructing the works which would make this possible.

ADDRESSES OF INTEREST TO ELECTRIC RAILWAYS

Four sessions were held simultaneously on Thursday, the first devoted to government organization in relation to business in war, the second to finance, the third to railroads and highway transportation, and the fourth to shipping. Among the addresses of special interest to electric railway men were ones by Thomas N. McCarter, president Public Service Corporation of New Jersey, Newark, N. J.; Alba B. Johnson, president Baldwin Locomotive Works; Roy D. Chapin, president Hudson Motor Car Company and chairman highway transportation committee of the Council of National Defense; Charles A. Eaton, head of national service department of Emergency Fleet Corporation; Francis H. Sisson, vice-president Guaranty Trust Company, New York, and P. H. Gadsden, president Charleston Consolidated Railway and Lighting Company, Charleston, S. C. Mr. Gadsden's paper was presented in his absence. This and the address by Mr. McCarter are abstracted on following pages.

Mr. Johnson discussed the problem of motive power under the United States Railroad Administration. He first described briefly the development of the steam locomotive. Standardization in its designs has been an ideal much talked of, but never realized, because standardization implies the crystallization of present practice as the practice of the future. Many attempts have been made to fix standards for particular railroads and groups of roads, but in every instance these have given way to the urgency of keeping pace with other roads. Those most rigidly adhering to their standards have lagged behind their competitors. Railroad men are now convinced that the most advantageous field of standardization is with the details rather than the complete locomotive or car as a unit. The result in standardization attained by the Railway Master Mechanics' Association and the Master Carbuilders' Association may be said to have been as great as it was humanly possible to achieve under the diversity of managment, the diversity of ideas and the necessity of constantly keeping abreast of the march of improvements.

MOTIVE POWER IS NOW INADEQUATE

The participation of the United States in the World War, Mr. Johnson said, has brought about new conditions, as all the railroads are now subject to a unity of management and of control in their purchases. Under the instructions of the Director General a committee comprising eleven railway officials, collaborating with representatives of the three principal locomotive builders, have now agreed upon twelve standard specifications for the essential elements of locomotives, leaving a certain freedom in regard to accessories. These standards, however, are only proposed, and there are good arguments against any effort for their general adoption at this time.

Mr. Johnson then discussed railway electrification, for which he saw an extensive future, although the introduction of the electric locomotive must be gradual because of the cost of installation. The motive power of the country is admittedly inadequate for the service demanded under the present war conditions. Railroads have been unable since 1907, because of low earnings, to enlarge greatly their facilities. Adequate provision of motive power, like adequate provision of other rolling stock and other facilities, can only be assured when Congress places upon the functionary charged with the duty of regulating rates, the definite responsibility of making such rates as will yield earnings sufficient for thorough maintenance, adequate improvements and the attraction of necessary capital.

SERVICE IS MORE IMPORTANT THAN RATES

Mr. Sisson said in part: "The scepter in the railroad world has passed out of the hands of the railroads' executives and the bankers who financed them. The American people control the situation through their political representatives, and they will determine the whole course of the future. They will suffer or prosper, in accordance with the wisdom shown.

"No class of people will exercise so powerful an influence in reaching this decision as the shippers. The rates at which service is rendered are incidental to having service prompt and adequate. To serve their own ends in the future, shippers must take a constructive attitude toward the transportation question."

Mr. Chapin said that the resolution recently passed by the Council of National Defense approved the widest possible use of the motor truck as a transportation agency. He requested the State Councils of Defense and other state authorities to take all necessary steps to facilitate such transportation. A special plea was made for co-operation with the "Return Loads Bureau," by which motor trucks used over freight transportation routes would have loads in both directions. The Connecticut State Council of Defense, in co-operation with the National Committee, has established fourteen such bureaus in different cities in that State. They are listed in the telephone book, and no charge is made for their service. Similar action was urged on Chambers of Commerce elsewhere. Mr. Chapin spoke about the difficulty experienced by trucks last winter with the snow on country roads and said that several states made a record in clearing off this snow so that there might be no interruption in the army schedule of truck movements.

Mr. Eaton discussed the subject of "Patriotic Labor." In speaking of shipbuilding he said that the management in these enterprises had undergone a nervous strain without parallel. On one side they have had the government demanding, in the name of the people, results, and on the other they have been confronted with the most difficult and dangerous labor conditions. It is a physical impossibility to build ships with all equipment, and the equipment demand for anything approaching an adequate supply of ships could not have been filled, under war conditions, in less time than it has taken to bring the shipping interests to their present point.

According to Mr. Eaton the working men in the shipyards are paid more money than ever was received by this class of labor for similar work before, although this itself has constituted a danger and an embarrassment. The only solution is to have an agreement enacted into law so that the National Administration shall have capital and labor pledged to complete service and sacrifice until the war is won. This will eliminate profiteering of capital and profiteering of labor.

RESOLUTION FOR AID TO ELECTRIC RAILWAYS

Questions submitted by members of the Chamber of Commerce for consideration at the convention included a resolution by the American Electric Railway Association asking for rate relief. The resolution, which was to be voted upon Friday morning, is as follows:

Whereas the maintenance of the country's public utilities in the highest possible state of efficiency is essential not only to the war program of the United States but also to the nation's business and industrial interests; and

Whereas such efficiency depends upon the preservation of the credit of the companies providing public utility service; and

Whereas the increase of costs and the unusually onerous conditions of operation brought about by the war seriously threaten the ability of the public utilities to continue the furnishing of the necessary services they perform; and

Whereas the protection of the credit of public utilities is very largely in the hands of regulatory commissions and other public authorities, rather than in the utilities themselves: Now, therefore, be it

Resolved, That the Chamber of Commerce of the United States of America recommends to state and local authorities that they recognize the unusual and onerous conditions with which public utilities are contending, and that in the interest of the nation, of business and of the public they give prompt and sympathetic hearing to the petitions of such utilities for assistance and relief.

Immediate Relief Is a Prime National Necessity

Capacity of Utilities for Service Must Be Greatly Increased—Public Sense of Justice Toward Companies Must Be Developed

BY THOMAS N. MCCARTER

President Public Service Corporation of New Jersey, Newark, N. J.

IT HAS REQUIRED the conditions that have been brought about by the war to demonstrate to the nation that the public utilities of the country are national in their scope. The fact that they operate in relatively small units is an unimportant incident. Their ability as a whole to perform their chief function—that of providing adequate service—is of vital consequence to the comfort and economic welfare of the nation. If this great industry, viewed as a whole—however it may operate—be unable to perform its proper functions by reason of political or economic oppression or otherwise, a paralysis will spread over the business life of the country in fully as fatal a manner as would result from the collapse of the railroad industry.

UTILITIES MUST BE PRESERVED AND SPEEDED UP

If this country is ultimately to take its place in the forefront of the Allies and be the final decisive factor in the termination of the world war, as we all believe, not only must the integrity of the utility industry of this country be preserved, but its activities must be speeded up to a point never hitherto attained. Its capacity for service must be greatly increased, and the capital necessary to accomplish this result must be provided. The gas companies, as well as the by-product coke companies of the country, must be placed in a position where they can produce all the trinitrotoluol that the government requires for its high explosives. The power companies must keep pace with the extraordinary demands being made upon them to furnish power in large quantities to the shipyards, to the aeroplane factories and to the innumerable industries engaged exclusively in the manufacture either of war products or of materials which ultimately become a part of war products.

The electric railways, in addition to the performance of their usual every-day service, must be enabled to extend their lines to the war camps, the shipyards, the aeroplane factories, the shell-filling plants and all other similar government enterprises, and to equip the new lines, as well as their existing lines, with sufficient cars, copper, power and crews to transport daily the multitudes of workers, running in the aggregate into many hundreds of thousands, suddenly superimposed in many localities upon an already existing over-congested business.

That the solidity and integrity of this great enterprise is essential to the successful carrying on of the war, by the government, has been distinctly recognized by the administration. It was made the subject of vigorous comment by the Comptroller of the Currency in his last annual report. More recently, it has been the subject matter of correspondence between the Secretary of the Treasury and the President, which has been made public and in which both of these distinguished officials take pronounced ground to the above effect.

Like those of every other industry in the country, utility costs over pre-war conditions have enormously increased. It is susceptible of proof that their labor and material costs have increased by an average of 70 per cent. What is the truth in the experience of every individual and of every industry is true of them, in many instances in more accentuated form.

Unlike the ordinary private industry, however, they have not been able to "pass the buck" of increased costs to the consumer. The rates of charges of these companies have remained fixed, being, like those of the railroads, subject to regulation, differing only from the railroads in this respect: that the railroads have been primarily controlled on this question by one national power, the Interstate Commerce Commission, whereas the utilities are, for the most part, governed by their respective state commissions and in many cases by municipal authorities as well. The Interstate Commerce Commission, being located at Washington, may be expected to absorb quickly the spirit of the national necessity in the premises; but its control of the situation has been much impaired by the taking over of the railroads by the government.

The President, the Secretary of the Treasury and the Comptroller of the Currency, by their published statements above referred to, have done much to bring home to the various state regulatory bodies the necessity for prompt action to avert impending disaster. It is difficult, however, to overcome the deep-seated prejudices of the public, which are too often reflected in the decisions of state and local commissions.

PUBLIC SPIRIT OF FAIRNESS NEEDS DEVELOPMENT

There is now a country-wide movement under way by the utilities for increased revenue. In many cases the state commissions are facing the issue courageously and granting the necessary increases. If wide-spread disaster is to be averted, however, a public spirit of fairness and justice to these companies must be developed that will quickly manifest itself in the decisions of the commissions. The public must realize that in the economics of this business, as in every other business, two and two make four and not two or three, and it must be willing to pay as fair a price for 1000 cu. ft. of gas, a kilowatt-hour of electricity or a ride upon an electric car, as it freely pays for a pound of butter or a new pair of shoes. There is nothing peculiar about the utility business that excepts it from the inexorable laws of trade.

In the development of such a public spirit I can think of no influence which can be so effective as that radiating from the great body of business men composing the United States Chamber of Commerce. The opportunity of assisting the rightful solution of this problem is a patriotic service and one of tangible assistance in the prosecution of the war.

The government has lent its aid to this problem in another substantial manner. It has passed the war finance corporation act, which will undoubtedly afford many of these companies, either directly or indirectly, a channel of finance that would not have existed if the act had not been passed. Congress, fearful lest further inflation might ensue as a result of such legislation, has provided in the act more rigid requirements as to percentages of collateral and the like than I think were necessary or desirable under existing conditions, but we must do the best we can with the tools at our command.

The one great and controlling factor is this: the revenues of these companies must be increased to an extent that will provide net earnings sufficient to enable them to finance their maturities and to attract the new capital it may be necessary for them to obtain to meet war needs—whether that money is to be advanced by individuals, by banking corporations or by the government itself. No financial agency, individual, corporate or governmental, can be expected to make improvident loans or investments.

CLOSER CO-OPERATION WITH PUBLIC IN FUTURE

When the proper time arrives and we have opportunity for the deliberate consideration of such problems, I look forward to the working out of a plan that will involve closer co-operation in the future between the public and these companies in their dealings each with the other. It will be a plan that will retain the manifest advantages of the private operation of these enterprises, subject of course to public supervision; a plan that will insure a fair return to capital already invested; a plan that will offer to the public, more or less generally, an opportunity from time to time to invest in these enterprises the capital needed for their development upon an assured basis of an adequate return; a plan that will provide an absolutely safe investment for the masses in suitable allotments.

Such a thought is not Utopian. It is practical of accomplishment and should result in the minimizing of the everlasting friction that hitherto has existed between the public and these companies. It should insure for the future the proper development and the logical expansion of their facilities to meet the reasonable requirements of the public.

Helping To Win the War

Shipbuilding Has Increased Railway Problems—Communities Should Aid in Distributing Traffic More Evenly

By P. H. GADSDEN

President Charleston Consolidated Railway & Lighting Company, Charleston, S. C.

WHAT can local business organizations or enterprises do to help provide adequate transportation facilities for shipbuilding employees? The most important thing—that which will bring the best returns—is to foster a feeling of co-operation toward the local electric railway. This includes a willingness to be put to inconvenience—less frequent service if need be—and a realization that the management is desirous of doing its best in the face of many problems.

To get electric railway service up to the highest standard obtainable in normal times may be practically impossible in the present emergency. It may be questioned whether the necessary man-power, if it were possible to pay wages high enough to attract men from other lines, could, in the interests of the government, be diverted from present or prospective occupations.

Perhaps the partial solution of this problem lies in the employment of women as conductors. There are arguments against adopting this plan, but the benefits may outweigh the objections. The practice has become quite general in England and France, and in some instances in this country. As a whole, it seems to be working fairly well.

SHIPBUILDING HAS INCREASED RAILWAY PROBLEMS

Obviously, the problems are vastly increased when there is added to the pre-war demand upon the electric railway the duty of transporting thousands of newcomers to and from the shipyards, in rush hours, practically all of them going in one direction at one time. This creates a condition which calls for the patriotic assistance and forebearance of every loyal member of the community. Without transportation facilities the shipbuilding plants cannot be kept going, as their character makes it necessary that most of them be situated in localities which do not permit employees to live within convenient walking distance from their work.

The electric railways are confronted with the need of providing extra equipment which will be used only an hour or two daily and extra employees whose services are required for the shipyard trips only. Some companies may be able without aid to provide the necessary men and facilities to transport these men, but most of them—and I think all of them—will require government assistance.

It may not be necessary, in order to transport shipbuilding employees to and from the plants, for the companies to resort to such extreme measures as using the equipment and the men that are required in regular schedules. If such a move becomes necessary, however, it is only urging the performance of a patriotic duty to ask that everybody co-operate, even at the cost of slight personal inconvenience.

PUBLIC CAN HELP TO DISTRIBUTE TRAFFIC

Communities can aid the electric railways by helping to bring about a more even distribution of traffic and consequent improvement of service. As the industrial plants must have more men than ever and from present indications it would be impossible for the railways to carry them all practically at one time, it would seem that the problem would have to be solved by some readjustment of the working hours, so that the men would not all start and stop work at the same time. This can be accomplished by a staggering of hours of employment in factories and large department stores. It would be helpful if the women whose duties do not require them to travel during the rush hours would shop earlier in the day.

Further relief that can be obtained without serious inconvenience to anyone can be had through the adoption of the skip-stop. This plan has been investigated by the War Board, and bulletins have been issued recommending it to all electric railways. This system has been in effect in Cleveland for a long time, and it has recently been put into operation on all lines of the Public Service Railway and in Toledo, Detroit, Cincinnati, Buffalo, Denver, Kansas City and Baltimore. It has also been recommended for early adoption in Washington, D. C. Immense saving can be made in coal if communities will co-operate with the companies to permit this plan and others just as desirable to be put into effect.

My recommendations may be set forth in the following order:

1. Communities should deal with the street-car problem with a spirit of co-operation and helpfulness. This includes consideration of an increase in the price of the commodity which the company produces, namely, transportation.
2. Electric railways which are not provided with equipment and other facilities to handle properly present and prospective traffic should make every effort to secure such equipment and facilities as far as practicable at the earliest possible date.
3. Electric railways should put into effect everything that can be done to bring about improved efficiency and the conservation of material and man-power.
4. The attention of the officials of industrial and governmental plants should be attracted to the necessity of full co-operation by staggering the hours of employees, so that the same number of cars and men can be used for several trips, instead of only one.
5. Attention of members of department stores and other commercial establishments should be called to this matter in the hope that they will adopt such means as may be most efficient in their efforts to induce their patrons to co-operate in the movement to secure a more even distribution of traffic by advocating that women do their shopping in the morning and early hours of the afternoon. The newspapers of the State should join in the movement in order that the greatest publicity might be attained.
6. The hearty co-operation of the authorities in the various municipalities in the State should be given to the movement, and Boards of Trade and Chambers of Commerce should give their assistance.
7. The skip-stop method of operation should be adopted.
8. The communities should forego during the period of the war new pavements or repavements and other improvements which would require expenditures by electric railways.

Keeping in Touch with the Boys at the Front

EMPLOYEES of the General Electric Company in the Chicago district have perfected an organization for the welfare of the men in this district who have gone into the service. The work is under the direction of a committee consisting of a chairman, a secretary, a treasurer and the heads of departments. A "service news letter" is sent to all men in service twice a month. Tobacco, candy and magazines are sent out at frequent intervals, and the women employees have prepared more than 200 knitted articles for the comfort of the soldiers. The funds for this work are obtained by monthly contributions pledged by the employees of the district. The company has seventy-five men in the service from this district.

During the year 1917 the Arkansas Valley Railway, Light & Power Company, operating more than 35 miles of railway lines in the vicinity of Pueblo, Col., gained 1095 hp. of lighting business and 3957 hp. of power business, making a total gain for the year of 9 per cent of the total load served at the beginning of the year. It is reported that prospects for new business during 1918 are excellent.

AMERICAN ASSOCIATION NEWS

War Board Holds Busy Session

AT THE MEETING of the American Electric Railway War Board held at Washington on April 5 all of the members were present, and in addition J. K. Choate, E. C. Faber, W. V. Hill, E. B. Burritt and H. C. Clark.

Chairman T. N. McCarter reported that as a result of a letter from Clarence Renshaw, of the Fuel Administration, to the New Jersey Fuel Administrator, arrangements had been made to inaugurate the skip-stop plan on one division of the Public Service Railway on April 1 and on the remaining divisions on May 1. Mr. McCarter also explained the plan of the current meeting of the Chamber of Commerce of the United States and of his own address prepared for that meeting. (An abstract of the address appears elsewhere in this issue.) He reported progress in the work of the advisory committee appointed as a result of a conference of utility men held at the Engineers' Club on March 22.

The War Board discussed the purchase by the government of equipment to be loaned to the electric railway lines. Mr. Budd suggested that the matter of the handling of government passenger business by electric lines be taken up with the Director General of Railroads for adjustment.

Mr. Gadsden made a progress report on the activities of the joint committee of public utilities. Arrangements have been made to push the work actively early in April, the state and regional committee organization being now complete. Mr. Gadsden had asked for a meeting of the advisory committee at an early date.

A large part of the War Board meeting was taken up with a discussion of the War Finance Corporation, the shortage in platform labor, the relation of the electric railways to transportation by motor trucks, and House Bill HR-10265, which authorizes the Secretary of Labor to acquire local transportation lines which may be necessary in war preparations. On the second topic the hope was expressed that arrangements can be made to secure the loan of men from shipyards served by electric railways to do platform work in rush hours.

The statement was made that the War Board will move its headquarters about July 1 to the new District National Bank Building on G Street. The board adjourned to meet again on May 3.

The Largest Section Organized in the Smallest State

IN ACCORDANCE with the program announced in earlier issues of the ELECTRIC RAILWAY JOURNAL, on April 9 the employees of the Rhode Island Company, Providence, R. I., organized Company Section No. 12 of the American Association. The number of charter members was just 200, the largest number of charter members in the sections formed to date.

A number of visitors from out of town were present to explain to the men the possibilities of company section work as demonstrated elsewhere. E. B. Burritt, New York City, told of the way in which the association is trying to help the government and presented a framed charter to the section. H. C. Clark, New York City, showed how the section work acts to develop latent talent in the members. H. H. Norris, ELECTRIC RAILWAY JOURNAL, emphasized the importance of high ideals of transportation service, particularly in war times. Martin Schreiber, Newark, N. J., chairman of the committee on company sections, used as the basis of his talk the "Company Section Hand," of which the thumb represents loyalty, and the fingers enthusiasm, efficiency, team work and public relations (see ELECTRIC RAILWAY JOURNAL, May 26, 1917, page 961). Cyrus Ching, Boston, Mass., spoke along patriotic lines and urged his hearers to make the most of their opportunities for service. Theodore Francis Green, secretary and director of the Rhode Island Company, related his experiences at the Rhode Island meeting of the Connecticut Company section held last month, the most important lesson being that through the company section the employees of the company become acquainted in a way otherwise impracticable.

The closing and principal address of the evening was by Charles C. Pierce, Boston, Mass., who pictured vividly the present condition of the electric railway and analyzed the situation for the purpose of pointing out the reasons for the present difficulties. He said that while fares in the pre-electrification days were much higher than at present, when horse railways were electrified the railway managers voluntarily adopted the 5-cent fare because they felt assured of ability to give the required short-haul service at a profit for this figure. Natural development, however, has partly robbed the electric railway of this business so that it is very illogical to try to meet present requirements under ancient specifications. After showing how the uniform 5-cent fare had acted to improve living conditions by building up the suburbs, Mr. Pierce said that theoretically at least the zone system is the best solution of the fare problem and this country may ultimately come to it in practice.

The organization meeting was presided over by Charles E. Redfern, claim agent of the company. The election of officers and directors resulted as follows: President, Mr. Redfern; first vice-president, A. L. Campbell; second vice-president, F. L. Caswell; secretary, E. J. Cooney; treasurer, G. A. Worrall, assistant secretary, C. R. Ballou; company representative, A. E. Potter; directors, W. D. Wright, R. R. Anderson, A. V. Gardner, A. E. Paddock, H. W. Sanborn and W. C. Slade. Mr. Cooney was appointed chairman of the program committee and he selected the following to assist him: J. A. Lockhart, G. B. Merchant, J. A. Hackett and B. T. Raymond.

Traction Company Completes Transmission Line

A 33,000-volt transmission line from Fort Smith, Ark., to serve Alma and other communities has been completed and these towns will now receive electrical energy from the Fort Smith Light & Traction Company. With the completion of the line now under construction from Alma to Ozark, the Fort Smith Company, which also operates approximately 33 miles of electric railways, will meet all the electrical requirements for a distance of 45 miles west and south of Fort Smith. The railway receipts of this company for January and February are reported to have been 22 per cent greater than for the same months of last year. General business conditions in the city are exceptionally good, due to the many new industries now in operation.

LETTER TO THE EDITOR

Calibration of Switchboard Watt-Hour Meters

BROOKLYN RAPID TRANSIT COMPANY
BROOKLYN, N. Y., April 10, 1918.

To the Editors:

In my article "The Testing Organization of Electric Railways," which appeared in the March 16 issue of the ELECTRIC RAILWAY JOURNAL, I stated under the caption "Calibration of Ammeter and Other Shunts," page 515, that where mercury-type watt-hour meters are used, and charges between one company and another are based on the meter registration, the resistances of the watt-hour meter shunts ought to be measured *in situ*. Quite obviously the argument was one applying to shunt-type watt-hour meters, whether mercury meters or meters of any other form, and that the article put it otherwise must be ascribed to the lack of use of precise language.

The argument itself is open to criticism. Accuracy of measurement of energy output of direct-current circuits of very large power is difficult to insure because whatever kind of watt-hour meter is used, whether of the series type or the shunt type, the ultimate foundation for accuracy of calibration must rest on some measurement of a shunt resistance, and such measurement should be made on the shunt *in situ*. This, although somewhat difficult, is undoubtedly capable of accomplishment with high accuracy. The point I wish to make clear is that a shunt-type watt-hour meter does not suffer under any disadvantage in this respect compared with a series type. Either reliance is to be placed on the accuracy of the manufacturer's calibration of both types having been maintained, or the accuracy of the completed installation has to be established in terms of working standards. To do this latter involves ultimately a measurement of resistance of some fairly large shunt, because no measurement of thousands of amperes is practical except as it produces potential drop across some known resistance.

It is true that shunt-type watt-hour meters, while having the advantage of ease of calibration as low-current instruments apart from their shunts, yet have the offsetting disadvantage of necessitating the alignment of measurements so made to obtain assurance that the resistance of the shunt watt-hour meter and its leads has the nominal ohmic resistance called for. Otherwise accuracy of registration is not assured even though the meter may have been given correct adjustment by the easy means of low-current calibration, and the watt-hour-meter shunt may be known to have its nominal resistance. This point, however, was in nowise touched upon in the article.

HARTLEY LEH. SMITH,
Chief of Testing Bureau.

Progress of the Headway Recorder

Accuracy in Recording Car Movements Enables Operator to Determine Weak Spots in Service and Checks Up Car Crews

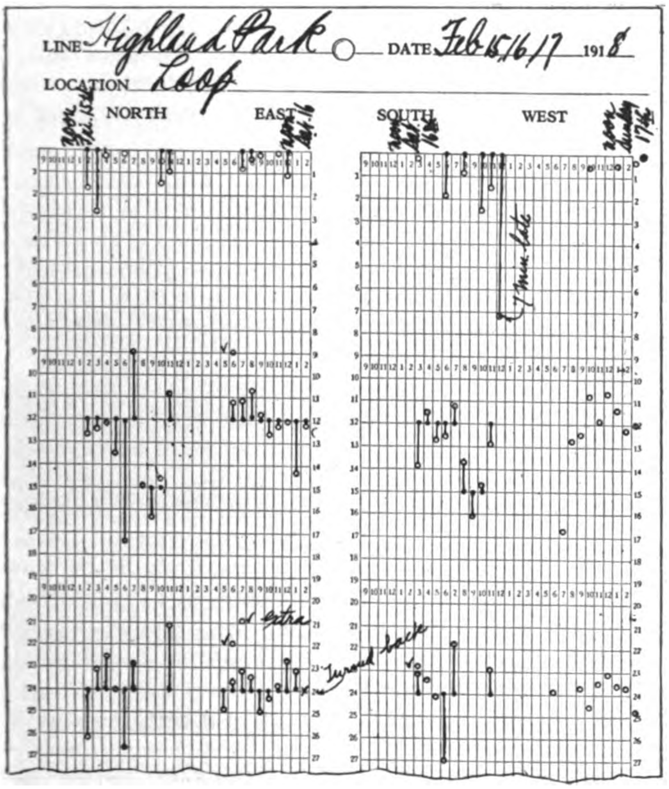
THE rapid progress of the one-man car, especially in towns with single-track service, has given a still wider usefulness to the headway recorder of the Nachod Signal Company, Louisville, Ky. Considerable experience with this recorder has led to improvements which have made it possible to produce a clock mechanism that will run with high accuracy to drive a fast-moving record sheet through a wide range of temperature and weather conditions. This adjustment to provide for large changes in temperature is cared for by a compensated balance wheel. A micrometer screw adjustment on the regulator also permits regulation to a nicety in the shortest time. A stop works prevents over-winding and breaking of the spring; while the use of a zig-zag feed prolongs the useful life of the ribbon since its whole width becomes available.

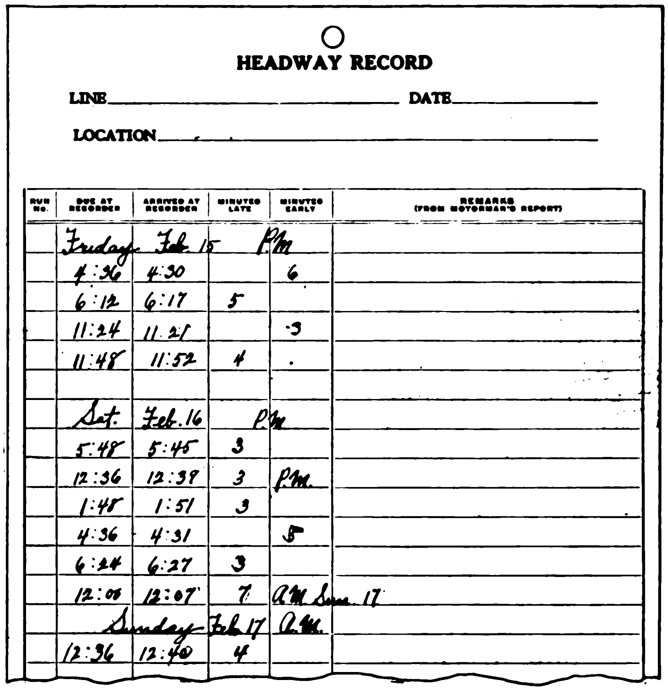
The Nachod automatic headway recorder gives a daily history of car movements at a given point, enabling the operator to find the weak spots in his service, whether they are due to causes within or without his control. Accuracy in making time points is indispensable to a high standard of service; and the recorder gives its results with an accuracy not possible by human means, and without any favoritism. Like any other checking device, the full value of the headway recorder can be obtained only by enthusiastic follow-up and intelligent analyses.

The recorder will show such operations as: A motorman reversing his car without proceeding all the way to the end of a single-track line; car crews lying over too long at a point and running at high speed to get on schedule again, which not only invites accidents, but wears out both rolling stock and track, and wastes power; a motorman running ahead of schedule, an act sometimes dangerous and one that irritates regular patrons; and a car crew "dragging" the car at peak load in order to obtain more fares than usual; but turning in only the usual amount.

The recorder is also valuable: In enforcing a slow order, by making a graphic record of the time consumed between the two points; for presenting definite evidence showing car delays at a railroad crossing; in cultivating the good-will of the public, by making an absolutely incontrovertible record showing the regularity of the service; in enabling the work of a careful motorman to count, and, in general, improving the morale of the crews; finally, for general schedule studies, as traffic counts, waiting at meeting points, etc.

The instrument is inclosed in a cast-iron box attached to the pole at a point where the record is to be taken, at which point a Nachod trolley contactor is placed on the trolley wire and connected to the recorder.





HEADWAY RECORD

LINE ______ DATE ______

LOCATION ______

RUN No.	DUE AT RECORDER	ARRIVED AT RECORDER	MINUTES LATE	MINUTES EARLY	REMARKS (FROM MOTORMAN'S REPORT)
	Friday	Feb. 15		P.M.	
	4:36	4:30		6	
	6:12	6:17	5		
	11:24	11:21		3	
	11:48	11:52	4		
	Sat.	Feb. 16		P.M.	
	5:48	5:45	3		
	12:36	12:39	3	P.M.	
	1:48	1:51	3		
	4:36	4:31		5	
	6:24	6:27	3		
	12:00	12:07	7	A.M. Sun. 17	
	Sunday	Feb. 17		A.M.	
	12:36	12:40	4		

AT LEFT, PART OF HEADWAY RECORDER RECORD WITH COMMENTS; AT RIGHT, INTERPRETATION IN FIGURES

Every car passing under this contactor prints a mark on a moving paper record showing the exact time of its passage. The record sheet is about 8 in. x 17 in. in size, the ruling divided into halves for movements both ways for one day, thirty hours being ruled. The time of any mark is given by its position both in the vertical hour ruling and in the horizontal minute ruling, the chart forming virtually a clock dial of unusual kind. If, for instance, the schedule is every fifteen minutes, the cars on time will make a straight line across the record, at the hour, fifteen, thirty and forty-five minute line; and any marks scattered away from this line show the irregularities of the schedule in a most graphic manner. On the back of the record is a form for noting these irregularities and the reason

New-Type Cars for Melbourne Suburban Electrification

Equipment Includes 400 Four-Motor Cars and 400 Trailers—Will Operate in Two to Six-Car Trains Over 300-Mile System

AN ABSTRACT of a report by Charles Merz, consulting engineer, to the Victorian Railway Commission on the electrification of the suburban steam railways of Melbourne, was published in the Oct. 3, 1908, issue of the ELECTRIC RAILWAY JOURNAL. Mr. Merz at that time recommended the direct-current system for the conversion of some 300 miles of track. The later development of the high-tension direct-current system and the single-phase system called for further investigation, and according to an article appearing in the Dec. 7, 1912, issue of the JOURNAL estimates showed that the direct-current system would be less expensive both in first cost and in operation.

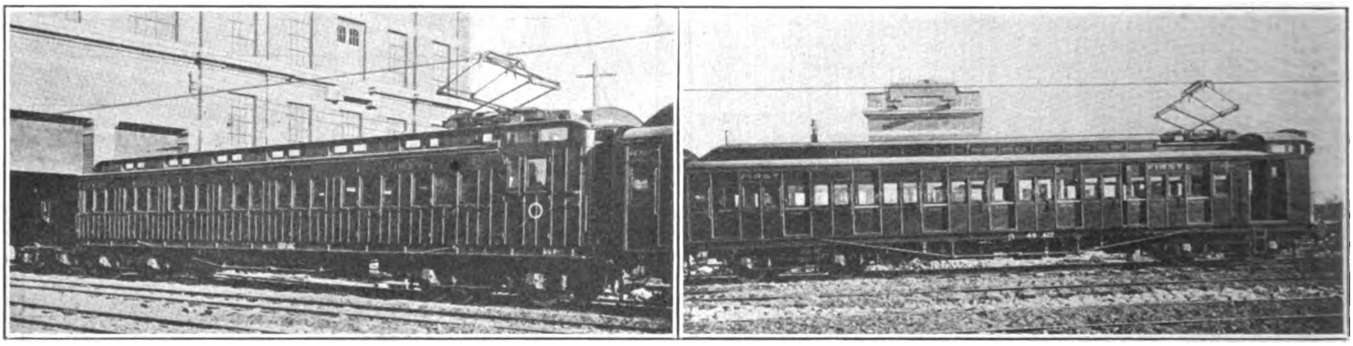
The Feb. 8, 1913, issue of the JOURNAL announced the award of the contract for this electrification to the General Electric Company. This contract specified that the work should be carried out on a 1500-volt direct-current system. The contract comprised 400 motor-car equipments, consisting of four motors each, 800 control equipments, 400 of which were for trail cars, and 400 air-compressor equipments. This was said at the time to be the largest single order ever placed for electric railway apparatus.

The mileage of the suburban steam lines included in this scheme was made up of 150 route-miles or 289 track-miles of running road and 34 miles of sidings. The electrification has now been in progress for some years and is nearing completion. The main generating station is located at Newport, from which point current will be transmitted to substations located at various points on the line and delivered to the overhead contact system at 1500 volts.

The accompanying photographs* show the new cars which have been designed to operate in conjunction with this electrification. They are equipped with roller pantograph collectors and will be operated in trains of from two to six cars, an equal proportion of motor coaches and trailers.

All trains on the system wherever possible will follow a regular schedule throughout the day and rush-hour traffic will be provided for by increasing the lengths of the trains, though it is not proposed to have trains of more than six coaches to begin with. The schedule speed including stops will be 21 m.p.h.

The suburban traffic amounted to 70,000,000 passengers in 1908, and when the contract for the system was awarded it was estimated that the lines would carry 150,000,000 passengers by 1917. For this reason all parts of the electrification scheme were designed to be capable of extension.



SWING DOOR AND SLIDING DOOR TYPES OF CARS FOR MELBURNE SUBURBAN ELECTRIFICATION

The 1600 motors for the 400 motor coaches are of the GE-237 type provided with commutating poles and rated at 140 hp. each at 725 volts. They will be operated two in series on 1500 volts. These motors are self-ventilating by centrifugal fans cast integral with the pinion-end armature-core head.

The motors are arranged for tap-field control and are geared so as to have a running speed of 52 m.p.h. over a level track on express runs. The control equipments are of the Sprague-General Electric Type M form with relay automatic control.

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*Reproduced with permission of C. F. Dewey, Victoria Railways, Sydney, N. S. W.

(Concluded from page 717)

therefor. The scale is very open or fast moving, a minute requiring $\frac{1}{4}$ in. on the chart. The record is given in a compact form convenient for filing, obviating a large amount of clerical work. The recorder does not identify the particular car that made the record, but this information is obtained from the run number, or predetermined succession of cars.

Within the cast-iron box is a switchboard and the recorder itself, which is removable as a unit. The latter consists of a record-bearing drum, driven by a Seth Thomas clock movement, jeweled and compensated for temperature. The drum is revolved once an hour and is fed axially $\frac{1}{16}$ in. per revolution. The printing bar, operated by a magnet armature, prints the mark through an endless band of typewriter ribbon feeding on the backward stroke. Two pairs of magnets are used, one for each direction of car movement. A perforation in the blank record slips over a locating pin on the drum, while the edges of the record are further aligned by shrouded ends of the drum. The attention required is winding the clock daily, putting on a new record and removing the old. To expedite this, the case is provided with a door switch to throw on a light when the door is open.

The contactor, through which the printing magnet received current as the car passes it, is easily installed and requires no maintenance.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Service-at-Cost Proposal

Minneapolis Street Railway President Urges Settlement of Franchise Matter Up Since 1915

Horace Lowry, president of the Minneapolis (Minn.) Street Railway, has addressed a communication to the street railway matters and extensions committee of the City Council, indicating that the company desires the early conclusion of a cost-of-service franchise agreement.

Under date of June 8, 1915, the company addressed a letter to the City Council stating that the Minneapolis Street Railway desired to enter into negotiations with the city of Minneapolis with regard to the extension of its franchise. It was hoped that the outcome of such negotiations would result in an agreement with the city which would put the company on a firm enough financial footing to attract the additional capital required for its development.

Since the sending of the letter the committee took up the matters mentioned and proceeded with negotiations preliminary to an agreement of this kind. This work has been done slowly and carefully in order that there could be the most free discussion of all points, but during the last year events unforeseen when the original negotiations were entered into have developed and changed the aspect of things by creating an emergency which calls for speedy action. On this point the company says:

HIGHER FARES PREDICTED

"Because of the constantly increasing cost of essential materials and supplies and the constant decrease in our earnings during the last nine months, our ability to continue the standard of service set up in the past and to pay our employees reasonable wages will depend upon our entering into a cost-of-service agreement with the city. We realize that your committee is entirely familiar with this general situation in our business, but desire to submit the attached communication from John Skelton Williams, Comptroller of the Currency, to the Congress of the United States, to show the national necessity for maintaining our local public services at maximum efficiency and to indicate that the new conditions confronting electric railway companies and other public utility companies are entirely beyond the control of the management of such companies.

"The Minneapolis Street Railway has no desire to create any undue alarm, but wishes to direct your attention to the gravity of this situation. Whether a cost-of-service agreement should now be considered or whether for the present the service should be curtailed which is least needed and which could, therefore, be modified with the least inconvenience to the traveling public is a question which the company believes is now of utmost importance to the city. Six other cities in the United States of similar size have met this situation by increasing their rates of fare. Forty-four smaller cities have done likewise, and sixty-one other cities have negotiations under way with the same purpose in view.

"We ask that your committee give this company the earliest possible opportunity to discuss the matter with you, and we believe that such discussion should be carried on with free and unprejudiced minds on the part of all concerned and that the program arising out of such discussion should be tested only by the question as to whether it is for the benefit of the average citizen."

Mr. Lowry's letter was considered by the committee at a special meeting. A tentative draft of a cost-of-service franchise is ready for the consideration of the committee. It was prepared by Stiles P. Jones and City Attorney C. D. Gould. The question of fair valuation, however, still is to be determined in the face of reports from several engineers and minority and majority committees of the Central Franchise League. The valuations so fixed vary from $15,000,000 to $26,000,000.

Municipal Railway Extension

Oliver T. Erickson, a member of the City Council of Seattle, Wash., has announced that he is having prepared for submission to the Council a bill authorizing the issuance of utility bonds and the adoption of a plan and system for the extension of the present municipal railway on Avalon Way, Thirty-fifth Avenue Southwest and Admiral Way, and other streets in West Seattle. In connection with this, a bill will be prepared providing for the issuance of utility bonds for an extension of the proposed elevated railway on Washington Street, from First Avenue South to Fourth Avenue South, and for condemnation proceedings for the right to proceed with such construction.

The plans above announced indicate that the Council will not act favorably on the application of the Puget Sound Traction, Light & Power Company for a grant on Avalon Way. That company recently advised the Council of Defense that work would begin on the line as soon as the City Council granted a franchise.

President's Labor Appeal

In Approving Appointments to National War Labor Board President Outlines Methods to Be Observed

President Wilson on April 8 approved the appointments that had been made to the National War Labor Board by the Secretary of Labor in accordance with the recommendations contained in the report of the War Labor Conference Board dated March 29. The members of the board are William Howard Taft and Frank P. Walsh, representatives of the general public of the United States; Loyall A. Osborne, L. F. Loree, W. H. Van Dervoort, C. E. Michael and B. L. Worden, representatives of the employers of the United States; and Frank J. Hayes, William L. Hutcheson, William H. Johnston, Victor A. Olander and T. A. Rickert, representatives of the employees of the United States.

START OF THE LABOR PROGRAM

In January the Secretary of Labor, upon the nomination of the president of the American Federation of Labor and the president of the National Industrial Conference Board, appointed a war labor conference board for the purpose of devising for the period of the war a method of labor adjustment which would be acceptable to employers and employees. This board made a report recommending the creation for the period of the war of a National War Labor Board with the same number of members as the War Labor Conference Board, to adjust labor disputes in the manner specified, and in accordance with certain conditions set forth in the report, referred to at length in the ELECTRIC RAILWAY JOURNAL for April 6, page 673.

PROCLAMATION BY THE PRESIDENT

The President has now made proclamation of the following for the information and guidance of all concerned:

"The powers, functions, and duties of the National War Labor Board shall be: To settle by mediation and conciliation controversies arising between employers and workers in fields of production necessary for the effective conduct of the war, or in other fields of national activity, delays and obstructions in which might, in the opinion of the National Board, affect detrimentally such production; to provide, by direct appointment, or otherwise, for committees or boards to sit in various parts of the country where controversies arise and secure settlement by local mediation and conciliation, and to summon the parties to controversies for hearing and action by the National

Long Strike on Interurban Railway Ended

First the Trainmen, Then the Engineers, of Kansas Road Go Out—Union Charter Revoked

The Joplin & Pittsburg Railway, operating in Southeastern Kansas and southwestern Missouri, was shut down by a strike of its employees from Feb. 12 to March 21, when the men returned to work under former conditions. W. D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees, was able to show the men that they had made a mistake. The local union had been suspended from the national body because of its action in breaking its contract with the railway company, but it was reinstated following the course it took in instructing the members to return to work. The engineers, who struck after the trainmen went out, returned at the same time as the trainmen. Service in full has now been restored. The strike in its various ramifications was so unusual that a brief review of some of the outstanding features of the disturbance would seem to be of general interest.

REVIEW OF STRIKE

The company made a three-year contract with its trainmen in the fall of 1917, granting increased wages amounting to about 35 per cent. While the company dealt with the Amalgamated Association, it had an explicit understanding that the property was to be operated on the "open shop" basis. At that time the officers of the company talked over the situation confronting the company very frankly with the representatives of the union, and the men co-operated with the company shortly afterward in securing an increase in fare to 2 cents a mile. This increase helped to take care of the increase in wages and of other extra expenses.

On Feb. 12 the men voted to strike because of the company's refusal to grant a further increase in wages. The company had explained to the men that the contract fixed the wages for three years, and that the increase demanded would provide a larger wage schedule than the revenues of the company could stand. In support of its position with respect to its financial inability the company presented figures as to revenues provided by the State Utilities Commission. But the men went out and operation of the line was suspended.

Officers of the Amalgamated Association immediately went to Pittsburg. They pointed out that the men were violating their contract. The men however, refused to heed the advice of the national union. That body thereupon suspended the charter of the local union. The company therefore had to seek employees from other sources. Under the agreement made with the amalgamated, the company was at liberty to employ such men as it could secure, the new employees to be at liberty to organize a local to be recognized and chartered by the Amalgamated Association.

In pursuance of this program the company on March 2 started its cars with new men. When the first car from Joplin to Pittsburg reached Pittsburg, the power plants and substation men went out, claiming that they as union men could not supply power for the operation of cars by non-union men. Incidentally it should be mentioned that the engineers had been kept at work on full pay from Feb. 12 so that the power would be available the moment the company was prepared to resume operation.

Officials of the railway company remonstrated with these men and on March 4 the engineers were all laid off. Since it was apparent the cars could not be operated until the engineers had shown willingness to supply power, there was no necessity for having the engineers around.

FIRST THE TRAINMEN, THEN THE ENGINEERS

On March 11 the trainmen of the local union at Pittsburg voted to recede from their position and return to work under the conditions of their original contract. They were willing to abide by the instructions of the amalgamated. But they could not work unless there was power. On March 12, the day on which the trainmen were to return to work, the engineers, who now were in the position of having the original grounds for their "strike" removed automatically, made demands for increased wages and for payment for the time they had been idle since March 4. The demand for more pay would have been sufficient to prevent the company from re-employing them, but the demand for pay while the men were idle could not be considered.

The engineers pointed out that watchmen were necessary at the power plant and contended that because of their priority they should have been retained to guard the plant while the stations were idle. In other words, these men refused to perform the duties for which they were employed, but they demanded that they be paid the salaries scheduled for such duties while performing minor duties for which other men were available who were willing to do the work for which the engineers were hired.

COMPANY USES PUBLICITY

The railway company promptly took the public into its confidence, making clear the exact conditions under which the men quit work and those under which they were willing to resume work. The public was well aware, therefore, that the men violated a contract and that the engineers made illogical demands in their proposals with reference to returning to work.

(Concluded from page 719)

Board in event of failure to secure settlement by mediation and conciliation.

"The principles to be observed and the methods to be followed by the National Board in exercising such powers and functions and performing such duties shall be those specified in the said report of the War Labor Conference Board dated March 29, 1918.

"The National Board shall refuse to take cognizance of a controversy between employer and workers in any field of industrial or other activity where there is by agreement or federal law a means of settlement which has not been invoked.

"I urge upon all employers and employees within the United States the necessity of utilizing the means and methods thus provided for the adjustment of all industrial disputes, and request that during the pendency of mediation or arbitration through the said means and methods, there shall be no discontinuance of industrial operations which would result in curtailment of the production of war necessities."

War Attitudes Stated

Indiana Commission Indicates Conditions That Will Govern Its Consideration of War Appeals

The general attitude of the Public Service Commission of Indiana with respect to granting relief to public service corporations affected for the time being by the extraordinary conditions imposed upon them by the war has been set forth by the commission in the case of the Greencastle Local Phœnix Telephone Company. In its ruling the commission said:

COMPANIES MUST DO THEIR BIT

"These are war times and the commission has time and again emphasized the proposition that it would not guarantee normal dividends to utilities during the period of the war. The utility must bear its share of the war's burdens, just as every other person and institution must bear its share. Even if it were necessary for the officers of the company to forego a portion of the usual salaries which they are receiving in order to pay a portion of the increased costs of operation, this would be a much more equitable solution of the problem than an increase in the rates.

"The commission is not unheedful of the fact that much has been said recently as to the necessity of carrying our public utilities through the war period. The commission is keenly alive to the point thus emphasized by Secretary McAdoo, and has laid down the fundamental proposition that it will grant a full measure of relief whenever necessary to prevent injury to the business or interests of utilities. But certainly the statements above quoted are not to be interpreted as meaning that state and local authorities should, during the period of the war, guarantee to utilities the full or excessive profits of peace times.

"In several cases before the commission it has developed that utilities have built large and valuable properties out of earnings and that the profits in the years preceding the war were in excess of what would have been considered reasonable profits under the regulatory system. Now when war conditions have arisen and the large profits of the past have decreased, the utility will feel that it has just grounds for asking increased revenue. The commission, of course, cannot concur in such a conclusion."

One Commission Proposed

Measure That Would Consolidate Two New York Regulating Bodies Passed by Senate

Senator Thompson's bill consolidating the two public service commissions of New York and generally revising the public service commission law was passed by the Senate on April 5 with just the required twenty votes.

It is the opinion of William L. Ransom, chief counsel of the commission for the first district, that the new bill would cause the city actually to "lose contact with and control over its public utility matters." Mr. Ransom says further:

"The Thompson bill ought to be entitled 'A measure to abolish the powers of the commissions, but leave all the offices in existence for salary purposes.' It is not too much to say that the act would place all complainants at a hopeless disadvantage and weaken the power of the commission to compel a corporation to do anything against its will."

NO ECONOMY IN CONSOLIDATION

After analysis of the bill, the members of the commission with jurisdiction in New York City fail to find that the proposed organization would cost the State less than the present plan. Because of the insertion of a clause creating three additional commissioners to take care of transit matters, bringing the total number now at work, the argument for economy is not substantiated, it is thought.

None of the political reporters at the Capitol have so far cared to hazard a guess as to the possible fate of the measure when it comes up in the House.

New Wage Scale in Spokane

A new wage scale has been put into effect by the Spokane & Inland Empire Railroad, Spokane, Wash. It fixes a maximum wage of 38 cents an hour after six years' service and provides a graduated wage scale for the period up to that time. A man commences at 31 cents an hour, is increased 1 cent an hour for the second six months, and after that 1 cent an hour for each year of service up to the time his sixth year commences, when he receives the maximum wage.

Wage Question in New York City

Employees Referred by Public Service Commission to the City Administration for Relief

A committee of the Brotherhood of New York Railways Company Employees' Association called upon Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, on April 9 and made an urgent plea for commission aid in behalf of an advance in wage to meet the increased cost of living occasioned by war conditions. T. M. Fazakerley, president of the brotherhood, speaking for the organization, said in part:

"On Sept. 3, 1916, the employees of the New York Railways entered into an agreement with the company, which embodied a scale of wages and working conditions for a period of two years. When the contracts were signed the wage scale was satisfactory to all, but our rates of pay have not increased with the cost of the necessities of life, although the railway has from time to time granted to the employees 'War Bonuses' to help us meet these conditions. We have lived up to our agreement with the company, but when the time comes for the signing of new contracts, unless some material increases over the present rates are granted, we shall consider ourselves free to seek more remunerative employment elsewhere.

"It must be apparent to you that the men are entitled to a living wage for the support of themselves and families. We feel that you should know the facts from our standpoint. We recognize that the company cannot give us more money unless its income is increased. We see no immediate prospect of any decrease in the cost of materials."

Chairman Straus told the committee that he was in accord with the efforts of the men to obtain an increase in wages commensurate with the advance in living expenses, but explained to them the limited jurisdiction of the commission over matters involving the wages of men employed by utility companies. In respect of an advance in fare to the New York Railways, the chairman set forth in detail the recent decision of the Court of Appeals in the Rochester fare case, holding that the commission has been correct in its view that, without the city's consent, the commission could not undertake to raise a rate of fare above the 5-cent maximum fixed by the company's franchise agreement with the city. On this question the chairman said:

"This commission some two months ago took this position in the North Shore Traction case, where, after a hearing, it was found that the railroad, by the facts presented, was entitled to an increase in fare, but the commission, under its view of the law, as now upheld by the highest court, felt that its power was limited by the 5-cent maximum fixed in the franchise.

"If you feel that the company which employs you is not receiving from its rate of fare a sufficient return to be able to pay you adequate wages, the only remedy open to you, in view of this recent decision of the highest court of the State, is to invoke the aid of the city authorities, with a view of obtaining their consent to an amendment of the franchise limitations. Without such an amendment by the city, the hands of the commission are tied, and rightfully so, because if any change in a solemn franchise is to be made, it ought in simple justice to be made by the parties to the original agreement, to wit, by the city of New York and the railroad company, before any other governmental agency can step in and vary the terms of the agreement which these two parties made."

Mr. Straus urged the men to bear in mind they were quasi-public servants and that they owed the public the duty of maintaining the surface railroad facilities of the city intact and serving the public without break or interruption. He said:

"The public in turn should recognize that it owes you men a duty also, and if necessary should be willing to approve a slightly higher fare for your company to make possible the payment to you of the prevailing and adequate rate of wage so that you may receive a fair return for your labor. To this end you may be assured of my earnest sympathy and support."

The committee thanked Chairman Straus for the commission's friendly interest, and announced its intention of taking the matter of a franchise modification up with Mayor Hylan and the Board of Estimate & Apportionment.

On April 11 Governor Whitman also advised the men to seek conferences with the officials in their home cities, with the end in view of changing the existing franchise agreements.

Wage Increase in St. Joseph

The trainmen in the employ of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., and the management have agreed to a wage increase of 2 cents an hour for the men. The original request was for an advance of 5 cents an hour. An increase the first six months is one feature of the new scale. New men will receive 27 cents an hour and after six months an increase of 1 cent an hour. After the first year, the men will be increased yearly as before. During the fourth year the men will receive the maximum, 32 cents an hour. The extra men will also receive an increase of $5 a month. Their wages in the future will be a minimum of $60 a month. In November, 1917, wages were increased 2 cents an hour and in March, 1917, they were increased 2 cents an hour.

Chicago Traction Discussion

Considerable Headway Seems to Have Been Made at the Council Meetings on April 4 and 5

Having agreed upon the physical program for Chicago traction improvements a sub-committee of the local transportation committee of the City Council held meetings on April 4 and 5 to discuss other features of the proposed ordinance. These included length of franchise term, the question of a transfer charge, the matter of rate of return on old and new securities, the qualifications and authority of the proposed board of control, and the details of amortization.

It was tentatively agreed that the board would consist of three members with six-year terms to be appointed by the Mayor subject to approval of the Council. Mr. Busby contended that when the Traction & Subway Commission recommended a guarantee of 6 per cent on outstanding securities, this was intended only as a reasonable minimum. Even though the commission report allowed a possible return up to 8 per cent, the figures show that this would average about 6.2 per cent during the franchise period, whereas the average rate for the surface lines during the last ten years has been nearer to 7 per cent.

It developed that the commission's estimate of receipts was below the actual figures for last year. The companies pointed to this as evidence that the commission's figures were conservative.

Owing to the expected absence of several members of the committee for several weeks an adjournment was taken until their return.

Increase in Wages in Duluth

The Duluth-Superior Traction Company, Duluth Minn., recently announced salary increases to all conductors and motormen effective April 1. The old and revised schedules in cents per hour are as follows:

	New Scale	Old Scale
First year	32	29
Second year	33	31
Third year	34	32
Fourth year	35	33
Fifth year	36	34
Sixth year	37	35

The guaranteed minimums for men reporting on the extra list remain unchanged.

Herbert Warren, vice-president and general manager of the company, made a statement in part as follows:

"In increasing the wages of our motormen and conductors at this time, the company hopes to show its disposition to recognize existing conditions affecting the cost of living and the demand for man power resulting from the war. This increase is made voluntarily, notwithstanding the fact that the rate of fare is fixed at 5 cents and all operating expenses of the company are increasing heavily in every department and will undoubtedly continue to do so."

News Notes

M. O. Proposal Defeated.—The proposition to bond the city of Tacoma, Wash., for $5,200,000 to provide funds for the purchase of the railway property of the Tacoma Railway & Power Company was defeated in the city primaries on April 2.

Increase in Wages in Chichasha.—The Chickasha (Okla.) Street Railway has increased the pay of its men from 20 cents an hour for the first year, 22½ cents an hour the second year and 29 cents the third year to 25 cents for the first year and 30 cents the second year.

Waco Strike Over.—The strike of motormen and conductors in the employ of the Texas Electric Railway in Waco has been ended. The men demanded recognition of the union and an increase in wages. Both demands were rejected by the company and the strike resulted. New employees were soon secured, however, and traffic was restored without the company negotiating with or giving recognition to the newly created union.

License for Motormen Rejected.—The City Council of St. Paul, Minn., has voted down an ordinance proposed by Commissioner O. E. Keller to provide for licensing of motormen by a committee composed of the commissioner of public utilities, the street car inspector and the city electrical inspector. One commissioner said if there was to be any examination of motormen it should be by experts instead of city officials.

M. O. Bills Dead.—A committee has reported to the New York Senate advising either to have a special committee appointed to investigate and report on municipal ownership at the next session of the Legislature or leave the matter in abeyance until another year. It is probable an investigating committee will be chosen. Under the circumstances, pending municipal ownership bills are regarded as dead as far as this session is concerned.

Cleveland Subway Ordinance Legal.—The Supreme Court of Ohio has rendered a decision to the effect that the ordinance providing for the appointment of a rapid transit commission and the construction of a subway in Cleveland is legal. The commission will at once ask for a bond issue of $100,000 to provide funds for preliminary investigations and engineering work. The members of the commission are Charles A. Otis, M. A. Bradley, C. E. Adams, Street Railway Commissioner Fielder Sanders and Finance Director Neal.

Increase in Wages in Louisville.—In response to a request of the employees of the Louisville (Ky.) Railway for an increase in wages, the board of directors, through Samuel Riddle, superintendent of transportation, has announced that the wages of all employees will be increased 3 cents an hour. The rate of pay under the new schedule will be as follows: for first year, 27 cents an hour; second year, 28 cents; third year, 29 cents; fourth year, 30 cents; fifth year and thereafter, 31 cents. The increase went into effect on April 1.

Mr. Taylor Opposes Philadelphia League.—In connection with the hearings before the Public Service Commission of Pennsylvania in regard to the final adoption of the rapid-transit lease between the Philadelphia Rapid Transit Company and the city, A. Merritt Taylor, formerly director of the Department of City Transit, filed on March 27 a brief of objections. Mr. Taylor not only criticised in detail various provisions of the league but also stated that the present time was not a proper one for the consummation of a long-term contract.

Bridge Tolls Decision Favors Company.—The Appellate Division of the Supreme Court of New York has affirmed the Supreme Court's decision in favor of the Brooklyn (N. Y.) Union Elevated Railroad and the New York Consolidated Railroad (Brooklyn Rapid Transit System) in the suit brought against them by the city of New York. The city sued the corporations for tolls over the Williamsburg Bridge from Aug. 4, 1913, to May 1, 1914. The decision holds that a new contract made in March, 1913, supersedes the previous agreement of 1907.

Wage Increase in Atlanta.—The Georgia Railway & Power Company, Atlanta, Ga., increased the wages of its trainmen 3 cents an hour on April 1. This increase will amount to about $85,000 for the year and is in addition to an increase of 1 cent an hour which became effective on Jan. 1, 1917, and to a second increase of an additional 2 cents an hour which became effective on Nov. 1, 1917. The scale of wages per hour under the increase in effect on April 1 is as follows: first year, 25 cents; second year, 27 cents; third year, 29 cents; fourth year, 30 cents; fifth year, 31 cents; sixth year and thereafter, 32 cents.

Relief Proposed for New York Contractors.—In order to insure the prompt completion of important subway lines in New York threatened by the inability of certain contractors to carry out their agreements, there has been introduced in the Legislature on behalf of the Public Service Commission for the First District a measure which may have the result of providing such relief as is necessary. The contractors contend that the increasing cost of labor and materials and delays in the delivery of materials have brought the majority of them to the verge of bankruptcy. The contractors prepared a bill to meet the situation, and introduced the measure in the Legislature, but the commission did not approve this because of its mandatory character.

Railway Wins Paving Case.—In the suit of the City of New York against the New York Railways to recover $2,161 for pavement repairs on Lexington Avenue, the Appellate Division of the Supreme Court has directed a verdict for the defendant. The case involved the question of the duty of the railway to maintain pavement after temporary restoration following subway construction. In this instance, at the completion of the subway work, the contractors restored the pavement, but at the end of six months it had settled so that repairs became necessary. The city notified the company to repair the pavement in the railway area. The company refused to comply, contending that the contractors were responsible for the restoration of the pavement to its original condition. The decision is regarded as particulary significant in New York, since the paving along the lines on Lexington and Seventh Avenues is affected by the subway construction in progress in those thoroughfares.

Programs of Meetings

Foreign Trade Convention

The fifth convention of the National Foreign Trade Council will be held at the Gibson Hotel, Cincinnati, Ohio, on April 18, 19 and 20. The theme is "The Part of Foreign Trade in Winning the War." Those who desire to receive invitations to attend the convention at Cincinnati are requested to send their names and addresses to O. K. Davis, secretary National Foreign Trade Council, 1 Hanover Square, New York City.

American Institute of Electrical Engineers

It has been decided to hold an annual convention of the American Institute of Electrical Engineers in Atlantic City, N. J., on June 26, 27 and 28, 1918. Among the papers likely to be presented are the following: "Split-Conductor Cables—Balanced Protection," by W. H. Cole; "Overhead Cables," by E. B. Meyer; "Wood-Stick Insulators," by H. H. Cochrane; "The Applications of Theory and Practice of Transmission Systems," by G. I. Gilchrist; "America's Power Supply," by C. P. Steinmetz; "Education," by D. C. Jackson and M. W. Alexander; "Charged Condensers," by V. Karapetoff; "Method of Symmetrical Co-ordinates Applied to the Solution of Polyphase Network," by C. L. Fortescue; "Flux Distribution in Alternators Under Sustained Short-Circuit Conditions and Different Loads," by N. S. Diamant.

The meeting will open at 10.30 a. m. on June 26, with an address by the president. An informal reception will be held at the Marlborough-Blenheim Hotel at 8.30 the same evening.

Financial and Corporate

Costs Mounted

Commonwealth Company Shows How Expenses Climbed During January and February

Unprecedented storms and extreme cold weather in January and the early part of February caused such damage and extraordinary expenses that the board of directors of the Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., has deemed it advisable to explain the operations for these two months. The statement follows:

"These conditions and the critical shortage and the very poor quality of coal, brought an unusual burden to the company in numerous ways. There were many days when it was impossible because of the snow to operate interurban cars, and when operation in towns was very seriously interfered with. The increased cost of the removal of such vast quantities of snow was very heavy, as was also the increased cost of car repairs, due to the great strain on the equipment, attendant upon operation in such extreme winter weather.

"Added to this was the acute coal shortage, curtailing the operation of the company's properties to a great extent, and necessitating the cutting off of electric power to customers on many occasions. Also the quantity of the coal received was most unsatisfactory and entailed a heavy additional expense. Because of the shortage of gas coal, the gas plants were forced to make a much larger amount of water gas than usual, necessitating the use of a much greater quantity of gas oil at greatly increased prices.

"As an indication of the increased cost of operating the properties because of the weather and coal shortage in January and February, 1918, over corresponding months of 1917, the following statement of such increased costs is appended:

	January	February
Coal for electric plants	$51,000	$28,000
Coal for steam heating	43,000	14,000
Gas coal and oil......	91,000	84,000
Snow removal	53,000	15,000
Car repairs	22,000	42,000
	$260,000	$183,000

Dividend Policy Outlined

The report of the Standard Gas & Electric Company, Chicago, Ill., contains the following reference to the dividend policy of the company:

"The uncertainty of the times makes it increasingly difficult to forecast dividend distributions. It is unlikely that the conditions produced by the war will permit any increase in the preferred stock rate during the current year over the 6 per cent now being paid. Construction requirements have been reduced to a minimum in accordance with the general request of the government to conserve materials and money for war purposes. It is impossible, however, to cut off construction entirely. Should it become impossible to finance necessary improvements and extensions, your company may find itself compelled to apply its earnings to such purposes, even to the extent of reducing its dividends.

"At this time, however, it seems improbable that resort will have to be made to an emergency measure of this nature. Practically all of your subsidiaries are in a position to finance their respective requirements in any but the most extraordinary times. Even in such times they will not necessarily have to rely exclusively upon your company for funds if the service to be rendered by the anticipated War Finance Corporation is correctly interpreted. In this connection it is again emphasized that the rapidly growing gross earnings of the subsidiaries are much less due to war conditions than are the abnormally high operating costs, and that materially increased net earnings must follow the return of normal times. This would quickly be reflected in your company's collectible income and correspondingly increased dividend rates."

C. D. & T. Reorganization Planned

Owners of bonds of the Cincinnati, Dayton & Toledo Traction Company, deposited under an agreement of Jan. 12, 1916, have been notified by the bondholders' committee that the property has been purchased by it and that a plan of reorganization has been adopted. A company with a capital stock of $1,250,000, all common, is to be formed to take over the property. As a matter of fact, the Cincinnati & Dayton Traction Company has been organized for this purpose, as already stated in the ELECTRIC RAILWAY JOURNAL, and the Public Utilities Commission has authorized the reorganization.

The company will issue $250,000 of 5 per cent ten-year bonds on the line between Spring Grove and College Hill, with a branch to Mount Healthy; $500,000 of bonds on the Lindenwald power house and $250,000 on the equity in the Hamilton city lines.

All of the stock and bonds go to the committee as part payment for the property, but will be held to insure the completion of the plan, which contemplates the exchange of all the above bonds and all of the $2,300,000 of underlying bonds for like amounts of an issue of $4,500,000 of first and refunding consolidated mortgage 5 per cent twenty year bonds on the entire property.

Rapid Transit Deficits

Commissioner Whitney Shows Total of $6,000,000 for City and Company—Each Passenger Cost 6¼ Each

A report concerning the deficits in operation from the new lines of the dual rapid transit system in New York has recently been made public by Commissioner Travis H. Whitney of the Public Service Commission for the First District. It was known at the time of the signing of the rapid transit contracts in 1913 that there would be such deficits from operation on some of the new lines, particularly in the outlying suburban districts, for several years after operation over them had begun. Some of these lines were built in districts relatively small as to their population, but giving promise of great population increases in the near future, at which time the deficits will probably be entirely wiped out or greatly reduced.

Under the contracts with the Brooklyn Rapid Transit Company and its subsidiaries, provision was made that with the beginning of operation of the first of the new city owned lines, the earnings should be pooled and deficits in operation shared by the city and company. The first operation under the dual contracts by the Brooklyn Rapid Transit Company began on Aug. 4, 1913, at which time the Center Street loop was placed in operation. Since then the total city and company deficits have amounted to about $6,000,000. It is shown that the total cost, including operating expenses and fixed charges, is equal to about a 6¼ cents for hauling each 5-cent fare passenger. Commissioner Whitney points out that the deficits are in excess of original estimates and that this is largely due to war conditions. He noted also that some consideration must be given to reducing the amount of the city's deficit.

Under the city's contract with the Interborough Rapid Transit Company, a somewhat different arrangement was made by which the consideration of deficits became necessary upon the placing in operation of certain of the new lines. Such of the new Interborough lines as have already been placed in operation, Commissioner Whitney finds, have showed a deficit of about $1,250,000, or an amount only about $100,000, less than the total gross revenues. He indicates, however, that as soon as the principal branches of the Interborough line are placed in operation, including the tunnel to Brooklyn, the revenues of the first subway will be pooled in the earnings and take care of the charges on the lines which are not yet fully developed.

Toronto Railway Outlook Better

Sir William Mackenzie, president of the Toronto (Ont.) Railway, recently made a statement in regard to the report that he had been disposing of his holdings in the company. He is reported by the Canadian *Financial Post* to have said that he has not been selling recently. His present holdings are 2182 shares. He has been head of the company for twenty-seven years. With respect to the franchise situation, he is reported to have said that during the last five years there never was a chance for getting together with the city, but that things were changing. The recent reduction in the dividend was necessary in order to secure the renewal of the short-term notes which the company had been compelled to float.

Tramways in Japan

The report of the Imperial Government Railways of Japan for the year ended March 31, 1916, contains a section devoted to tramway lines in Japan proper. The results of the working of these for the year under review are shown in the following table:

STATISTICS OF JAPANESE TRAMWAYS FOR 1916

	Electric Tramways	Steam Engine Tramways	Gas Motor Tramways	Horse Tramways	Rikisha Tramways	Total
Number of tramways..	64	22	4	34	14	138
Mileage open	667.66	211.65	60.56	244.18	70.40	1,255.05
Mileage under construction	232.62	38.34	2.07	13.36	3.23	289.02
Capital (yen)	264,106,120	5,864,244	1,290,000	2,341,990	909,500	274,511,854
Cost of construction (yen)	277,017,116	5,370,111	1,022,361	2,119,858	349,197	287,377,643
Locomotives	5	147	79	....	....	226
Carriages	3,849	182	88	437	128	4,684
Wagons	251	301	132	577	518	1,779
Passengers carried ...	624,890,286	6,428,420	2,822,032	4,064,980	277,449	638,483,167
Passenger earnings (yen)	24,882,962	605,908	225,271	379,178	26,509	26,119,828
Goods hauled (tons)...	468,158	271,051	79,575	134,181	358,569	1,311,534
Freight earnings (yen)	334,926	137,065	53,163	127,960	148,676	801,790
Total revenue (yen)...	38,666,330	767,889	297,908	581,894	344,277	40,658,298
Total expenses (yen)..	25,377,798	500,311	210,254	510,341	298,951	26,897,655
Profit (yen)	13,288,532	267,578	87,654	71,553	45,326	13,760,643
Employees	14,538	796	351	841	529	17,055

Note: Yen=$0.4985.

War Finance Bill Signed

President Wilson on April 6 signed the War Finance Corporation bill, creating a government corporation with a capital of $500,000,000 and authority to issue $3,000,000,000 of bonds, designed for the aid of industries engaged in work essential to the carrying on of the war.

It is reported from Washington that when the directors of the corporation are appointed they will find a huge pile of applications for money on their desks. Applications already made are said to vary from $5,000,000 to $60,000,000. Applications cover all character of public utilities claimed by the applicants to be war necessities.

The terms of this measure have been referred to previously in the ELECTRIC RAILWAY JOURNAL.

Navy Runs Railroad

The Navy Department has taken over the Cape May, Delaware Bay & Sewell's Point Railroad, Cape May, N. J., including the local line from the Reading Railroad station to the beach. It has bought the equipment outright out of $175,000 recently appropriated by Congress. The men of the naval reserve are at work putting the road in order for the operation of cars. Service over the line was discontinued following appointment of a receiver two years ago.

Financial News Notes

Income Interest Declared.—The directors of the Chicago (Ill.) Railways have declared the 4 per cent interest on the $2,500,000 of adjustment income bonds for the year ended Jan. 31, 1918, payable on May 1.

Billings Line Being Removed.—The system of the Billings (Mont.) Traction Company is being torn up and the rails removed from the streets by the company. The rails are being stored in the company's carhouse on Division Street. No cars have been operated by the company since last fall.

Bondholders Cannot Recover from Directors.—The United States Supreme Court has upheld the California decree denying the right of the bondholders of the Ocean Shore Railroad, San Francisco, Cal., to recover from the directors of the company, which had been declared insolvent.

Action on Dividend Put Over.—Action on the dividend on the common stock of the Philadelphia Company, Pittsburgh, Pa., due at this time, has been deferred until April 27, when a special meeting of the directors will be held to consider the dividend. The company controls the Pittsburgh Railways.

Extension of Lease Payment.—The United Power & Transportation Company, Philadelphia, Pa., has granted the Trenton & Mercer County Traction Corporation, Trenton, N. J., lessee, a further extension until July 1 for the payment of the rental due on Jan. 1, 1918, on account of the Trenton street railway properties.

Directorate Increased.—The Northern States Power Company, Chicago, Ill., has increased its directorate from fifteen to seventeen members. B. W. Lynch and M. A. Morrison of H. M. Byllesby & Company have been elected to the board. H. C. Cummins has been elected a director in the place of W. R. Thompson, who resigned.

Dividend Passed at Trinidad.—The Trinidad (Port-of-Spain) Electric Company has omitted the quarterly dividend ordinarily payable on April 10. The dividend was resumed in July, 1917, after having been suspended in 1915. Since the resumption of the dividend the government has imposed a war contribution tax which the company has been compelled to pay, amounting to $20,018. This is a charge against the company, the imposition of which the directors were unable to anticipate. They consider the tax most inequitable and "are pressing the matter with all diligence."

Stockholders Notified of B. R. T. Dividend Action.—Formal notice has been sent to the stockholders of the Brooklyn (N. Y.) Rapid Transit Company of the resolution adopted by the board of directors on Feb. 28, approving the recommendation of the executive committee that action upon the quarterly dividend, regularly payable on April 1, be postponed until a subsequent meeting of the board. While the company's net profits justify the declaration of the usual dividend, the committee believed it advisable to withhold action pending negotiations relative to the $57,735,000 secured gold notes maturing on July 1.

Sold Under Foreclosure.—The property of the St. Joseph Valley Railway, Elkhart, Ind., has been sold at receiver's sale for $390,000 to Benjamin Harris & Company, Chicago, Ill. The plan is to dismantle the road as soon as the Superior Court ratifies the sale. The sale was made by J. H. State, an attorney, representing Herbert E. Bucklen, the receiver, a son of the late Herbert E. Bucklen, Elkhart, whose ambition was to build an electric railway to connect Toledo and Chicago. The Indiana Public Service Commission concurred in the Superior Court's order of sale when it was shown that the property had always been a losing proposition. The road is 9 miles long.

Seattle's Municipal Ownership Losses.—Seattle's two municipal car lines, Division A and the Lake Burien line, were operated during the month of February, at a loss of $2,509, including interest and common user charges and excluding depreciation. Division A, extending to the north city limits through Ballard, earned $476 more than the actual cost of operation, not including $295 for common user on Fourth Avenue, which will be included in the March report for February operation, and interest. In February 153,289 people were carried on the Ballard line, and the revenues were $7,159, with operating expenses at $6,683. On the Lake Burien line, 27,276 passengers were carried, with revenues of $1,639 and expenditures of $2,236, a loss of $596, with no interest to consider.

Another Road Suspends.—A. L. Abington, general manager of the Fort Scott Gas & Electric Company, Fort Scott, Kan., controlled and operated by the Light & Development Company, St. Louis, Mo., reports that operation of the 7-mile railway of the Fort Scott company has been permanently discontinued. The company recently made a plea for relief from municipal restrictions which it considered unduly burdensome, and conferences were arranged through the local Chamber of Commerce looking toward the company receiving some measure of help. It would seem from the decision to discontinue operation that the company was unable to secure terms which it deemed essential to insure the successful operation of the railway. Proceedings in connection with the matter were referred to in the ELECTRIC RAILWAY JOURNAL for March 9, 1918, page 476.

Reorganization Cost Allowances.—The City Commission of Dallas, Tex., has finally disposed of the application of the Dallas Railway—the consolidated railway lines under the Strickland-Hobson franchise—to add the cost of reorganization of the companies to the property valuation to be used as a basis in calculating returns from operation and the fares based thereon. An addition of $100,000 was allowed by the commission, such increase in value to date from Nov. 21, 1917, the date on which the service-at-cost franchise became effective. A like addition has been allowed for the Dallas Power & Light Company, also a Strickland-Hobson property. This is a cut of $100,000 from the amount originally asked by the companies. The items rejected consist of the postcard pre-election vote, hire of bands, halls, speakers, etc., for promoting the interests of the companies during the franchise campaign.

Holders Asked to Deposit United Railways 4's.—The committee formed in the interest of the holders of the first general mortgage 4 per cent gold bonds of the United Railways, St. Louis, Mo., due 1934, consisting of N. A. McMillan, president of the St. Louis Union Bank, chairman; Edwin G. Merrill, president of the Union Trust Company, New York, and Edward Mallinckrodt, J. Herndon Smith, and M. Kotany, St. Louis, has decided that conditions facing the company render it necessary to ask holders to deposit their bonds immediately in order that steps may be taken to safeguard their interests. The advertisement calling for deposits directs attention to the adoption by the Board of Aldermen of St. Louis of the settlement ordinance calling for a material reduction in the present outstanding securities of the company. Holders of bonds of the St. Louis Transit Company have been requested to deposit their bonds with a committee of which Edwin M. Bulkley, of Spencer Trask & Company, New York, is chairman.

Bonds of Southern New York Company Offered.—P. W. Brooks & Company, New York, N. Y., are offering at 96 and interest to net about 6½ per cent $950,000 of Southern New York Power & Railway Corporation first mortgage 6 per cent ten-year gold bonds. The Southern New York Power & Railway Corporation is the successor to the Otsego & Herkimer Railroad. It operates an interurban line between the cities of Oneonta and Mohawk, connecting with Cooperstown and passing through Richfield Springs, a total of 68½ miles of track, with trackage rights to Utica and Herkimer. It also owns and operates five hydroelectric or steam power stations and more than 70 miles of high-tension transmission lines. The authorized capital of the company consists of $774,900 of common stock, $1,000,000 of 7 per cent cumulative preferred stock and $5,000,000 of first mortgage 6 per cent ten-year bonds. Of these amounts the following are issued: all of the common stock, $500,000 of the 7 per cent preferred stock and $950,000 of first mortgage bonds.

Electric Railway Monthly Earnings

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$538,938	*$279,650	$259,288	$217,152	$42,136
1m., Feb., '17	497,800	*231,327	266,437	216,203	50,270
2m., Feb., '18	1,114,865	*571,458	543,407	434,684	108,723
2m., Feb., '17	1,039,095	*465,660	573,435	432,434	141,001

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Jan., '18	$589,787	*††$344,825	$244,962	$178,895	$66,067
1m., Jan., '17	490,231	*260,189	230,042	182,338	47,704
12m., Jan., '18	6,123,067	3,661,231	2,461,836	2,148,609	313,227
12m., Jan., '17	5,518,352	3,040,711	2,477,641	2,178,833	298,808

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., Jan., '18	$484,586	*$350,410	$134,176	$88,903	‡$55,621
1m., Jan., '17	379,782	*257,105	122,677	78,725	‡44,796
12m., Jan., '18	4,994,719	*3,434,488	1,560,231	1,014,605	‡622,33
12m., Jan., '17	4,049,083	*2,399,050	1,650,033	842,037	‡829,550

*Includes taxes. † Deficit. ‡ Includes non-operating income. †† $17,560 ncludes for depreciation.

TAMPA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Jan., '18	$86,449	*$52,210	$34,239	$5,083	$29,156
1m., Jan., '17	92,314	*47,579	44,735	4,255	40,480
12m., Jan., '18	995,445	*568,169	427,276	56,948	370,328
12m., Jan., '17	972,695	*531,457	441,238	52,372	388,866

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, CLEVELAND, OHIO

1m., Jan., '18	$40,772	*$27,973	$12,799	$11,321	$1,478
1m., Jan., '17	36,436	*22,134	14,302	11,436	2,866

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

1m., Jan., '18	$141,554	*$115,307	$26,247	$36,125	†$9,878
1m., Jan., '17	129,505	*94,926	33,579	34,374	†795

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

1m., Feb., '18	$460,246	*$332,815	$127,431	$99,864	‡$36,644
1m., Feb., '17	357,645	*251,644	106,001	78,685	‡28,301
12m., Feb., '18	5,097,320	*3,515,660	1,581,660	1,035,783	‡630,679
12m., Feb., '17	4,096,270	*2,467,554	1,628,716	856,382	‡792,108

Traffic and Transportation

Queue Loading in Detroit

Opportunity for Others to Emulate Detroit and Reform Manners Notoriously Bad as Regards Car Etiquette

Some queue loading is done at present on the lines of the Detroit (Mich.) United Railway, but the company is making a vigorous plea for more of it as a time saver. People bow to the rights of others, it seems, nearly everywhere except on a street car. There the race to board is to the strong. The hog asserts himself. The man who knows that he would get a bat over the head if he tried "rough house" tactics at a ball game, a theater or other public place feels sure of immunity if he indulges his atavistic self when boarding a car.

RAILWAY STARTS CAMPAIGN

The company in Detroit recently called the attention of its patrons to the matter in *Electric Railway Service* for March 29. It said in part:

"When you go to purchase a ticket at the theater and you find other people already there you don't rush to the window and shove the other people away in order that you may be served first.

"Of course you don't. If you tried it the chances are more than equal some one would bat you over the head. What you do is to take your position in line. If you are fifth you stand fifth in the row; if you are number 100 you know there are ninety and nine to be served before. You keep your place and you move up with the row although you may be uncertain whether seats will be left or you will get a pasteboard calling for standing room only.

"When you go to Navin Field, see Hughey Jennings eat grass and view Ty Cobb slide into first you don't tear your coat into shreds nor elbow the next fellow out of the way in order to beat him inside the ball grounds.

"Of course you don't. You go through the turnstile in an orderly manner and in your turn. If you tried the other plan—oh, well you wouldn't because you know blamed well something unpleasant would happen to you.

PLEA FOR ORDERLINESS

"Why can't there be the same orderly, sane and pleasant manner of boarding a street car when there are a number of people all desirous of traveling at the same time?

"Just because you may happen to be a husky chap is no valid reason why your strength should give you the right of way into the car. Nor should your weakness be permitted to force you to the rear.

"The proper way for people to enter a street car is in order of their arrival at the car stop. To accomplish this the thing is to line up one behind the other. This is what is known as queue formation.

"A nice thing in theory but something that will not work out in practice you say?

"Oh, but you are wrong—very much wrong—if you think it cannot be done.

"Queue loading of cars is quite common in other countries. It is the absolute law of many municipalities in Great Britain.

"And queue loading is done right here in Detroit. But not enough of it is being done here, for which we are sorry. More of it is certain to be done in Dynamic Detroit for which we are very, very glad.

"We claim for the queue formation of passengers awaiting to board cars that it has many advantages over the common method. These advantages accrue to the company and to our customers—chiefly to our customers. The chief advantage of queue loading is the saving of time in each car getting its quota, hence permitting the car to leave so much the sooner and go on its way distributing our customers at their respective streets. This helps us and it helps the car rider.

"Not only is there the saving of time, which is mighty important in these days of hurry and hustle, but queue formation does away with disputes and dangers; it protects the weaker from the onslaughts of the more vigorously constituted people."

Accompanying the article were two pictures—one showing queue loading on Woodward Avenue opposite the Ford motor plant; the other showing improper loading of cars during the rush hour out Chene Street.

Trenton-Princeton Fare Hearing

A hearing was held on April 9 before the Board of Public Utility Commissioners of New Jersey in the matter of the New Jersey & Pennsylvania Traction Company's application to increase its fares from 5 cents to 6 cents in each of the four zones between Trenton and Princeton. The company contends that the present 5-cent fares are unjust, unreasonable and insufficient to enable it to provide the service demanded by the public and to maintain the integrity of its securities.

In addition to wanting to boost the 5-cent fare to 6 cents in each of the four zones of the company, permission is asked to withdraw the block tickets, which are sold at the rate of twelve for $1, each ticket being good for a ride between Lawrenceville and Trenton or Lawrenceville and Princeton. It is claimed that the privilege extended to passengers by the sale of these tickets has been abused.

Raise After Four Years

South Carolina Commission Sanctions Increase in Fare From Twenty-five Cents to Forty Cents

The Railroad Commission of South Carolina has recently authorized the Augusta-Aiken Railway, controlled by the Augusta-Aiken Railway & Electric Company, Augusta, Ga., to establish a fare of 40 cents from Augusta to Aiken, the fare for each zone to be 5 cents. The former rate between the cities was 25 cents.

A FOUR-YEAR FIGHT

The question of an increase in passenger fare over the railway has been under consideration by the commission for the last four years. The company asked for a 50-cent rate from Aiken to Augusta and for a system of zones which would guarantee to the company not less than 2 cents a mile for each mile traveled. The commission refused this petition. The company then appealed to the courts. After hearing before one of the circuit judges, it was ordered that the South Carolina Commission had erred and that the railway should have been granted an increase of rates. The circuit judge expressed the opinion that the amount prayed for in the petition was reasonable. The court directed the commission to reopen this case and expressed its opinion that at this rehearing the Augusta-Aiken Railway should be granted the increased rate. From this decision an appeal was taken to the Supreme Court of the State. There the matter was pending when the commission entered its present order.

COMMISSION NOW SEES NEED

John G. Richards, chairman of the Railroad Commission, in his letter to W. C. Callaghan, general manager of the Augusta-Aiken Railway, allowing the company to establish the 40-cent rate, said:

"The commission realizes that on account of the changed conditions brought about by the war, the increased cost of material, the increased wage scale, in fact, the increase in the cost of everything necessary in the proper operation of a railroad, the company is entitled to some increase in its passenger fare. However, the commission, as much as it regrets to disagree with a member of the courts of the State, feels that a 100 per cent increase over the rate now in operation is neither reasonable nor just, nor do the necessities of the case demand such a sweeping increase. Therefore, to meet the demands of the Circuit Court at least in part, and to give to the Augusta-Aiken Railway a rate which the South Carolina Commission feels is just and reasonable under present conditions, the commission submitted to you the rate as set forth in the letter which we have received from you. The commission is pleased that your company has seen proper to accept a rate of 40 cents from Aiken to Augusta and a 5-cent rate for each of the eight zones which are herein set out. By so doing, the whole question can be settled, and the litigation pending in the Supreme Court stopped."

The order of the commission directing that the rate for passenger fare shall be 40 cents from Aiken to Augusta, with 5 cents as the charge for each zone, is to remain in force for ninety days. The commission, however, reserves to itself the right, after that period, and after investigation, to rearrange the zones so as to meet the demands of the travel that develops during this period.

Cleveland and Columbus

Train Operation, Skip Stops and Faster Schedules Work to Advantage of Former City

Councilman Lamneck and Samuel G. McMeen, president of the Columbus Railway, Power & Light Company, Columbus, Ohio, both addressed the Kiwanis Club in that city on the evening of March 27. Following the addresses the resolution of the public activities committee of the club urging the Council to allow the company's request for an increase from eight tickets for 25 cents to six tickets for 25 cents was referred back to the committee for discussion at a future meeting.

On the following day the company in an advertisement, signed by President McMeen, replied to statements made by Mr. Lamneck. In this statement many comparisons were made between Cleveland and Columbus. Later in replying to the question of why it costs 1.566 cents per ride to operate the Columbus road and only 1.38 cents to operate the Cleveland road, the Columbus company said:

THE DIFFERENCES EXPLAINED

"1. The density of population in Cleveland is 12,000 per square mile and in Columbus it is 8000. This increases the number of rides possible in any one hour or on any one trip, and the greater the number of riders in a given time on a given unit of operation, the lower the cost per ride. The density of the population is the measure of the opportunity of doing a street railway business and the greater the opportunity the less the cost per unit of service. This opportunity is 50 per cent greater in Cleveland than in Columbus.

"2. A very large number of cars in Cleveland are operated in trains of two cars, manned by three men. In Columbus four men are necessary for each two cars. This materially affects the cost of producing each ride.

"3. The Cleveland cars ran nearly a mile an hour faster; skip stops were the rule in Cleveland all of last year and were not in Columbus. This resulted in 177 miles a day of eighteen hours for each car in Cleveland, as against 163 miles a day in Columbus. This affects the cost of producing each ride.

"4. More modern equipment has its effect in lessening the cost of producing the service in Cleveland as compared with Columbus."

Another Case Involving Franchise Obligations

Cities in Washington Make Plea in Behalf of Franchise Integrity in Case Brought to Require Commission to Fix Reasonable Fare

The Supreme Court of Washington, at Olympia on March 29 took under advisement the mandamus suit of the Tacoma Railway & Power Company against the Public Service Commission, to compel the commission to set aside the Tacoma franchise obligations, and fix a reasonable fare other than 5 cents, if found necessary. Eight judges heard the arguments.

THE ATTORNEY GENERAL'S ATTITUDE

Attorney General Tanner, who was statutory legal representative for Commissioners Spinning and Lewis, at the opening of the case announced his inability to act in that capacity, because the two commissioners had refused to sign and verify the answer he had made outlining his position, and wished to strike from his answer several points which he regarded as highly important. Attorney-General Tanner asked the right to appear as counsel for the people of the State and bring in the arguments which he had presented. This permission was granted, and he was joined in preparation of the case by City Attorney Harmon of Tacoma.

In opening the company's case, Attorney James B. Howe declared that the company was not asking for a specific judgment, but for a ruling by the Supreme Court. He stated that the company desired the Supreme Court to pass on the questions presented, so that the company may know whether or not the Public Service Commission has the power to set aside franchise provisions and to grant a fare of more than 5 cents. Mr. Howe asserted the company found that after it had paid its operating expenses and taxes, there was not enough left to pay the nominal depreciation on the property or to keep the properties up. He declared that the commission had power to require adequate service, and that this implied power to take away the franchise provisions or other conditions that hindered the company from obeying the commission's orders. He further declared that the present high wages offered to men in other lines of work made it impossible to keep men and that the company's receipts would not permit of further wage advances.

Scott Z. Henderson, who appeared for Chairman Blaine, asserted that Commissioner Blaine had not taken sides with the company but that he believed the commission had full power to act. He urged the court to order Commissioners Spinning and Lewis to do their duty.

Attorney General Tanner contended that the company had taken the wrong legal method of obtaining redress. He asserted that mandamus proceedings could not lie in this case. Mr. Tanner planned an attack upon the company's course in asking for a writ of mandamus to direct the Public Service Commission how to proceed in a case it had not yet passed upon. The latter case was the complaint of the Tacoma Commercial Club against inadequate service furnished in Tacoma as a whole. It was filed with the commission, but not formally considered. The company alleged, in asking for a writ, that the majority of the commissioners had refused to grant relief in a similar case brought by J. E. Blomberg, and would follow the same course in the Tacoma Commercial Club's case unless otherwise directed by the Supreme Court.

Mr. Tanner opposed this assumption on the ground that it could not be officially known what action would be taken by the commission in the case still to be tried, until the commission had made a decision and that the Supreme Court could take no jurisdiction until it had been so disposed of by the commission and referred to the Supreme Court in the regular course of review. He stated that in the Blomberg case, the question of increasing the 5-cent fare had not been raised, but that it was now raised by the company. He also questioned whether the Supreme Court could reinvest the commission with jurisdiction in the case that it had already passed upon, through a writ of mandate governing another hearing still to be held, the general challenge being directed to the method followed by the company, and the nature of relief asked. Mr. Tanner contended the process of writ of law provided ample remedy.

This form of defense Commissioners Lewis and Spinning refused to indorse because of their purpose to have it appear that they would follow their former course in refusing to attempt to revoke franchise requirements, and to increase the 5-cent fare if the question of jurisdiction were raised in the Commercial Club complaint when that was heard. They want the Supreme Court to dispose of the vexed question of commission jurisdiction before another hearing involving that question was called.

MR. CALDWELL CLOSES FOR CITIES

Alex Winston, assistant city attorney for Spokane, joined with Attorney-General Tanner and City Attorney Harmon of Tacoma, and Corporation Counsel Hugh M. Caldwell, Seattle, in calling attention to previous pleas by the company in which it had asked concession on the admission that it was unable to realize more revenue by increasing fares on account of the statutory 5-cent limitation. Mr. Caldwell closed for the cities with a vigorous plea in behalf of franchise integrity. He supported Mr. Tanner's view that the company has adequate remedy in applying for a writ of review rather than for one of mandate to perform something it had not yet passed upon.

Service-at-Cost Discussed

Company at Columbus Shows What a Grant With Such Provision Means to City

The publicity campaign of the Columbus Railway, Power & Light Company, Columbus, Ohio, is now turning to the service-at-cost plan. In one advertisement used recently the company compared the present service with what might be enjoyed, with such a plan in operation, if the people choose to pay the real cost. Under the present contract, made in 1901, only one kind of service can be had and that is the kind provided in that agreement, and the income is not even paying for that.

The community should pay the cost of the service, the advertisement says, and the city ought to have the right of purchase at a price based upon a fair value. None of these things are included in the agreement under which the company is operating. The community is not paying and for several years has not been paying the cost of the service demanded in 1901, and the city has only a technical right to purchase the property, as neither the city nor the company knows the price at which such a purchase could be effected.

PLEA FOR A FAIR RETURN

In another advertisement the company called attention to the fact that Columbus citizens all desire that merchants and manufacturers receive a fair return on a fair value of property used in business. Emergencies occasionally arise when returns must be increased and usually they are promptly met in this way. The railway emergency is no different from any other and should be met in the same way, until a permanent flexible service, with a flexible rate of fare, is adopted.

On April 2 Samuel G. McMeen, president of the company, asked fellow members of the Rotary Club to give the railway a fair, square deal in its request for an increase in the rate of fare, so that it may take care of increased operating and construction costs. He said that books of the company were open to any Rotarian who wishes to confirm the statements that were made in the advertisements of the company. No effort was made to have the club go on record for or against the request.

Report on Syracuse

Charles R. Barnes, electric railway inspector of the Public Service Commission for the Second District of New York, has reported the result of his study of traffic conditions on the lines of the New York State Railways in Syracuse. Mr. Barnes made a general recommendation for the rerouting certain lines. He recommended that the University Summit and West Genesee-Grape lines be divided, the Summit line to be joined with the Grape Street line and the West Genesee with the University. There are other minor recommendations for rerouting.

Mr. Barnes also recommends that all double-truck cars be equipped with air-brakes, that a certain number of single-truck cars be retired, that two sand cars be acquired, that all cars be equipped with proper destination signs, etc.

Many of the recommendations contained in the report have already been put into effect.

Mr. Barnes criticised the people of the city in the following words:

"In none of the other large cities of this State are cars so delayed in movement by the deliberate and slow progress of passengers in boarding and leaving. This delay is further amplified by the number of people who board the 'pay-as-you-enter' cars without having the proper fare ready for deposit. Before real rapid transit can be obtained in Syracuse the people must change their habits in these respects."

The Nickel

I was once a popular fellow
And I did a lot of things.
But my prestige has been waning
And my vogue has taken wings,
And I feel my day is passing
And my value, now I fear,
Is like the storied bird nest
In the treetop of last year.
Time was when I went for sodas,
Of the luscious ice cream sort,
Or procured a fair "Havana"
As a headlight for a sport.
I was welcome at the airdrome
At the closing of the day—
For 'twas I who killed the "drammer"
And made moving pictures pay.
But "That's all shove' behind me,"
I hear Mr. Kipling sigh,
And my name is rarely mentioned
Where men come to sell and buy;
Still they take me on the street car,
But I feel I'm in there wrong—
For the red ink of the ledger cries,
"How long, O Lord—how long?"

—*Kansas City Railwayan.*

Portland Fare Argument April 20

Mayor Baker of Portland, Ore., announces that if the city loses its fight before the State Supreme Court to annul the 6-cent fare order of the Public Service Commission to the Portland Railway, Light & Power Company, the Council will demand a rehearing before the commission. The Mayor plans to have the Council petition the commission to reopen and reconsider the 6-cent fare decision, on the ground that conditions for the company may have improved.

City attorneys state that such an action on the part of the Council would be a strategic mistake, and might jeopardize the city's interests.

Edward Cousin, valuation expert for the city, has been instructed to familiarize himself with all features of the fare situation, in order that the city may be properly prepared with information in asking for a reconsideration of the case if such a course is necessary. The city will endeavor to show that the valuation placed on the railway is excessive, and should not be made the basis for the order for a 6-cent fare.

The hearing before the Supreme Court on the appeal of the city from the decision of the circuit judges upholding the commission in the 6-cent case will take place about April 20.

Commission Has Jurisdiction

Missouri Body So Rules with Respect to Fare Application of the Kansas City Railways

The Public Service Commission of Missouri on April 6 rendered an informal decision that it had jurisdiction to regulate the rate of fare for street railway service. The decision followed a hearing on the subject in Jefferson City on March 26, at which briefs were submitted by the Kansas City Railways and the city.

The city contended that the franchise of the railway explicitly provided for 5-cent fares, and that the city alone had power to change this provision. Many citations were made by the railway to show that the Public Service Commission, even without the authority explicitly given by the act creating it, would have power to regulate rates as against the authority of a city which granted a franchise to the railway.

The ruling of the commission grew out of the request of the Kansas City Railways to the Public Service Commission of Kansas for increased fares. The company has a franchise in Kansas City, Kan., with seven years to run. It is probable that one or more joint meetings may be held by the two state commissions, during the progress of their consideration of the petitions now before them.

Since February the railway has been conducting a campaign of advertising, showing the need for higher fares and emphasizing the statement of President Wilson that "it is essential that public utilities be maintained."

"Cut Out" Stops Decided Upon

The San Francisco-Oakland Terminal Railways, Oakland, Cal., has completed its program for the elimination of unnecessary stops. The company has consulted with the officials of Oakland, Berkeley and Alameda and so-called "cut out" stops have been decided upon. The Councils of the three cities mentioned have indorsed the plan by resolutions.

It is not proposed arbitrarily to eliminate "every other stop," but to skip "every unnecessary corner." The skips, however, will be so regulated as to leave no unreasonable distances between stops.

The company proposes to put the new plan into effect as fast as possible, taking one line at a time. Notices will be posted in the cars of each line prior to the change. As soon as possible after the new system is in good working order, the schedules will be revised, so as to give better service.

Transportation News Notes

One-Man Car in Nashville.—The Nashville Railway & Light Company, Nashville, Tenn., is trying out its first one-man car.

Zone Fare Increase Sought.—The Jersey Central Traction Company, Keyport, N. J., will apply to the Board of Public Utilities Commissioners for higher fares on a zone system basis.

Bundle Racks Required in Kentucky.—During the final hours of the General Assembly of Kentucky a bill was passed and becomes a law under which all interurban cars will be compelled to provide bundle racks.

City Will Appeal Hartford Case.—It has been decided by the City Council of Hartford, Conn., to take an appeal from the recent decision of the Public Utilities Commission sustaining the 6-cent fare of the Connecticut Company in that city.

Seven-Cent Fare for Mauch Chunk.—The Town Council of Mauch Chunk, Pa., has consented to allow the Carbon Transit Company to increase its fares from 5 cents to 7 cents for the duration of the war and for eighteen months thereafter. The company operates 12 miles of line.

Stark Electric Asks Increase in Fare.—On April 2 the Stark Electric Railway, Alliance, Ohio, submitted an ordinance to the City Council of Alliance for an increase in the rate of fare as follows: Cash, from 5 cents to 6 cents; tickets, from six for a quarter to five for a quarter and from twenty-five for $1 to twenty-one for $1. The ordinance has been referred to the committee.

Increase in Fare in Lexington.—On March 24 the Kentucky Traction & Terminal Company, Lexington, Ky., increased the cash fares on its interurban lines from 2½ cents to 3 cents a mile with the exception of the through rates from Lexington, where in each instance the straight one-way ticket was increased 5 cents, thus making the former 5-cent zones, which were for a 2-mile ride, 6 cents under the present increase.

Would Abolish Skip Stops.—The City Council of Toledo, Ohio, on April 1 adopted a resolution abolishing the skip-stop plan adopted by the Toledo Railways & Light Company last winter. The resolution was introduced by Councilman Collins, after Councilman Curtis and Bitters had asserted that the people were anxious to have the old method resumed of stopping cars at all street intersections. H. G. Wilson, county fuel administrator, promptly notified councilmen that the skip-stop plan was advocated by the government as an aid to fuel conservation.

Objects to Interurban Cars in City Service.—An appeal has been taken to the Supreme Court of Ohio by the Northern Ohio Traction & Light Company in the case brought by the city of Akron to force the company to operate interurban cars within the city limits as local cars and at the city rate of fare, including the issue of free transfers. The company contends that it is a hardship to stop interurban trains and cars at each corner and carry city passengers at the local rate of fare. The contention of the city was sustained by the Court of Appeals.

Increase in Fare Wanted in Paducah.—The Paducah (Ky.) Traction Company petitioned the City Commissioners on April 1 for an amendment to its franchise to permit the company to increase fares from 5 cents to 7 cents. A. S. Nichols, manager of the company, presented the company's case, after the ordinance had been introduced. He stated that the company's books were open for investigation. Mr. Nichols said that 5-cent fares had been responsible for the troubles of the electric railways at Bowling Green and Henderson, Ky., as auto competition and increased costs of material and operation left no profit on a 5-cent basis.

Reduced Rate Tickets Eliminated.—The Railroad Commission of Wisconsin authorized the elimination of six-for-a-quarter tickets and the 3-cent fares to children under twelve years of age at Fond du Lac, effective on April 1, thus complying with the petition of the Eastern Wisconsin Electric Company to eliminate all fares of less than 5 cents. Up to April 2, the commission had rendered no decision on the company's request to apply a surcharge of 1⅛-cents per kilowatt-hour to the electric and power rates at Fond du Lac, and had also rendered no decision with reference to the application to eliminate the eight-for-a-quarter tickets at Oshkosh.

Resort Line Would Increase Fares.—Clarence L. Cole, receiver for the Atlantic City & Shore Railroad, Atlantic City, N. J., has asked the Board of Public Utility Commissioners for increased rates that would bring additional revenue of about $20,058 a year. The company proposes to charge 12 cents instead of 10 cents between Atlantic City and Pleasantville and Linwood; 6 cents instead of 5 cents between Linwood and Somers Point, and to sell six tickets for 60 cents instead of six for 50 cents between Atlantic City and Pleasantville. The petition shows that the company had a deficit of $17,236 in 1915; a deficit of $17,484 in 1916, and one of $20,050 in 1917. It is also shown that for the first two months of 1918 the deficit was about $1,000 a month greater than for the corresponding period in 1917. It is proposed to put the new rates into effect on May 10. The commission will hold a hearing on the matter at Trenton on April 30.

Little Rock Wants Six-Cent Fare.—The Little Rock Railway & Electric Company, Little Rock, Ark., will ask permission from the City Council to raise its present 5-cent fare to 6 cents, preserving the present transfer system, according to a statement by D. H. Cantrell, president of the company. Mr. Cantrell said in part: "We have delayed asking the Council for permission to raise our rates but now further delay is impossible if efficient service is to continue. We expect shortly to petition the Council to grant us permission to charge a 6-cent fare with free transfers as at present. The fairness and justice of such an increase will, we believe, appeal not only to the Council, but to all thoughtful citizens. It is not necessary for me to say that every article we use in construction, maintenance and operation has increased in price. If anything that is sold at present has not advanced in price in the last year, I don't know what it is except it is electric railway transportation."

Council Sticks to Jitney Measure.—In an attempt to secure the repeal of the ordinance passed on March 6, regulating and licensing jitneys in the city of Terre Haute, Ind., the jitney drivers went on strike during the week of March 24. On April 3 the jitney drivers, members of various labor unions and socialists, headed by Eugene V. Debs, paraded to the city hall carrying a petition 39 ft. in length and bearing 4730 signatures demanding the repeal of the jitney ordinance. While the demonstration was taking place the City Council met, but an attempt to repeal the ordinance was lost by a vote eight to two. The ordinance went into effect on March 19. It was upheld by the Council as being necessary to regulate the jitney properly and provide for the safety of the public. The Council stated that it was manifestly unfair to the Terre Haute, Indianapolis & Eastern Traction Company not to tax the jitneys, which were operating over the same streets and in competition with the railway.

Wants Utility Act Made Clear on Fares.—George L. Record, counsel for the Associated Municipalities in the case of the application of the Public Service Railway, Newark, N. J., for an increase in fares to 7 cents, has written a letter to Governor Edge urging him to call an extra session of the New Jersey Legislature to amend the public utility statute. Mr. Record says the company contends that a recent decision of the Supreme Court of New Jersey relieves it of its franchise 5-cent fare limit. He adds that the statute creating the Board of Public Utility Commissioners was never intended to have that effect and calls on the Governor to have the Legislature amend the statute. Mr. Record recommends the enactment of "an amendment of the public utility statute, providing in substance that nothing in the statute shall be construed by any court to relieve any company operating a street railway from any of the obligations imposed upon it by the original franchises granted by the local public authorities."

Personal Mention

C. E. Cox, formerly vice-president and purchasing agent of the Chicago & Interurban Railway, Chicago, Ill., is now connected with the Mid-West Box Company, Cleveland, Ohio, where he is installing a new cost system. Mr. Cox expects to be located in Fairmont, W. Va., in the future, as manager of the West Virginia plant of the company.

P. C. Chestnut, superintendent of the New Castle Electric Railway, Youngstown, Ohio, a division of the Mahoning & Shenango Railway & Light Company, with which he has been connected for eleven years, has resigned to become general manager of the Pittsburg County Railway and the Choctaw Power & Light Company, McAlester, Okla.

R. W. Spofford, general manager of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., who is a retired officer of the United States Navy, has been called to active service. W. C. Callaghan succeeds him as general manager. Mr. Callaghan has been with the J. G. White management organization, New York, N. Y., the operators of the Augusta company, since 1913.

C. J. Fifer has resigned as general manager of the Cleveland, Alliance & Mahoning Valley Railroad, Ravenna, Ohio, to become general superintendent of the Gary & Southern Traction Company, Crown Point, Ind. Mr. Fifer has also been secretary of the Columbus, Magnetic Springs & Northern Railway, Revenna. He was formerly general manager of the Philadelphia, Coatesville & Lancaster Passenger Railway, Parkesburg, Pa.

Prof. George F. Sever, formerly professor of electrical engineering and acting dean of the Faculty of Applied Science at Columbia University and for over twelve years consulting electrical engineer for the department of water supply, gas and electricity for the city of New York, has been commissioned a major in the Engineer Officers' Reserve Corps, with headquarters in Washington, D. C. He has closed his engineering office in New York.

F. G. Buffe, formerly of the Illinois Traction System, has been with the Kansas City (Mo.) Railways since Sept. 1, 1917, in the office of the president, Philip J. Kealy. Mr. Buffe instituted the publicity department of the Illinois Traction System in 1909 and for five years was in charge of this work for the interurbans and city utilities of this system. He re-entered newspaper work as managing editor of the *Herald-Transcript* of Peoria, Ill., for two years. He then returned to the Illinois Traction System in the office of H. E. Chubbuck, vice-president executive, in connection with the publicity work, labor matters, franchises, rate cases and commission hearings, and he remained with the company until he assumed his present duties at Kansas City.

H. G. Lauter has been appointed superintendent of transportation of the Chattanooga Railway & Light Company, Chattanooga, Tenn. Mr. Lauter was born in Chattanooga. Previous to engaging in electric railway work he was in the cigar business. In 1901 he began his railway career as gatekeeper for the Chattanooga Electric Railway at the old transfer station. He held this position until he was promoted to transfer agent the year following. In 1906 the Chattanooga Electric Railway and the Rapid Transit Company were consolidated. Following the merger the transfer station was abandoned and Mr. Lauter was made dispatcher. In 1907 he was promoted to assistant superintendent under G. E. Miller. When the Chattanooga Railway, the consolidated company, was taken over by E. W. Clark & Company, Philadelphia, Pa., and their associates, Mr. Lauter continued as assistant superintendent and retained that position until his recent appointment as superintendent of transportation.

H. G. LAUTER

John A. Ritchie has been elected president of the Fifth Avenue Coach Company and the New York Transportation Company, New York, N. Y., to succeed Richard W. Meade, who becomes chairman of the board of the companies. Mr. Ritchie enters the motor bus field after twenty years of experience in steam railway operation and in municipal rapid transit work. He was formerly connected with the Illinois Central Railroad and more recently with the Interborough Rapid Transit Company as operating statistician.

Thomas F. Murphine has been appointed superintendent of public utilities of the city of Seattle, Wash., to succeed A. L. Valentine, who was removed by Ole Hanson, the newly-elected Mayor. Superintendent Valentine has been in charge of the department since September, 1909, and his term would have expired on Dec. 31, 1918. Mayor Hanson gave as his reason for announcing the appointment of Mr. Murphine that he did not believe that Mr. Valentine was "whole-heartedly for the city and city-owned utilities." Mr. Murphine was assistant attorney general at the time of his new appointment.

H. E. Blain, operating manager of the London General Omnibus Company, the Metropolitan District Railway, the London Electric Railway and other companies in the city of London, England, was the subject of a special letter contributed by Helen H. Hoffman to the New York *Evening World* of April 5. The writer told how Mr. Blain fearlessly tackled the problem of increasing his force with women and how his action proved something more than an interesting experiment. The account was accompanied by a portrait of Mr. Blain and photographs of women ticket collectors and omnibus employees on the lines in London that are under Mr. Blain's direction.

Richard W. Meade, president of the Fifth Avenue Coach Company and the New York Transportation Company, New York, N. Y., has been elected chairman of the board of the companies. Mr. Meade has been president and general manager of the two companies since 1904. He will continue to be actively interested in their direction, the rapid development of the coach company in particular opening up various broad phases of urban transportation to which he will give his attention. Mr. Meade was formerly connected with the Metropolitan Street Railway, New York, now the New York Railways, under President H. H. Vreeland.

G. H. Blaikie, formerly auditor of the Albany (N. Y.) Southern Railroad, is now auditor of the Connecticut Light & Power Company, with general offices at Waterbury, Conn. This is a newly created office with that company and Mr. Blaikie was appointed to the position largely as a result of his record with the Albany Southern Railroad. From April, 1904, to December, 1911, Mr. Blaikie was head bookkeeper and chief clerk of the Consolidated Railway and the Connecticut Company, New Haven, Conn. When the United Electric Light & Water Company began operation on Jan. 1, 1912, at Waterbury, he was offered the position of chief accountant and continued in that capacity until May, 1914, when he was appointed to the Albany Southern Railroad.

J. C. Rockwell has been promoted from manager of the light and power department to general manager of the Manila Electric Railroad & Light Corporation, Manila, P. I. Mr. Rockwell was graduated in 1904 from Cornell University with the degree of mechanical engineer. Following his graduation he engaged in track construction work. In 1906 he became superintendent of transportation of the Syracuse, Lakeshore & Northern Railroad, Syracuse, N. Y. He was appointed general superintendent in 1909 of the Charleston (W. Va.) Interurban Railroad and the following year was made general manager of the company. In 1911 he joined the operating organization of the J. G. White Management Corporation, New York City, and was assigned to the Manila Electric Railroad & Light Corporation as manager of the light and power department. Mr. Rockwell has been on a visit to the United States and is now returning to Manila.

Lesley C. Paul, who has been connected with the editorial staff of the ELECTRIC RAILWAY JOURNAL in the New York office, has been appointed editorial representative of the paper in Chicago, to succeed H. L. Brown, whose acceptance of a position in Government work was noted recently. Mr. Paul was graduated from the civil engineering department of the University of Colorado in 1915, and accepted a position in the field service department of the McGraw Publishing Company, Inc., publishers of the ELECTRIC RAILWAY JOURNAL immediately following his graduation. He remained in the field service department until October, 1916, during which time he traveled over a large part of the United States in the interests of the company. He then accepted the position of assistant circulation manager in charge of ELECTRIC RAILWAY JOURNAL circulation and continued in that capacity until November, 1917, when he was appointed to the editorial staff of the paper in New York.

W. B. Voth has resigned as manager of the Ogdensburg (N. Y.) Street Railway, the Ogdensburg Power & Light Company, and the Ogdensburg Gas Company, to become manager of the properties at Eau Claire, Wis., operated by the Wisconsin-Minnesota Light & Power Company. Mr. Voth was formerly chief engineer and purchasing agent of the Empire United Railways, Inc., Syracuse, N. Y. Before that he was general superintendent of the electric railway and lighting properties at Sheboygan, Wis. Mr. Voth is a native of Milwaukee. He was graduated from the University of Wisconsin in 1897. After designing, constructing and operating several small hydroelectric plants in his native State, he was appointed resident engineer at Sheboygan in 1904 during the building of a steam station and the reconstruction of the local commercial and street lighting system. After finishing the construction work, Mr. Voth remained to operate the plant as general superintendent. At the same time he acted as consulting engineer for the Greensboro (N. C.) Company, controlled by the same interests. He resigned from these companies in 1914 to enter the service of the Empire United Railways.

J. W. Welsh, electrical engineer and traffic agent of the Pittsburgh (Pa.) Railways, has been called to Washington, D. C., by A. Merritt Taylor, manager of passenger transportation of the Emergency Fleet Corporation of the United States Shipping Board. Mr. Welsh, who will serve on Mr. Taylor's staff, will assist in providing transportation facilities and abating deficiencies, where such exist, to the various shipyards on the Atlantic and the Pacific coasts. Mr. Welsh became associated with the Pittsburgh Railways in 1906 as assistant electrician. In 1910 he was made electrical engineer and in 1913 took charge of the traffic department. Prior to this time he was employed as an electrical engineer by the National Tube Company, Wheeling, W. Va., and also by the Westinghouse Electric & Manufacturing Company at East Pittsburgh. He was graduated from Wittenberg College in 1900, Harvard University in 1901 and Massachusetts Institute of Technology in 1903. He is a "Fellow" in the American Institute of Electrical Engineers and several years ago served as chairman of the Pittsburgh Section of this organization. Since 1914 he has been chairman of the power generation committee of the American Electric Railway Association and has written many articles for the ELECTRIC RAILWAY JOURNAL and other technical papers.

J. W. WELSH

In January the number of delays of more than five minutes' duration to cars of the Public Service Railway, Newark, N. J., exceeded 2200. The company will put warning notices in the cars calling the attention of drivers of all classes of vehicles to the law in regard to impeding traffic and the penalty imposed for violations of the statute. It will also send to the 146 municipalities which it serves cards telling of the movement and asking the co-operation of the police and municipal authorities. Placards have been placed on the front platforms of the company's cars calling the attention of drivers of vehicles to the matter of causing delays to electric railway cars.

Obituary

John Thomas Funk, general superintendent and claim agent of the Louisville (Ky.) Railway, died on March 20, following an illness of several months. Mr. Funk was born at Jeffersontown, Ky., on April 20, 1854. He entered the service of the old Louisville Street Railway in 1865 as a switch boy. In 1890 Mr. Funk was named a member of the State Constitutional Convention, and aided in drafting the present constitution. He was active in politics for many years, and was a member of the Board of Education, of which he was at one time president.

Richard Ward Baker, aged sixty-eight years, superintendent of outside construction of the Watson-Stillman Company, New York, died on March 24 at his home at Roselle, N. J. He spent his entire business life in the services of the Watson-Stillman Company, the service of which he entered at the age of fourteen. Upon the completion of fifty years' service in 1914, the board of directors of the company celebrated the event by the presentation of a substantial check and an engrossed copy of the resolution setting forth the company's appreciation.

R. W. Blackwell, president of R. W. Blackwell & Company and Johnson & Phillips, cable and electric supply manufacturers, London, England, died in that city on March 29. Mr. Blackwell was born in New York City on Jan. 27, 1858. He was educated at Andover Academy; Princeton, class of 1879, and Columbia Law School, class of 1881. He was associated with R. R. Hazard in the Gramme Electric Company, a combination of all the early electric companies. He was also associated with Mr. Hazard and with W. B. Parsons in the first proposed underground railroad in New York. He was one of the organizers in 1883 of the Bentley-Knight Electric Company, of which he was president. This company built underground and overhead electric railroads in New York, Boston, Providence, Cleveland and a number of other cities. The Bentley-Knight Company was purchased by the Thomson-Houston Electric Company in 1888. Mr. Blackwell then went to England, where he formed the importing and contracting firm of R. W. Blackwell & Company, which built the first electric railways in England and equipped them with American apparatus. In all, some fifty roads were built by the firm, the last important work being the electrification of the London, Brighton & South Coast Railway in order to increase its capacity as a supply line to the war front in France. Both R. W. Blackwell & Company and Johnson & Phillips have been active in furnishing munitions to the British government since the beginning of the war. Mr. Blackwell is survived by his widow, Lillian Rogers Blackwell.

Construction News

Franchises

Bessemer, Ala.—The Alabama Interurban Corporation has asked the City Council for a franchise to construct a line in Bessemer, in connection with its proposed line from Birmingham to the Warrior River. Thomas L. Cannon, Birmingham, president. (March 23, '18.)

Newark, N. J.—The Public Service Railway has asked the City Council of Newark for a franchise to construct an extension of its line in Hamburg Place to the Submarine Boat Corporation's shipyard at Port Newark terminal.

Lockport, N. Y.—It is reported that the Niagara River & Eastern Railway will renew its application to the Public Service Commission for the Second District of New York to build a double-track line from Lockport to Niagara Falls. The petition of the company was denied by the commission two years ago. The plans of the company included the acquisition of the Buffalo, Lockport & Eastern Railway and the double-tracking of the line. E. G. Connette, president of the International Railway, was reported interested in the Niagara River & Eastern Railway. (Dec. 9, '16.)

Dallas, Tex.—The City Commission of Dallas has granted the second six months extension to the Dallas Railway for beginning construction on the new 30-mile interurban provided for in the franchise given the company last year. The first extension was granted Oct. 1, 1917, and at that time it was tentatively agreed that if war conditions continued other extensions would be granted until financial difficulties in promoting the new interurban could be easily overcome. A second interurban line must be constructed, under the terms of the franchise, when the earnings of the company reach a certain point. The traction company is under $200,000 bond as a guarantee that the interurban lines will be built.

Track and Roadway

Clear Lake Suspended Monorail, Company, Hopland, Cal.—The government committee has granted the application of the Clear Lake Suspended Monorail Company for the issuance of $500.000 in bonds for the construction of its proposed line from Hopland to Lakeport. G. L. Hardison, San Francisco, is interested. (March 2, '18.)

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by the Pacific Electric Railway on the double-tracking of its line from Long Beach to San Pedro.

United Railroads of San Francisco, San Francisco, Cal.—Taxed with not affording sufficient transportation to the Union Iron Works, the United Railroads has offered to build a mile of temporary track over Army Street. This, it was agreed, would solve most of the difficulties. Mayor Rolph has asked the engineers of the city and the company to get busy at once and in the meantime the attorneys are to draw up an agreement whereby the city can take over the temporary tracks at their value any time it desires.

Washington-Virginia Railway, Washington, D. C.—The construction of an extension from Mount Vernon to Camp Humphrey, 4 miles, is being considered by the Washington-Virginia Railway.

***Tamiami Railway, Miami, Fla.**—Work will be begun by the Tamiami Railway on the construction of an electric line between Miami and the Curtiss aviation school, now a government marine aviation camp. The line will be a part of the proposed steam railway between Miami and Fort Myers. J. F. Jaudon, Miami, is interested.

St. Petersburg-Tampa Railway, St. Petersburg, Fla.—Work will be begun about May 1, by the St. Petersburg-Tampa Railway on the construction of a 6-mile bridge across Old Tampa Bay in connection with its proposed 20-mile line from St. Petersburg to Tampa. The cost is estimated at $1,000,000. George S. Gandy, Sr., St. Petersburg, president. (Nov. 24, '17.)

Frankfort & Shelbyville Traction Company, Shelbyville, Ky.—The Frankfort & Shelbyville Traction Company, which proposes to construct an electric road between Frankfort and Shelbyville, 20 miles, has placed on the market an issue of $175,000 cumulative 7 per cent preferred stock, with shares of the par value of $100. The full issue authorized is $250,000. Dividends are payable June 1 and Jan. 1. The stock is redeemable on any dividend date after Jan. 1, 1923, at 105 and accrued dividends. The total capitalization of the company is $500,000. Half of this is common stock. The stated limited liability is $1,000,000. The money realized from the sale will be used as working capital for the company during the construction period and for part payment of construction work. First mortgage bonds amounting to $600,000 will be presently issued. The company was inaugurated in 1917 in Kentucky with a ninety-nine-year franchise and no burdensome restrictions. The line will connect the Kentucky Terminal & Traction Company and the Louisville & Interurban Railway Company at Shelbyville, thus affording through electric passenger and freight service from Lexington and the Bluegrass country to Louisville. A survey of the line is now being made. It is proposed to build the road throughout with rock ballast. Pending the construction of their own power plant the company will purchase power from a near-by central station. The cars will be of the modern interurban type. L. G. Smith, Shelbyville, president. (Dec. 8, '17).

Mattawamkeag & Northern Railway, Bangor, Me.—Application has been made by the Mattawamkeag & Northern Railway to the Public Utilities Commission of Maine for a three years' extension of its charter to construct a line from Mattawamkeag to Millinocket and East Millinocket, 23 miles. George W. Stearns, Millinocket, and Artemus Weatherbee, Lincoln, interested. (Nov. 13, '15).

Detroit (Mich.) United Railway.—An extension will be built by the Detroit United Railway to the Ford plant on the River Rouge.

Kansas City (Mo.) Railways.—This company reports that it is rearranging and adding to its tracks at Forty-eighth Street and Harrison yards. The company will construct an extension of its crosstown line from the North Liberty Street terminus to Sugar Creek.

International Railway, Buffalo, N. Y.—E. G. Connette, president of the International Railway, recently informed the City Council at a public hearing that the company's line on Bailey Avenue between Genesse Street and Broadway and between Kensington and Delavan Avenues will be completed this year if the company can finance the proposition, which will cost $260,000.

Long Island Electric Railway, New York, N. Y.—Owing to the improvement of Rockaway Turnpike from Hook Creek to Broadway, Lawrence, through service has been discontinued temporarily on the line of the Long Island Electric Railway between Jamaica and Far Rockaway. A new steel bridge is being built over Mott Creek to replace the old bridge.

Portland Railway, Light & Power Company, Portland, Ore.—Work will be begun immediately by the Portland Railway, Light & Power Company repairing its tracks on Second Street, between Madison and Flanders Streets.

Philadelphia, Pa.—Mayor Smith of Philadelphia on April 4 made a plea to the Government for permission to complete the Frankford elevated line, after a conference at which he received reports from the heads of the city departments giving the status of all public works under construction which are affected by Secretary McAdoo's work-stoppage order. Copies of the reports, together with a detailed account by W. S. Twining, Transit Director, of the work on the elevated line and the necessity for its completion now, were forwarded to the capital-issues committee of the Treasury Department, which has charge of the matter.

Montreal & Southern Counties Railway, Montreal, Que.—An agreement has been concluded between the Montreal Tramways Company and the Montreal & Southern Counties Railway, by which a loop will be constructed around the terminal station of the Southern Counties Railway, involving the crossing of the Montreal Tramways Company's lines, to enable a more speedy handling of the cars.

Charleston-Isle of Palms Railway, Charleston, S. C.—It is reported that the Charleston-Isle of Palms Railway will construct an extension from the Mount Pleasant ferry wharf to the shipyard site at Remley's Point, 2½ miles.

Dallas (Tex.) Railway.—The Dallas Railway, the consolidated street car lines under the Strickland-Hobson service-at-cost franchise, is now carrying forward much improvement work under the provisions of its franchise which authorize the expenditure of $1,000,000 in betterments and extensions. These include the purchase and installation of many electrically-driven machines designed to save labor and facilitate the work of making repairs and maintaining track and equipment. An electric track drill, an electric spike driver, an electric bonding machine and an electric tie tamper are among the new machines installed. The new tie tamper does the work of twenty men. Gravel is being hauled by electric trains at a cost of 75 cents per cubic yard below the cost of hauling in wagons with teams. Much new equipment has also been purchased and the arrival of the following materials is reported: Twenty carloads of cross ties, twenty carloads of steel rails, one carload of spikes, three carloads of special track material, consisting of frogs, curves, etc. Shipment of the following material is also reported: Thirty carloads of steel rails, forty carloads of cross ties and fifteen carloads of special track material.

Houston, Richmond & Western Traction Company, Houston, Tex.—It is reported that the bonds of the Houston, Richmond & Western Traction Company have been sold to Howard Kenyon, Houston, who has the contract for the construction of the company's line from Houston to San Antonio, 186 miles. Ed. Kennedy, Houston, president. (Feb. 16, '18.)

Bamberger Electric Railroad, Salt Lake City, Utah.—A report from the Bamberger Electric Railroad states that the company plans many improvements at its Lagoon resort, which include a new $14,000 merry-go-round, a 1-mile double-racing coaster, new bath houses, concreting of three bath pools and the construction of a mammoth sand beach.

Seattle (Wash.) Municipal Street Railway.—C. B. Bagley, Secretary, Board of Public Works, is receiving bids for the furnishing of labor, material, tools and equipment for driving capping and bracing the pile supports for the municipal elevated railway along Railroad Avenue, from Washington Street to Holgate Street. About 200,000 lin.ft. of piling will be required, the bulk of the piling to be untreated. Piers supporting the twelve wooden trusses across the street crossings will be creosoted piling. A station platform with covered shelter and stairways leading to the streets below is provided about every 1000 ft. on the completed railway. The trestle will be 13 ft. wide and 2¾ miles long. The first section will cost about $30,000 to $40,000. Other calls for bids will be issued for the trestles and ties as fast as certain stretches of the piling substructure work is completed. The construction of the line will be pushed as rapidly as possible. F. A. Rapp, assistant city engineer, in charge of bridge construction, states that bids for the work will be let in sections. It is expected that line will be completed within six to eight months. The State of Washington recently offered to buy the $350,000 in bonds issued for the elevated railway line, and the City Council has voted to accept the offer.

Shops and Buildings

Gadsden, Bellevue & Lookout Mountain Railway, Gadsden, Ala.—A report from the Gadsden, Bellevue & Lookout Mountain Railway states that within the next three weeks it expects to construct a new carhouse 50 ft. x 140 ft.

Pacific Electric Railway, Los Angeles, Cal.—It is reported that the Pacific Electric Railway contemplates the construction of a new passenger station at San Pedro.

Boston (Mass.) Elevated Railway.—Fire on April 7 completely destroyed the wooden section of the Clarendon Hill carhouse of the Boston Elevated Railway, located in West Somerville, together with thirty-five open cars and five of the semi-convertible type, sixteen snowplows and thirty-five box cars. The loss is estimated at about $250,000.

Kansas City (Mo.) Railways.—A report from the Kansas City Railways states that the company is constructing an addition to its carhouse at Forty-eighth and Harrison Streets, 75 ft. x 114 ft., to be used as a shelter for car repairs.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—This company reports that it expects to construct a new carhouse.

Philadelphia & West Chester Traction Company, Upper Darby, Pa.—A new freight and passenger station will be built by the Philadelphia & West Chester Traction Company at Gay and Walnut Streets, West Chester.

Montreal & Southern Counties Railway, Montreal, Que.—A new passenger and freight station will be built by the Montreal & Southern Counties Railway on Youville Street. The building will be three stories, constructed of steel, concrete and pressed brick.

Power Houses and Substations

New York, New Haven & Hartford Railroad, New Haven, Conn.—A contract has been awarded by the New York, New Haven & Hartford Railroad to C. W. Murdock, New Haven, for the construction of a one-story electric battery building, about 20 ft. x 140 ft., at Dover, near Boston.

Maryland Electric Railways, Annapolis, Md.—A contract has been awarded by the Maryland Electric Railways to the Cogswell-Koether Company, Baltimore, for the construction of a new two-story brick substation at Linthicum Heights.

Kansas City (Mo.) Railways.—A report from the Kansas City Railways states that the company has purchased twenty underfeed stokers, two boiler feed pumps, one locomotive crane and one feed water heater.

Southern Public Utilities Company, Charlotte, N. C.—The Southern Public Utilities Company contemplates increasing the generating capacity of its power plant.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—A report from the Hocking-Sunday Creek Traction Company states that it has purchased a large rotary converter set to be delivered this month. A new substation will be built by the company.

Lehigh Valley Transit Company, Allentown, Pa.—An order has been placed with the General Electric Company, Schenectady, N. Y., by the Lehigh Valley Transit Company for a style A interlocking machine to be installed at Easton, Pa.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C.—A new 500-kw. rotary substation is being built by the Charleston Consolidated Railway & Lighting Company near the navy yard for the purpose of supplying direct current to the suburban railway.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Plans are being prepared by the Puget Sound Traction, Light & Power Company for the construction of coal bunkers for its coal pulverizing plant at 1316 Western Avenue. The improvement will cost about $17,000.

Monongahela Valley Traction Company, Fairmont, W. Va.—Surveys are being made by the Monongahela Valley Traction Company for the erection of a high-tension transmission line from the Speedway to the new electric power plant at Rivesville.

Ashland Light, Power & Street Railway, Ashland, Wis.—Plans are being made by the Ashland Light, Power & Street Railway for the construction of a new hydroelectric plant at Superior Falls, to cost about $100,000. The L. E. Meyers Company, Chicago, is in charge of the work.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Trolley Cord Advancing With High Price of Cotton

Within a Year the Cost Has About Doubled—The Latest Increase—Stocks Low

With the fluctuations in cotton every article using the material to any extent—there are a number in the electric railway line—is affected. This has been going on since the beginning of the war, and to-day the principal raw material of cords of all kinds is going higher. For nearly a year the cost of trolley cord, bell and register cords has been on the upward trend. Within the last twelve months trolley cord, that sold for about 45 cents a pound, has advanced to from 75 cents to 80 cents a pound. The last advance of 8 per cent was made inside of a month.

Manufacturers and sales agents, describing conditions, said cord—trolley, bell and register—which is of a superior quality, to withstand the hard wear and tear of careless and trying usage—was subject to the uneasy and changing situation of cotton. The price is jumping in sympathy with this state of affairs. Wednesday cotton was from 28 to 36 points higher than on the previous day, making a new high record. Manufacturers are therefore obliged to pay stiff figures for their material, and, consequently, to reflect the views of large handlers of trolley cord, another increase in price would not be surprising. Stock is none too plentiful and deliveries are far from prompt.

Brush-holders Likely to Be Advanced in Price

Additional and Repeated Increased Cost of Castings and High Wages the Cause

A manufacturer of brush-holders who has had the price of his casting advanced 3 cents a pound several times recently, says he is very much inclined to pass this extra cost along to the selling agency and the ultimate consumer. As a brush-holder weighs about 5 lb. the castings price runs into money. Improved machinery for stamping slots, whereby six are stamped at one operation as against one before, has reduced the cost of production slightly; but this is offset by the increase to almost double the wages formerly paid the skilled mechanics employed. Other overhead charges have also added materially to the cost.

In relating these facts the chief of an Eastern railway supply house specializing on brush-holders, and handling the aforementioned manufacturer's product, stated that under the circumstances an advance in price would be justified and doubtless will be shortly announced. If the producer marks up his goods, added the supply man, the higher figure will naturally be added on the seller's quotation. Deliveries to near-by points were prompt, but were behind to the Middle West, South and New England.

Car Curtain Specialties Gradually Going Higher

Pantasote to Be Marked Up April 20—Rollers and Metal Fixtures Also Advance

Railway supply men, when asked if an advance in price on the material or accessories or machinery they handle had been made, almost invariably answer "things are about at peak, and can hardly go higher." Notwithstanding this encouraging attitude prices are still going higher particularly where cotton is a basic staple. One of the latest products to advance is car curtain materials. While the preliminary announcement has been sent out to the second line manufacturers and sales agents of an advance in the price on pantasote of 5 per cent, the increase does not become effective until April 20. Agasote, another product of the Pantasote Company, used for car headlining, was marked up 10 per cent within a month. Factory deliveries are fairly good.

Car curtain self-acting spring rollers, inside of a year or so, have gone up 125 per cent, although the last increase was made in January. Several manufacturers of car curtains stated they were not consulted by customers as a rule. The railways, in buying passenger cars, designate the curtain material to be used, whether pantasote, peppercorn or what not, and their choice is mandatory. In fact, as one widely-known concern stated its case, "we would make curtains of calico if they were specified." With the revised cost of pantasote a higher figure will also be established on the above date for car curtains of that material.

Likewise, with the scarcity of tin and the high cost of brass no surprise would be expressed if an increase in the cost of curtain fixtures were to come along. With the past rapid jumps in the price of curtain rollers no one pretends to deny that if a further revision on a higher level were to be forthcoming it would be only in keeping with market tendencies.

To Prevent Confusion in Government Ordering

Requirements Division Created to Collect All Purchasing Information, With Special Sections for Separate Commodities

A new plan of organization of the War Industries Board has been undertaken, the general purpose of which is to prevent confusion and conflict in the ordering and delivering of supplies and to secure unification of the government's policy in dealing with industrial problems. The essential change involved is the creation of a requirements division to which will be furnished information on all contracts, purchases and deliveries, and to which the supply divisions of the purchasing departments and the Allied Purchasing Commission will as far in advance as possible submit statements of their respective needs.

To take charge of particular problems of supply there have been created special commodity sections, and whatever necessary to handle raw materials or finished products of which there is an actual or threatened shortage or the price and production of which should be controlled new sections will be created by the chairman of the War Industries Board. It is the purpose of the chairman of the War Industries Board to make each of the section heads the sole government agency for dealing with the industry for which his section is responsible.

The chief of the commodity section will study the problem referred to his section and will procure from all available sources, including the supply departments, information and data which will be helpful in the allocation of these requirements. At meetings of the commodity section the allocation of materials or facilities to meet the requirements will be determined.

In addition the commodity sections they will consider from time to time the extent of the existing sources of production, the creation of new facilities, the disclosure—if necessary, the opening up—of additional sources of supply, and the conversion of existing facilities to new uses.

Each commodity section will consider market conditions pertaining to the materials or commodities over which it has jurisdiction and will, where deemed advisable, recommend purchase plans to the several purchasing departments. In cases where it becomes necessary to control an industry in whole or in part by means of allotments, the appropriate section will determine the allotments of materials, commodities and facilities to the several departments of this government and to its allies, and also the extent to which manufacturers and others, whether serving the civilian population or engaged in the manufacture of war supplies, shall be supplied.

Asphalt Paving on an Advancing Market

Nearly Every Month Prices Have Been Revised—Still Another Increase Is Expected Shortly

Paving material, used largely in city railway construction work particularly, is reflecting the general tendency of the times by increased cost. Asphalt is one of the most important in this line, and importers of the raw material testify to the uncertainties of the market. The greatest percentage of asphalt comes from the island of Trinidad, one of the West Indies off the north coast of South America. Its production and supply is in the hands of practically a monopoly. The concession is held by an American company, and in discussing conditions this week one of the leading officers said that for some time asphalt had been commanding a higher price, and a further increase could be reasonably anticipated. Scarcity of tonnage for regular shipments, heavy freight charges and absorption for government work is responsible for the shortage and consequent high selling cost.

This authority also stated that last month asphalt had gone up $2 a ton. It meant where previously $36 was the price it was now $38 a ton, in minimum lots of 150 tons, for "hot" asphalt. "Cold" asphalt, in the same quantity, with packages weighed in f.o.b. plant in New Jersey, was $42 a ton against the former price of $40. Another increase was expected next month. Asphalt filler, which follows the primary product, is now quoted at $48 a ton.

Dumping Cars for Excavation Work in San Francisco

The White Company, Cleveland, Ohio, reports that White 5-ton power dumping cars have been used extensively in the excavation work for the Twin Peaks Tunnel in San Francisco. This tunnel is being constructed for use by the cars of the Municipal Street Railway. In this construction work one White truck, in service twenty months on a sixteen-hour schedule, covered 34,000 miles. Another on the same time ran 35,500 miles. Two others in service ten months, for twenty-four hours a day, registered mileages of 15,000 and 16,000. The dumping trucks were used to haul rock blasted from the tunnel and to bring up supplies. Inside the tunnel mules were employed to haul out the material. Later White trucks with special bodies and flanged wheels for running on rails were substituted for this inside work, in addition to the fleet used for general construction purposes.

Rolling Stock

Kansas City (Mo.) Railways recently purchased 100 National Pneumatic door-operating equipments.

Sheffield (Ala.) Company is reported as having bought a number of open trail cars from the North Alabama Traction Company, Albany, Ga.

International Railway, Buffalo, N. Y., is reported as having ordered thirty new cars from the G. C. Kuhlman Car Company.

Gadsden, Bellevue & Lookout Railway, Gadsden, Ala., within a month will be in the market for two open ten-bench cars and two closed cars, second-hand.

Brooklyn (N. Y.) Rapid Transit Company has ordered 220 sets of Gould slack adjusters from the Railway Utility Company. These are to be applied to the company's semi-convertible cars having Peckham 14D5 trucks.

Washington Railway & Electric Company, Washington, D. C., has placed an order for twenty-five new cars with the J. G. Brill Company as referred to in the ELECTRIC RAILWAY JOURNAL of March 23.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has placed an order with the St. Louis Car Company for twenty-five single-truck one-man cars, mention of which appeared in the ELECTRIC RAILWAY JOURNAL of March 30.

Springfield (Mo.) Traction Company's order for twelve new one-man cars, placed with the American Car Company, referred to in the ELECTRIC RAILWAY JOURNAL of March 30, comprises the following specifications:

Number of cars ordered	12
Name of road	Springfield Traction Co.
Builder of car body	American Car Co.
Type of car	Double-end safety motor
Seating capacity	32
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Height, rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	None (rafter finish)
Roof	Arch
Air brakes	Westinghouse Traction Brake Co.
Axles	J. G. Brill Co.
Bumpers	American Car Co.
Car trimmings	Dayton Mfg. Co.
Control	West. K-63
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Hunter illuminated
Door operating mechanism	Am. Car Co.
Fenders or wheelguards	H. B. Life Guards
Gears and pinions	West. Elec. & Mfg. Co.
Hand brakes	Am. Car Co. with standard drop brake handle
Heaters	Peter Smith
Headlights	Golden Glow
Journal boxes	J. G. Brill Co.
Lightning arresters	West. Elec. & Mfg. Co.
Motors	G. E. 506-AN-2
Motors	Inside hung
Sanders	Elec. Service Supplies Co.
Sash fixtures	Dayton Mfg. Co.
Seats, style	Waylo light-weight reversible
Seating material	Birch, veneer and rattan
Springs	J. G. Brill Co.
Step treads	Feralun
Trolley catchers or retrievers	Elec. Service Supplies Co.'s
Trolley base	West Elec. & Mfg. Co.
Trolley wheels or shoes	West. Elec. & Mfg. Co.
Trucks	Brill 78-M-1
Ventilators	Utility Honeycomb
Wheels	24-in. cast spoke

Richland Public Service Company, Mansfield, Ohio, on April, it is reported, took over the property of the Mansfield Public Service & Utility Company, and has placed orders for several new pay-as-you-enter cars. The merger, reports say, was approved by the Ohio Public Utilities Commission.

Hudson & Manhattan Railroad, New York, N. Y., mentioned in last week's ELECTRIC RAILWAY JOURNAL as about to construct a spur or new line from Newark, N. J., to the Port Newark Terminal, the site of the new shipyards, and purchase additional all-steel rolling stock equipment, being under government control, must be officially financed before the plan can be put into effect. In the meantime the proposition is held in abeyance, and as soon as the matter is finally determined the order for cars will be placed and the work pushed to completion on a special rush schedule.

Lehigh Valley Transit Company, Allentown, Pa., recently placed in service twelve new double-truck center-exit and entrance cars built by the J. G. Brill Company, at a cost of $10,000 each, reference to which was made in the ELECTRIC RAILWAY JOURNAL a year ago. An immediate inquiry was made for a quotation on twenty additional cars of the same type. The figure submitted to the Lehigh Valley Company was $15,000, which was so surprising that the proposal was withdrawn at once. In normal times such cars cost about $6,500.

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., which ordered seven new one-man cars, from the American Car Company, St. Louis, Mo., as mentioned in the ELECTRIC RAILWAY JOURNAL of March 30, furnishes the appended specifications:

Number of cars ordered	7
Name of road	Central Arkansas Railway & Light Corporation
Builder of car body	American Car Co.
Type of car	Double-end safety motor
Seating capacity	32
Length over bumpers	27 ft. 9½ in.
Length over vestibule	26 ft. 9½ in.
Width over all	8 ft. 0 in.
Height, rail to trolley base	12 ft. 6 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	None (rafter finish)
Roof	Arch
Air brakes	General Electric
Axles	J. G. Brill Co.
Bumpers	American Car Co.
Car trimmings	Dayton Mfg. Co.
Control	K-63-B
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Destination signs	Hunter Illuminated
Door-operating mechanism	Am. Car Co.
Fenders or wheelguards	H. B. Life Guards
Gears and pinions	General Electric
Hand brakes	Am. Car Co. with Pittsburg drop handle
Heaters	Peter Smith
Headlights	Golden Glow
Journal boxes	J. G. Brill Co.
Lightning arresters	General Electric
Motors	2 G. E. 258
Motors	Inside hung
Registers	International Register Co.
Sanders	Electric Service Supplies Co.
Sash fixtures	Dayton Mfg. Co.
Seats, style	Waylo reversible seats
Seating material	Birch wood, veneer and rattan
Springs	J. G. Brill Co.
Step treads	Feralun
Trolley catchers or retrievers	Electric Service Supplies Co.
Trolley base	General Electric
Trolley wheels or shoes	General Electric
Trucks	Brill 78-M-1
Ventilators	Utility Honeycomb
Wheels	24-in. cast spoke

Trade Notes

H. W. Johns-Manville Company, New York, N. Y., has opened a new branch office at 1015 A Street, Tacoma, Wash. This branch carries a complete stock of asbestos packings, molded and in sheet form, and other well-known Johns-Manville power-plant specialties.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has moved its service department from Amberson Avenue to new quarters at 6905 Susquehanna Avenue, in the Homewood district of the city. Express and freight should be consigned to East Liberty, Pa., via Pennsylvania Railroad.

Railway Improvement Company, New York, announces that it has received an order for Rico Anti-Climbers to take care of the 100 new cars for the Philadelphia Rapid Transit Company's Hog Island service, specifications for which cars were published on page 552 of the ELECTRIC RAILWAY JOURNAL March 16.

Economy Electric Devices Company, Chicago, Ill., has recently sold the Dayton, Springfield & Xenia Southern Railway Company, Dayton, Ohio, Sangamo Economy electric railway meters for use in an energy-saving campaign. These devices will be used on all city and interurban cars of this railway.

W. Nelson Nib Smith, for a number of years electric traction engineer with Westinghouse Church Kerr & Company and recently efficiency engineer for the American Agricultural Company, has become connected as an electrical engineer with Sidney E. Junkins & Company, engineers and constructors at Vancouver, B. C.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has recently secured the services of G. W. Bichlmeir, formerly connected with the supply departments of the Missouri Pacific and Kansas City Southern Railway companies. Mr. Bichlmeir joins the Zelnicker machinery department.

New Advertising Literature

George W. Fleming Company, Springfield, Mass.: Illustrated circular descriptive of the company's "Combination Lathe, Boring and Milling Machine."

Diamond Power Specialty Company, Detroit, Mich.: Bulletin No. 119, illustrated in two colors throughout, is a review of current mechanical soot blower practice.

Spray Engineering Company, Boston, Mass.: Bulletin No. 202 describes the Spraco system for cooling condensing water and gives illustrations of some installations.

Ingersoll Rand Company, New York, N. Y.: Booklet describing its products and giving a list of the uses of compressed air. Valuable engineering data and information are also presented in the booklet.

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletins No. 236 listing and describing rails, locomotives, cars, machinery and other railway equipment and material.

Economy Electric Devices Company, Chicago, Ill.: Bulletin No. 50 describes construction of Economy meters and advantages to be derived from checking energy used in car operation.

Automatic Reclosing Circuit Breaker Company, Columbus, Ohio: Bulletin No. 30, illustrated, entitled "Automatic Reclosing Circuit Breakers and Relays" for the protection of direct-current circuits—general description, theory and application.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Bulletin entitled "The Further Prospect of Railroad Electrification." A discussion of the cost and advantages of railroad electrification is made in the bulletin.

Otis Elevator Company, New York, N. Y.: A bulletin referring to its skip hoists, which are automatically operated. Different types of skip hoists, their layout, and some typical installations in manufacturing plants, coal and coke plants, gas, electric light and power stations are shown.

Westinghouse Traction Brake Company, Pittsburgh, Pa.: The industrial department has issued an illustrated, copyrighted 6-in. x 9-in. booklet, desigignated as publication No. 9035, 113 pages, describing in detail its complete line of motor-driven compressors, both stationary and portable installations, ranging in capacities from 11 to 110 cu. ft. Compressed air accessories for doing almost every possible job of work are included.

NEW YORK METAL MARKET PRICES

	April 3	April 10
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26½	26¼ to 26½
Lead, cents per lb	7.20	7
Nickel, cents per lb	50	50
Spelter, cents per lb	7¼	7
Tin, Straits, cents per lb	*85	*85
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

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* Nominal. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	April 3	April 10
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6¼	6¼
Zinc, cents per lb	5½	5¼
Steel car axles, Chicago, per net ton	$42.41	$41.52
Old carwheels, Chicago, per gross ton	$30.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$35.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$17.00	$16.50

ELECTRIC RAILWAY MATERIAL PRICES

	April 3	April 10
Rubber-covered wire base, New York, cents per lb	27 to 30	30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	28¼ to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	8	8
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95

	April 3	April 10
Car window glass (single strength), first three brackets, A quality, New York, discount	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount	79%	79%
Car window glass (double strength, all sizes AA quality), New York, discount	80%	80%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	12½ to 13	12½ to 13
Asphalt, hot (150 tons minimum), per ton, delivered	$38	$38
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42	$42
Asphalt filler, per ton	$45	$45
Cement (carload lots), New York, per bbl	$2.65	$2.65
Cement (carload lots), Chicago, per bbl.	$2.71	$2.71
Cement (carload lots), Seattle, per bbl.	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.60	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	42½	41

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* Government price.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, April 20, 1918 *Number 16*

What Is a "Reasonable Rate of Return," Now?

TO SPEAK of the rate of return—because we are all speaking of it these days when much financing is being done on a 7 per cent basis—it is interesting to read the following in an official notice from the acting commissioner of internal revenue in regard to the return for special excise taxes on companies organized in the United States: "It has been found upon examination of returns of net income of a large number of different classes of corporations listed on an exchange that they earn approximately the following rates in order to make their stock worth par." Then follows the rates for various kinds of business, including 8 per cent for public utilities.

In Doolittle's book on "Cost of Urban Transportation Service, the average showing of 975 companies in 1912 was given as 4.90 per cent on interest-bearing debt and 2.64 per cent on capital stock. The showing made by sundry manufacturing concerns was also quoted, the percentage of profit to investment ranging in several cases to more than 40 per cent.

A recent report on Boston conditions says: "Nothing better illustrates the difference existing between various types of big business, perhaps, than the fact that a threatened possibility of limiting some of the big industrials to 'cost plus 10 per cent profit' sends the stock market tumbling down, while a like profit to a traction company would probably start an investigation looking toward a reduction in fares."

For some reason the public has the idea that utilities are not bound by the inexorable laws of trade. That is foolish. Utilities must have a rate of return sufficient to attract new capital. The safer such a return is, the lower it should be. But the people want a low return without safety. Such a policy means disaster, and commissions ought so to aver.

Of Course Business Men Approve

The Chamber of Commerce of the United States is composed of men with a keen sense of practical values. They know how to listen to facts and give prompt decisions in accordance therewith. The business men of the country were running true to form when last week in Chicago they adopted the following resolution:

> ***"The Chamber of Commerce of the United States recommends to state and local authorities that they recognize the unusual and onerous conditions with which public utilities are contending, and that in the interest of the nation, of business and of the public they give prompt and sympathetic hearing to the petitions of such utilities for assistance and relief."***

We are glad that another ally has joined the forces of those fighting for utility preservation. Most of the commissions are courageously trying to do their duty, but the public must be made to feel more deeply the nation's need for utility maintenance and extension.

Has Municipal Ownership Lost Its Charm?

WITH federal control of the steam railroads, one would think that the time would be propitious for the municipal ownership advocate again to demand that the municipalities take over the local trolley lines. Actually, there seems to be comparatively little talk of this kind outside of New York State, where there has been a rather feeble effort to get the subject into politics. Of course, the request of the federal government that the municipalities should keep down to the minimum their construction projects and the high rate of interest which the municipalities have to pay now on any new securities issued probably have had a great deal to do with this abatement of interest. But we believe a more effective factor has been the better understanding that local trolley systems are not money makers.

When the electric railways were considered financially profitable there was a great cry that the city ought to own them. Now that conditions are such that they are paying only a very low rate of return upon their investment, the glamor about them seems to have passed away. Nevertheless, they are the same properties that they were before, consisting of the same rails, cars, wires, power stations, etc., as when coveted by the M. O. advocates.

Most electric railways owners, we believe, would be much pleased to get out whole from their properties and sell them to the city for the money actually invested in these properties. As a matter of self-interest, they could very properly agitate for city purchase. But the experience of the last few years has shown that an electric railway is a hazardous undertaking financially, and raises the question whether a city has any right to invest large sums from the municipal treasury in an enterprise which may not be a financial success.

Free the Nickel Fare from Non-Transportation Charges

"IF A STREET RAILWAY is required to pay a sum greater than is actually required to repair the pavements that have actually been deteriorated by its presence, the real result is that the car riders are paying a tax which should be borne by the community."

In these words, the Street Railway Investigation Commission of Massachusetts in its recent report on electric railway problems calls attention to a factor which has an important bearing on the cost of transportation. The commission goes so far as to recommend the passage of an act requiring these companies to maintain in good repair, but not to renew or replace, the paving between the rails and tracks and, in the case of streets otherwise unpaved, for 18-in. outside the rails. The commission also recommended that if an alteration is made in the location of tracks in highways, no portion of the expense of such changes shall be borne by the company, except when the alteration is made upon petition of the company.

With the renewal of franchises in various cities and a growing demand for the adoption of the partnership principle in such contracts, the importance of freeing the nickel fare from such charges is appreciated more and more. The same applies to other public burdens, such as cleaning the right-of-way and restoring tracks which have been disturbed for the construction of sewers and other underground improvements being installed by the city. That these items are not inconsiderable may be judged from a statement made by one of the larger companies some time ago, showing that the expenditure, made by it for non-transportation charges during eight years, represented a charge for interest and operating expense of more than $600,000 per year.

The property of an electric railway company, when laid in the street, is entitled to the same protection as any other property. If some other utility is being constructed in the street, and during this work it is necessary to destroy a part of the property of the electric railway, the value of the property so destroyed should be considered as a part of the cost of such other utility and the railway company reimbursed to the full amount of its damage and expense. The patron who pays a nickel for a car ride is entitled to a nickel's worth of transportation, and in large cities where the cost of rendering the service is constantly increasing, it will be necessary when the contract relations of the city and the company are being readjusted to provide that the entire fare shall, if necessary, be used for transportation purposes.

The special Massachusetts commission asks whether it is fair to require the person who rides in the street car to pay some of the taxes which should be paid by the automobile rider. It points out that local authorities can reduce the tax rate in their municipality by this expedient, and that there is little doubt but that it has been done to some extent in the past. The same point was made in the Bay State fare case, where the commission declared that any burden imposed on the company must ultimately be paid by the people. The Oregon commission in the Portland Railway case evidently had the same views when it said: "The question then arises as to whether this paving should be installed and maintained by the car rider when, as such, he derives no benefit therefrom, or whether the burden should be borne by the abutting property owner who enjoys not only the benefit of the paving, but any advantage which may accrue from the proximity of the car service."

If the people of a community want to keep down the rate of fare they should see to it that non-transportation charges are carried by those who benefit most from them.

"Bunghole Economy" and the Electric Railways

THE big idea, which the general movement for increased revenues for the street railways has driven home, is "value of service." Getting to work means more in war times than it used to mean in peace times. It means more to the government in results of the work; it means more to the workmen in wages.

In the earliest days of the movement for 6-cent fares, the objectors' sole thought seemed to be to avoid the payment of an added cent of fare. They gave no thought to the idea that unless the railways got the added cent they could not meet their rising costs, that service would have to be cut down. It seemed to be taken for granted that the cars would keep on running, and that the only difference would be that the "swollen profits" of railway magnates would be reduced. It was a general attitude of "we should worry."

But the public's eyes are opening to the fact that the real thing at stake is service—not only the old service, but the necessary new service. Countless factories have sprung up in outlying sections of cities everywhere, with a need for new lines.

The parallel between the case of the electric railways and that of the steam railroads is almost exact. Time after time the steam railroads applied to the Interstate Commerce Commission for increased freight rates, pointing out the need of greater revenues to provide more cars, more locomotives, more track and new terminals. Time after time their requests were denied Even before the war the equipment was suffering depreciation, and when the war actually came the railroads could not meet the huge new demands for service. No one can ever calculate what that unpreparedness has cost the community. The savings to the shippers on freight bills are infinitessimal compared to the loss in service now and the direct addition to costs for lack of it.

Let the householder who last winter had to pay from $9 to $10 (or more) a ton for coal do a little calculating. Say the average family in the average small house uses 10 tons of coal a year. At $7 a ton the fuel bill was $70. At $10 a ton it was $100, a difference of $30. There was more coal mined in 1917 than ever before, but there weren't enough cars, engines, tracks, etc., to handle the total freight, and the increased cost of coal arose principally from that fact.

Apply the same reasoning to all the things thus affected by the transportation trouble—food, furniture and supplies of all sorts. The staggering amount that it has cost the country not to keep the railroads in position to supply service becomes apparent. The millions saved by keeping down freight rates in 1910 and the following years have become billions in losses and in added prices of materials, due to lack of railroad service.

And so with electric railways. They, too, produce and sell transportation. The cent added to the car fare may cost one constant user of the trolley line $6 a year. The loss of value on his home on account of reduced trolley service might easily be one hundred times that. If the new factory were delayed a month in opening up each prospective workman in it would quickly be out more than the $6. Two days' delay in getting to the new job would cost him that and more.

New trolley lines cannot be built to-day to run on 5-cent fares. Cars that cost $6,000 last year, cost $10,000 or more to-day, and even at these prices they cannot be had in less than a year to two years. In Tacoma the cost of the municipally owned extension to a new industrial district forced the city recently to raise the fares to 10 cents.

The public is beginning to see that the important point is not the rate of fare—it is the service. When your child is ill you do not haggle over the cost of the doctor's services. You pay his bill. And, if it actually came to the question of having some doctor's services or not having any—you'd pay twice anything you had.

But there are many doctors. The services of other electric railway systems cannot be commanded by telephone.

These are the reasons back of the call of Secretary McAdoo, reinforced by the letter from President Wilson, to local authorities everywhere to treat the electric railway needs with an eye upon the service result. The government's experience with the railroads has taught most convincingly the lesson that it is the most flagrant uneconomy to pour cider out of the bunghole to save buying a spigot. That form of government economy has been scrapped. The case is no different with the electric railways, and the public is learning it.

Schools Should Utilize Educational Opportunities Afforded by Conventions

GREAT inventors are continually producing machinery and equipment of recognized value. Science is adding methods for manufacture and production that decrease the amount and expense of the labor necessary to turn out and maintain the equipment. The real benefits which can be derived from conventions may have escaped the ordinary citizens but they have not escaped the men responsible for railway operation and equipment manufacture. There is never a time during a convention that the special exhibits and new equipment are not crowded with attentive, thinking, inquiring railwaymen, and the sales of new equipment prove that these men go to conventions to learn of the latest and most efficient devices for getting the maximum output from their cars and the equipment necessary to operate and maintain them and they buy to improve their equipment.

It is the custom of our various institutions of learning to organize inspection trips for their students to visit large manufacturing plants, power stations and railway systems as a means of educating them in the duties they will be called upon to perform in the profession they have chosen. Why not make more use of our industrial exhibitions? There is no place where more desirable information and education can be obtained readily. Not only are the exhibits a great source of knowledge, but the technical papers presented and discussed present an exceptional educational opportunity.

What the Electric Railway Figures for the Year Show

REPORTS on the business of individual electric railways in various parts of the country are given each week in this paper, and other general statistics are presented from time to time. It was interesting, therefore, in the light of current financial and economic developments, to have an opportunity to study the more comprehensive figures for the year 1917 gathered by the information bureau of the American Electric Railway Association and published in detail in the issue of March 30. They represent for most of the data the returns from 8437 miles of line, or about one-fourth of the total mileage in the United States. For this reason they may be taken as fairly indicative of general conditions.

The story of rising costs of materials, supplies and labor is best told in the increased operating ratio. Even this does not present the full significance of the facts because it gives no credit for the efficient management which in many instances kept that percentage from mounting still higher. It is not surprising to learn that the largest increases occurred in the expenditures for coal and labor. The experience of the past winter will not soon be forgotten, and while the termination of the war probably will bring an appreciable relief on these two important items of cost the railway executive must take to heart the lessons of conservation which he has had opportunity to learn.

This annual summary of figures would be more encouraging if the increase in gross revenue meant a corresponding gain in net. There is no satisfaction to a management to know that it hauled more passengers during the year if that amount of business did not mean a gain in net earnings. When the contrary is true, one may not be blamed for asking "What's the use?" However, an indication of the tendency toward higher rates of fare is to be seen in the slightly increased average fare per revenue passenger. This may be taken as the most encouraging basis for a reply to the one who is inclined to ask whether the game is worth while.

Another indication of the tendency of the times is shown in the fact that the revenue car-hours increased to a greater extent than the revenue car-miles. On its face this would suggest lower speed, but it may result from the growing practice of having the car-hours represent not only running time but lay-over time and bonus time paid to employees in certain cities. At any rate it is the plainest evidence that transportation is costing the companies more than heretofore.

The information bureau of the association is carrying on an important work in gathering and publishing these figures monthly. It is to be regretted that more companies do not contribute information to this service. It represents the best kind of publicity data because these figures show in cumulative form a picture of the status of the electric railway industry which must impress the authorities to whom appeals for relief are constantly being made. The more complete the information published, the stronger will be this silent argument for corrective measures.

What the Way Department Finds It Must Do in the Spring

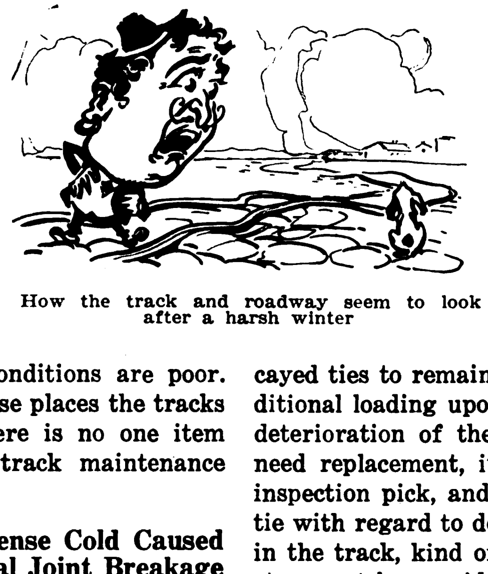
By R. C. Cram

Assistant Engineer Department of Way and Structure, Brooklyn Rapid Transit System

In Addition to Ordinary Wear and Tear the Track Needs Careful Maintenance, Especially in Drainage, to Repair the Ravages of Winter

SPRING is the season of the year when the way engineer, like the good housekeeper, begins to put his house in order. During the winter he has been busy fighting snow and the effects of frost, and making plans for the next season's work. Before the season has advanced far enough to permit the beginning of the big jobs, such as reconstructing, rerailing and general overhauling, which are in contemplation there is a large amount of work which must be done to overcome the ravages of winter.

Open tracks in private right-of-way suffer most from the action of the elements in winter. Drains and ditches become clogged; tracks heave from frost, and shims or "frost blocks" have to be put in during cold weather to keep the rails in fair surface because it is almost impossible to resurface the tracks by tamping when the roadbed and ballast are frozen.



How the track and roadway seem to look after a harsh winter

The extreme cold of winter also has its effect on tracks in paved streets, particularly in older tracks where the pavement may be of a kind having poor waterproofing qualities and in places where the surface drainage of the street in general and the subsoil conditions are poor. If track drains are not present in these places the tracks suffer greatly for this reason. There is no one item which has so great an effect on track maintenance as drainage or the lack of it.

Last Winter's Intense Cold Caused Unusual Joint Breakage

The winter just past has been one of the utmost severity, and it has left its mark on the track structure. The rails, especially those of tram girder and groove type perhaps fifteen to twenty years old, have suffered an unprecedented amount of breakage, mostly in the vicinity of joints. It is a quite well-known fact that intense cold has a tendency to render steel brittle and when a period of several months is encountered during which the temperature hangs around zero for weeks at a time, the rail steel is bound to suffer. The joint which has dropped most slightly has the effect of the drop greatly magnified, and the frozen ballast acts as an anvil upon which the cars pound the rails with direful results to the latter.

A long, very cold winter also prevents keeping up with joint maintenance to the reasonable degree which is possibly in an ordinary winter. As a result there is an extraordinary accumulation of defective rails and joints which the way department must try to overcome before the heavy business season arrives. This spring the situation is all the more serious because of the lack of men to put on in extra numbers in the attempt to get even with the game.

In open track, tie renewals impose the first and most important work upon the maintenance of way department. Commencing late in March or early in April, or as soon as frost has disappeared, the section gangs are usually increased in size and tie replacement begins. The work is ordinarily carried out upon a predetermined plan which has been made up by the roadmaster or supervisor, following an inspection during which ties needing renewal are marked by spots of paint.

In connection with the renewal inspections it will be found best to have them made by a regular tie inspector rather than to leave the question open to the judgment of the section foremen. The latter have a tendency to put in all the ties that are available regardless of the fact that some ties in the track may have a year or two of life still left in them. The matter is one requiring experience and judgment because, while ties should not be removed if still fit for some service, yet it is just as important not to permit badly decayed ties to remain in the track. Poor ties impose additional loading upon the good ties, causing more rapid deterioration of the latter. In determining what ties need replacement, it is worth while to use a standard inspection pick, and such items as the condition of the tie with regard to decay, wear, splitting, traffic, position in the track, kind of timber, condition of adjacent ties, etc., must be considered.

There has always been some question among track engineers as to which of the following methods of renewing ties is the better: (1) Single renewals ("spotting in"), or (2) renewals in continuous stretches ("out of face"). The relative values of the two methods have been considered to be as follows:*

> The advantages of single tie removals may be stated thus:
>
> 1. There are always several sound new ties under each rail, making a stronger and safer track.
> 2. A longer average life of tie is obtained, resulting in less waste of material.
> 3. Uniformity, year by year, of maintenance charges.
> 4. A better maintenance organization because the labor force is more nearly constant.
> 5. Tracks can be kept to more uniform gage.
>
> The disadvantages of single tie renewals are:
>
> 1. A continual disturbance of track with resultant irregularities of surface, the disadvantage being much greater where other fixtures, such as paved street crossings, interlocking plants, etc., must be disturbed.

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*From Willard's "Maintenance of Way and Structures," page 75.

2. A probable higher renewal cost per tie.
3. The requirement of a large amount of time of the section forces each spring in making tie renewals at a time when the track badly needs general attention.
4. Right of way is littered each year with new and old ties.

The following advantages may be claimed for renewals in continuous stretches:

1. Labor cost is less and at the time of renewing ties ballast can be cleaned by using forks and screens.
2. Roadbed is disturbed less frequently resulting in a more uniform support to the traffic.

The disadvantages of renewals in continuous stretches are:

1. The first year or two track is in better condition than by making single renewals. But from the time the renewals are made the condition of the track steadily deteriorates until the time comes, which is just before renewal should again be made, when the track contains no sound ties and is unsafe.
2. Because of the inequality of the life of the ties, even of the same wood, many ties which would last one, two or three years longer would be taken out and wasted. Therefore the average life of ties would be shortened.
3. Track eventually develops irregularities of gage which it is difficult to renew without placing a few new ties under each rail.

It has been found that the single-renewal method is the best for ordinary track conditions and this method is the one most used by the railroads throughout the country. Of course this does not prevent renewing adjacent ties when warranted, and generally it is good practice to renew both joint ties even if one is in somewhat better condition than the other. There are always times when it is best to renew ties "out of face" in such points as at highway crossings, station platforms, interlocking plants, special work, and narrow cuts and other restricted places. The "out-of-face" method also applies to those tracks which are in improved streets because the cost of single renewals would be exorbitant with pavement costs added, even if it were possible to determine just what particular ties needed renewal without opening the pavement.

When it is remembered that from 85 to 90 per cent of all ties purchased are used for renewals and that for open tracks tie renewals constitute the largest item of maintenance cost except labor, it is evident that the subject of tie renewals is one which will bear careful study. In the past there has been much waste in connection with the use of timber, and altogether too little attention has been paid to the matter of ties and timber from an economic viewpoint. Now conservation is being forced upon us by the increasing cost of labor and material. Tie lumber has increased from 30 to 50 per cent in cost within a year and the quality of the timber has not been maintained. A lower grade is being offered and accepted.

In 1915 electric railways spent about $4,500,000 for ties. If in 1918 they could find the means to make renewals on the customary annual consumption of about 8,000,000 ties their expenditure for tie timber would be about $6,000,000. The average labor cost of removing an old tie, placing a new one and tamping the ballast around it was 23 cents in 1915 in steam road work. This did not include distribution to the job or disposal of the old ties. It probably costs at least 35 cents now do this work which previously cost 23 cents. Hence if 8,000,000 ties were to be placed this year the cost in place including the ties would be at least $8,800,000.

No substitute for the wooden tie for use in open track has yet proved equivalent to it; hence for some time to come the wooden tie will hold its place. In view of this and because of the rapidly increasing expense connected with its use, all possible means must be adopted to make the available timber go as far as possible. Much can be done by the use of proper specifications for ties and by careful inspection at the source of supply. The use of treated ties should be increased and careful study should be made to determine the kind of timber most suited to the soil and ballast conditions obtaining. The use of tie plates will often help in rendering timber suitable for longer service.

Why Winter Weather Causes So Much Joint Trouble in Worn Rail

The most urgent spring work on tracks in paved streets is that of joint repairs. Not only is it the most important but it is also the factor which causes the largest single item of expense for maintenance of track in streets, particularly if the rails be of the old tram girder type and have an average age of from fifteen to eighteen years. When they have reached this age the head wear has usually reduced the thickness of the head to such a degree that the resistance to shocks and distortions is greatly diminished. In consequence the rate of breakage of rails at joints increases and the difficulty in making repairs becomes more pronounced. There is trouble in finding equally worn rails to cut into the track, and more grinding and welding is necessary in leveling the heads. Sometimes a stock of second-hand rails suitable for repair work is not available and in such cases it is customary to select some sections of the lines, generally in outlying regions for relaying with new rail, thus releasing the old rail for repair use elsewhere. This is an expedient with which every track man is quite familiar.

AN AGGRAVATED CASE OF DRAINAGE INSUFFICIENCY

In the spring the value of drainage is demonstrated. On open tracks the ditches and waterways must be cleaned of the accumulation of the winter's dirt and rubbish. Similar conditions around the mouths of culverts require attention. This work should be done just as soon as the snow has disappeared and will need the attention of section gangs for several weeks as a rule. After the first cleaning, these points should receive attention from time to time during the year, and in the late fall they should be thoroughly cleaned and put in order for the winter. There is no question but that clean, well-kept, deep ditches and waterways are of great assistance in lessening trouble from heaving of tracks in the winter season.

Ditches for draining the ballast are better than none but they are not enough greatly to help in maintaining good surface. Ditches should be deep enough to drain the sub-grade and from 2 to 3 ft. below the bottom on the tie, depending somewhat upon the character of the soil. A general manager once asked a roadmaster what was the most important element in good track. The answer was "Drainage." The manager then asked for the second element and received the laconic reply. "More drainage." Asked for the third factor the roadmaster reiterated, "Still more drainage." This was to emphasize the fact that without good drainage, no matter what kind of rail and ballast might be used, the track would be rough and puddled through the working up of mud through the ballast in wet track.

Preliminary Surfacing and Gaging Are Seasonable Spring Jobs

Another early spring job for the section gang on open track is that of surfacing after shims and frost blocks have been removed. While surfacing work is continued throughout the year, it is most necessary in the spring in order to overcome the effect of frost. Consequently, as soon as frost has disappeared the track must be gone over and given a fair running surface. This is done by tamping up the low spots to bring the track to an easy riding surface, without much attention to general surface. The work of general surfacing is more often done later in the season following rerailing or reballasting.

Gaging of track is still another job which must be attended to in the spring. Tracks are apt to get out of gage during the winter season as a result of poor surface conditions. The trouble is aggravated if the percentage of first-class ties in the track is somewhat low, since the ability of spikes to hold the rail to gage depends upon the strength of the tie timber. Rails also need gaging, occasionally to take up side wear. It is, therefore, essential that tracks be regaged after a winter season, and all variations from the standard gage should be corrected. The usual maximum tolerances in gage are ½ in. wide and ⅛ in. narrow. Variations over these tolerances should be removed.

What May Happen With Poor Drainage

The importance of drainage for all kinds of tracks can be emphasized in no better way than by calling attention to the accompanying view of a situation created by the lack of it. Here the tracks run through outlying territory and in an old private way. The land has been filled in on either side of the railroad to a height of 7 ft. or 8 ft. above the track level. In an ordinary winter no great trouble was experienced from lack of proper drainage as the water rose only a few inches above the rail and then seeped away rapidly after the storms ceased. The past winter, however, was so severe and the frost went in so deep that the water could not get away fast enough to prevent trouble. The operating department of the railroad resorted to the scheme of mounting motors on a car above the floor so as to permit running it through the high water. It is now planned to install drains which will obviate further difficulty from this source.

Winter Frost Plays Hob With Paving

The repair of pavement is a line of work which comes up in the spring. The winter season is particularly hard on track pavements, partly because of frost action, and partly because vehicular traffic is often confined to the track area for very long periods. This concentrates the wear and adds to the maintenance work which must be done. It is the practice on some roads to send out inspectors to cover the lines early in the spring and make up reports from which it is possible to construct a program of pavement repair work. As a rule the work itself is confined to replacing patches here and there and the best results in doing the work can only be obtained by putting out special gangs to work over carefully-prepared routes. Knowing the routes in advance and the amount of work to be done on each line or street, the materials clerk can arrange the most economical delivery of materials.

Testing a Line to See if It Is Alive

By G. H. McKelway
Engineer of Distribution Brooklyn Rapid Transit System

When two power stations or substations feed into the same section of a heavy line, and the circuit breakers through which this line is fed at one of the station opens, it is desirable immediately to know whether or not the other station is still feeding into the line or whether its breaker also has come out.

The scheme generally employed to determine whether or not the line is still alive is to hang a cluster of lamps on the lower stud of the feeder switch, that stud being connected to the outgoing cable even when the switch is pulled. If the lamps light up it is evident that the line is alive from the other station.

At some stations the cluster is permanently connected to ground, so that all that the operator has to do when the breaker "blows" is to pick up a long flexible lead, left hanging about the center of the switchboard, and touch the desired switch blade or stud with a terminal on the end of the wire.

Even when a permanently connected cluster is used as a detector some time is lost in this operation. To save this time in one new station, each panel has been arranged with a pilot lamp of the small bull's-eye pattern connected in series with a resistor between the cable and ground. A snap switch is inserted in the circuit so that it is possible at any time to cut out the lamp and to test the cable for grounds in the ordinary manner with a voltmeter.

Ordinarily the snap switch is left closed and the lamp burns continuously as long as the line is alive. If the circuit breaker should open, the operator does not need to waste even the usual few seconds in testing with the cluster, as a glance at the pilot lamp will tell him immediately whether or not it is lighted and, thereupon, the condition of the line to which it is connected.

Getting the Right Wood Poles for Electric Railway Service

By Charles R. Harte

Construction Engineer The Connecticut Company
New Haven, Conn.

Cedar Heads the List—Chestnut Blight a Factor—Characteristics of Available Woods Are Analyzed and Specifications for Pole Purchase Are Given

LOW FIRST cost, above all other considerations leads to, and will continue for some time to result in the use of wood poles as the chief support of most of the light and medium heavy power lines, irrespective of whether or not this is true in the long run. In addition to being relatively cheap, wood poles are easy to handle; they are reasonably available (there are few sections of the country which cannot furnish some sort of local pole); they are easily climbed, and in soft ground they can be successfully used with special but relatively inexpensive construction where steel or concrete structures would require very costly foundations.

Poles Last About Twelve Years on the Average

As against these advantages, wood poles are comparatively short-lived. This is due to decay (which accounts for about 95 per cent of the replacements) insect attack, fire, lightning stroke, woodpecker injuries, and sleet and wind storms.

In the years 1907 to 1911 inclusive, the Department of Agriculture recorded the purchase of some 17,560,000 poles. If we assume that 10 per cent of these were used on new construction, and this is more likely an over-estimate than the contrary, the average annual replacement was about 3,512,000 poles. This on a basis of 40,000,000 poles in use, a generally accepted figure, would mean an average life of twelve years. Such a life checks closely with some figures gathered by the National Electric Light Association. If we multiply the average life of each kind by the ratio of that kind to the total in 1915 we get the data given in Table I.

TABLE I—LIFE OF TRANSMISSION LINE POLES

Kind of Pole		(*a*) Average Life, Years, N. E. L. A. Data	(*b*) Dept. of Agriculture, per Cent of Total	Product of (*a*) and (*b*) Years
Cedar		13.5	63.9	8.6
Chestnut		12.0	17.5	2.1
Cypress		9.0	2.3	.2
Pine		6.5	6.0	.4
Oak, etc.	say	8.5	10.3	.9
		"Weighted" Average Life		12.2

The above table, however, does not tell the whole story, for the labor of replacing a pole is considerably greater than that of originally setting it, and the disturbance of the attachments not only costs money, but shortens the life of the attachments themselves. Altogether the annual bill for wood-pole replacements is a serious matter. Part of the outlay is unavoidable, but a considerable part is unnecessary and should, therefore, be prevented.

There are many species of tree which are sufficiently upright and straight in their habits to permit their use for poles, but most of these give short service life, lack strength, or are scarce so that there are but few which are extensively employed for this purpose. The Department of Agriculture records purchases of 4,077,964 poles of all kinds, for the year 1915; nearly a third of these, however, (1,236,694) were under 20 ft. in length. Telegraph and telephone companies took 44 per cent of the total, electric railway and power companies 35 per cent and steam railroads the remaining 21 per cent. The government records, covering the years 1907-1911 inclusive, and 1915, show the relative demands for several leading species of timber as given in Table II.

TABLE II—RELATIVE USE OF SEVERAL POLE WOODS

Kind of Wood	Consumption in 1915, per Cent		Consumption Average, 1901—1911 and 1915, per Cent
Northern white cedar	42.8		
Western red cedar	13.9		
Red cedar	2.9		
Southern white cedar or juniper	2.2		
All cedars		61.8	63.9
Chestnut		15.9	17.5
Pine		13.4	6.0
White oak	4.4		
Red oak	0.5		
All oaks		4.9	5.2
Cypress		1.6	2.3
Redwood, spruce, tamarack osage, orange, etc.		2.4	5.1

Cedar, which furnishes about two-thirds of the poles used, is long-lived in service, strong, light, straight and of a nature which permits easy and safe climbing by means of spurs. Further, the wide distribution of the several varieties makes it available almost everywhere without prohibitive transportation charges.

Of the four varieties chiefly used, the northern white cedar or arbor vitae is by far the most important, furnishing in 1915 two-thirds of all cedar poles, or 43 per cent of all poles. This was nearly three times as many as were furnished by the next most important wood, chestnut.

Winter-Cut Poles Are Best

Cedar is a common swamp tree in the Lake and the Northeastern States and in Canada, the bulk of the supply, however, coming from the Lake States. Like practically all timber it should be cut when the sap is not flowing as the sapwood contains the least amount of food for the fungi and other causes of decay. Further, unless the seasoning is done very slowly, the rapid evaporation of the large amount of water present if the sap is flowing is likely to cause serious checking.

It is accordingly quite customary to specify "winter cut" poles, but in very few cases is any effort made to determine whether or not the specifications have been complied with. It so happens, however, that winter is the most convenient time for cutting poles, hence the majority of poles, fortunately, meet the specification. Distinguishing "winter cut" wood from "summer cut" is in most cases, if not always, much like distinguishing "bled" yellow pine from "unbled"; unless the facts are known it is practically impossible to do it.

Western red cedar, known also as red cedar, Western cedar, or Idaho cedar, ranked third in importance in 1915, 13.9 per cent of the poles used being of this species. It is being cut chiefly in the region of the lower Columbia River, of Puget Sound and of northern Idaho. It, however, is much more widely distributed than this. Poles from the Columbia are said to be much freer from butt rot and to weigh more than those from the other localities; otherwise there is said to be little difference.

Western cedar is a very straight-growing tree and furnishes poles of particularly fine appearance. Its chief shortcoming is that it tapers but slightly, hence to secure the necessary butt diameter for heavy service, poles much longer than would otherwise be needed must be cut. In spite of the freight charges, Western cedar has been able in the past to compete to a small extent with chestnut even in the territory of the latter. With the serious reduction of the supply of chestnut as a result of the spread of the blight, its more extended use in the East is almost certain.

Red cedar, which furnished 2.88 per cent of the 1915 supply, occurs throughout the East. In the Northern States the trees are usually too short and too crooked for use as poles, but in the South they grow tall and straight. The heartwood lasts for a long time in the ground, but the sapwood decays very rapidly, giving the untreated pole a comparatively short life.

Southern white cedar, better known as juniper, furnished 2.19 per cent of the 1915 cut. Like red cedar its use is largely local, due, however, not to other demands for the wood, but to the fact that it is one of the less desirable poles, having a fiber strength in pounds per square inch of 3300, against 3600 for Northern white cedar, 4200 for red cedar and 5100 for Western red cedar. Moreover, its life, untreated, is but eight and one-half years against thirteen and one-half years for the others.

Chestnut Is Hard Hit by the Blight

Chestnut has heretofore furnished a much larger proportion of the poles than any of the woods except cedar, the percentage in 1915 being 15.98. However, the enormous destruction of the trees of this species by the "blight," or bark disease, the effect of which is now being widely felt, is certain to make it much less important for some time to come.

Growing freely in most of the eastern part of the country, its mechanical strength, long service life, straightness, height and wide distribution have made chestnut a general favorite. It is, however, considerably heavier than the cedars, is not so straight and, if we except juniper, is not so long-lived in service, averaging, untreated, twelve years as against thirteen and one-half years.

In 1905 the chestnut trees were first attacked by a fungus which feeds on the inner bark and the outer growing, or cambium, layer of the wood. In 1908 the loss of ornamental chestnut trees was estimated by the forest service of the Department of Agriculture to be "certainly several million dollars." Since that time the plague has spread until to-day there is comparatively little chestnut left east of the Appalachians and north of Virginia. So far no practicable method of prevention is known. Fortunately the wood itself is practically unaffected, and on the death of the tree the fungus also dies. It has, therefore, been possible to use much of the larger timber, but the loss of the young wood is now beginning to be seriously felt. Under the most favorable circumstances there will be a considerable period when the available pole material of this wood will be almost nil.

Chestnut grows from individual seed, or from groups of sprouts from live stumps. In the former case it is usually straight throughout, but in the latter the several trunks grow out at an angle of about 60 deg. for a few feet, thus getting clearance, and then rise vertically. In pole stock this bend usually occurs not over 6 ft. from the butt, so that it comes at or below the surface and affects neither the appearance nor strength of the line, although the unset pole may appear hopelessly crooked to one not accustomed to this peculiarity.

Pine Poles Require Treating For Long Life

Pine until recently has made up less than 5 per cent of the total pole supply, due to the fact that although it is one of the strong pole woods, it has the shortest service life of any unless treated. There is also a great demand for it for other purposes. The heartwood is fairly long-lived in the ground, but the sapwood, which is a large portion of most kinds of pine, decays very rapidly.

Of the Southern pines, the long-leaf variety does not take preservative treatment very well. It has been used to some extent for sawed poles, but the well-justified dislike for such poles and the value of the wood for other purposes are steadily reducing the proportion of this species in use for poles. Short-leaf pine has more sapwood, and so takes preservative better, but its value for lumber also cuts down its use for poles, and it is weaker than long-leaf pine. "Loblolly" pine, which is steadily growing in importance, unlike most pole materials, requires treatment all over and not merely at the butt. So treated it has long life and, while the weakest of the three kinds of pine mentioned, its strength is about the same as that of the Northern white cedar.

Western Yellow Pine Has Good Qualities as Pole Wood

Western yellow pine when treated makes a good pole for local use, particularly if hill grown. Such stock is better shaped, finer grained and stronger than that from the valleys. Untreated it lasts barely three years, but it takes preservative readily and in many parts of the Southwest where this pine is common, a butt-treated pole is cheaper than Idaho cedar untreated, due to the high freight charges on the latter. It has substantially the same service value. Its use is steadily increasing, and in 1909 it was estimated that the supply was more than half as much as the combined supply of all the hard woods in the United States. It grows freely and rapidly, with a strength practically that of Western red cedar. In view of these facts it is quite likely to become one of the more important pole woods of the near future. The best stock is found on the Pacific Coast, but the tree grows commercially in more than a third of the United States.

"Lodgepole" pine, untreated, has the family weakness, but takes preservatives readily. In its own territory, which is the mountain section of the West, it is steadily growing in popularity. Although it is widely distributed its low strength, about 75 per cent that of the Western red cedar, will probably confine its use as at present to a limited territory. Lodgepole is a slow growing tree and one that has been extensively killed by forest fire. Much of the wood so killed, however, is in fine condition for treatment, for it has been thoroughly dried out and as long as the wood remains sound, which is often for many years, it is at least as good as if live cut.

The Department of Agriculture figures show almost exactly three times as many pine poles purchased in 1915 as the annual average for the years 1907 to 1911 inclusive, and although the percentage of each species used is not given, this increase is in all probability due largely if not entirely to the growing employment of treated poles of species less valuable for lumber.

White oak, which furnished 4.36 per cent of the 1915 total and had maintained approximately that position in earlier years, until recently was employed almost entirely in short lengths and on light and comparatively unimportant communication circuits. Its short life, great weight and high cost makes it one of the less desirable pole woods. Although the total number of white oak poles reported in 1915 did not materially differ from those of previous years, there was a very peculiar change-about. The communication companies, which up to that time had used about 90 per cent of the annual cut, leaving about 1 per cent for power, light and railways and about 9 per cent for the steam roads, in that year took but 19½ per cent, while the steam roads took 73 per cent and the electric companies 7½ per cent.

Red oak has all the shortcomings of white oak, and in addition some of its own. Its use is so limited that it hardly deserves mention. It is used almost entirely on light short-pole communication circuits of minor importance. It furnished but 0.53 per cent of the total cut of 1915.

Cypress Seems Better for Shingles than Poles

Cypress, which produced 1.66 per cent of the 1915 poles, has shown since 1907 a steady falling off, not only in percentage but in actual number of poles cut. It is a slow-growing swamp tree of the South, of peculiar characteristics. The sapwood decays rapidly, but the heartwood has an extremely long life. Many instances are recorded where shingles have been in service for more than 100 years. Greenwich, Conn., Brooklyn, N. Y., and Clifton, Staten Island, N. Y., have reported shingles still in service after 200 years. Brooklyn claims 228 years life for the shingles, and Greenwich, 250 years. In its home territory cypress makes a very satisfactory pole, but elsewhere it has shown much variation. One case was reported in the Northeast where a line of unusually heavy poles had a life of less than 5 years.

Redwood, used locally on the Pacific Coast, furnished nearly 1 per cent of the total cut of poles in 1907. The reports show wide variations in different years, the number in 1915 being too small to record separately. The poles are strong and durable, and as they are almost always if not invariably sawed from large logs, there is no trouble in securing uniformity of size and taper.

There Are "Also-Rans" Among Pole Woods

Besides the above-named woods there is an extensive list of "also-ran," a few of which are very good, but too rare for any but very local use. Others are used because they are the cheapest, or the only material available.

A number of these are as follows, the approximate ratios of the maximum use of some of the most important to the total being given: Balsam, bois d'arc (0.5 per cent), butternut, catalpa, cherry, chinquipin, cottonwood, douglas fir (0.7 per cent), elm, hemlock, locust (0.3 per cent), mulberry, osage orange (0.6 per cent), sassafras, spruce (0.3 per cent), tamarack (0.8 per cent), walnut and willow.

Often a good deal more hand labor is used in the erection of wooden poles than is really economical

Averaged over a number of years, however, the proportion of the woods used is very small and they usually are reported under the charitable mantle of "all others." Throughout the Middle West and the West, particularly, are many miles of "independent" and country party lines which employ of necessity anything to which their wires can be attached, many of the "poles" being living trees. The fact that of the "all other" poles which made up 2.44 per cent of the 1915 total, practically half were under 20 ft. in length, and 39½ per cent more were between 20 and 29 ft., clearly indicates the character of lines on which they were employed.

Practical application of the above information can only be made in the light of local facts. Other things being equal the local pole is obviously the one to use. As against one or more of the superior virtues of longer life, greater strength or better appearance of the foreign pole must be weighed its cost at the hole, including not only the f.o.b. price, but the freight, handling and hauling charges. Sometimes poles can be hauled direct from car to hole, but often they must be stored for a time, in which case there are not only the double handling charges, but yard service and fire and accident insurance, all or part of which can generally be avoided in the case of local poles.

Weight should also be given to the fact that a wood which has a long service life in the locality where grown may show much shorter life elsewhere. This is apparently due to the same fact which makes possible the various inoculations against disease. A light form of the given or a related disease often leaves in the system of both animals and plants a substance which is poison to other "bugs" of the same kind. The local tree, through a mild attack while alive, has stored up that which for some time keeps the local form of decay from the pole; but this is of little or no avail against the different fungi or bacteria of another region. The case of cypress, referred to previously, is apparently of this kind. It should also not be forgotten that a local material, short lived if untreated, may as the result of treatment show better results than a higher grade of foreign timber. Finally it must be remembered that, in replacing a pole, not only is there the direct cost of the work, but the disturbance of the attachments always shortens their service life, and in many cases leads to the immediate replacement of material which, if untouched, would be good for some time longer.

The injuries to which wood pole-stock is subject naturally divide into two classes, those occurring before use as poles and those occurring in service.

"Rot" Is the Principal Enemy of Pole Life

"Rot" is the result of the action of plant life, chiefly fungi, but of bacteria to some extent also, the general effect of the two being the same. Through the action of these parasites the cell structure of the wood is broken down, leaving a mass with little or no strength. The appearance of the rot depends on the kind of wood and the "villain" that produced it. Except in name it is identical with the decay which occurs after a pole has been set, but the term "rot" is generally used for internal breakdown which occurred during the life of the tree.

"Butt rot" is the least serious of these evils, because it is so obvious that its extent can readily be determined. It is common in the cedars and occurs more or less frequently in almost all pole woods, but unless it takes up more than 10 per cent of the butt section, or extends above the ground line when the pole is set, it is of little importance. The action does not continue after the pole has seasoned unless the cavity is open to the air as well as to moisture.

"Heart rot" and "ring rot" are much more serious because of their concealment, although signs are almost invariably present which to the experienced pole man at once tell the story. The majority of the rots require air, moisture, and heat for their development. Their occurrence inside the pole is possible only as some opening admits the two first-named, and inspection will usually reveal the holes, or decayed or loose knots, responsible for the trouble. Tapping will reveal the presence of hidden cavities by the characteristic sound.

Bacteria and Fungi Must Be Kept Out of the Poles

"Shakes" and "checks" are cracks resulting from wind action or from too rapid seasoning. "Ring," or "cup shakes," involving separation on the lines of growth, usually result from the swaying of the tree in the wind and doubtless indicate a previous weakness in the growth. "Star shakes," "star checks," "checks" and "cracks" are radial splits of greater or less extent and may be the result of wind action, of abuse when the pole was cut, or of too rapid seasoning with consequent irregular shrinkage and cracking.

"Cat faces" are spots which have been stripped of bark at some time, and over which the bark has never entirely grown again, leaving a round spot of dead wood. Sometimes there is but a thin shell of this dead wood and beneath it the wood is perfectly sound. However, like any bark injury which reaches the wood, it is an invitation for fungus to enter which is quite likely to be accepted. The scar is looked upon with a suspicion often well justified by the heart or ring rot which has resulted through it.

CEDAR POLES MAKE A BEAUTIFUL LINE

Knots are obviously unavoidable in natural sticks, and so long as they are sound no criticism can reasonably be made of their presence except possibly on the ground of appearances. If the knots are discolored or at all loose or decayed it is quite another story, and rejection of the pole is almost invariably the part of wisdom. If rot has not already occurred inside it certainly will unless special measures are taken to prevent it from doing so.

Ant, grub, and worm holes in themselves are usually not important, but, unless they are of very small extent and will be below the groundline when the pole is set, their presence indicates existing or probable trouble in the wood itself. Further they are apt to lead woodpeckers into investigations which if they do not directly

TABLE III—COMPENSATION FOR "HOLLOW HEART" IN POLES

Pole Length	30 ft.	35 ft.	40 ft.	45 ft.	50 ft.	55 ft.	60 ft.	65 ft.
Average diameter of hollow, inches	Circumferences must be increased by these amounts in inches							
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	1	0	0	0	0	0	0	0
4	2	0	0	0	0	0	0	0
5	3	1	1	1	0	0	0	0
6	4	2	2	2	1	1	1	1
7	Reject	4	4	4	2	2	2	2
8	Reject	6	6	6	3	3	3	3
9	Reject	Reject	Reject	Reject	4	4	4	4
10	Reject	Reject	Reject	Reject	5	5	5	5
11	Reject	Reject	Reject	Reject	7	7	7	7
12	Reject	Reject	Reject	Reject	9	9	9	9
13	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject

TABLE V—MINIMUM POLE DIMENSIONS, SPECIAL POLES

Length of Pole	Sawed Redwood Dimensions at		Creosoted Yellow Pine Circumference at	
	Top and Ground Class A, Inches	Top and Ground Class B, Inches	Top and Ground Class A, Inches	Top and Ground Class B, Inches
Feet				
30	7 x 7 11 x 11	6 x 6 10 x 10	22 35	20 32
35	7 x 7 12 x 12	6 x 6 11 x 11	22 38	20 34
40	7 x 7 13 x 13	6 x 6 12 x 12	22 40	20 36
45	7 x 7 14 x 14	6 x 6 13 x 13	22 42½	20 38
50	7 x 7 15½ x 15½	6 x 6 14 x 14	22 44½	20 40
55			22 47	20 42½
60			22 49	20 44½
65			22 51	20 47
70			22 53	20 49
75			22 55	20 51
80			22 57	20 53

"Ground" circumference to be taken 6 ft. from butt.

TABLE IV—MINIMUM POLE DIMENSIONS, NATURAL POLES

Length of Pole	Chestnut Circumference at Top and Ground, Inches		Crook,	Cedar Eastern White Circumference at Top and Ground, Inches		Crook,	Cedar Western Red Circumference at Top and Ground, Inches		Crook,	Juniper Circumference at Top and Ground, inches	
Feet	Class A	Class B	Inches	Class A	Class B	Inches	Class A	Class B	Inches	Class A	Class B
30	24 40	22 36	10	24 43	22 38	.	28 37	25 34	5	24 40	22 37
35	24 43	22 40	11	24 47	22 43	10½	28 40	25 36	6	24 43	22 40
40	24 45	22 43	11	24 50	22 47	12	28 43	25 38	7	24 47	22 44
45	24 48	22 47	11	24 53	22 50	9	28 45	25 40	8	24 50	22 48
50	24 51	22 50	12	24 56	22 53	10	28 47	25 42	8	24 53	22 52
55	22 54	22 53	13	24 59	22 56	11	28 49	25 44	9	24 56	
60	22 57	22 56	14			12	28 52	25 46	10	24 59	
65	22 60	22 59	15				28 54	25 48	11		
70	22 63	22 62									
75	22 66	22 65									
80	22 70	22 69									
85	22 73	22 72									
90	22 76	22 75									

"Ground" circumference shall be taken 6 ft. from butt. "Crook" is maximum distance from pole to string stretched from point 6 ft. from butt to point at top.

result in weakening the pole, give the rain and the rots an opportunity to enter.

Cypress is subject to a disease which, so far as the writer is aware, attacks no other pole timber, or at least no other important pole timber. It is true, however, that the "incense cedar" of the Pacific Coast is subject to "pin rot," which is somewhat similar. In the cypress a fungus eats holes through the wood of the living tree, which are from a quarter of an inch to an inch wide and often several inches long. The holes are frequently bored in very great numbers, seriously reducing the strength of the wood, although oddly enough it at least does not seem to reduce its resistance to decay. It is commonly believed that the "pecky cypress," as it is called, lasts very much longer than the unaffected wood.

In many specifications the writers have included unwarranted objections to "dead," "fire killed," or "river" poles. There is a more or less widespread prejudice against the use of poles which show any signs of having died on the stump, although exhaustive tests of the woods most subject to such untimely end has shown no appreciable effect on the life so long as the wood is sound. The better specifications of to-day provide for the acceptance of such poles which show sound wood under a thin dead surface.

The extent to which defects may or may not occur in poles for various services is set out in much detail in many specifications, more or less intelligibly. The following summary of these covers the important elements.

Wood poles must be delivered in piles or on cars at specified delivery points, and will be inspected at points of shipment or of delivery as may be agreed. In either case the shipper must give the purchaser every facility for inspection.

Poles of whatever kind of wood must be first quality, reasonably straight, well proportioned from butt to tip, without short crook, reverse curve, or two or more curves or crooks; they must be barked but not shaved, with knots and limbs closely trimmed and butts and tips squared, and they must be of full dimensions. No allowances will be made for alleged shrinkage said to be due to seasoning or to any other cause.

The poles must be sound, free from butt rot, butt hollows which would impair the strength as poles, large cracks or season checks, large, loose, hollow, unsound, rotten, or plugged knots; ant-eaten, grub-eaten, or worm-eaten wood unless of small extent and below a line 6 ft. above the butt; woodpeckers' holes, cat-faces unless small and sound and not within 6 ft. of the butt or within 10 ft. of the tip; wind-shakes, ring-shakes, or cup-shakes, sap-rot, internal rot or bad tops.

Some Woods Require Individual Specifications

Northern white cedar and Western red cedar, in addition to meeting the above requirements, must have at least three-fourths of the surface free from dead streaks. Dark red or copper-colored surfaces will not be considered cause for rejection if good sound wood lies immediately beneath. No pole will be accepted if it has a twist in excess of one complete twist in 20 ft. of length. Hollow heart in sound butts will be accepted if the circumference at a point 6 ft. above the butt is greater than specifications for sound poles by the amounts given in Table III.

Scattered rot not less than one-fourth of the diameter from the circumference will be figured as equivalent to hollow heart of the same cross-section; cup shakes, star shakes, and heart shakes will be figured as equivalent to hollow heart area as that checked or shaken.

Redwood poles must be sawed from first or second butt-cut logs of sound No. 1 redwood and shall have not over 4 per cent of area in sapwood, nor shall the sapwood be over 1 in. at any point. No transverse cracks will be allowed, and butt hollows, if present, must have sound walls and must not have an area over 10 per cent of the pole section at that point.

Dimensions of Class A and of Class B wood poles must be as given in Tables IV and V.

Service Conditions Determine Car Equipment Characteristics

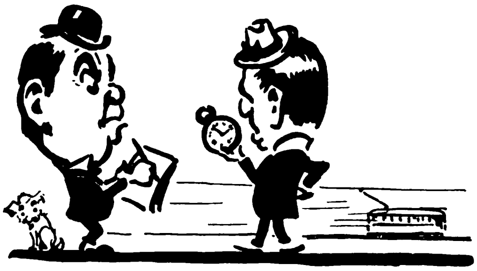
By C. W. Squier
Electrical Engineer

The Writer Shows What Fundamental Traffic Data Are Required Before Making a Choice of Motor Equipment

IN A PREVIOUS article I gave an outline of the data that are desirable to determine service conditions, and some suggestions as to the best methods for obtaining these data. Let us now consider a particular service and make use of these data to determine the motor equipment best suited for the requirements.

How Number and Duration of Stops Vary with Service

I have chosen for consideration first a city and suburban service and the data I shall use are from actual tests made on a large system operating this service. In making these tests twenty of the most important lines were chosen as being representative of the entire system, and a traffic survey was made of these lines. In tabulating the results for the summarized data record, each line was divided into sections and the data have been tabulated for each section. By this method we have been able to determine accurately the service characteristics of the various districts as well as the requirements for the complete line. A comparison of the results of these tests indicates that this service in most cases is made up of four distinct classes as follows:



The first essential in motor selection is accurate knowledge of car operation.

1. At the ends of the lines there are runs of from 1½ to 2½ miles in length through a suburban district where the stops average from five to six per mile. These stops are of comparatively short duration due to the small number of persons boarding and alighting at each stop.

2. Another class of service is through a more closely populated residence section with stops of from seven to nine per mile, with some transfer points and with a correspondingly longer time for stops.

3. The next class is operation through a business section where the stops average from twelve to sixteen per mile and where the headway betwen cars is so short, due to several lines operating over the same tracks, that there is very little operation beyond the series position of the controller. Frequent slow-downs for traffic also add somewhat to the congestion.

4. The last class of service involves entering and operating across bridges which have severe grades at each end and where the only stops are due to congestion of traffic. The length of these runs is from 1 to 1½ miles in each direction.

In the following "Traffic Data Record" I have shown this summarized record for four of these lines. This will illustrate how the data were separated for each line so as to show average results for each class of service:

The columns on passenger loads give some very good information as to districts where passengers are picked up and discharged and the average loads carried throughout the various sections of the line. In order to illustrate this more clearly I have plotted graphs showing the average number of passengers carried in the different zones for the four lines given in the table and have also indicated the seating capacity of the cars operated and the average schedule speed that is maintained.

It should be borne in mind that these represent average and not maximum conditions, and also travel in both directions through the various sections.

A further comparison of the different classes of service is obtained by averaging the results from all lines with the data divided and tabulated as follows

TRAFFIC DATA RECORD

Line	Section	From To	Class of Service	Length of Run, Miles	Per Cent of Total Mileage	Average Schedule Speed M.P.H.	Average Number Stops per Car-Mile	Average Length Actual Stops Seconds	Average Number Passenger on for Day	Maximum Number of Passengers on Car One Time	Maximum Number Passengers Carried Any One Trip
No. 1	A	Ridge—Ralph	2	1.086	16.8	8.23	8.05	9.58	23	62	68
	B	Ralph—Birch	2	3.185	49.7	8.55	8.34	6.60	35	84	127
	C	Birch—Water	3	0.607	9.3	5.40	16.50	7.54	22	63	67
	D	Water—Terminal	4	1.570	24.2	9.90	2.12	8.26	18	66	67
	E	Ridge—Terminal Av.	Av.	6.448	Total	8.25	6.96	7.04	26	66	145
No. 2	A	Depot—Twentieth Avenue	1	1.566	19.0	11.40	3.87	6.72	5	35	36
	B	Twentieth Avenue—Atlantic	2	3.997	48.6	8.90	6.90	7.82	28	98	109
	C	Atlantic—Water	3	1.105	13.1	6.70	11.80	8.94	24	101	116
	D	Water—Terminal	4	1.589	19.3	8.90	2.40	5.68	17	59	59
	E	Depot—Terminal	Av.	8.257	Total	8.90	6.94	7.99	33	101	127
No. 3	A	Sixteenth Avenue—Church	1	0.593	6.1	11.70	5.58	7.89	19	36	49
	B	Church—Reed	2	4.725	48.5	10.70	7.64	6.73	24	54	69
	C	Reed—Plaza	3	2.852	29.3	7.14	11.75	7.07	24	70	86
	D	Plaza—Terminal	4	1.550	16.1	12.36	1.32	6.63	10	34	40
	E	Sixteenth Avenue—Terminal	Av.	9.720	Total	9.45	8.00	7.41	27	55	101
No. 4	A	Prospect—Avenue X	1	12.50	2.01	12.28	4.54	7.15	7	18	20
	B	Avenue X—Plaza	3	3.505	56.2	7.60	13.54	7.31	20	78	108
	C	Plaza—Terminal	4	1.478	23.7	12.55	1.25	4.06	16	63	63
	E	Prospect—Terminal	Av.	6.233	Total	9.46	7.55	7.09	18	78	108

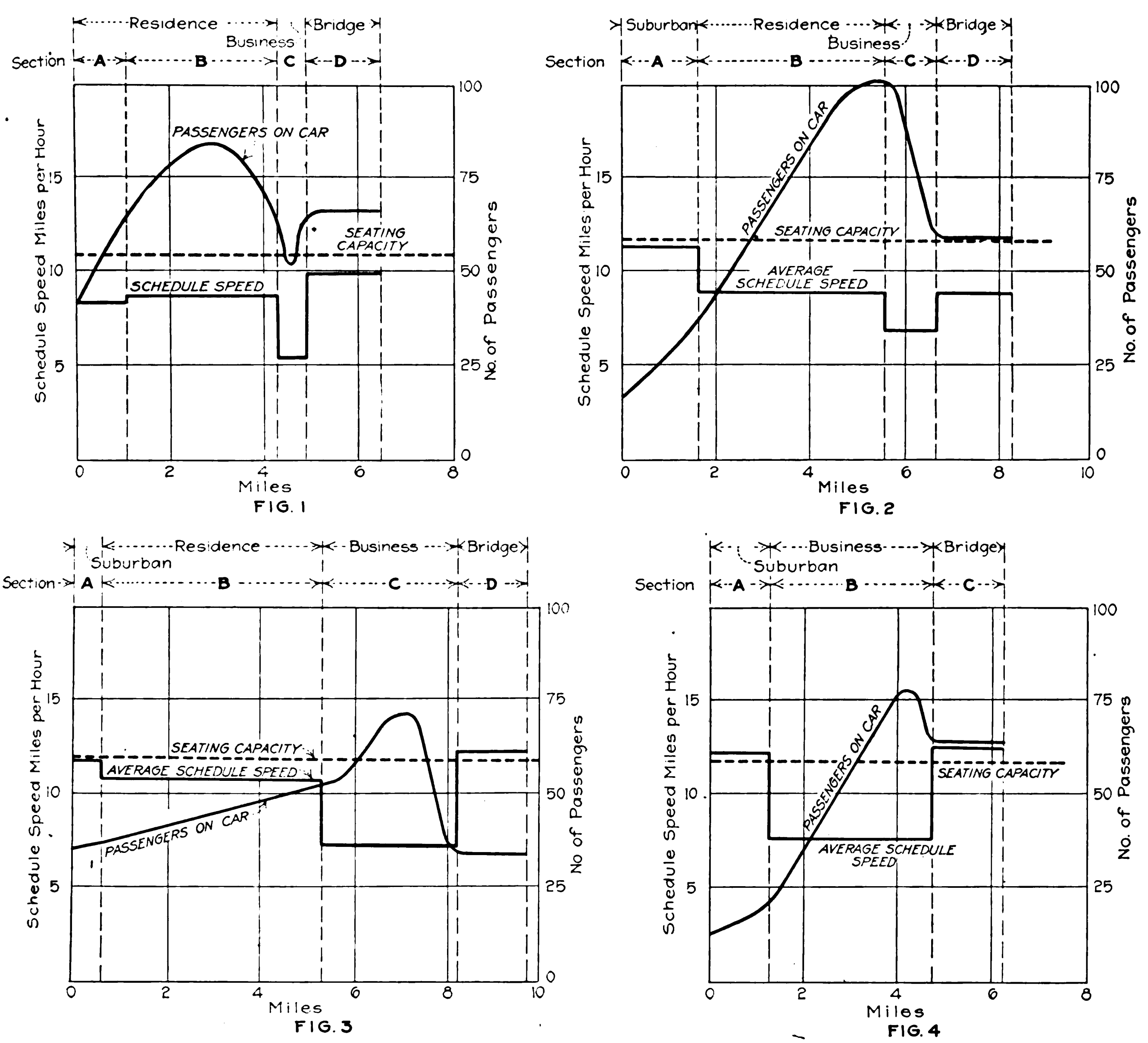


FIG. 1 FIG. 2 FIG. 3 FIG. 4

FIGS. 1 TO 4—GRAPHS SHOWING CAR LOADING IN DIFFERENT ZONES FOR FOUR TYPICAL LINES

to show average requirements for each class of service:

SUMMARY OF SERVICE TESTS

Class of Service	Per Cent. of Total Mileage	Average Schedule Speed, M.P.H.	Average Number Stops per Car-Mile	Average Duration of Stop, Seconds
Suburban	12	11.3	4.4	7.2
Residence	38	8.7	8.1	7.2
Business	37	7.3	12.4	7.6
Bridges	13	10.9	2.7	6.6

In the column showing the percentage of total mileage operated in each class of service it is seen that the mileage for suburban operation is practically the same as for bridge operation, these being 12 per cent and 13 per cent of the total mileage respectively. Also the mileage operated in residence districts is nearly the same as that operated in business districts, these being 38 per cent and 37 per cent respectively of the total mileage, or about three times that operated in suburban and bridge service. The highest schedule speed obtained was 11.3 m.p.h. in suburban service with an average of 4.4 stops per car-mile of 7.2 seconds each, while the lowest schedule speed through business districts was 7.3 m.p.h. with an average of 12.4 stops per car-mile of 7.6 seconds duration. This average number of stops per car-mile includes slow-downs; it being assumed that two slow-downs are equal to a stop. The average length of stop is very uniform, this varying only from 6.6 to 7.6 seconds.

Operating Characteristics Show Schedule Speed as Affected by Stops

From these data I have plotted an operating characteristic graph, Fig. 5, showing the variation in schedule speed with the number of stops made per mile. By referring to this figure it is seen that the schedule speed varies from 7.3 m.p.h. with a stop every 425 ft. to 15 m.p.h. with stops every 2600 ft. Such a graph plotted from the service conditions on any road will be found very useful for comparing the different equipments operated. We can now use this curve for the preliminary selection of motors upon which to base our calculations in choosing new equipment.

Our first problem in connection with the choosing of the motor equipment of a car is to lay out a duty cycle from the service requirements, with certain preliminary assumptions as regards weight of the car, desired rates of acceleration and retardation and a decision for our first calculations as to the number of motors per car to be used. I shall later make some comparisons to show the relative advantages possessed by two and four-motor equipments, but for the preliminary study we shall assume two motors per car.

In the preliminary calculations for any proposed equipment, speed-time curves with the current and energy consumption curves form the basis for calculating the performance of the equipment and give the first start toward making the selection of the motors to be investigated for capacity as limited by heating. There are a number of things to be considered in the selection of a motor for a given service. The most important requirement is that the motor chosen must be capable of performing the required service without becoming overheated. The amount of heating in service is determined by the "square-root-of-the-mean-square" motor current and the average voltage on the motor. In the service which we are considering, a long series of tests has shown the average line voltage at the cars to be 540 volts.

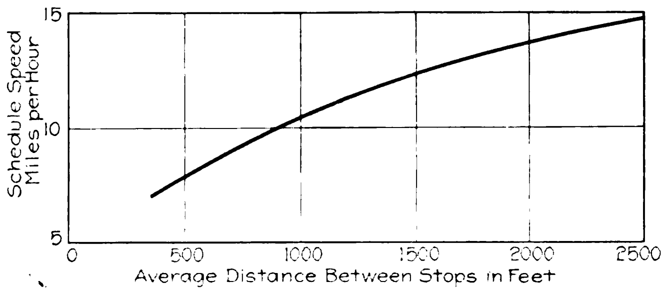


FIG. 5—VARIATION OF SCHEDULE SPEEDS, WITH NUMBER OF STOPS

Again the motor should be able to make the desired schedule speed safely and, in addition, it should have some additional capacity and speed for making up lost time. The maximum attainable speed, however, should be kept as low as is consistent with the above condition, and the gear ratio chosen should be such that when the car is running at its maximum speed, the motor armature speed will not exceed a safe limit.

OPERATION WITH SINGLE CARS

Weight of car	39,000 lb.
Seated load fifty-eight passengers	8,120 lb.
Standing load 130 passengers	18,200 lb.
Average line voltage from test	540 volts
Diameter of driving wheels	28 in.
Number of motors per car	2
Average length of runs:	
Suburban	1,200 ft.
Residence	658 ft.
Business	427 ft.
Average	620 ft.
Bridge runs will be studied in detail	
Average duration of stop:	
Suburban and residence	7.2 sec.
Business	7.6 sec.
Average	7.3 sec.
Schedule speed:	
Suburban	11.5 M.P.H.
Residence	9 M.P.H.
Business	7½ M.P.H.
Bridges	12 M.P.H.
Average	9 M.P.H.
Accelerating and braking rates	1½ M.P.H.P.S.
Train resistance	Use curve from actual tests
Curve resistance	8 lb. per ton per degree of curvature
Speed in m.p.h. on curves to be limited to the square root of the radius in feet	

DATA FOR DUTY CYCLE AND SPEED TIME CURVES

Speed at crossovers not limited.
A tractive effort of 100 lb. to be used for accelerating 1 ton at a rate of 1 m.p.h.p.s

Motor Capacity Theory and Practice Can Be Brought into Close Agreement

A number of articles have appeared in the ELECTRIC RAILWAY JOURNAL from time to time giving methods of calculating the performance of railway motors while operating under service condtions. It is possible, however, that the degree of accuracy with which a service may be predetermined is not very generally understood. By checking preliminary calculations with actual results taken from tests, railway engineers have reached a stage where it is possible to choose the equipment and be certain that it will fulfill the required conditions. So close agreement has been established between theory and practice.

In these preliminary calculations it is usual to simplify the work somewhat by substituting a uniform grade for the irregular profile of the road. This uniform grade is taken as the average of the various grades between terminal points. In the present service I intend to treat the bridge runs where the most severe grades are encountered separately, while the average grade for the remainder of the service is so small that it may be neglected in the first calculations. Curve resistance and the effect of curves on the speed is usually averaged in laying out the typical run except in districts where these occur so frequently and are so severe as to require low-speed running.

Instead of figuring out each individual run for a car or train making frequent stops, the service is studied by typical runs equal in length to the average distance between stops for the service under consideration. Some discretion has to be used in applying these methods as they do not hold good over too wide limits, but with precautions they will produce accurate results.

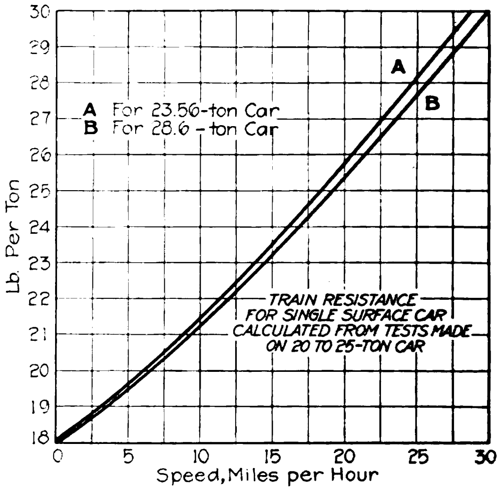


FIG. 6—TRAIN RESISTANCE FOR SURFACE CARS

In order to apply this method to the study of the service selected for illustration the data in the accompanying table will be used.

Numerous empirical formulas have been developed for train resistance, some of them based on very elaborate tests. The values obtained by the use of these formulas differ widely. The graphs, Figs. 1 to 4 and 6, shown in accompanying illustrations are derived from

Testing and Treating Power Plant Feed Water

Careful Analysis and Judicious Use of Chemicals Are Necessary to Insure Long Life of Boiler and Condenser Tubes—Corrosion, Scaling and Priming Are the Enemies of Satisfactory Boiler Operation as Far as Water Is Concerned—"Concentration" of Boiler Water Needs Watching

By Hartley Le H. Smith

Chief of Bureau of Tests
Brooklyn Rapid Transit System

IN THIS and succeeding articles we shall deal with the raw materials of the power plant, in this one with water. In line with strictest logic water cannot be called such because kinetic energy in electric form is the one finished product, and potential heat of the fuel (its B.t.u. content), is the one raw material. The very strict logician would even find fault with this statement, reminding us that potential heat, while a very real entity, is not a material substance, raw or otherwise. Such a logician would also tell us that even a hydro-electric plant converts, fundamentally, the *potential energy* of the water into *kinetic energy* in electric form. He would bring out that in both the steam driven plant and the hydro-electric plant, water serves as a material medium for energy transformation, and in both plants all of the water that enters leaves again as water. Even in the steam plant water, manufactured if you like into steam, is in the end reconverted into water.

But putting aside such fine distinctions, and thinking only of the steam plant, let us consider some of the problems with which plant operators are faced due to the numerous and all important ways in which water, by changes of state and of temperature, serves its purposes in the production of kinetic energy in electric form.

Impurities in the Water Are Sources of Preventable Trouble

These problems raised by water handling are chemical problems. In many ways hydraulic engineering problems are real enough in steam-electric plants. They are not entirely problems of the designing engineer either, although very often if he would give them more attention as technical hydraulic problems the operating man would get a few additional credits in the station thermal-efficiency accounts. But the operating man is faced continuously with some all-important chemical problems due to water. If water were just water these problems would disappear; but all water in the power plant has contained in it other substances in solution or suspension, and they make the trouble. Even hot-well water in the act of condensation absorbs gases. Thus the power plant engineer's chemical problems are ever present.

Power plant water will corrode, it will scale, it will prime. It has to be kept from doing all three things, or so nearly kept from doing them as to make their evil effects of small consequence. There is still room for the better accomplishment of this even in the best operated of present-day power plants.

Water may corrode condenser tubes, ferrules, tube sheets, boiler tubes, boiler drums and internal feed pipes. Condenser circulating water is all too often corrosive, in fact is usually so. It is used in such vast amounts that correction of its corrosive properties is absolutely prohibitive in cost and is never attempted. Sole reliance is placed on selection of metal for the tubes, ferrules, and tube sheets of condensers which will be least affected consistent with reasonable cost. But in connection with the requirement last mentioned it must be remembered that the cost of condenser tube corrosion is all too often entirely unreasonable, so that any costly tube which would stand up would be cheap in the end.

The corrosive properties of the feed water can be controlled; so also can its scale-forming properties and likewise its priming properties. With proper handling of these three the boiler-room-water chemical problems, at least are solved.

Water "Concentration" in the Boilers Must Be Kept Down

Boiler water will not corrode if it is alkaline, but not too alkaline. It will not scale if its sulphates are converted to carbonates. It will not prime if undue concentration of feed water is prevented in the boiler drums. This last point is of very great importance. To hear some power plant engineers talk one would think that they ran their plants on two separate and distinct kinds of water, namely, condenser circulating water and boiler feed water. Instead they actually use three separate and distinct kinds of water; condenser circulating water, boiler feed water and *concentrated water inside the boilers.*

A natural question at this point is: How much does boiler water concentrate? The answer is furnished by noting how much water the boiler-room engineer blows out of the boilers through the blow-offs, or how much

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(Concluded from page 750)

a series of tests which I made on surface cars of from 20 to 25 tons weight operating on city service. Since making these tests I have had occasion several times to check these with the results of other tests in similar service. I find that they compare very closely with results obtained. To adapt these data to calculations where the weight of the cars vary slightly from the ones actually tested, I have worked out the following empirical formula:

$$F = 18 + 0.3V + 0.1\frac{V^2}{T}$$

when F=train resistance, pounds per ton
V=speed, miles per hour
T=weight of cars in tons

This formula for train resistance, worked out graphically in Fig. 6, should be used only for single-car operations on surface tracks and for cars corresponding closely in weight to those tested.

leaks out through leaky blow-off valves in addition to the water which is intentionally blown off. If it amounts to 5 per cent the station thermal efficiency account must be looked into, and, of course, the cost account also. If as little as 1 per cent high concentration in the boiler water, with its baneful effects, may be expected.

Watch the Sodium Chloride of the Concentrated Water

Now the simplest of all means exists, if chemical test facilities of very elementary sort are available, by which the power plant engineer may determine very accurately the percentage of feed water blown off (or blown off and leaking away combined) or its reciprocal, the concentration of the feed water in the boilers. Practically all power plant water contains common salt, sodium chloride. Sodium chloride does not undergo any changes in the actions and reactions which make other chemical substances in the water the source of so much power plant trouble. Therefore if the amounts of sodium chloride in the concentrated water of the boilers and in the feed water are determined the one figure will be much higher than the other and the ratio will be the ratio of concentration of the boiler water compared with the feed water. Its reciprocal, expressed as a percentage, will be the percentage of water blown off (or blown off and leaking combined). Right here it may be noted that if track is kept of the water intentionally blown off the difference between the percentage determined as above will be a direct and very excellent measure of the quantity leaking through valves which need repair.

Feed Water Analysis Is Not Enough

The problems of corrosion prevention and scale prevention are jointly handled by maintenance of proper alkalinity. However, there is much confusion and misinformation on this subject. It is usual where water treatment is undertaken to base the treatment on analysis of feed water and to "let it go at that."

Such procedure is wrong, as can be illustrated in this way. One does not run an automobile rapidly down a straight road by manipulating the steering wheel so as reasonably to insure that the plane of the front wheels is parallel to the length of the car, taking the worm gear and sector, reach rods, etc., all into due consideration. One keeps his eye fixed down the road ahead, and the steering wheel is moved a little this way and that so that the sides of the road, as they seem to speed past, make no objectionable approaches to nor recessions from the car. In short, one's attitude is pragmatic, and so it should be with water treatment.

Analysis of the feed water, elaborate or otherwise, is the proper step for a beginning. A decision must first be reached as to *what* should be used as treating agents. The analysis, elaborate or otherwise, might almost as well be qualitive as quantative, and the result will indicate what should be used. This should be used as the automobile is steered. The *concentrated water* in the boilers should be examined, tested, analyzed. This will show when too little or too much of the one or more kinds of treating reagents is being used, so that proper corrective action can be taken. This will furnish a safe guide. If one bases quantities of reagents on analyses of feed water, in ninety-nine cases out of a hundred he will be fooling himself, as he might do also by watching the feed water after the reagents are in the water but before the water is in the boilers. It is the *concentrated water in the boilers* which must be watched.

Power plants naturally differ enormously in the variable factors entering the water treatment problem. Electric railway power plants have a proverbially variable load. Most of them are now steam turbine stations and most steam turbines work with surface condensers. If the condenser circulating water is in any way bad the tubes will leak and contaminate the hot-well water. The sodium chloride content of the contaminated hot-well water again furnishes the control guidance.

Make-Up and Circulating Water Must Be Analyzed Also

Below a certain limit of salinity the hot-well water is good for boiler feeding; above a certain limit it is unsuitable. The limit of salinity above which the contaminated hot-well water is no longer acceptable as feed water depends upon the quality and cost of the make-up water. If make-up water is free, for instance, the standard set for comparative freedom of hot-well water from condenser leakage contamination should be very rigorous, provided that the make-up water is of good quality and the condenser circulating water is of poor quality. It comes down ultimately to the writing of an equation properly relating the important and somewhat numerous terms.

Satisfactory boiler feed water at the minimum cost is the desideratum. It is the corrosive, scale-forming, and priming properties of the waters which are to be evaluated, not merely the salinity values. Thus analyses in some form of condenser circulating and make-up water are required. Upon such analyses the suitable working standards are calculated. Then salinity determinations alone suffice to dictate the admission or rejection of hot-well water to the feed lines.

The hot-wells of the various condensers in a plant have to be dealt with upon an individual basis. In most modern stations the number of generating units is not great. Therefore if the hot-well water from any one of them becomes unduly contaminated by condenser-tube leakage and consequently the hot-well water is to be rejected it follows that a large proportion of additional make-up water needs to be immediately admitted to the feed lines. On the other hand the water from any individual hot-well may be so contaminated as to make it in itself unsuitable for boiler feed water and yet when it has added to it the water from other condensers which at the time have only slight leakage the resulting mixture may be of entirely satisfactory quality.

Sometimes Tests at Very Short Intervals Are Needed

The practical way of handling this is, of course, to have one limit for individual condenser hot-well water and another and stricter limit for the salinity of the general mixture of feed water about to enter the feed lines. If the circulating water is highly corrosive and therefore serious condenser tube leakage is imminent in any condenser at any time, it becomes necessary to make routine tests of the salinity of individual condenser hot-well water at short intervals, let us say at one hour intervals. Likewise it is necessary to make salinity tests of the general mixture of water about to enter the feed lines at the same or even shorter intervals.

A very excellent way of maintaining proper standard of feed water salinity is to make the determinations on the general mixture of feed water at quite short intervals and whenever excess above the standard is found immediately to make tests of all the individual condenser hot wells which are operating, rejecting the water of the condenser which has the highest salinity regardless of what the salinity may be. While this is advantageous it necessitates *quantitative* determinations of the individual condenser hot-well salinities, whereas determinations which merely show whether salinity of a water is above or below the set standard are merely *qualitative* and therefore simpler to make. It is possible to arrange both sorts of tests so that the manipulation will be so simple that it can be readily performed by engineers entirely untrained in chemistry. In fact such simplicity is quite essential for practical station operation.

Good coal for railways is getting scarcer daily

Feed Water Softeners Have Their Place

After the question of what hot-well water to accept for feed water and what to reject has been settled the problems of the general feed water treatment come up for solution. In those plants where surface condensers are used and yet the use of hot-well water is a matter troublesome even though immensely worth while financially the purification of the feed water mixture by a softening system is hardly feasible and, further, it is hardly necessary. It is such plants which in the main I am discussing. Occasionally where the make-up water is quite bad but the circulating water is fairly good, and therefore does little in the way of contaminating the hot-well water, a softening system is used to bring up the quality of the make-up water. In these cases the softening system may be of reasonable size and cost. But a softening system to handle the entire feed water of a power plant, whether the plant is one using no hot-well water or all the hot-well water possible, is a proposition formidable in first cost and liable to prove disappointing in results. Such systems have substantially no representation in American practice. If the water which such a softener would be able to handle were very bad the results would almost certainly be disappointing, and if the water were not very bad the softener would be unnecessary anyway.

Although as has been shown, a water softener is limited in its scope, and although boilers are supposed to generate steam and not to serve incidentally as chemical reagent tanks, chemical water treatment of the feed water of the representative modern power plant is necessary. Further, it may be unequivocally stated that to permit the boilers to serve incidentally as reaction tanks, provided there is proper control, is far better than to allow scale to accumulate and acidity to corrode. If scale does accumulate and acidity does corrode, the boilers are making reaction tanks of themselves anyway.

If boilers need chemicals, what chemicals do they need? The essential chemical is a soluble carbonate or a soluble hydrate, or both. A cheap soluble carbonate is sodium carbonate, that is, soda ash. A cheap hydrate is lime, but for boiler internal use it is unsatisfactory in that it ultimately increases the suspended solid matter in the boiler. A soluble hydrate free from this disadvantage is sodium hydrate, that is, caustic soda. It costs more than lime, but its cost is not prohibitive. As a basis of judgment for the treatment needed, whether full qualitative analyses are made or not, the fundamental requisite is knowledge of the hardness and the alkalinity of the feed water. Hardness should be determined by the soap test and alkalinity by the use of two indicators, mythal orange and phenolthalene. The results of these tests will determine whether soda ash will be sufficient or whether caustic soda should be used to supplement it.

Any calculations which are made of the quantities to be used should be regarded as merely tentative. The treatment should be started and the concentrated water in the boilers should be tested for hardness (by the soap test), and alkalinity (by the mythal orange and phenolthalene tests). The latter quality, by the way, is sometimes called the "causticity." If the hardness does not come down to very low values it is evident that insufficient treatment is being given. If the alkalinity to mythal orange does not numerically exceed the hardness, calcium sulphate is present and hard scale is forming. The soda ash should then be increased until the alkalinity to mythal orange does exceed the hardness. If the alkalinity to mythal orange accumulates to high values and at the same time the hardness comes down to very low values, as for instance two parts per 100,000 parts of water, the amount of soda ash should be decreased.

"Hardness" May Be Temporary or Permanent

The use of caustic soda is to prevent corrosion. If the feed water has high temporary hardness (that is if it contains bicarbonates of calcium and magnesium) and low permanent hardness (due to calcium sulphate) the use of caustic soda alone or supplementing soda ash may be necessary. It should be borne in mind, however, that soda ash becomes partially converted to caustic soda under the conditions of temperature and pressure in the boilers. In other words, the tests made on the concentrated water in the boilers will show the presence of caustic soda even though soda ash may be the sole treating agent put into the feed water. Therefore in many cases the supplementary use of caustic soda is not necessary.

In turbine stations which have good circulating water and, therefore, but little tendency to hot-well water contamination through tube leakage, it is well so to regu-

Car Bodies Must Be Designed for Economy as Well as Strength

By Norman Litchfield

The Modern Electric Railway Car Is a Truss in which the Weight Is Largely Carried by the Sides of the Body

IN A PREVIOUS article the writer gave a general classification of electric railways cars into several distinctive types, varying more or less in construction to meet the varying conditions of service for which they are designed. The difference noted therein had to do with arrangement rather than with principles of construction. All of the types contain essential elements in common, whether the service be, on the one hand, of the extreme light-weight, one-man character, or on the other, the heaviest train operation.

These essential and common elements may be enumerated as follows: (1) Safety and comfort of passengers. (2) Ability to carry the load and withstand reasonable shocks. (3) Durability. (4) Ease of manufacture and repair. (5) Minimum weight.

The primary feature from a structural standpoint is the ability to carry the load and to withstand end shocks. The relative importance of the two subdivisions of load and end shocks will depend largely on the character of service, as each different class of service contains one or more controlling elements which either may be absent entirely in the others or may be of less consequence. Variation in the design may thus be permitted, not so much in the fundamental principles as in the degree of intensity which one feature bears to the whole.

In Steam Freight Cars Buffing Strains Predominate

A good instance of this is a freight car in steam trunk-line service, in which case cars are operated in long trains, pulled or pushed by a locomotive at the extreme end, or dropped down the grade of a "hog back" freight yard against a bumping post. All of these are conditions combining to produce enormous buffing strains, which thus become the controlling features. The importance of this feature is well recognized and its effect is summed up in the 1915 report of the M. C. B. committee on car construction which contains the following:

> During the past year the committee has given careful consideration to the various types of existing freight-car designs, and has investigated current troubles and analyzed causes for such troubles. A large number of failures can be traced directly to weak center-sill construction and to incorrect analysis of draft-gear effect on center-sill construction.

The committee then proceeds to the consideration of the intensity of the end force which should be allowed for, and concludes that this should be assumed equivalent to a static load or steady pressure of 250,000 lb. Some idea of the relation that this load bears to ordinary electric car service can be obtained by considering that a typical double-truck city surface car with passenger load will weigh at least 50,000 lb., and that a force of 250,000 lb. would be about sufficient to slide the wheels of a train of twenty such cars coupled together.

Just as we have the standard freight car at one end of the scale, so at the other is the ultra light-weight car for city service, wherein the operating speeds are so low as to make the end forces practically negligible as a factor in the car construction.

A somewhat parallel case in its effect on design is that of passenger interchange, or facility in loading and unloading on a pay-as-you-enter surface car where it is of prime importance to have ample platform capacity to permit the picking up of a large number of passengers. Of only secondary importance is the necessity for making the steps as low as possible. These features introduce a condition of an overhung weight which must be borne on dropped platform sills. They are points which do not have to be given as much weight in the design of a car to operate in service where the station platforms are level with the car and platform floor, thus permitting the use of a continuous straight sill.

Passenger Interchange Needs Dictate Features of Car Design

Detail differences and distinction could be multiplied and cited at length, but these soon become evident to the designer as he studies his own problem, and consideration of the structure of any fairly representative car will focus attention to the chief essentials. For this purpose a short analysis is given in the present article of a level-floor car body weighing with equipment approximately 40,000 lb., and designed to carry a maximum load of 160 passengers weighing 140 lb. each.

The car body can be considered simply as a load-carrying structure or bridge, the abutments or points of support being the center plates of the trucks. It

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(Concluded from page 753)

late the feed water treatment as to prevent undue accumulation of caustic soda in the concentrated boiler water. It should be present in no greater quantity than is the sodium sulphate resulting from the elimination of hard scale-forming matter by the soda ash acting in the feed water to convert calcium sulphate to calcium carbonate.

In the above discussion the technique of water tests has not been gone into. All but one of the tests mentioned are simple, and that one is by no means difficult. The salt test and the hardness and alkalinity tests to mythal orange and phenolthalene are so very simple that anyone unacquainted with chemistry can readily be taught to make them. It is unnecessary to describe them here and to show how they can be performed with least manipulation. After all, in my opinion, the main thing about power plant water treatment is its philosophy, not its technique.

is customary to provide clearance between the body and the truck side bearings, to allow the body to rock slightly to improve riding qualities and to give ease in rounding curves, so that the side bearings cannot be considered as points of support. Cross members or bolsters are provided to carry the load of the sides and the roof to the center plates. These are designed as cantilevers resting on the center plates. The detail design of these bolsters will be discussed later, attention being given first to the longitudinal structure of the car, in relation to its function of carrying the load from bolster to bolster. There are various types of floor frames, but in general they consist of the following main members: Two side sills, two center sills, two end sills, two bolsters and two main cross-bearers. The choice as to whether the load shall be carried equally by all longitudinal sills, by the center sills alone, or by the side sills alone has been influenced in the past by the conditions of service, the nature of the materials used in the car construction and the methods of manufacture. Thus early types of freight cars had truss rods under each sill, so that each would carry its portion of the load, and cross members or "needle beams" were provided underneath the longitudinal members to distribute the load more or less evenly among them all. As the length of freight trains increased, the buffing shocks became excessive. As pointed out in the foregoing, they soon became a controlling feature, and forced the use of powerfully constructed center sills and, as it were, automatically the center sills became the chief load-carrying members. This followed because they had necessarily to be built strong enough to resist the end strains, and the structure thus formed was available for carrying the vertical loads. The same feature has had its influence in the construction of passenger cars for high-speed trunk-line service in long trains, many of which are constructed with heavy center sills. In these the side sills are comparatively light and supported from the center sills at a number of points by cantilever arms.

The bolster is rightly named for it is a mighty important part of the truck

But on cars for electric service the center sills have not been very generally used for load-carrying purposes and for two reasons. One is that the attaching of the electric and air-brake apparatus to the bottom of the car makes it undesirable, from the standpoints of both installation and inspection, to have a deep center sill. The other is that the conditions on the usual electric road are not such as to be likely to impose any excessive end strains. Furthermore, the sides of the car have in any event to be built sufficiently deep to provide standing height and the necessary air space for passengers and hence, as the sides are there for these purposes, they are also economically available for use as load-bearing members. The center sills are, therefore, as a general rule made comparatively light, and while they carry a portion of the passenger and car equipment load directly to the bolsters, they cannot support the entire load of themselves. They are, therefore, reinforced or propped up by two cross-bearers which carry the excess load to the side frames.

The side frames thus get a combined load consisting of their own weight, that of the roof, a fairly uniformly distributed load of that portion of the passengers, floor and apparatus directly supported by the side sills, two concentrated loads at the cross-bearers, and an overhung load outside the bolsters.

To meet these conditions various forms of side construction have been devised, and those in general use may be divided into three main classes: (1) Truss rod, (2) plate girder, and (3) framed truss. The origin of the first of these, the truss rod, dates back to the early simple roof and bridge trusses wherein, when the distance to be spanned became too great for a simple beam, resort was had to a truss rod and queen post to prop up the beam at the center. This plan naturally was adopted for the same reason in car construction, but it was soon found to be inadequate in itself, as it provided no stiffness to resist the oscillations set up by the motion of the car along the track. Consequently it became the practice to use deep planks set on edge on the tops of the side sills, and bolted thereto, these being known as truss planks. These also were found insufficient, and stiffening trusses were added. These consisted of wooden struts carefully fitted between the sill and the belt rails, and tied together with iron rods put into initial tension with turnbuckles. These trusses were also used to help support the overhung platform loads. As these trusses were at best very flexible the truss-rod lent itself admirably for use with them, but with the advent of steel in car construction the truss-rod became unnecessary. The side frame in itself is now sufficiently strong and rigid to carry the load without further reinforcement.

The earliest form of steel-side construction was that in which the load was carried on a structure at or below the floor level. It consisted either of a pressed or built-up beam, deepened at the center and from its shape generally known as a "fish-belly" girder. This was eminently well adapted to a car in which, as at first, only the underframe was of steel, the sheathing, posts and roof being as yet of wood.

With the further use of steel for side posts and sheathing, it was at once evident that for comparatively light service, with small buffing strains, the "fish-belly" side construction was superfluous. The belt rail, side sill and sheathing in themselves formed a plate girder simple in construction and sufficiently strong and stiff for a car having no doors in the sides between bolsters. This permitted the use of light side posts and roof construction, and gave a very satisfactory structure.

When the congested traffic conditions in the larger cities began to force the use of additional doors in the sides of rapid transit cars in order to provide quick passenger interchange, some other method than the side plate-girder had to be used as the doors cut the girder in half. The designer thus found himself confronted by three alternatives: First, to resort to the old "sub-fish-belly" girder; second, to patch the two halves of the side plate girder together, either by a stiff frame carrying the compression strains over the top of the doorway or by a short "fish-belly" girder under the door, and third, to treat the entire side of the car as a truss.

The different types of girder construction are shown in Fig. 3. When we come to consider the use of the entire side structure of the car for carrying the load, it must be remembered that the car side is more than a simple load-carrying structure such as a bridge truss, in that it is also the side wall of an inclosed moving vehicle designed primarily for the comfortable housing of passengers. As such certain parts must be included regardless of whether the supporting structure is a truss rod, a girder or a truss. These are the floor sill, the window sill, the top member generally known as the side plate, the sheathing, the posts, and the windows. The desirable proportion of the windows from the standpoint of the comfort of the passengers precludes the use of diagonals, which form a necessary part of a true truss. In such a truss all of the members are either in straight tension or compression without being subject to bending. The place of these diagonals therefore has to be taken by the posts which are put under bending stress, resisted and braced either by the belt rail and sheathing directly or by an independent structure below the window sill and back of the sheathing.

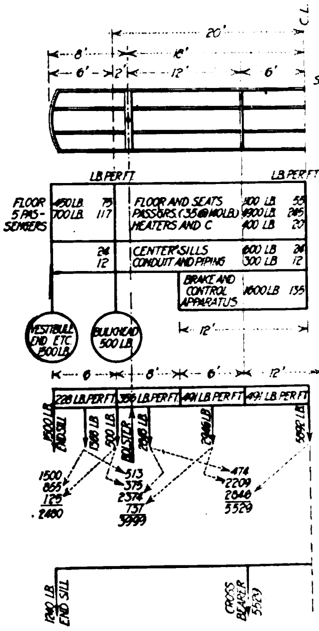
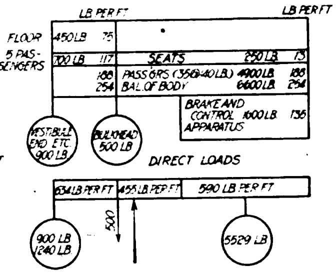

C.L.
20'
8'
12'
6'
2'
12'
6'
LB PER FT
LB PER FT
FLOOR
5 PASSENGERS
450 LB 75
700 LB 117
FLOOR AND SEATS 300 LB 55
PASS'GRS (35@140 LB) 4900 LB 205
HEATERS AND C 400 LB 20
24
12
CENTER SILLS 600 LB 24
CONDUIT AND PIPING 300 LB 12
BRAKE AND CONTROL APPARATUS 1600 LB 135
VESTIBULE END ETC. 1500 LB
BULKHEAD 500 LB
12'
6
8'
6'
12'
228 LB PER FT
356 LB PER FT
491 LB PER FT
491 LB PER FT
1500 LB END SILL
1388 LB
500 LB
BOLSTER
2846 LB
2946 LB
5892 LB
1500
855
125
2480
513
375
2374
737
5999
474
2209
2846
5529
1240 LB END SILL
CROSS BEARER 5529

Fig. 1—Loads on Center Sills and Loads transmitted to Side Sills


LB PER FT
LB PER FT
FLOOR
5 PASSENGERS
450 LB 75
700 LB 117
SEATS 250 LB 75
188
254
PASS GRS (35@140 LB) 4900 LB 188
BAL. OF BODY 6600 LB 254
BRAKE AND CONTROL APPARATUS 1600 LB 136
VESTIBULE END ETC. 900 LB
BULKHEAD 500 LB
DIRECT LOADS
634 LB PER FT
455 LB PER FT
590 LB PER FT
500
900 LB 1240 LB
5529 LB

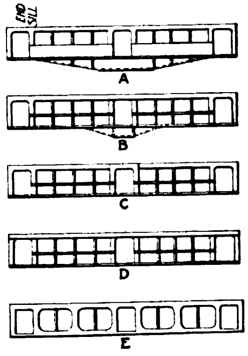

END SILL
A
B
C
D
E

Fig. 2—Direct and transmitted Loads on Side Sills

Fig. 3—Different types of Girder Construction

Some Departure From "Orthodox" Bridge Design Is Necessary

To the designer of bridge and roof trusses, the bending of main members is considered "anathema" and not to be tolerated. But as before stated the side of a car is not a structure alone, and inasmuch as the strains in the posts can be quite definitely determined and sufficient resistance against bending provided in normal dimensions of posts of not excessive weight, it has proved entirely satisfactory in electric car design to follow this procedure, the structure being as shown in Fig. 3D.

To overcome the bending stresses herein mentioned, and to produce a side structure which should be as nearly as possible a true truss, the design shown in Fig. 3E has been used somewhat. In this the windows are rounded, giving the effect of a somewhat modified Howe truss, and the design has proved entirely satisfactory.

Generally speaking, the use of the car side for carrying the load in one form or another has reached the point where it may be considered as a fixed element of all electric car construction for other than trunk-line purposes.

Good Engineering Requires Elimination of Unnecessary Weight

The railways have for a number of years felt the desirability of obtaining all possible economies in the use of power, and have recognized the expense caused by excessively heavy cars. Each item entering into the construction of the car and its equipment has received careful attention as to the possibilities of reducing weight. To this end it is necessary to ascertain as nearly as possible to what stresses each part of the construction is subjected, and then to design the part specifically to meet those stresses, a course which the use of steel has made possible without involving excessive weight.

For the floor framing the stresses imposed by the vertical loads may be approximately determined by the use of loading diagram such as shown in Figs. 1 and 2, in which approximate estimates are used of the weight of component parts of the car structure together with such data as may be available in regard to the operating apparatus which is carried on the car body.

With the loading diagram of the floor framing thus plotted, the individual loads on the side sills are laid off to some convenient scale as in Fig. 4, the force and equilibrium polygons are drawn, and the resulting moment and shear diagrams are constructed. In the figure as reproduced the force polygon and rays have been omitted for convenience. The method of the force and equilibrium polygons is one of the simplest for determining the bending moments. It is described in detail in several standard works on analytical mechanics, and need not, therefore, be explained here. It will be seen that the maximum bending moment is at the center of the car, and amounts in the case under consideration to 120,000 lb.ft. The distance between the neutral axes of the top and bottom members of the side frame or the so-called "effective depth" being approximately 7 ft., the stress in these members is 8571 lb.

Having determined this stress the next question is that of the safe allowable unit stress. This, of course, is a matter which is influenced by such points as operating speeds and track conditions. It is also one which for the electric railways has not been authoritatively standardized, and has been left more or less to the individual judgment of the designer.

For trunk-line service an authoritative specification is that of the United States Postoffice Department for the construction of steel postal cars as follows:

All parts of the car framing shall be so proportioned that the sum of the maximum unit stresses shall not exceed the following amounts in pounds per square inch, except as modified in sections 6 and 18. These stresses, unless otherwise stated, are for steel having an ultimate strength of from 50,000 to 65,000 lb. per square inch. When other materials are used they shall bear the same proportion to the ultimate strength of the material used.

Bolster of rolled steel—Stress shall not exceed 12,500 lb. per square inch.

Sills and framing of rolled steel—Stress shall not exceed 16,000 lb. per square inch.

When cast steel is used the allowable stresses may be the same as for rolled steel, except tension stresses, which must be at least 20 per cent less than those for rolled steel as specified above.

For members in compression the stresses shall be determined by the following formula:

Steel $16{,}000 - 70\frac{L}{R}$

In the above formula $L =$ length in inches.

$R =$ least radius of gyration in inches.

Shear,	other than buffing,	10,000 lb. per square inch
Bearing,	other than buffing,	20,000 lb. per square inch
Shear, buffing,		12,000 lb. per square inch
Bearing, buffing,		24,000 lb. per square inch

The foregoing stresses are based on the assumption that the maximum end shock due to buffing shall be assumed as a static load of 400,000 lb. applied horizontally at the resultant line of the forces acting at the center line of the buffing mechanism and at the center line of the draft gear respectively, and shall be assumed to be resisted by all continuous longitudinal underframe members below floor level, provided such members are sufficiently tied together to act in unison. Calculations for resistance to buffing shocks shall be based only on underframe members below floor level.

These underframe members may be considered supported against buckling vertically by the superstructures between center plates at cross-bearers to the extent that the strength of the superstructure cross-bearers and attachments is available for that purpose.

For electric cars operated on lines where electricity is the only motive power, and the total weight of trains does not exceed 600,000 lb. the static load may be assumed to be 200,000 lb.

All connections, except those specified for end construction, shall be designed for the maximum load to which the member connected shall be subject; and secondary stresses in any members caused by eccentric loads shall be combined with the direct stresses in such members. The maximum fiber stress in any member subject to both direct and secondary stresses may be taken at 20 per cent greater than those given in section 20; but the direct stresses considered above must not exceed the allowable stresses.

With regard to vertical end members, the Postal specification requires:

For electric cars operated on lines where electricity is the only motive power, and the total weight of trains does not exceed 600,000 lb., the sum of the section moduli of the vertical end members shall be not less than forty, and the section moduli of the main members, either forming or adjacent to the door posts, shall be not less than 75 per cent of this amount.

The horizontal reactions of all vertical end members at the top shall be calculated from an assumed external horizontal force, applied 18 in. above floor line, to all vertical members in proportion to their respective section moduli, such force being of sufficient amount to cause bending of all vertical members acting together, and top connections of vertical end members shall be designed for their reactions. The bottom connections shall be sufficient to develop the full horizontal shearing value of such members.

Except when vertical end members shall bear directly against or be attached directly to longitudinal members at either top or bottom, the assumed reactions shall be considered as loads applied to whatever construction is used at end sill or end plate, and both these last members shall have section moduli, respectively, sufficient to prevent their failure horizontally before that of the vertical end members.

Other specifications make allowance for oscillation, either by assuming as high as 25 per cent additional load or by reducing the allowable unit stress as low as 12,500 lb. per square inch.

The Postal specifications may be taken as representing good practice for electric car service as far as unit stresses are concerned, and also for buffing strains for cars in rapid transit service where speeds are high. For lower speeds and light trains the buffing strains may be reduced, as these will vary with the speed and with the energy of the moving mass. Thus if 200,000 lb. is considered to be sufficient for a maximum speed of 60 m.p.h., then for a city surface car whose speed will not exceed 15 m.p.h., the maximum end force would probably not exceed 12,500 lb., which for a car weighing 50,000 lb. with load is equivalent to a retardation rate of between 5 and 6 m.p.h.p.s., and would permit of approximately double that amount before the elastic limit of the material would be exceeded.

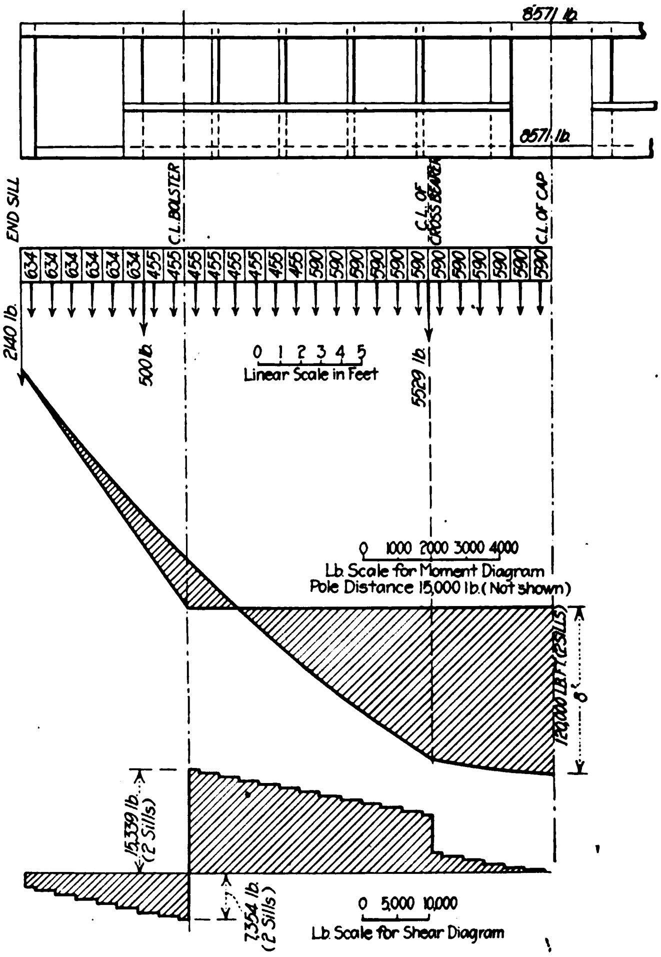


Fig. 4—Loading, Moment and Shear Diagrams of Side Sills

In the design of parts under compression particular attention should be paid to proper bracing, and in fact it may be stated that, throughout, care must be taken that the structure is sufficiently rigid. It must be remembered that strength and rigidity are not necessarily synonymous, and the latter quality must be obtained by the proper reinforcement against buckling of parts in compression, and gusseting of joints subject to wearing action. On this point the Master Car Builders' Association has ruled that the length of center or draft-sill members between braces shall not exceed twenty times the depth of the members measured in the direction in which buckling might take place.

Protecting Car Equipment Effectively Against Lightning

By R. T. Wagner
General Electric Company, Schenectady, N. Y.

The Car-Type Aluminum Arrester Has Made Good as Records from Users Show—How Best to Install and Maintain Such Arresters

IT IS the purpose of this article to consider protection against lightning in localities where severe lightning is a menace to good operation. The problem is considered in its relation to those electric railways which know by experience that lightning protection is necessary.

The superlative merits of the aluminum (electrolytic) type of arrester are no longer a subject of discussion: it is widely admitted that this type of arrester is the most efficient. Where the electrolytic type of arrester is not used there is some reason other than the efficiency of the arrester for the use of another type.

Superiority of Aluminum Type Worth Extra Cost and Trouble

The question considered in this article is whether the electrolytic type of arrester is suitable for electric railways operating in hazardous localities. Is the protection worth the cost? The electrolytic arrester individually costs more than any other type, requires more frequent and careful attention and has a higher maintenance cost. It will be shown that taken in the aggregate, considering the protection secured and the number of arresters required, the first cost per unit is not uneconomical, the attention required is not burdensome and the maintenance is not excessive.

The 600-volt arrester has two aluminum cells connected in series directly across the circuit or apparatus to be protected. It is an electrical safety valve acting somewhat like the well-known steam safety valve. When the pressure reaches a certain point, the valve opens and a discharge occurs until the normal pressure is reached. To put it in another way, the arrester offers an extremely high resistance to the flow of current at normal potential and allows a free discharge of current at higher, or lightning, potential.

Without going into the theory of lightning arrester design, it may be pointed out that, to give protection, an arrester should discharge at low rises in lightning potential, should freely discharge disturbance, should not allow the line current to follow the lightning discharge, and should not be damaged in these processes. The aluminum arrester meets these four requirements. In one important respect it is more effective than the alternating-current electrolytic arrester, universally used for the protection of large power plants. It does not have a gap. The slightest rise of potential due to lightning causes a discharge.

The electrolytic arrester owes its protective qualities in part to the fact that it is a condenser. The films on the aluminum plates form the plates of the condenser. This condenser is of value in absorbing lightning disturbances of high frequency. The arrester illustrated in Fig. 1 has a capacitance of between two and three microfarads. As a condenser arrester, the aluminum arrester will therefore offer a high degree of protection, but the condenser effect is not relied upon alone to give protection. The main reliance for protection is placed on the valve effect which permits the quick discharge to ground of large quantities of lightning and, hence, immediate and complete relief from the stress on the insulation due to the lightning potential.

Answers to Questionnaire Show Practically Perfect Protection

The question of whether this condenser-electrolytic arrester is worth the cost to an electric railway for protection against lightning may be judged on its past performance, records of which are available.

To obtain information on these arresters a questionnaire was sent to a number of railways that had been using them for several years. Twenty-eight replies were received. Sixteen of the companies were located in the Southern or South Atlantic States, where lightning is known to be severe, and the remainder were located in the Middle West. The twenty-eight roads had had 1291 cars equipped with aluminum arresters for periods ranging from one to seven years, amounting to a total of 4129 arrester-years. *They reported just twenty-four cases of damage by lightning.*

Among the cases of lightning damage there were two damaged arresters, one burnt-out coil on a control circuit, and four doubtful cases of motor damage, possibly due to water in the motors.

Had these 1291 cars been operated for only one year with even more than twenty-four total cases of trouble, the record would have been a remarkable one. It shows conclusively that lightning damage to cars protected by aluminum arresters is practically negligible.

Would lightning losses have been suffered had these cars not been protected? The replies to this question were disappointing because many companies did not begin to keep records until after the aluminum arresters had been installed, so that a comparison with previous years cannot be made directly. About half gave no information whatever. Three companies replied that they had no records previous to the installing of aluminum arresters because trolleys had been pulled down and service discontinued during lightning storms on account of frequent damage to motors. Seven companies reported a total of 225 cases of damage, an average of fifteen a season. One reported 688 cases in five years, an average of 137 a year, and another 386 in six years, an average of sixty-four a year.

Some of the losses reported occurred to cars that had no arresters; some occurred to cars that had other arresters, part occurred just previous to aluminum arrester installation, and others occurred after aluminum arresters had been installed on part of the cars. The road that reported 688 cases of trouble in five years had, at the beginning of 1917, 181 cars equipped with aluminum arresters which had been installed during the previous five years. In that time not a single case of trouble had occurred to those cars. The number of arresters now is being greatly increased.

While these records are somewhat meager they show unquestionably that the cars would have suffered damage had aluminum arresters not been used.

It remains to be shown whether or not the protection was obtained at too great a cost. In the questionnaire the following queries appeared: "What was the cost per arrester per year for installation in the spring, renewal of parts and removal in the fall? One company with thirteen arresters in service for two years reported a total expenditure of 50 cents for all repairs. Another, with eighty-one arresters in service for seven years, reported an annual cost per arrester of 90 cents, not including repair parts. Ten companies, having a total of 499 arresters in use for from one to four years, gave full answer to this question. The lowest maintenance cost was 50 cents, the highest was $3 and the average was $1.58. The records, therefore, show that the maintenance of these arresters was not excessive, even if the highest cost, $3, be taken as representative.

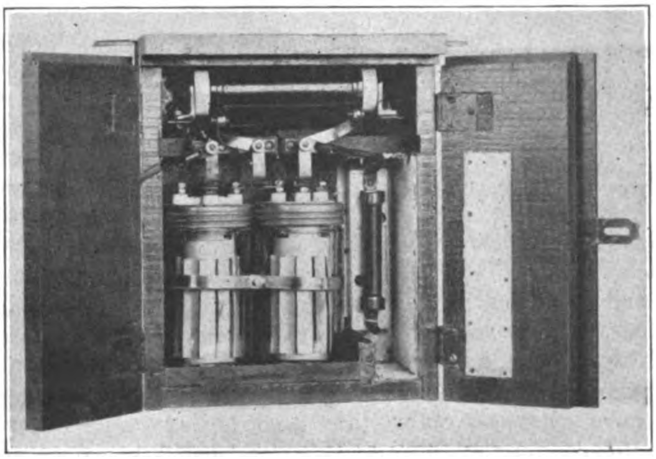


FIG. 1—ELECTROLYTIC LIGHTNING ARRESTER FOR USE ON CARS

An aluminum arrester of the type shown in Fig. 1 costs about $19. Allowing a life of five years, which is very conservative, the capital cost per year is $3.80. Adding to this the maintenance cost at $1.60, and interest at 6 per cent, or $1.14, the cost per year is $6.54, not including installation which would be about the same for any type of arrester. This is the cost per year for insurance against lightning, and it differs from other insurance because it guarantees that there will be practically no loss. The cost of lightning damage varies greatly, depending upon the apparatus affected and the extent of the damages. Of least importance, except under some circumstances at night, is the burning out of the lighting circuit.

Damages to other parts of the equipment ordinarily involve taking the car immediately out of service. Whether it goes in on its own power or is towed in the cost would be $2 or $3 at least. The most frequent cause of trouble is damage to the armature coils, and the cost of repairs depends on whether the armature is burned out entirely or only a few coils are destroyed, and also on the size and age of the motor. The repair of only a few coils might cost $10 to $15. Rewinding the armature completely might cost $60 to $70. Old motors, in which the insulation has deteriorated, are most likely to be damaged by lightning and are expensive to repair.

One company figures that it costs $15 to $20 to repair a new motor and $50 to $60 to repair an old one. On another road the costs vary from $4 to $65, the average being in the neighborhood of $25. Three large systems in the East put the cost at $50, $60 and $75 respectively.

Air compressors may be damaged also. A few coils would cost from $3 to $6 and totally rewinding the armature would cost $15 to $18. If the control circuit is affected the damage may be only a hole in the metal case of the controller which, however, requires patching, a burnt-out terminal board which would cost $10 to $15 to replace, or a blow-out coil which would cost $9 to $12.

These are only rough averages, but railway men know this item of cost and can readily judge whether the cost of the arresters is justified. It can hardly be doubted that for the kind of a system under discussion, one operating in a locality of severe and frequent lightning storms, the arrester is worth its cost, on the grounds of saving repair expenses only. The arresters pay for themselves even if the gain which comes from keeping the cars operating in the severest storms is not taken into account. This gain cannot be measured in dollars, but it is undoubtedly worth much more to a public utility than the cost of repairs.

In considering damages from lightning it should always be remembered that a damaged car represents much more than the cost of repairing the damages, that is, something more than the mere cost of the mechanical work and the material necessary to rewind the motor and put the car back into commission. First and most important, a damaged car causes inconvenience to the public on account of the interrupted schedule, not only to the actual passengers but also to prospective passengers. This inconvenience is aggravated by its coming at a time when the public most urgently requires transportation.

In the second place a dead car represents dead capital, that is, an interest charge with no compensating revenue. Again, for every car out of commission, reserves in rolling stock or motors have to be provided if service is to be maintained. This also represents dead capital which may be reduced if protection against lightning troubles can be insured. Considering all of these factors and the past performance of these arresters it cannot be doubted that the aluminum arrester is worth its cost. This is particularly true under present conditions, when nearly all railways are working their cars to the limit, and many really need additional equipments. Any loss of cars due to lightning will not only be high in the cost of repairs, but also unusually detrimental to service.

The operating man is likely to ask if an inspector can tell whether or not an arrester is in good operating condition. This is indicated by the record of protection as previously given. Either the arresters required very little attention or the necessary care was ascertained readily by the inspectors. Otherwise the arresters would not have given practically perfect protection at such a low maintenance cost. However, as the active elements of the arrester can be seen plainly upon opening the arrester doors, an inspector can readily determine its condition. The color of the electrolyte gives a good indication. As the arrester is also a condenser, its condition may also be judged from the spark when the arrester fuse is pulled. There is no danger of an internal short-circuit between condenser plates, and the films are kept formed as long as the arrester is on the circuit.

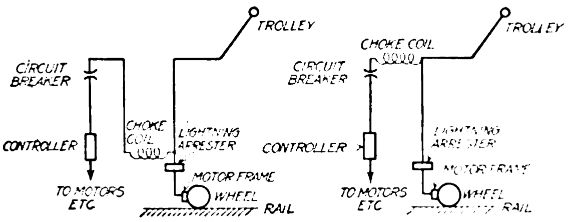


FIG. 2—PROPER ARRESTER CIRCUIT ARRANGEMENT FOR SINGLE-END CARS. FIG. 3—WIRING FOR ROOF OR VESTIBULE LOCATION OF ARRESTER

The aluminum type of arrester is frequently criticised on the grounds of its requiring frequent and elaborate inspection. One of the questions asked in the questionnaire was: "Are aluminum arresters inspected regularly?" Fifteen companies gave complete replies as follows: Monthly and after storms, four; weekly and after storms, three; weekly, two; every ten days, two; four times during the season and after storms, one; every two weeks and after storms, one; once a year, one; every 1000 miles, one.

These companies got protection at a low maintenance cost, and certainly the inspection could not be considered burdensome, especially as the regular inspections were made as part of the usual inspection of the equipments. The best method is to inspect the arresters after every storm and at the time of the regular car inspections which usually are given at intervals of two weeks or less.

Arrester Connections, Choke Coils, Grounding

In order to obtain the full benefit of the aluminum arrester it must be properly installed. The most important consideration is that the discharge circuit should be the shortest and most direct path from line to ground, and that no wire that may carry lightning should be near nor parallel for any considerable length any of the other wiring. This prevents damage being done by an induced charge.

The most desirable connection is shown in Figs. 2 and 4. The latter is shown for a car with double-end control, but applies equally well to single-end cars, one-half of the diagram only being considered. With this connection the arrester is located under the car floor and the wire to the arrester is kept away from all other wires.

The connection shown in Fig. 3 is sometimes used when it is desired to place the arresters on the car roof or in the motorman's vestibule. This connection is not as effective as the one shown in Fig. 2 because there is a greater length of wire in the arrester circuit. The wires to and from the arrester should not be run in iron conduit, on account of the choking effect of a long piece of the latter.

Choke coils should always be used as they increase the effectiveness of the arresters. These are usually made by winding a few turns of the motor lead on a wooden core. Of the twenty-eight companies referred to above, only one used no coils, one used them on some cars and the remainder used them on all cars.

The grounding of car arresters is, of course, easily taken care of by grounding to the car, truck or frame, the only precaution being to make the ground wire as straight as possible and to attach it securely.

No Line Arresters Necessary If All Cars Have Aluminum-Cell Type

The question is frequently asked whether it is necessary, when aluminum arresters are used on the cars, to use arresters of the aluminum or some other type on the lines. It is not possible to give a "yes" or "no" answer to this question for the reason that there are insufficient data on which to base an opinion. Some roads have operated with aluminum arresters on the cars and with no arresters on the lines and have not had any lightning troubles on the cars. Most companies using aluminum arresters on the cars have also had some kind of arresters on the lines. The indication is that with aluminum arresters on the cars, properly installed and properly maintained, there is no need for any kind of arrester on the lines as far as protection of the car goes.

This is consistent with theory and practice in the protection of other kinds of apparatus. It has been proved both in the laboratory and in the field that an arrester gives the best protection when installed at the terminals of the apparatus to be protected. In this case the apparatus is the car motor and, therefore, the aluminum arrester installed on the car meets the conditions for the best protection.

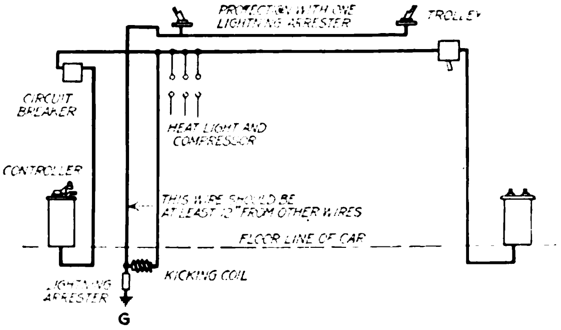

PROTECTION WITH ONE LIGHTNING ARRESTER
TROLLEY
CIRCUIT BREAKER
HEAT LIGHT AND COMPRESSOR
CONTROLLER
THIS WIRE SHOULD BE AT LEAST 12" FROM OTHER WIRES
FLOOR LINE OF CAR
KICKING COIL
LIGHTNING ARRESTER
G

FIG. 4—PROPER ARRESTER CIRCUIT LAYOUT FOR DOUBLE-END CARS

Line arresters can be considered only as adjuncts of the car arresters. When an arrester of lower "protectability" is used on cars, line arresters should be used to help the car arresters in discharging the lightning disturbances. This, of course, is aside from the protection of any other apparatus on the lines, such as signals, which may require individual protection. Line arresters do give some protection to the line insulating material, but lightning is so often purely local in character that the expense of line arresters for this purpose alone is not justified. They may be judged of value only as they assist the car arresters to protect the cars.

Probably the most practical answer to this question is that when cars are being equipped with aluminum arresters, no additions need be made to the number of line arresters. A season or two will indicate whether line arresters may be discarded or should be increased in numbers. It will probably be found that the line arresters may be abandoned.

It must be remembered, however, that the aluminum arrester can be held responsible only for the car on which it is installed. If other cars have a lesser degree of protection they have to depend, in part, on the line arresters. Where the trolley insulation is exceptionally weak, as indicated by frequent failures during lightning storms, it may be advisable to use arresters on the lines, although the alternative of improving the insulation should be carefully considered.

How This Arrester Has Made Good in Denver

This discussion is based on many years of experience. The arrester was first tried out about 1907. In 1910 more than 200 arresters were added by the Denver Tramway to an installation of arresters made in the preceding three years. Cars were rewired in order that the full benefit of the arresters would be attained and an engineer of the General Electric Company co-operated with the Denver Tramway in watching the installation and studying the results. The installation was a success, and the number of arresters has been increased from time to time, so that now in Denver, a city subjected to notoriously severe lightning storms, damage to cars from lightning has now become practically nonexistent.

The improvement that followed may best be indicated by the following quotation from the March 16, 1918, issue of *Tram-O-Grams*, a publication of the Denver Tramway, in connection with a failure of power due to transmission troubles.

> Here on the plains, up high in the air, electricity has been more of a "divil" than in other altitudes and other cities. Those of you who were living in Denver six or seven years ago will remember how the Tramway spent hundreds of thousands of dollars experimenting with lightning arresters for the cars before a satisfactory one was invented, and how all the cars would stop and their trolley poles would be pulled down every time there was a thunder and lightning storm. They would remain quietly in puddles of rain water until the storm was over. With the usual perverseness of nature the storm always arrived in the middle of the rush hour when the cars were loaded with home-going people.

New Ticket Books for Empoyees

Free transportation for employees of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, will be supplied in a new form. The annual card pass will no longer be used. The ordinary form of pass will be a book of tickets for use on the lines within city limits. These books will all be marked for the city or cities in which the tickets may be accepted for transportation and the cover of the book will constitute the pass. In all cases the book must be in plain view of the conductor and the ticket must be detached from it in his presence. Furthermore the book must be handed to the conductor for examination on his request.

War-Time Problems

California Public Service Commissioner Discusses Rates, Service and Other Points—Outlines Duties of Regulatory Bodies

MAX THELEN, president of the California Railroad Commission, recently discussed utility rates, service, extensions and finances before an extension course of the University of California. He also made several suggestions as to the duty of the various state commissions with reference to utilities and their war problems.

In California, Mr. Thelen said, 106 formal applications for authority to increase rates were filed with the commission between April 6, 1917, the day on which war was declared to exist, and March 1, 1918. Forty-seven applications have been granted, sixteen have been denied or dismissed and forty-three are now pending. Of the applications pending, more than one-half were not filed until the last two months.

Where an emergency exists and where the usual method of handling rate applications, including a valuation of the property and an audit of the books, fails to meet the situation, the commission does not hesitate to apply emergency measures. To the extent to which short-cuts are necessary to meet the emergency, the board applies them. The commission, Mr. Thelen stated, fully agrees with President Wilson's letter to Secretary McAdoo that it is essential that the utilities be maintained at their maximum efficiency during the war.

Nearly all the public utilities which have applied to the California commission for authority to increase their rates, subsequent to the entry of the United States into the world contest, have specifically stated that they will be content with the same net return which they received before the recent large increases in operating expenses, and that they do not expect to increase their profits during the war.

ECONOMIES MUST BE SOUGHT

In Mr. Thelen's opinion, electric railways present important service problems. In order to conserve fuel or to reduce operating expenses, or for both purposes, careful consideration should be given by such carriers to the use of skip or stagger stops, the elimination of such car mileage as can be spared without hardship to the public, the reduction of heating, the operation of one-man cars under proper safety regulations, and the substitution of light-weight cars for the heavier cars now commonly in use.

Electric railways in all sections of the United States are making applications to the state commissions and the various local authorities for permission to increase their fares, but Mr. Thelen said that in very few of these instances have the companies given the proper consideration to the reduction of their operating expenses by the methods just mentioned. He believed that utilities should come prepared to show that they had eliminated all unnecessary expense and had introduced all economies of operation compatible with the continuation of reasonably good service.

As for extensions, Mr. Thelen said that while it is not likely, as the problem presents itself now, that usual service extensions in the ordinary course of business will be seriously curtailed, each extension or addition involving a major expenditure must be carefully scrutinized to determine how it synchronizes with the requirements of the nation at war.

On the other hand, the requirements for additional light, heat, power and transportation by industries engaged in the production of necessary materials, supplies and food are such as to require imperatively additions and extensions all over the United States. Mr. Thelen considered it essential that the financial strength and stability of the utilities be conserved by deferring capital expenditures not directly needed for war purposes, and that the funds thus conserved and other funds necessary be used for such additions and betterments as would assist most effectively to meet the nation's war requirements.

FINANCING IN CALIFORNIA

Notwithstanding the difficulties created by the war, the acquisition of additional funds by public utilities from the sale of securities subsequent to April 6, 1917, has not entirely ceased. Thus the California Railroad Commission, during the eleven months beginning with April 6, 1917, authorized the issuance by public utilities of stocks, bonds and notes having a face value of $72,828,150 as contrasted with $99,625,000 during the twelve months ended June 30, 1917, and $231,644,870 during the twelve months ended June 30, 1916. Of the securities authorized by the commission subsequent to April 6, 1917, $15,650,000 were for additions and betterments, $10,900,000 for refunding, $11,360,000 for collateral, $34,875,000 for consolidations and reorganizations, and $32,500 for other miscellaneous purposes. Of the securities thus authorized, $29,982,000 were capital stock, $32,520,000 bonds and $10,275,000 notes.

California, Mr. Thelen said, is fortunate in that a local market for securities authorized by the commission has gradually been created and has largely assisted in meeting the requirements of the public utilities during the war. While to some extent sales have continued to be made locally in the various states of the Union and to a greatly diminished extent and generally on increasingly onerous terms in the financial centers of the country, it seemed clear to Mr. Thelen that most public utilities will not be able, without some form of assistance or encouragement from the federal government, to secure large amounts of additional funds on their own credit in competition with Liberty bonds and other government securities.

DUTY OF STATE COMMISSIONS

In the situation which now confronts many of the public utilities, Mr. Thelen stated, the duty of the state commissions is manifestly as follows:

"While providing for the continuation of adequate service, it is the duty of the commissions to act promptly and vigorously on applications for increased rates based on increased operating costs.

"Where the usual methods of rate-making would result in unreasonable delays, short cuts must be applied to meet the emergency conditions.

"The public utilities must be kept in a sound and healthy financial condition, so that they will be able to meet not merely the requirements of their existing patrons but also the additional requirements of the war.

"The state commissions should not wait until the utilities come to them with pleas for assistance. It is their duty to inform themselves by their own investigations, if necessary, concerning the condition of the public utilities under their jurisdiction, and to keep themselves constantly informed."

Government and Industries Should Get Together

Mr. Shonts Suggests Plan for Securing Efficiency of Private Operator and Benefits of Government Control

IN AN address on April 1 before the Economic Club of Boston T. P. Shonts, president Interborough Rapid Transit Company, New York, N. Y., discussed social reconstruction following the war. Mr. Shonts favored a program of partnership in great industries between the government and industry, and between industry and labor. He said in part:

"Such widespread phenomena as each day's news brings before us, be it Bolshevism or communism in Russia or I. W. W.-ism in America, cannot be waved aside as passing disturbances. They are symptoms of a disorder that demands searching diagnosis and intelligent remedy.

"Privately controlled industry avoids waste but creates a tendency toward monopoly with swollen fortunes. On the other hand, governmental ownership and operation, in the light of experience, spells inefficiency. I believe, however, that the efficiency of private operation and the benefits of governmental control can be secured through a partnership between the government and private industry, thus leaving room for individual initiative with corresponding reward.

"Such a plan is now in successful operation in the city of New York in the case of the contracts between the city and the rapid transit companies, for the construction and operation of the dual system of subway and elevated lines.

"The government of the United States might easily work out a partnership plan for the operation of the steam railroads after the war along the foregoing lines. In this way the railroads will have all the benefits of private management, and the government, through its general control, can bring about a more scientific distribution of traffic.

"What can be done with respect to the railroads can be accomplished in the case of all main industries, thereby saving them from the evil effects of a purely socialistic control and the country from the conduct of business by political methods."

Patriotic Use for Backs of Transfers

The Connecticut Company is printing on the backs of transfers information regarding the number of employees of the company now in service in the army or the navy. The latest list shows the following numbers of men so employed: Motormen and conductors, 162; inspectors and starters, three; shop employees, thirteen; power station employees, five; line department employees, eight; express department employees, ten, and office employees, twenty-four. The total is thus 225.

Commerce Delegates Indorse Utility Relief

Group Meetings of United States Chamber Take Up Topics Connected With Railroad and Highway Transportation and Effect of Government Financing on Industries

ABOUT 3000 business men from all sections of the country attended the annual convention of the United States Chamber of Commerce at Chicago last week. Besides the departmental or group sessions, which were held at the Congress Hotel, several general meetings were held in the Auditorium, and among the speakers were Secretaries Daniels and Lane and Lord Reading, special British ambassador.

The group sessions of most interest to electric railway operators where those of Group B (finance) at which the topic considered was the effect of government financing on industries, and of Group C (railroads and highway transportation).

EFFECT OF GOVERNMENT FINANCING ON INDUSTRIES

The address of Thomas N. McCarter on immediate relief for the utilities, printed in the issue of this paper for April 13, comprised part of the program of the finance group. Another speaker was Daniel R. Forgan, president National City Bank, Chicago, who discussed the Liberty Loan issue. Among other things he said:

"The question which every loyal American must ask himself is: 'How far can I use my individual credit or the credit of my business to purchase government bonds?'

"If an active business man chooses to sell his bond at a loss to some of these final absorbers and thus be ready to take his proper share of the next loan, I think he should be commended—not criticised.

"The business must be subordinate to win the war. The banker's duty is clear. He must give himself—his bank—his influence—his credit to the country's cause."

Another speaker was John V. Farwell, banker, Chicago, who said that organization and morale in our army abroad and in our government and business at home will win the war. It was indeed fortunate that the Federal Reserve System was in operation when the war broke out. Otherwise we would be in a very much worse condition. This system, however, was designed for peace, and something additional was required for war conditions. The War Finance Corporation was so designed. It was better to keep it apart from the Federal Reserve System, and this has been done. The method by which this law will be applied has not been worked out yet, or at least not made public, but undoubtedly the Secretary of the Treasury will be fair. Unfortunately the government cannot directly raise the rates of public utilities, and for this reason it is very necessary for it to do all it can to induce local authorities to do so.

The speaker then discussed the effect of government control during the war through price fixing, financial assistance to corporations and otherwise. It was wise to grant this power to the government, but the trouble may be to get rid of it after the war. For this result, public opinion should be molded, and chambers of commerce throughout the country can help greatly in this work.

The final address was by O. M. W. Sprague, professor of economics, Harvard University, who spoke of the effects of the way in which the war is financed on the way in which the government can carry on its program. Where a government expands its purchases and the people do not contract on theirs, prices are bound to increase and credit expands. Where a war is financed on credit expansion, the burden falls principally on owners of securities with fixed incomes and on public utilities with fixed rates of charge. The speaker suggested the passage of a law requiring all persons either to invest a certain percentage of their income, depending upon its amount, in government bonds not of the ordinary type but registered and non-negotiable until after the war, or else to pay a large extra tax.

In the discussion, Walter A. Draper, Cincinnati Traction Company, spoke about the increased cost of labor in electric railway undertakings, made necessary to hold the men. He urged the members of the chamber to take a stand against expenditure of money for municipal improvements during the war, including those improvements which were called for in the franchises of public utilities.

RAILROAD TRANSPORTATION

The first paper at the railroad session was on "Terminals," and was presented by Edward J. Noonan, chief engineer Chicago Railway Terminal Commission. The speaker explained that in railway operation the terminal problems were the chief ones confronting railroad operators, and their importance was shown by the fact that the investment in terminals is more than the investment in all the rest of railroad property. He also explained that a freight car spends twelve hours in the terminal for every hour outside. After describing the requirements of different classes of terminals he expressed the belief that the solution of the terminal problem, indeed of all railway problems, depended upon a clear conception of the principle that there can be no conflict between the interests of the railroads and those of the public. He argued in favor of greater joint use of railroad terminals, which is more practicable under government operation than formerly. Thus, a local district manager can more easily route cars around a terminal than formerly.

In the discussion a delegate from Baltimore explained that even before the government assumed control, a war committee with representatives from the business interests and the railroads worked out a system of joint use of terminals. Another speaker suggested that if more passenger transportation was diverted to the electric lines there would be less congestion on the steam railroads. The question of autonomous operation of the railroads after the war was discussed, and it was suggested by one speaker that possibly railways in divisions of the country might be operated in territorial groups.

Alba B. Johnson, president Baldwin Locomotive Works, then presented a paper on "Motive Power," abstracted briefly last week. In addition he said that the normal capacity of the locomotive building shops before the war was about 7000 locomotives per annum and rarely have they not been adequate to the needs of the country. The business in the past has either been a feast or famine. Under average conditions the shops had a surplus of about 50 per cent of their capacity for export, although they had not exported that number. Now, of course, all the shops are very busy, most of the work being for export. In his opinion the downfall of the Russian government was caused largely by its failure to meet transportation needs. At present no orders for locomotives can be placed in the United States without the permission of the government. In 1914 the company which he represented turned out from four to five locomotives a week. In December of last year its average was from sixteen to twenty locomotives a day.

CAR SHORTAGE ON MARCH 1 AMOUNTED TO MORE THAN 138,000 CARS

Samuel O. Dunn, editor *Railway Age*, then read a paper on "Car Supply." He said, in part: "In 1917, there were only 3 per cent more freight cars and 1 per cent more locomotives than in 1916. The roads handled the enormous traffic of 1917 without any more cars and locomotives than they had had three years before. Furthermore, many of the cars and locomotives used were such as under normal conditions would have been sent to the scrap heap. On March 1, 1918, the net shortage reported was more than 138,000 cars.

"At the rate of eight to ten thousand cars a month, all the car builders could hardly build more than 50,000 or 60,000 before Jan. 1. The total year's output would be 75,000 to 85,000 cars as compared with a minimum of 125,000 necessary to maintain the present equipment.

"In these circumstances it is necessary to do two things—First, the railways and the public must co-operate to secure the maximum utilization of existing locomotives and cars; and second, the railroad administration must give preference to traffic essential to the war and to the public for its subsistence and comfort."

FINAL OUTCOME WILL LIE BETWEEN GOVERNMENT PARTNERSHIP AND GOVERNMENT OPERATION

The final paper of the session was one on "Extensions" by Francis H. Sisson, vice-president Guaranty Trust Company, New York, who urged the necessity of creating new wealth, by making up for the destruction of property during the war. In such a program railway extension is necessary. It is more than probable also that water powers now going to waste will be developed. We must plan for these extensions now. In the meantime the railways should keep up maintenance, without which extensions are hardly practicable. The final decision rests on the people, and in it shippers will exercise an important influence. They are now suffering under conditions they largely caused and must lend a helping hand. In considering the final outcome the speaker predicted that the answer might lie somewhere between the words "government partnership" and "government operation."

HIGHWAY TRANSPORTATION

A special session was devoted to highway transportation, or that by motor truck. The first paper, that by Roy D. Chapin, chairman highway transportation committee, Council of National Defense, was published in abstract last week.

According to F. A. Seiberling, president Goodyear Tire & Rubber Company, the next speaker: "The 400,000 motor trucks now in service in this country have sounded the death-knell of the short line railroad. All that is needed is the building of hard surfaced brick roads capable of carrying 10-ton trucks at a speed in excess of 20 m.p.h.

"We have approximately 2,500,000 miles of highways designed to carry traffic as it existed prior to the introduction of the motor truck," Mr. Seiberling continued. "It requires no stretch of the imagination to state that within a few years all these roads will go to the scrap heap. It seems desirable to institute at once a separate highway department in which there will be centralized authority and control with a view to providing roads capable of handling all the tonnage that our motor truck equipment can carry, of solid construction—macadam, hard surfaced brick, or concrete."

NEARLY 5,000,000 AUTOS AND TRUCKS

The third speaker in the highway transportation group was A. C. Bedford, president Standard Oil Company of New Jersey and chairman of the Petroleum War Service Committee. Mr. Bedford said that at the beginning of 1916 there were about 2,400,000 cars and trucks in the United States while, on Jan. 1, 1918, the official registration was 4,941,276. Roughly speaking, 5,000,000 motor vehicles will require 50,000,000 barrels of gasoline a year, and including gasoline exports to the Allies, the total demand this year will be over 60,000,000 barrels. On Jan. 1, 1918, there were about 351,000 motor trucks in this country and the present output is estimated at about 22,000 a month. Continuing, Mr. Bedford said:

"There remains another problem in connection with the further development of motor truck transportation, and that is the problem of the roads. Existing good roads are deteriorating rapidly, for various reasons, and we all know that when deterioration sets in it is exceedingly rapid unless the roads are currently maintained. Thus, the maintenance of existing highways will require large quantities of asphalt or heavy binders, and more good roads are desired and required if truck transportation is to develop its full efficiency."

The speaker then explained that nearly all of this asphalt has to come from Mexico, Bermuda or Trinidad, but at the present time practically none is imported. Then he said: "There is the additional difficulty of labor for construction and maintenance work on the scale we would like to see. From the viewpoint of the motor truck alone, it would require a large number of men, who probably at this time can be used to better advantage in agricultural, shipbuilding and other industrial work. There is also to be considered the large number of men required to operate motor trucks, as compared with the number in a train crew.

"My feeling, then, as regards the road end of the problem, is that the auto truck transportation plan, especially in its relation to the prosecution of the war, is so important that it should be put into effect to the utmost extent possible, making the most possible use of existing roads, even though no new good roads can be built. With respect to the demand for gasoline for essential purposes, I can only repeat what I said at the outset—it can and shall be met."

RESOLUTIONS PASSED

At the meeting on Friday the Chamber passed the resolution for utility relief, suggested by the American Electric Railway Association and published last week.

Other resolutions adopted were a renewal of the pledge made last year to the government of "its full and unqualified support in the prosecution of the war until Prussianism is utterly destroyed"; universal military training; support of Liberty Loan and War Savings and Thrift Stamp campaigns; definite co-operation with shipbuilders to help the production of ships; that "any measure or proposals having for their objects control of industries by the government be subjected to close scrutiny and examination, and that such proposals should be adopted only where there is sufficient evidence indicating that the state of war makes such control more effective for the proper conduct of the war"; discouraging the construction of public buildings and other improvements which will not contribute toward winning the war as well as the erection of industrial plants which cannot be utilized in the prosecution of the war; recommending the appointment of a permanent committee to study the conditions surrounding fixed prices and to provide a formula on which such prices shall be fixed; co-ordination of railroads, water routes and highways for traffic service; the calling of a conference to consider the formulation of a basis for the control and the operation of the railroads after the war, and the development at an early date of the water powers of the country.

Philadelphia, Washington and Kansas City Go to Pneumatic Door and Step Control

THE tendency toward pneumatic doors and step control is illustrated by four recent cases of importance. One of these is Philadelphia where National Pneumatic 2⅜-in. x 4½-in. air engines and door and step fittings have been specified for the 100 new double-end cars of the Philadelphia Rapid Transit Company. The others are the Capital Traction Company, the Washington Railway & Electric Company, and the Kansas City Railways.

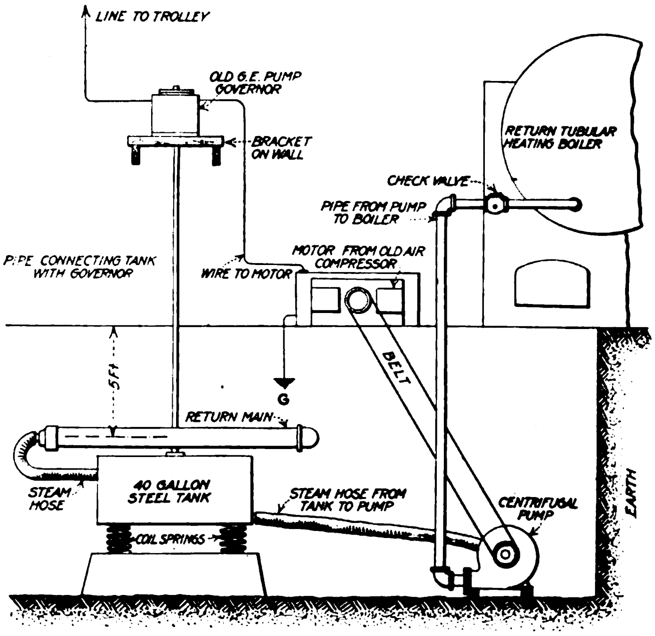
The Capital Traction Company has not only specified GM 2⅜-in x 4½-in. engines for twenty new cars, but will install them on fifty-one present pay-as-you-enter cars which are being remodeled to the inclosed vestibule type. The Washington Railway & Electric Company has ordered GM 2½-in. x 4⅜-in. engines for twenty-five new cars and also for ninety-six end-entrance and seventy-five center-entrance cars. The last named cars may be supplied with a new type of engine control. The Kansas City Railways has also ordered 100 2½-in. x 4⅜-in. folding-door engines for existing cars.

Automatic Return for Condensate from Heating Pipes to Boiler

BY F. J. FOOTE
Master Mechanic Ohio Electric Railway, Columbus, Ohio

AT THE Columbus shops of the Ohio Electric Railway we have a novel arrangement of apparatus for lifting the condensate from the pipes of the heating system and returning it to the heating boiler. This arrangement of apparatus is shown in the accompanying sketch, and the method of its operation is as follows:

The boiler used is of the ordinary return tubular type, and it is set on the ground in the usual manner. Most of the steam-heating coils are in the pits between the tracks, so the condensate flows into a return main about 5 ft. below the surface of the ground. The end of this return main is connected by means of a steam hose to an old 40-gal. tank, which formerly served as an air reservoir under a car. This tank rests on light coil springs, which compress as the tank fills. The tank is connected by a vertical rod to an old General Electric air-pump governor with diaphragm and spring removed. When the tank settles, due to the weight of the water as it fills, the governor closes a switch and starts an old air-compressor motor, which is belt-connected to the centrifugal pump placed in the bottom of the pit. The water is pumped from the tank through another piece of steam hose and is returned through a pipe to the heating boiler, a check valve being installed to prevent the water from flowing back through the pump. When the weight of the tank has been reduced sufficiently to permit it to rise, the governor operates to shut down the pump.



AUTOMATIC STEAM HEATING APPARATUS FOR RETURNING CONDENSATE TO BOILER, OHIO ELECTRIC SHOP

Prior to installing this apparatus a steam pump was used, making it necessary to keep up not less than 15 lb. of steam no matter how mild the weather might be. The pump needed also considerable attention from the fireman, whereas the apparatus described above is entirely automatic. In mild weather only from 3 to 5 lb. of steam need be carried.

A Motor Car That Carries Its Own Turntable

ON THE Hetch Hetchy Railroad, which was built to convey supplies to the construction work involved in the construction of the new water supply for San Francisco, it was desired to furnish at low expense transportation service of the order usually given by motor cars. Accordingly a four-cylinder Cadillac automobile was equipped with four-flanged steel wheels 30 in. in diameter, and put in service on the line.

With this equipment there was some trouble in operating the car on account of difficulties in steering. In fact, it several times jumped the track on curves where there was a tendency to "climb" the outer rail. The machine was therefore brought back to the shop and a four-wheeled pony truck mounted under the front end in place of the single pair of larger wheels. Since this substitution there have been no derailments and the car is reported to work very satisfactorily.

A feature of the car which has greatly increased its serviceability is a turntable permanently attached under the center of the chassis. This consists of a channel-iron framework carrying a ball-bearing turntable, the lower part of which has a transverse beam extending on each side to nearly the width of the car body. Under the ends of this beam jacks can be placed to raise the car clear of the rails. In this position it balances on the turntable, which is 5½ in. in diameter, and can be revolved and lowered onto the rails again facing in the opposite direction. This has been found a most convenient device when using the car on short trips or branch lines where turntable facilities are not available.

The automobile has been adapted for rail service under the direction of M. M. O'Shaughnessy, city engineer of San Francisco.

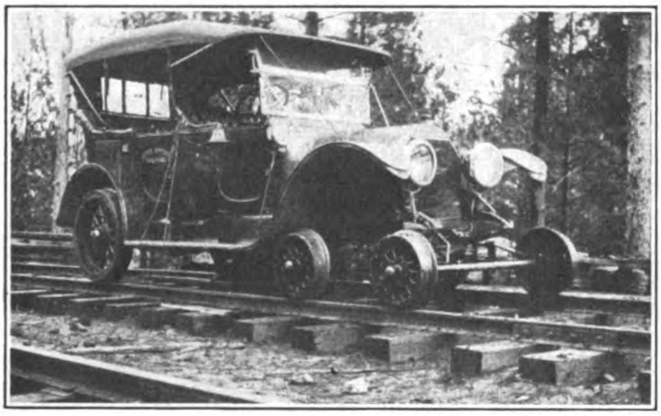


FIG. 1—CADILLAC AUTOMOBILE EQUIPPED FOR RAIL SERVICE

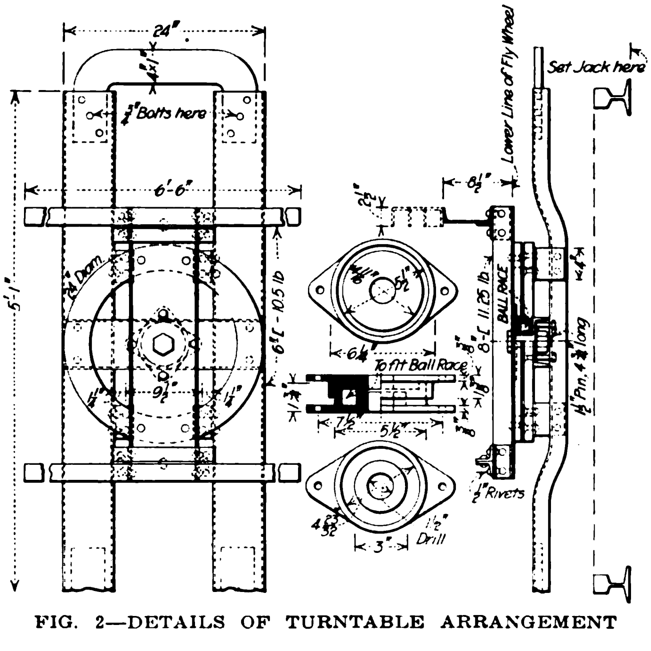


FIG. 2—DETAILS OF TURNTABLE ARRANGEMENT

Electric Car Equipped for Hospital Service at Boston

A Nine-Bench Open Car with Very Few Changes Is Arranged to Carry Sixteen Reclining Patients on Stretchers

AT THE suggestion of Brig.-Gen. John A. Johnston, U. S. A., commanding officer of the Northeastern Department, the Boston Elevated Railway has converted one of its nine-bench open cars into a trolley ambulance for the use of the army medical staff. This is believed to be the first electric car ever equipped in this way in

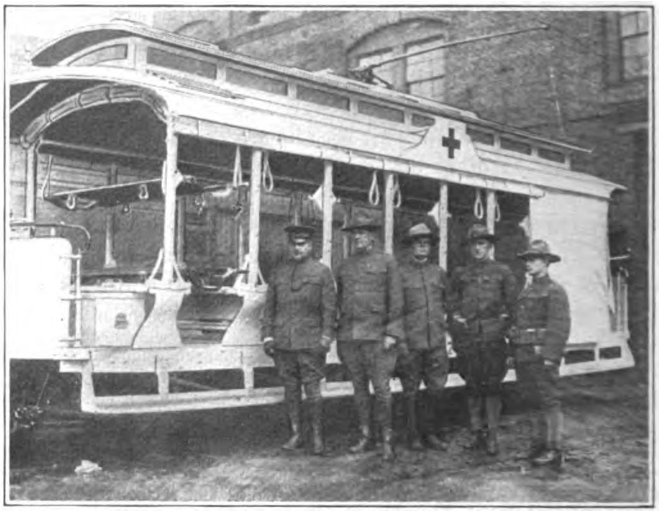


FIG. 1—OPEN CAR REBUILT FOR AMBULANCE SERVICE, BOSTON ELEVATED RAILWAY—BRIG.-GEN JOHN A. JOHNSTON AT LEFT

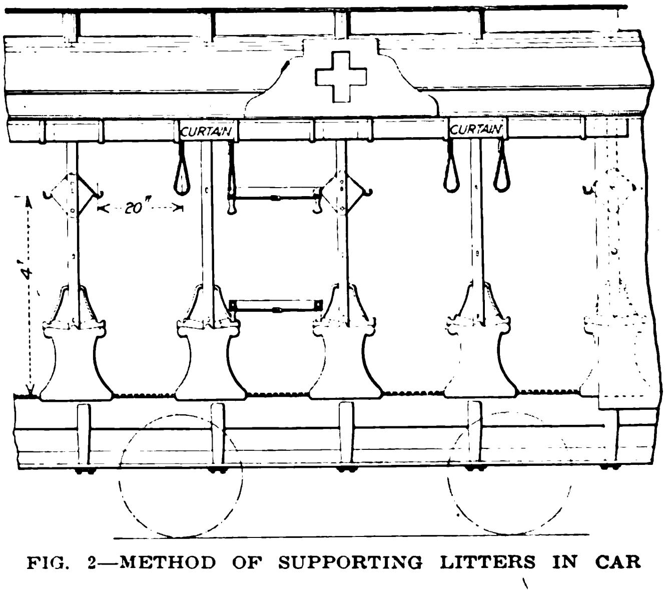


FIG. 2—METHOD OF SUPPORTING LITTERS IN CAR

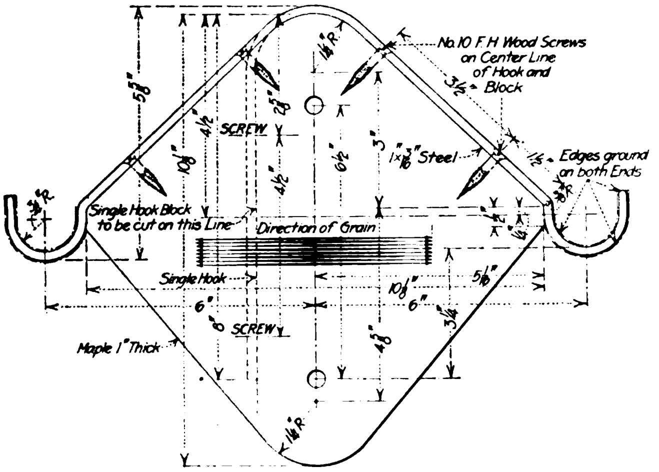

No. 10 F H Wood Screws on Center Line of Hook and Block
Edges ground on both Ends
1 x 3/16" Steel
SCREW
SCREW
Single Hook Block to be cut on this Line
Direction of Grain
Single Hook
Maple 1" Thick
1¼" R
5⅝"
10⅛"
6½"
6"
6"
5⅛"
3¼"

FIG. 3—HOOK BLOCK FOR SUPPORTING STRETCHER

this country, and it will probably be the forerunner of a considerable number of other units of the same kind, for the transportation of wounded men from ships to interior hospitals within a radius of 75 miles from Boston.

Fig. 1 shows the car as completed, with Brigadier-General Johnston standing at the left. One of the most striking features of the arrangement was the small number of changes necessary to adapt the car to hospital transport service. The changes were made under direction of John Lindall, superintendent of rolling stock and shops, with the co-operation of Col. Thomas F. Sullivan, of the department of maintenance of way, since appointed Commissioner of Public Works, City of Boston. With the slight changes necessary the car has been arranged to carry sixteen reclining patients on the standard medical department stretchers. About thirty patients can be carried in a sitting posture.

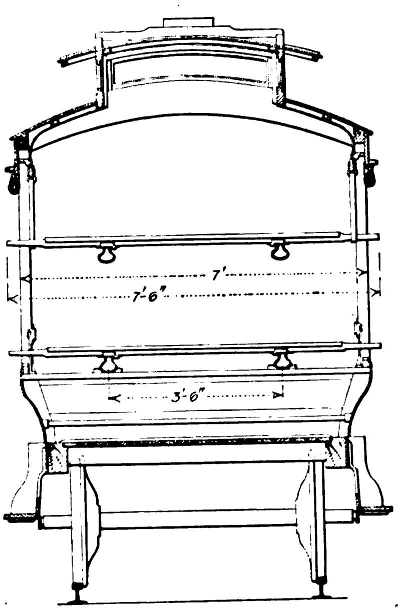


FIG. 4—CROSS-SECTION OF AMBULANCE CAR, BOSTON ELEVATED RAILWAY

The litters are so arranged that there will be eight upper and eight lower berths, the handles being held firmly in place by sockets and straps. The upper litters are supported as indicated in Figs. 1 and 2 between 1⅛-in. x ¼-in. leather straps and hook blocks attached to the posts. A detailed drawing of the special block used to carry the hooks is shown in Fig. 3. The straps are hung from 1-in. x 3-in. sills carried through the car on each side as indicated in Fig. 4, which is a cross-section of the car with two tiers of litters in place. The hooks are of 1-in. x $\frac{3}{16}$-in. steel strap, screwed to the blocks as shown, a single-hook type of block being used at the four end posts of the car. The litter handles seat in the straps and hooks in such a way as to preclude the danger of withdrawal through swaying. The lower tier of litters is carried on special seat blocks, Fig. 5, of maple, screwed into the seats and arranged to furnish a close and safe fit, securing the litters in place at their pedestals.

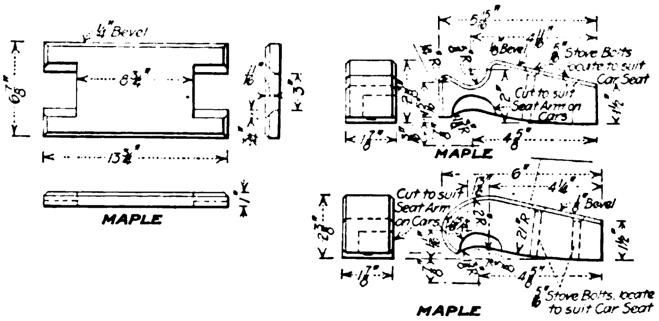

¼" Bevel
8¾"
13¾"
6⅞"
MAPLE
5 15/16"
4 11/16"
Bevel
5/16" Stove Bolts locate to suit Car Seat
Cut to suit Seat Arm on Cars
MAPLE
6"
4¼"
Cut to suit Seat Arm on Cars
Bevel
5/16" Stove Bolts, locate to suit Car Seat
MAPLE

FIG. 5—SEAT BLOCKS FOR SUPPORTING STRETCHERS

The car has been painted in white enamel, with appropriate Red Cross insignia on the sides and ends. White curtains are arranged to permit drawing when it is desirable for the comfort and welfare of the patients. A first-aid food and supply box is carried on one end of the car, and provision is made for carrying a 5-gal. water bottle overhead. One of the chief advantages of the car is that the patients may be attended from either end while in transit and on either side as well, besides offering the benefits of fresh air en route.

Tokyo to Have Rapid Transit Soon

ON ACCOUNT of the great congestion in the streets of Tokyo, Japan, and the urgent demand for better transportation facilities, plans have been completed for the immediate construction of a subway system, 9½ miles long. This will be built in a fairly straight line under the busiest part of the city. The construction work is to be of reinforced concrete throughout, with a track gage of 4 ft. 6 in., which is widely used in Japan. The third-rail system is to be employed.

The sum of 21,000,000 yen has been decided upon as necessary for the project, or at the rate of 2,210,000 yen per mile (1 yen = 50 cents). High-speed service, at five-minute headway will be given between 5 a.m. and 1 a.m. No cars will be operated from 1 to 5 a.m. The fare is to be 5 sen (2½ cents) and the estimated net profits are given at $970,000, with a guaranteed dividend of 8 per cent to the promoters. Substantial business men throughout Japan are backing the project and it is understood that work is to begin at once.

In comparing the estimated cost of this project with that of similar undertakings elsewhere the purchasing power of the yen in Japan must be considered. This is not far inferior to the value of the dollar in the United States. Labor is, of course, far cheaper than in this country and only a small proportion of the total amount mentioned represents labor cost.

The United States Fuel Administration has issued a warning against the use of anthracite where bituminous coal should be used. In the opinion of the administration such use is not fair to the domestic consumers of those communities that are to receive certain allotted tonnages.

Repair Shop Statistics Published

Data Just Issued by United States Census Bureau Give Interesting Information

THE census of manufacturers for 1914, just issued by the Census Bureau, gives some interesting facts about electric railway repair shops. The general statistics are given in Table I. In the following tables the term "establishment" is used to indicate all the shops and maintenance plants "under a common ownership or for which one set of books of account are kept." Table II shows the classification of the workers. Of the total number 99.3 per cent were males and 0.7 per cent were females. Statistics of the average number of employees by months showed that the fluctuation caused by seasons is very small indeed.

Table III gives the prevailing hours of labor per week and shows a tendency toward a shorter working day in the two years mentioned.

In 1914 61 per cent of the wage earners were employed in establishments where the prevailing hours were less than sixty per week, as compared with 47 per cent in 1909. A decrease is also shown in the proportion employed in establishments operated sixty hours per week, from 35 per cent in 1909 to 22.9 per cent in 1914.

Table IV gives the size of the establishments in 1914 and in 1909, as measured by the number of wage earners employed in the industry. As shown, the groups hold very nearly the same relative position in the two years. Table V gives the detail statistics of the work performed in the three years.

TABLE I—STATISTICS OF ELECTRIC RAILWAY REPAIR SHOPS

	Number or Amount				Per Cent of Increase		
	1914	1909	1904	1899	1909–1914	1904–1909	1899–1904
Number of establishments	649	541	86	108	20.0	529.1	—20.4
Persons engaged	28,215	23,699	11,551	7,226	19.1	105.2	59.9
Proprietors and firm members	4	......	......	......	....	....	....
Salaried employees	1,827	1,281	499	201	42.6	156.7	148.3
Wage earners (average number)	26,384	22,418	11,052	7,025	17.7	102.8	57.3
Primary horsepower	44,989	35,794	3,154	6,443	25.7	1,034.9	—51.0
Capital	$63,613,741	$38,898,686	$12,905,853	$10,781,939	63.5	201.4	19.7
Salaries and wages	20,559,383	15,690,228	7,555,485	4,598,268	31.0	107.7	64.3
Salaries	1,914,538	1,204,219	542,687	193,675	59.0	121.9	180.2
Wages	18,644,845	14,486,009	7,012,798	4,404,593	28.7	106.6	59.2
Paid for contract work	24,596	23,480	13,195	23,392	4.8	77.9	—43.6
Rent and taxes (including internal revenue)	581,657	351,626	119,598	136,193	65.4	....	—12.2
Cost of materials	17,609,574	15,167,899	5,463,360	4,336,744	16.1	177.6	26.0
Value of products	38,576,565	31,962,561	13,437,121	9,370,811	20.7	137.9	43.4
Value added by manufacture (value of products less cost of materials)	20,966,991	16,794,662	7,973,761	5,034,067	24.8	110.6	58.4

TABLE II—NUMBER OF PERSONS ENGAGED IN THE INDUSTRY

	1914	1909
All classes	28,215	23,699
Proprietors and officials	803	658
Proprietors and firm members	4	....
Salaried officials of corporations	101	107
Superintendents and managers	698	551
Clerks and other subordinate salaried employees	1,028	623
Wage earners (average number)	26,384	22,418
Sixteen years of age and over	26,377	22,403
Under sixteen years of age	7	15

TABLE III—PREVAILING HOURS OF LABOR

	Wage Earners in Establishments with Specified Number of Hours			
	Average Number		Per Cent of Total	
Prevailing Hours of Labor per Week	1914	1909	1914	1909
Total	26,384	22,418	100.0	100.0
Forty-eight and under	1,665	220	6.3	1.0
Between forty-eight and fifty-four	1,638	510	6.2	2.3
Fifty-four	6,160	4,803	23.3	21.4
Between fifty-four and sixty	6,640	4,992	25.2	22.3
Sixty	6,040	7,845	22.9	35.0
Between sixty and seventy-two	3,857	3,689	14.6	16.5
Seventy-two	23	74	0.1	0.3
Over seventy-two	361	285	1.4	1.3

TABLE V—CLASS OF WORK DONE FOR EACH DEPARTMENT

Class of Work	1914	1909	1904
Total value	$38,576,565	$31,962,561	$13,437,121
Motive power and machinery department, value	$5,380,573	$4,510,332	$510,946
Repairs to motors, etc.	$4,933,436	$4,004,336	....
Work for other corporations	$56,944	$88,070	$2,626
All other products or work	[1]$390,193	[2]$417,926	$508,320
Car department, value	$31,086,043	$25,835,463	$12,581,365
Cars built, value	$811,104	$626,752	$605,144
Passenger—			
Number	235	129	288
Value	$737,926	$498,709	$580,669
Freight—			
Number	11	63	13
Value	$21,196	$59,102	$11,366
Other—			
Number	58	51	9
Value	$51,982	$68,941	$13,109
Repairs to cars of all kinds	$27,628,802	$22,869,777	$11,254,505
Work for other corporations	$441,323	$624,805	$36,714
All other products or work	$2,204,814	$1,714,129	$685,002
Bridge and building department (shopwork), value	$434,427	$330,948	$327,855
Repairs and renewals	$199,751	$273,581	$253,133
Work for other corporations	$479	$5,093	....
All other products or work	$234,197	$52,274	$74,722
All other products and work, not classified, value	$1,675,522	$1,285,818	$16,955

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[1] Includes the value of one electric locomotive.

[2] Includes the value of three electric locomotives.

TABLE IV—CLASSIFICATION OF SHOPS ACCORDING TO NUMBER OF WAGE EARNERS

	Number or Establishments				Average Number of Wage Earners			
			Per Cent of Total				Per Cent of Total	
Wage Earners Per Establishment	1914	1909	1914	1909	1914	1909	1914	1909
All establishments	649	541	100.0	100.0	26,384	22,418	100.0	100.0
No wage earners	...	2	....	0.4	.....	.....	....	....
One to five wage earners	253	205	39.0	37.9	719	615	2.7	2.7
Six to twenty wage earners	193	169	29.7	31.2	2,134	2,000	8.1	8.9
Twenty-one to fifty wage earners	112	87	17.3	16.1	3,537	2,813	13.4	12.5
Fifty-one to 100 wage earners	37	31	5.7	5.7	2,623	2,400	9.9	10.7
101 to 250 wage earners	34	30	5.2	5.5	4,862	4,619	18.4	20.6
251 to 500 wage earners	9	8	1.4	1.5	3,366	2,688	12.8	12.0
501 to 1000 wage earners	8	6	1.2	1.1	5,265	3,661	20.0	16.3
Over 1000 wage earners	3	3	0.5	0.6	3,878	3,622	14.7	16.2

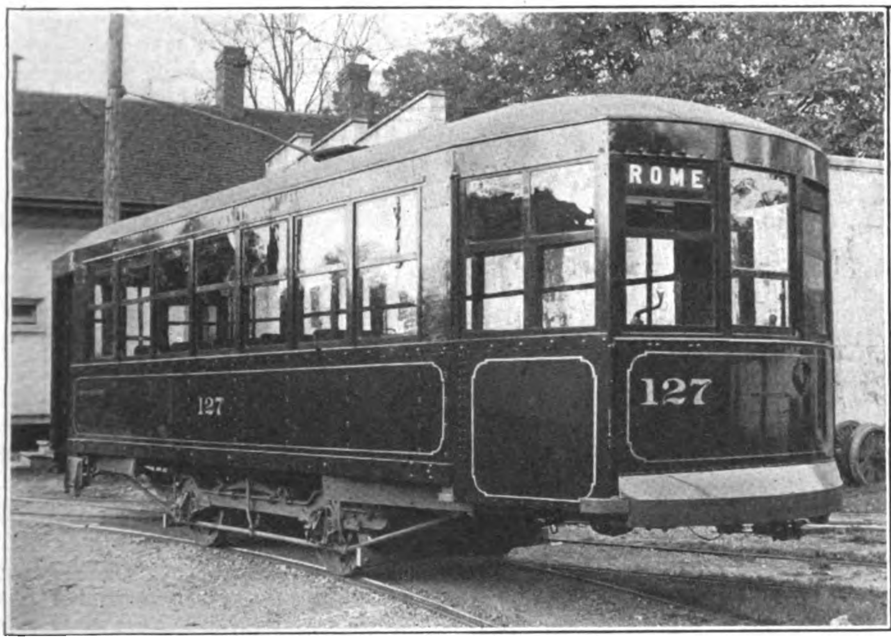
Of the work done in 1914, 13.9 per cent was for the motive power and machinery department; 80.6 per cent for the car department; 1.1 per cent for the bridge and building department; and 4.3 per cent for all other work, not classified. Repairs to motors constituted 91.7 per cent of the work in the motive power department, and repairs to cars constituted 88.9 per cent of the car department expense. The number of cars constructed shows a slight decrease in 1914, as compared with 1904, but the value of cars built shows an increase for the same period of 34 per cent.

One-Man Cars of Economical Design

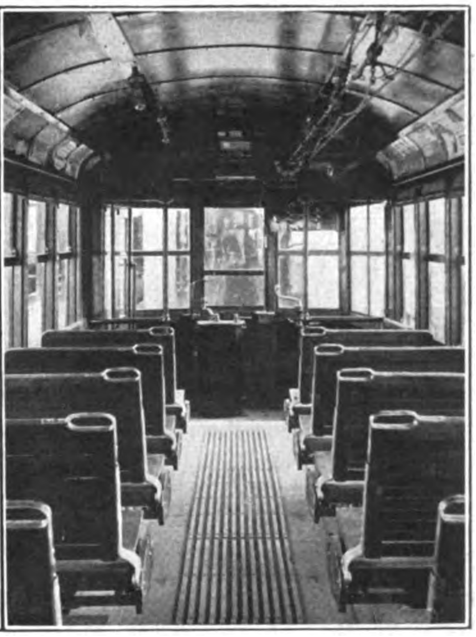
Bodies Built at Rome, Ga., Weigh 8000 lb., Have Seating Capacity of Twenty-eight and Cost $1,350 Each

By A. Wade
Master Mechanic Rome Railway & Light Company, Rome, Ga.

THE Rome (Ga.) Railway & Light Company has rerecently built in its shops four one-man cars. These cars are 20 ft. 8 in. over corner posts, 31 ft. over bumpers and 8 ft. 2 in. over belt rail with a seating capacity of twenty-eight. Hand-operated folding doors and steps are provided, the operating lever being placed at the left of the controller equipment.



MODERATE-COST ONE-MAN CAR BUILT IN GEORGIA—



INTERIOR ARRANGEMENT OF GEORGIA ONE-MAN CAR

The interior trim of the car is birch, stained cherry color to match the Heywood Brothers & Wakefield seats, and the headlining is Agasote painted green. Pantasote curtains and metal sash are used, the side sash being arranged to raise while the front vestibule sash drops in straight grooves and rests when closed on the pocket cover, making a leak-proof sash. Adams & Westlake No. 10 push-buttons with porcelain centers are used.

The truck sills are 3 in. x 9 in., of long-leaf yellow pine reinforced by 3-in. x 5-in. x ⅜-in. angles full length. The side sills are of 3-in. x 5-in. pine and the cross sills of 4-in. x 4-in. white oak. The end sills are 4-in. x 8-in. oak, bolted to all four of the longitudinal sills through angles forged from ½-in. x 6-in. x 3-ft. plate.

The side posts are 3 in. x 3½ in., of hard pine, cut away under the windows ½ in. to receive the siding, which is made up of three 1⅛-in. x 12-in. hard pine boards, the full length of the car, tongued and grooved and glued together. Each of the three side boards has two ⅜-in. through bolts at each side post and is dressed and stained cherry on the inside of the car, providing the finish under the windows.

The exterior of the car is covered with No. 16 sheet steel 36 in. wide continuous from corner post to opposite-end vestibule post. The dashes are one-piece No. 16 sheet steel. The letterboard is No. 14 sheet steel, 8 in. broad and riveted in continuous length entirely around the car and vestibules over the windows. A 1¼-in. x 3-in. plate extends from the door to the opposite end vestibule post and is secured to each side post by the ⅜-in. through bolts in the siding and a ⅜-in. x 5-in. plate is continuous around the car and bolted to the side and end sills. Eight ⅝-in. tie rods pass from side to side under the floor. The floor is double from the trapdoors to the wall and is made of full length rift pine tongued and grooved and screwed to the cross sills.

The car bodies complete weigh 8000 lb. and cost $1,350 each. The raw material for these cars was bought in the early months of 1917.

Lubricants for Anti-Friction Bearings

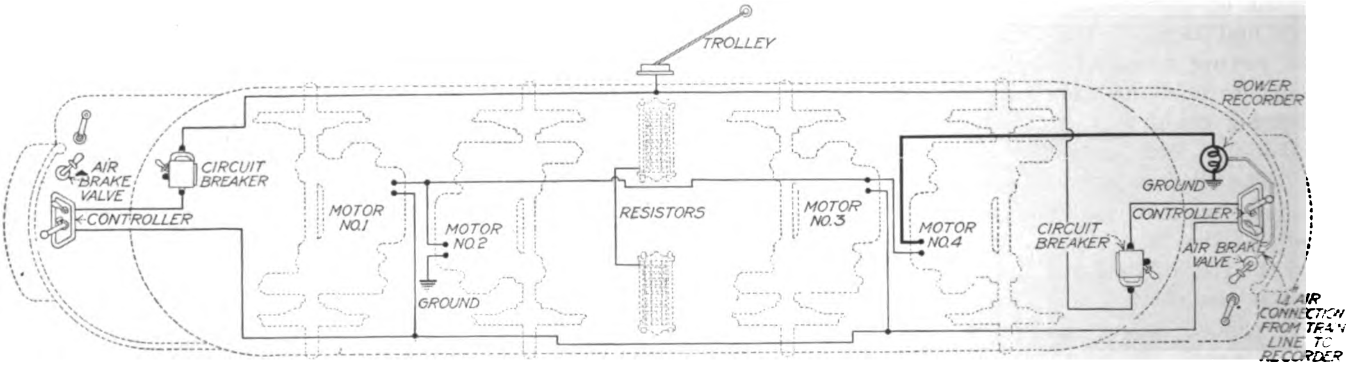
Roller and ball bearings require lubricants especially designed, as the nature of the duty upon the lubricant is different from that in sleeve bearings. The oil manufacturers must be looked to as the source of information in this field. As a result of a careful analysis of the needs of anti-friction bearings the Galena-Signal Oil Company has compounded a special oil and a grease to meet the preferences of the roller and ball bearing manufacturers. The former is known as "ball-bearing oil" and the latter as "ball-bearing grease No. 1."

Improvements in the Power-Saving Recorder

THE Arthur "Power saving recorder," described in the issue of the ELECTRIC RAILWAY JOURNAL for April 28, 1917, has recently been improved by the addition of a dial to indicate in minutes the "power on" time. This takes the place of the dial formerly used to register braking time, the lower dial giving a record of the number of brake applications, is still retained.

The "power on" dial is operated by means of an internal clock mechanism which is started by an electromagnet each time power is applied. The mechanism continues to run until the power is shut off and the magnet is deënergized. The coil of the electromagnet which starts and stops the clock is connected in series with one of the motors of the car on the ground side. No switches or fuses are used since the car control equipment provides the necessary safeguard, and there is no potential at the recorder that can give a shock to the crew or passengers. The electrical and air connections necessary are shown in an accompanying illustration.

The lower dial is connected to and is controlled by the brake. It records the number of stops and slow-downs made, that is, the actual number of brake applications.



CONNECTIONS NECESSARY FOR INSTALLING THE POWER RECORDER

All operating parts are inclosed in a small steel case which is preferably installed in front of the motorman just above the controller.

Among the advantages claimed for this device are the following: (1) It checks the motorman in his operation of both the controller and brakes and in addition emphasizes the safety features of operation. (2) It puts a premium upon his shutting off the power sooner and running with power shut off, or coasting, for as long as possible, this being the safe and economical way to operate a trolley car. (3) It also checks running at unnecessarily high speeds, since to produce these speeds requires that the power be kept on longer. (4) It checks "fanning of the air," and the making of unnecessary stops and slowdowns. (5) It also improves the spacing of cars, as a motorman soon finds that operation too close to the car ahead requires frequent and unnecessary applications of the brakes, and a consequent longer power-on period. (6) The record is in positive terms that a motorman can understand. (7) The mechanism is inherently simple, consequently the cost of the device and its maintenance is low; its installation cost is also low.

It will be seen from the diagram that it is necessary in installing the apparatus to run but one wire, shown heavier than the rest, leading from the ground side of No. 4 motor to the recorder, and a short length of ¼-in. iron pipe between the recorder and the train line. The latter connection is usually made immediately under the brake valve, much in the same way that the pressure gage is connected.

Built-Up Sections of Track for Diverting Traffic

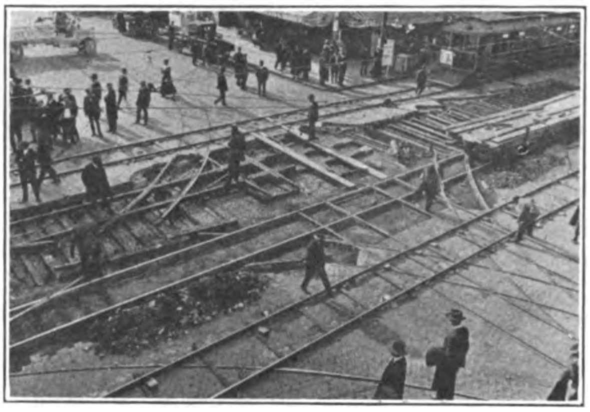
BY W. L. WHITLOCK
Office Engineer Denver (Col.) Tramway

IN preparation for the reconstruction of a number of heavy special-work layouts in the business district of Denver, the tramway engineering department had constructed at the storage yard a number of sections of temporary track which were rather unusual and with which it proved possible to construct very quickly a new path for the cars at the sides of the street. This construction was decided upon after a conference had determined that it was impracticable to reroute the cars to avoid the section at which the layouts were being installed, or to make the change in special work during the hours of the night. The necessity for allowing a certain time for concrete to set also influenced this procedure.

The track construction adopted consisted of 30-ft. sections of 30-lb. T-rail, which were held at the proper gage by means of ¾-in. x 4-in. x 7-ft. pieces of old guard rail welded to the bases of the rails and spaced approximately 4 ft. apart. The rails and cross-ties were welded at the four edges coming in contact by two men using an Indianapolis arc welder. To do this work, the T-rails were set, bottom side up ,on ties and held to gage by stakes, and the rail and tie were clamped together during the welding process. Connection from this straight temporary track to the permanent track was made by means of two standard temporary crossovers made of "bull" rail and T-rail, which were joined by a compromise joint shown in one of the illustrations. Rivets through the ball of the "bull" rail and the plate which was welded onto the end of the T-rail served to form the union, since bolting was impossible.

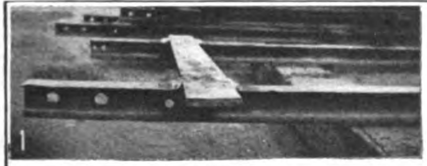
At the time of the rebuilding of the special work at Fifteenth and Curtis Streets, described in the ELECTRIC RAILWAY JOURNAL for Feb. 23, page 375, this type of "shoo-fly" track was given a thorough tryout. A 300-ft. stretch of it was laid along each side of the street by means of a 3-ton crane car. The sections were

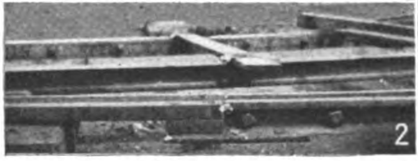
laid and bolted together and operation begun over the track in the short time of three hours.

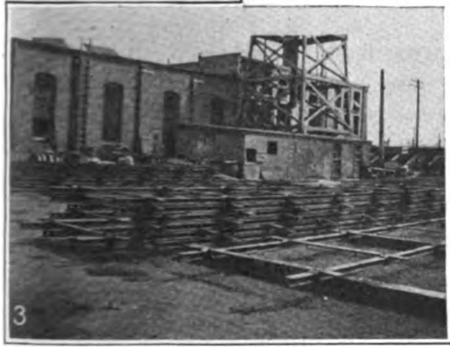


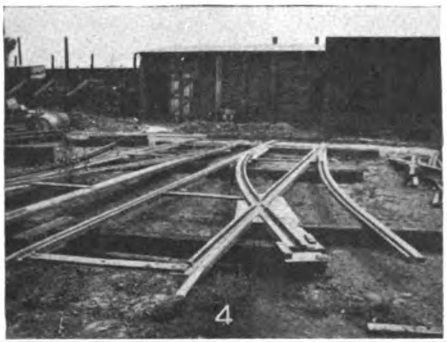
TEMPORARY TRACK ALONG EACH SIDE OF STREET UNDER CONSTRUCTION, DENVER TRAMWAY

When this track was first installed, the outside rail was blocked up with wooden wedges to compensate for the crown of the street, but after traffic was in full operation over the track it was found almost impossible to keep the wedges in place and the track was thereafter allowed to rest directly on asphalt pavement. As a result one side of the track was somewhat lower than the other, but this did not seem to disturb the regular operation of the cars. The "shoo-fly" track did not begin to move under traffic until the second day, when the trainmen, having become familiar with the operating conditions, began to operate their cars at more nearly normal speed. No attempt was made to stop the movement of the track until it would find its natural resting place and stop. But the asphalt paving offered little resistance, and it became necessary to hold the track in place. For this purpose a heavy log chain was attached to the turnout end of the "shoo-fly" and fastened to a tie in the permanent track. The chain held satisfactorily, but had to be removed later when it was found out that the strain pulled the rails of the turnouts apart. It was then attempted to hold the track by spiking the cross-pieces to the pavement, but the vertical and lateral motion of the track under service caused the spikes to be either pulled out or bent over.









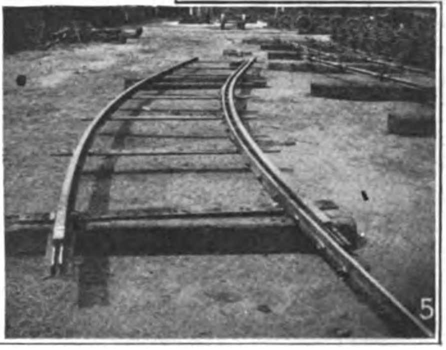


FIG. 1—CROSS-TIE PLATE WELDED TO RAIL BASE. FIG. 2—COMPROMISE JOINT BETWEEN "BULL" RAIL AND LIGHT T-RAIL. FIG. 3—"SHOO-FLY" TRACK SECTIONS MADE UP AT STORAGE YARD. FIG. 4—HALF OF SECTION OF "BULL" RAIL CROSSOVER. FIG. 5—CURVE CONNECTION WITH GUARD BOLTED TO RAIL

The scheme of chaining the cross-pieces rather than the rail itself was considered, but owing to the uncertainty of the firmness of the weld between the cross-pieces and the rails, it was thought best not to risk breaking them and spreading the rails, thereby causing a derailment. The final plan of taking care of this situation was simply to allow the track to assume its own path and draw it back to the original position every second night. This operation usually required about one hour with the help of two work cars and was considered the easiest thing to do under the circumstances.

The "shoo-fly" track construction, made of 30-lb. rail approximately twenty-seven years old, held up under very heavy traffic for three weeks, with a total of fifty breaks in the rail. Fortunately all these breaks occurred in straight rail, and in each case angle bars were put on by men detailed to watch the track. The rails usually broke under the front truck of a car, and in three cases derailment followed, tying up traffic for a maximum of twenty minutes. in one instance a motorman gave his airbrakes an emergency application to prevent hitting a person and the wheels gripped the rails so firmly that the momentum of the car pulled the "shoo-fly" track apart, breaking both rails. The portion on which the car was running separated from the rest approximately 18 in.

After completion of the construction work the "shoo-fly" track was removed by means of the crane car in approximately the same time that it was laid. The conclusions reached from our experience with this track construction is as follows:

The idea is all right and worked out reasonably well in practice; the electric arc welding for assembling the track at the storage yard is successful; the use of heavier rail and the spacing of cross-pieces 3 ft. apart instead of 4 ft. is necessary, and, finally, the lateral movement of the entire track can be overcome by means of heavier construction. Considering the construction as a whole it proved very satisfactory and by assembling the various sections at the yard as previously described a temporary route was made available for operating the cars in a very short time. This method also did away with the necessity for making changes during the night.

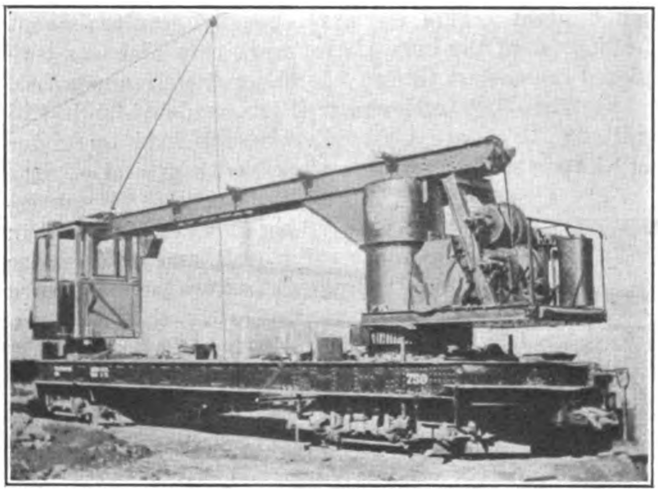


FIG. 1—HOME-MADE MOTOR-OPERATED 3-TON CRANE EQUIPMENT

Crane Car Built in Denver Shops

By W. H. McAloney

Formerly Superintendent of Rolling Stock, Denver (Col.) Railway

THE Denver Tramway has recently turned out in its shop a new steel-body crane car for the use of the engineering department in handling heavy materials. The car operates very successfully, and is proving to be a big labor saver. It was recently used to advantage in handling sections of special work and temporary track made up ready for use during replacement of the special work layout at one of the downtown crossings. This construction work was described in an article which appeared in the Electric Railway Journal for Feb. 23, 1918, page 375.

The car is 40 ft. long over all, 8 ft. wide, and weighs complete 53,000 lb., the frame being made up of 15-in., 33-lb. steel channels. It is equipped with two Brill 27-E trucks and four GE-58, 37½-hp. motors operated with a K-6 controller and auxiliary contactors. Tomlinson A1-2 couplers and Westinghouse semi-automatic air brakes are used. The car-operating cab is 15 in. above the floor, and is placed on three vertical supports made of 3-in. x 5-in. angles reinforced by substantial ¼-in. gusset plates. The angles go down through the floor and are fastened to the center beams of the car. The cab has a receptacle on both front and back for a Golden Glow searchlight with a 94-watt lamp on main and dimmer resistance.

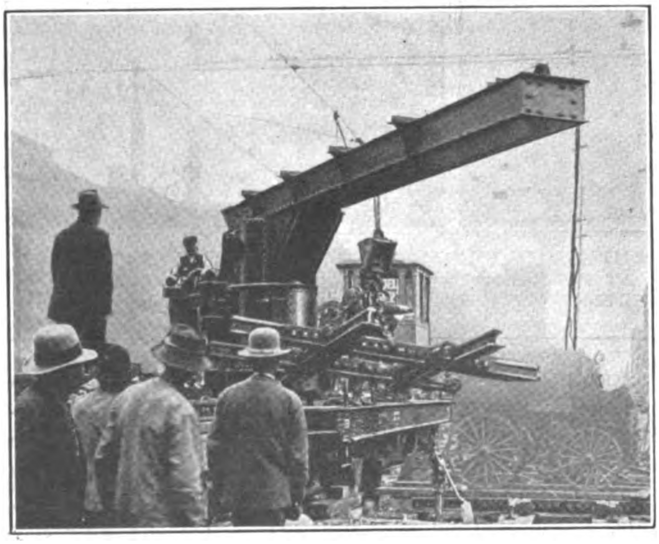


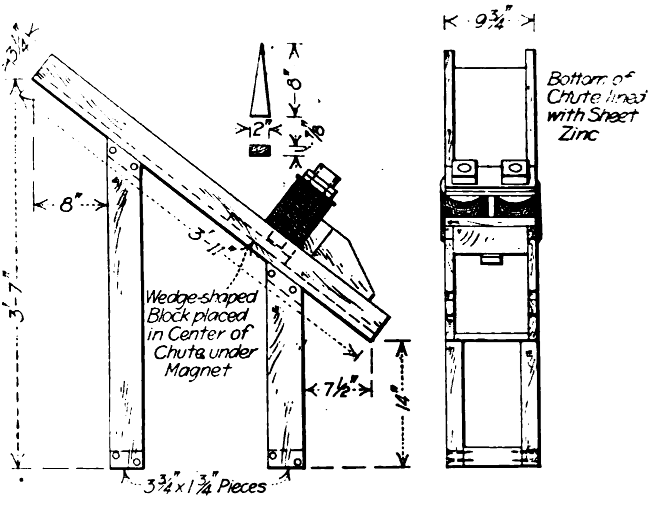
FIG. 2—DENVER TRAMWAY CRANE CAR HANDLING HEAVY SPECIAL WORK

The steel jib crane was built by a local iron works, and has a capacity of 3 tons and a reach of 21 ft. The revolving cylinder or drum is made of ¼-in. steel boiler plate, strengthened by angles and braces fastened to the crane beam, as shown in Fig. 1. The crane beam is 26 ft. 2 in. long, with the revolving axis 4 ft. 8 in. from one end, and stands 7 ft. 4 in. above the car floor. It is made up of four 12-in. channels arranged in pairs, back to back, the carriage running on the bottom flanges of the inside channels, which are faced with ⅜-in. steel strips. The top of the beam is strengthened by two ¼-in. plates for one-half its length and the balance laced by ¼-in. x 2-in. steel jibs, and in addition five ¼-in. x 3-in. angles are placed back to back across the top.

The crane is motor-operated, the platform being supported at the base of the drum by two 6-in. channels on the outside, and two beams of the same size channel placed back to back lengthwise in the center of the platform and cross braced with angles. The floor of the platform is made of ¼-in. steel plate. The distance from the bottom of the crane-motor platform to the car floor is 17 in. The motor, which is a 10-hp. Otis Elevator, compound-wound, direct-current machine, handled by an old K-10 controller, is placed in a horizontal position, and power is transmitted through bevel gears to a vertical shaft with a pinion which engages a large band gear encircling the lower part of the drum.

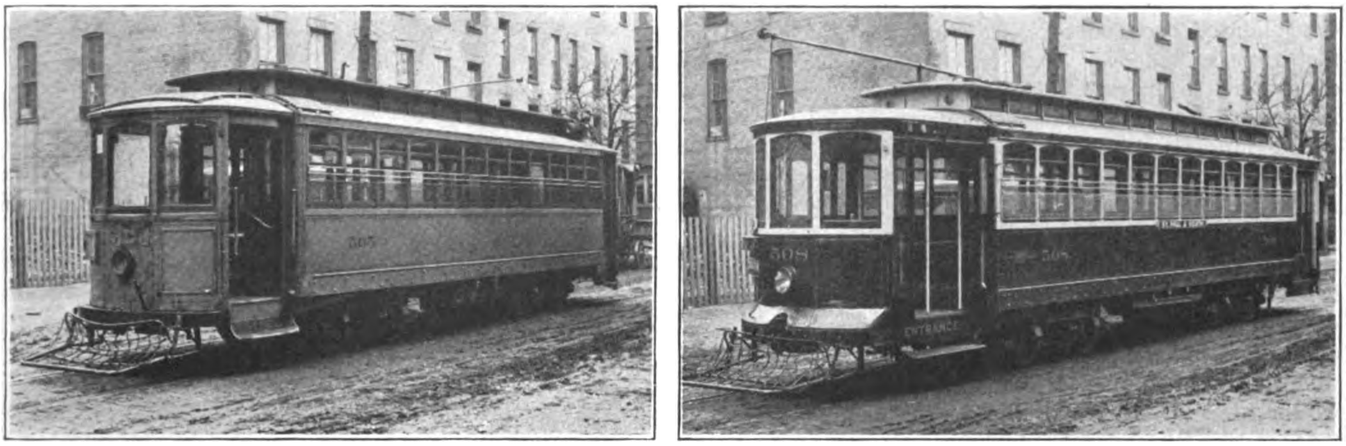
Magnetic Separator for Shop Use

For the benefit of the readers of the Electric Railway Journal who might like to duplicate the magnetic separator, described in the issue for Feb. 23, 1918, page 377, used in the New York Railways shops, Syracuse, N. Y., F. L. Hinman, master mechanic, was asked to make up a dimension drawing of the device. He has done so and the drawing is reproduced herewith.


3¼"
8"
2"
6"
8"
3'-11"
Wedge-shaped Block placed in Center of Chute under Magnet
3'-7"
7½"
14"
3¾" x 1¾" Pieces
9¾"
Bottom of Chute lined with Sheet Zinc

MAGNETIC SEPARATOR FOR USE IN SEPARATING SCREWS AND FILINGS

For convenience in construction standard contactor coils can be used in making the separator, as was done at Syracuse.



EXTERIOR OF ROCHESTER CITY CAR BEFORE AND AFTER REMODELING

$55,000 Car Remodeling Job at Rochester

Total of More Than 150 Cars Now Going Through New York State Railways Shop

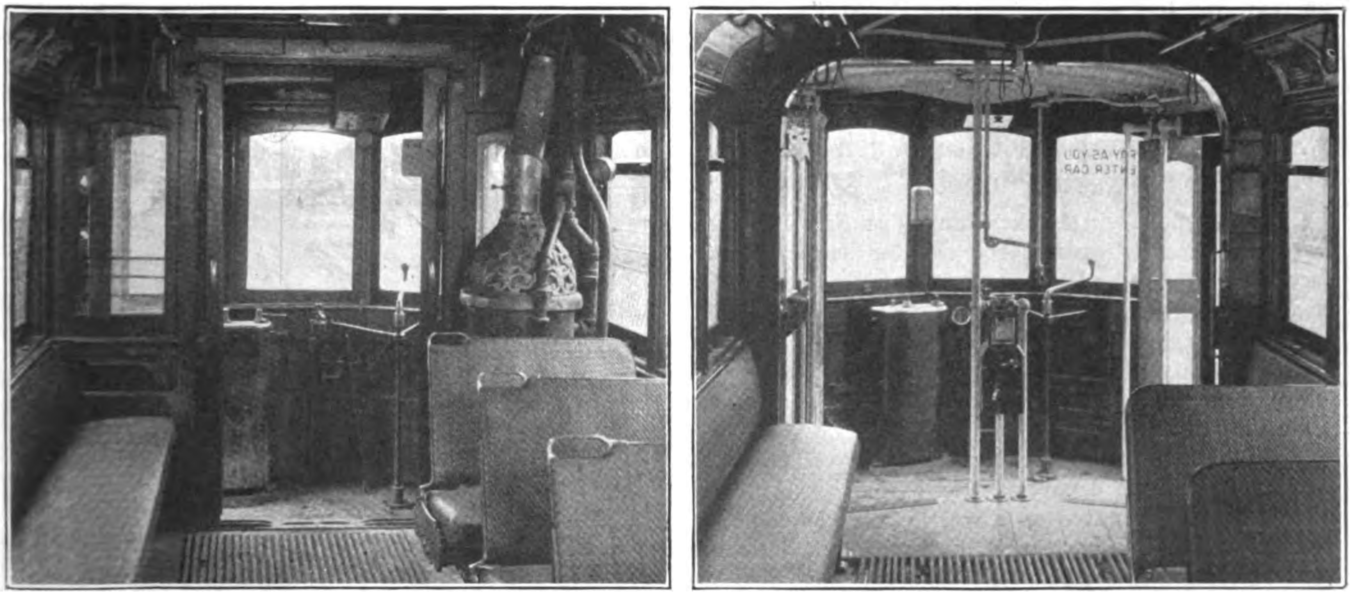
SINCE last April more than 100 cars of the local city and interurban lines of the New York State Railways, Rochester lines, have been put through the shops for remodeling work varying in cost from $325 to $500 per car. This has been done without any interference with the shop routine and in spite of severe labor shortage. At the present rate the entire schedule calling for about 150 cars will be completed this spring. These attractive remodeled cars, with the fifty "Pete-Witt" cars now in operation, will put the company on "easy street" for the time being as far as rolling stock is concerned. This remodeling has recently been the basis of very favorable comment by the Rochester Chamber of Commerce in its weekly bulletin. The work was planned and is being supervised by J. F. Uffert, who came to the company from Albany last spring.

The job comprises changes in forty-one double-end city cars which are being fitted up for pay-as-you-enter operation, 100 single-end cars being similarly equipped, and a number of interurban cars, four of which have already been completed. After completion of repairs all cars are being painted the new standard colors of the New York State Railways, a light green with cream trimmings.

WORK ON THE DOUBLE-ENDERS

The first step in the double-end car work is the lengthening of the platforms by 16 in., giving a total length of about 6½ ft. Then the bulkheads are replaced with arches as in new cars, and folding doors and steps are installed on both sides of each platform. For the manipulation of the entrance doors and steps a vertical rotating rod is provided in a central location at each end. The motion of this is transmitted by a simple crank and rod mechanism to the door and step rods. A detachable handle completes the equipment. The exit door and step have a similar but simpler mechanism operated also by means of a detachable handle.

For the conductor the floor is carried out about 6 in. beyond the end sill somewhat in accordance with the Montreal plan, in order to provide the maximum loading space and a good view of the platform, and so to place the conductor that he will not be in the way of entering or alighting passengers. (See photograph of Montreal car, page 402 of the issue of this paper for March 2, 1918.)



FRONT END INTERIOR OF ROCHESTER CITY CAR BEFORE AND AFTER REMODELING

In addition to the larger changes the installation of Consolidated door buzzers, Edwards sash locks on the motormen's windows, etc., serve to render the cars convenient to operate. The cost of this work, including painting, was about $500 per car.

The single-end car improvements are of the same general character as those described, except that the rear platform is being lengthened but 12 in. A number of these cars were too high for certain parts of the railway system, and the roofs of these are being lowered by eliminating the monitor deck. These single-end cars are in general heated with stoves, and as a convenience to the conductors coal boxes have been built under a section of the longitudinal seats to the left of the stoves. Access to the box is had by raising a 3-ft. section of the seat. In ten of the cars new Peter Smith hot-air heaters are being installed. About sixty out of 100 of these cars are already completed at a cost of about $325 each.

Several important changes are being made in the interurban cars, including painting to match the city cars as a general advertising feature. In the first place the bulkheads are being pushed forward 3 ft., giving room for two additional cross seats accommodating four passengers in the front or smoking compartment. Minor changes in the seating arrangement have permitted installing one other additional seat so that the seating capacity has been raised from fifty to fifty-six.

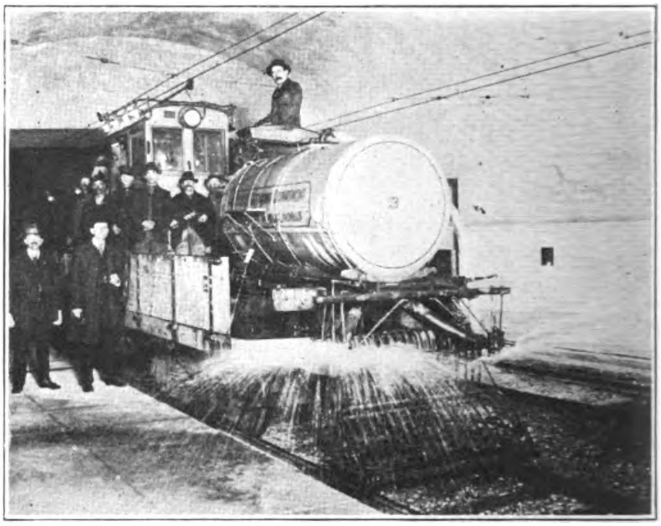
Formerly there were solid panels between the front vestibule and the car. These have been replaced with glazed panels so as to give a good view forward. All seats have been arranged to face forward for the maximum convenience of passengers, and all have been equipped with arm rests. These rests are not only a comfort to the passengers but they also preserve the full width of the aisle. Sliding doors are being placed in the partitions between smoking compartments and main sections as these close more positively than swinging doors.

The reduction in size of the front platform, of course, necessitated putting the hot water heaters elsewhere in the cars. Therefore, metal-lined compartments have been built forward of the toilet rooms in the rear of the cars, the heaters being entirely inclosed. Screens are provided at the top and bottom of the doors to provide necessary circulation of air.

Sprinkler Improvised to Wash Ballast in Tunnel

WHEN the Twin Peaks Tunnel in San Francisco was recently opened for regular service it was necessary either to oil the roadbed or to find some other means of laying the heavy deposit of fine dust which had gathered in the crushed rock ballast. The accompanying illustration shows the equipment with which the roadbed in the tunnel was freed from dust at almost negligible expense.

The tank of an 800-gal. street sprinkler owned by the city street cleaning department was taken from its running gear and mounted on a work car. The tank was blocked up and fastened in position with a cable to prevent shifting while in service. The sprinkler had two outlets so that a throw of 15 ft. each way was secured by gravity, the flow being controlled in the ordinary manner from the driver's seat.



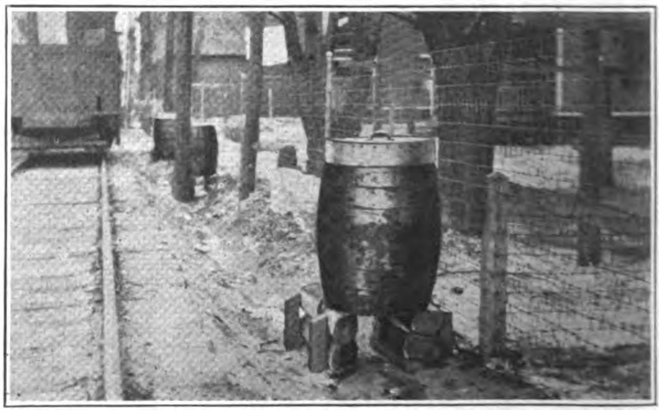
ROAD SPRINKLER PLACED ON WORK CAR TO LAY DUST IN TUNNELS

This equipment was used in the tunnel for three consecutive days, operating on both tracks. The roadbed was thereby given a soaking rather than a sprinkling, as the repeated trips over the 12,000-ft. length of the tunnel were sufficient thoroughly to wash the ballast and the base of the walls. It is believed that the treatment will not need to be repeated for many months, if at all.

Convenient Sand Storage for Car Service

AT THE Hooker Street carhouse of the Springfield (Mass.) Street Railway sand is conveniently stored, for immediate service on the cars, in barrels mounted at the side of the yard, as shown in the accompanying illustration. Each barrel is fastened to a set of four short sections of discarded ties braced against four wooden uprights driven about 18 in. into the ground.

Iron straps are used to fasten the barrels and ties together and covers are provided as shown. Each side of the yard is equipped with about a dozen barrels which are filled at night from a sand car run along the outer yard track. With a minimum disturbance to car movements individual cars can be supplied with sand during the day from the barrels instead of being obliged to move into the carhouse.



BARRELS FOR DAILY STORAGE OF SAND

LETTERS TO THE EDITOR

To Zone or Not to Zone

NEW YORK CITY, APRIL 10, 1918.

To the Editors:

I was glad to see from your issue of April 6 that the Massachusetts Public Service Commission has approved the establishment of a zone system in Springfield. The basic principle of the zone fare idea is that people should pay in accordance with what they get, and that is assuredly not the case in American street railroading. When visitors to a spa are allowed to drink for a nickel as much water as they want, they naturally assume that the cost of production is next to *nil*. Similarly, could the American public be blamed for assuming that transportation production costs next to nothing when it could get for a single nickel all the transportation that it wanted? Worse than this, the railway operator himself had no incentive to determine the cost of service in proportion to distance. Confronted at last by the *debacle* of the nickel fare, his first impulse is to seek relief via the seeming short cut of an increased flat fare rather than to take the longer, harder but surer road of determining the proper charge for different amounts of service. Yet even if the increased flat fare does bring in the needed revenue, the public is still encouraged to assume that it costs no more to be carried 10 miles than 1 mile.

Of course, I do not mean to say that the zone fare unadulterated is the universal solution. Each road will have to work out its own salvation, but it must first show willingness to be saved! Perhaps the least favorable place to consider a zone fare is in a city where short-haul riding in the business section has been discouraged by placing the surface cars underground. Since the great majority of riders are in the long-haul class, an increase in the flat fare should produce a practically proportionate increase in revenue. Yet even here, there may be an opportunity to build up profitable short-haul riding within the limits of the suburban towns.

A completely opposite case is presented by railway system "A" which is made up principally of small city properties. Although a neighboring railway, "B," of like characteristics has had success with zone fares, system "A" prefers an increased flat fare. The many short-haul riders of system "A" are dissatisfied and have begun to ask themselves why they should be taxed for the benefit of the long-haul rider. Is it logical for the railway to discourage the patronage of the profitable 5-cent customer who can walk, while failing to charge a sufficient increase for the suburbanite whose ride is so long that he won't walk? The suburban dweller's complaint that he moved far out because the fare was 5 cents, is hardly the concern of the railway. He might object equally well to paying higher taxes because taxes were low when he first became a resident of Lionel Terrace.

Finally, in your issue of Jan. 5, Peter Witt mentioned conditions where it might even be feasible to begin the zone fare at something below 5 cents, namely, in busy streets where many people might be encouraged to ride for a mile or less. This possibility will yet have to be considered in cities where extensive subway-elevated systems denude the surface lines of all long riding. In such cases, a higher unit fare for surface cars or a charge for a transfer will simply drive more people to the high-speed lines and increase the demand for through routing with its frequent waste of car mileage. What is wanted is a rate of fare and a frequency of service that will make long walks a rarity. London's zone fares have proved that this can be done, so why not the same plan in America? E. B. M.

Limitations in Track Spiral Standardization

KANSAS CITY RAILWAYS COMPANY

KANSAS CITY, MO., April 12, 1918

To the Editors:

Relative to the editorial in the ELECTRIC RAILWAY JOURNAL of April 6, and the article in the same number concerning track spirals and their standardization, please note the following points:

The principles which Mr. Ryder has used in working out formulas for the proposed standard spirals are undoubtedly correct, and to my mind the formulas are the best and most convenient for use in arriving at the ends sought. It would undoubtedly be desirable if all companies and manufacturers figured work of this kind in a uniform way, and if some such system of spirals is adopted this end would ultimately be accomplished, although it might take many years.

From an operating standpoint there is practically nothing to be gained by such standardization. A spiral is a spiral, and the changes sought are only those that apply to computation of such curves and their representation upon the drawings. There is little difference in the actual alignment of the track, finished to conform to various spirals. There is, therefore, no practical benefit to be derived from this change, from an operating standpoint. From the standpoint of economy it is a question whether anything will be accomplished by this move. I doubt if any concern engaged in the manufacture of special work would change its price by 1 cent because the curves are figured by some new formula or by the formulas which it has used in its shop as standard.

This change cannot possibly be brought about except through a long term of years. Special-work companies and traction companies have in their files drawings of curves that have been computed from the various formulas in use during past years. These curves will be used and referred to in ordering renewal parts for many years to come. If new formulas should be adopted as standard they would be used only where layouts are renewed in their entirety, or where layouts that did not exist before are installed; otherwise old computations would have to be gone over and the nearest one of the new standard spirals substituted for the old. This, I think, would ordinarily be deemed unnecessary and undesirable. The universal adoption of new spirals would not mean the simplifying of the procedure in drafting rooms of manufacturers, nor of many of the traction companies, as it would increase by one the systems that are now in use rather than decreasing them to a single standard.

It would seem that the farthest the committee could go in regard to this matter would be to adopt and recommend the computation of spirals in accordance with these formulas, and recommend this as good practice to be substituted, so far as practicable, for other formulas now in use, with a view gradually to eliminate the miscellaneous methods of making such computations.

A. E. HARVEY,
Superintendent of Way and Structure.

Section No. 12 Issues Challenge

THE RHODE ISLAND COMPANY
PROVIDENCE, R. I., April 13, 1918.

To the Editors:

We of Rhode Island Company Section No. 12, American Electric Railway Association, are desirous of issuing a challenge. We organized Tuesday evening, April 9, with 204 members. Consequently we have the distinction of claiming to be, in a charter membership, the largest section yet formed and this in the smallest state in the Union.

Not being selfish we desire to challenge some other electric railway company in the United States to beat our figures. The nearest approach to our record of 204 was the Public Service Railway Section with 156 charter members.

COMPANY SECTION NO. 12 ARRIVES AT PROVIDENCE, R. I.

We will gladly take our hats off to any other company that will beat us, but we feel that some lively work must be accomplished before that result can be attained.

The readers of the ELECTRIC RAILWAY JOURNAL will be interested in the accompanying sketch prepared by one of the members of our transportation department.

E. J. COONEY, Executive Assistant.

[NOTE.—Mr. Cooney states that the section members will take off their hats to a successful competitor. The ELECTRIC RAILWAY JOURNAL will supplement this with an appropriate cup as a tangible souvenir of such worthy accomplishment. We hope that a new section will be organized in such force as to furnish the opportunity for presenting this cup soon—Eds.]

A conference of all state fuel administrators from states east of the Mississippi River was held on April 10 and 11 under the auspices of the United States Fuel Administration. It was called to discuss general conservation, including the skip-stop system of electric railway operation among other details.

AMERICAN ASSOCIATION NEWS

Special Joint Committee of A.S.T.M. and A.E.R.E.A.

THE American Society for Testing Materials and the Engineering Association have appointed representatives on a joint committee to consider the possibility of substituting the Brinell hardness test for the drop test of girder rails. The reason for the appointment of this committee is clearly set forth in the following exerpt from the minutes of the recent meeting of committee A-1 of the A. S. T. M., which has been furnished by the secretary of that committee:

> The sub-committee called attention to the difficulty of making drop tests on girder rails, owing to the unbalanced and unsymmetrical sections of this type of rail, and pointed out that no question of safety is involved in the test, as the failure of a girder rail in track by breaking is almost unknown. The sub-committee has under consideration the substitution of a Brinell impression test in specifications A2-12 and recommends that the executive committee of the society urge the American Electric Railway Engineering Society to appoint a committee to co-operate with committee A-1 in the consideration of this revision.

In pursuance of this resolution the following representatives have been appointed by the two societies: Charles H. Clark, Cleveland (Ohio) Railway; C. G. Keen, American Railways Company, Philadelphia, Pa.; Martin Schreiber, Public Service Railway, Newark, N. J.; E. F. Kenney, Midvale Steel Company, Philadelphia, Pa.; F. A. Robbins, Jr., Bethlehem Steel Company, Steelton, Pa., and F. N. Speller, National Tube Company, Pittsburgh, Pa.

Section No. 7 Membership Passes 300 Mark

AS MENTIONED editorially some weeks back the last meeting of the Connecticut Company section was the occasion of a "Rhode Island Night" program. Talks were given by the following Rhode Island Company officials: Charles E. Redfern, claim agent; Theodore Francis Green, secretary and trustee; Alonzo Williams, attorney, and E. J. Cooney, executive assistant to the president.

W. R. Dunham, Jr., engineer of maintenance of way, Connecticut Company, a former Rhode Island Company employee, presided at the meeting. Harold Bates, assistant construction engineer, read a paper in which he emphasized the necessity of a continuous inventory and other cost records for the determination of accurate operating data.

In his paper Mr. Bates called attention to the ready availability of data provided by the continuous inventory. The greatest importance, however, lies in its use in connection with the calculation of operating costs. Mr. Bates said that it is essential on any railway property to know not only the total net income, but also the net income from the various revenue-producing divisions and departments. Thus any losses and inefficiencies can be ascertained and properly handled.

An interesting feature of the meeting was the report of the membership committee. This showed that in spite of the difficulties incident to the war fifty-two members had enrolled since the beginning of the year bringing the total membership to 301.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Legislature Does Little

Except for War Measures Passed, New York Body Conspicuous for What It Did Not Do

The Legislature of New York adjourned on the evening of April 13. Aside from legislation passed in the interest of the national government as an aid in furthering war preparedness, "no Legislature in the memory of any lawmaker now at the Capitol has achieved so little in the way of constructive legislation."

WAR MEASURE ENACTED

In deference to demands from the War Department the Legislature passed two bills, introduced by Senator Thompson, of Niagara, permitting the consolidation of the Hydraulic Power Company and the Niagara Power Company to insure more power for the munitions plants established at Niagara Falls and in its vicinity.

Another power measure enacted was that of Senator Thompson providing for the creation of a State hydroelectric commission to recommend a State policy for the development of the latent water powers in the streams of the State.

Among the measures that failed of passage was the bill to provide a 6-cent fare on the electric railways of the State. This bill was designed to bring order out of chaos with respect to the higher-fare cases now pending before the Public Service Commissions of the State and provide immediate relief for the electric railways struggling along under the greatly advanced costs of operation, but with pre-war incomes.

In addition, the Legislature failed to enact legislation fostered by the New York City administration and some of the smaller up-State municipalities to permit the cities of the State to acquire and operate public utilities. A special Senate committee was created to investigate the subject and make recommendations to the next Legislature. The original measure had a very stormy career. Leader Brown put through the Senate a concurrent resolution providing for an appropriation of $5,000 to defray the expenses of the special Senate committee created to investigate municipal ownership with a view to recommending a fixed policy for the State to the next Legislature. The resolution was sent to the Assembly for concurrence, but came back amended so as to provide for participation by that body in the investigation. Mr. Brown tried in vain to put the resolution through in its amended form, and then directed that it be returned to the House. Speaker Sweet, on further consideration, decided to let the resolution go through in the Assembly in the form in which it emerged from the Senate, so that, after all, the committee will have the funds necessary for its work.

Senator Ottinger's so-called West Side bill failed. This measure embodied a plan for the adjustment through a commission of the controversy between New York City and the New York Central Railroad in connection with the proposed west side terminal improvement and electrification.

Bills for the relief of contractors on public work demanded by war conditions were passed. Three such measures were sent to the Governor for his approval.

Whitaker of Baltimore

A True Short Story of Thrift Showing the Employee What Systematic Saving Will Do

Whitaker entered the office of John B. Duvall, assistant superintendent of transportation of the United Railways & Electric Company, Baltimore, Md.

"I've been drafted," he said.

"Well, we're mighty sorry to lose you, Whitaker," said Mr. Duvall; "but the government will get another good man, and I know you will do your best for the flag just as you have for this company."

"I'll try, sir," said the caller; "and when we win the war I'm coming back for my job as conductor on the Harford Avenue line."

"Good!" said Mr. Duvall.

"Before I go," continued Whitaker, "I want to buy a Liberty Bond."

"Good again," said Mr. Duvall. "A $50 or a $100 bond?"

"I'll take a $1,000 bond," replied Whitaker.

"How much do you want to pay down?" asked Mr. Duvall.

"All of it," answered Whitaker, and he produced a roll of bills from his pocket, from which he counted off $1,000.

Mr. Duvall went with him to the office of the Maryland Trust Company where Whitaker paid for and got a receipt for a $1,000 bond of the third issue.

This patriotic citizen who is going to fight for Uncle Sam and pay his own way, as it were, is John Howard Whitaker, Conductor No. 6936, of the Harford Avenue line of the Baltimore Company. He is thirty-one years old, and has been in the employ of the United Railways six years. He says he has put aside some of his earnings every payday since he has been in the service, and that the $1,000 represents the savings of the past six years.

Results of Toledo Audit

Inquiry Into Financial Condition of Toledo Company Indicates Inability to Meet Wage Demands

The Toledo Railways & Light Company, Toledo, Ohio, cannot grant the increase of 10 cents an hour to railway employees and a proportional increase to electrical workers, meet its obligations and keep its equipment in good condition unless an increase in the rate of fare is permitted, according to results shown by an examination of its books by expert accountants. This was disclosed at a conference on April 8, attended by representatives of the employees, Henry L. Doherty, chairman of the board of the company, and Mayor Cornell Schreiber. No details of the audit were given out at the time, but the statement seems to have been accepted by all.

Mayor Schreiber expressed the belief that the people would not sanction a higher rate of fare than is now in use. Representatives of the employees said they would not take snap judgment and that they do not want labor trouble of any kind if it can be prevented. They said, however, that in the end the temper and the necessities of the men would have to be considered. The power plants are furnishing service to several concerns engaged on government contracts, and there is no desire to interfere with them in any way.

It was intimated that it might become necessary for the government to take control of the situation in case developments indicate a possible tie-up of the electrical plants.

Report Against Municipal Ownership

Representative Johnson, chairman of the district committee of the House of Representatives, on April 17 presented to the house his minority report against ownership and operation of the electric railway lines there by the District of Columbia. The report by Mr. Johnson is the minority opinion on the Crosser bill for municipal ownership. Chairman Johnson emphasizes the point that both the Crosser bill and the majority report, written by Representative Crosser of Ohio, are practically reprints of an earlier bill and report and that they do not fit local and present conditions in Washington. He points out that no hearings were held on the present bill and that at the hearings on the identical bill in the Sixty-third Congress only one of the fifteen witnesses stated it was the desire of a majority of the people of the district to have public ownership of the electric railways.

Legislative Action Likely in Boston Case

Public Control Bill with Service-at-Cost Provision Reported for Boston Elevated Railway

Service-at-cost with public control of the road for at least ten years is provided in a bill relative to the Boston Elevated Railway filed in the Massachusetts House on April 12 by the joint committee on metropolitan affairs and street railways. Twenty-six of the thirty members signed the report (House 1442). The bill was heard by the joint ways and means committee on April 16 and will receive further consideration by the same committee at a hearing on April 22.

TRUSTEES TO SERVE FOR TEN YEARS

The bill creates a board of trustees for the company, three of whom are to be appointed by the Governor and two by the Mayor of Boston, subject to the approval of the civil service commission and compensated at the rate of $5,000 each annually. This board is to assume the management of the compay for a period of at least ten years, one trustee serving as chairman. Any appointee may be removed for cause. All the rights and powers of the company and its directors are to be exercised by the trustees.

The latter trustees are to have the right to regulate and fix fares, including the issue, granting and withdrawal of transfers, the imposition of charges for these, and to determine the character and extent of the service furnished, and in these respects their authority is to be conclusive and not subject to the direction or control of any other State board or commission. No contracts are to be made for the construction, acquisition, rental or operation of additional rapid transit, surface or other lines beyond the present system limits without the consent of the directors of the company. The directors' duties are to be confined to maintaining the corporate organization during the public control period. By acceptance of the act the company assents to all security issues deemed necessary by the trustees.

TRUSTEES TO FIX FARES

Prior to or upon acceptance of the act, the company is to provide for the raising of $3,000,000 in cash by the issue of preferred stock at not less than $100 per share, which is to be subject to the preferred stock authorized upon the acquisition of the West End Street Railway. This preferred stock is to be entitled to cumulative, preferential dividends not exceeding 7 per cent annually and is to be subject to recall at the request of the trustees or after the period of public operation. Of the above $3,000,000, $1,000,000 is to be set aside as a reserve fund and the remainder is to be subject to the disposition of the trustees to pay for the cost of additions and improvements to the company's property.

The board of trustees is to fix fares to meet the cost of service, including operating expenses, taxes, rentals, interest on all indebtedness, such allowance for depreciation, obsolescence and losses in respect to property sold, destroyed or abandoned as they may determine, all other expenditures chargeable against income or surplus, fixed dividends on all preferred stock, and dividends on the common stock at the rate of $5 per share during the first two years, $5.50 per share during the next two years, and $6 per share during the balance of the period of public operation.

The fares which in the judgment of the trustees will meet the cost of service as above defined are to be put in operation within sixty days of the appointment of the trustees, and within sixty days thereafter the trustees are required to adopt and publish a schedule of eight different grades of fares, of which four shall be below and four above the rate of fare first established. Whenever by reason of any change in the existing rate of fare there are less than four grades, either above or below the rate then in force, the trustees are to adopt and publish a schedule of such additional rates so that there shall always be not less than four above and four below the existing rate of fare.

Changes in the fare steps may be made at the discretion of the trustees. The reserve fund is to be used only for making good the deficiency in income of the company or for reimbursing the State in case the fund exceeds the amount originally established. The State is to make up any deficiency in the reserve fund upon semi-annual notification. The State is to have the right of terminating public management at the end of ten years or thereafter upon not less than two years' notice. Quarterly checks are to be made of the reserve fund to abolish the ability of existing fares to meet service cost.

OPTION OF PURCHASE TO STATE

The bill contains provisions for procedure and treatment of the reserve fund in case the company is restored to private management. The acceptance of the act by the company is to constitute giving the State an option upon the property in case the State decided to purchase it at a later period.

With the exception of the section relating to the issue of $3,000,000 in preferred stock, which is to take effect upon its passage, the act will take effect upon its acceptance by the holders of not less than two-thirds of the stock of the company, and upon certification that the entire $3,000,000 referred to above has been subscribed for and at least 30 per cent paid in cash.

The act is to constitute a contract between the State and the company, and the trustees, according to its terms, would assume management on the first day of the month following their appointment.

Pending the further discussion of the measure before the ways and means committee, Matthew C. Brush, president of the company, preferred not to be quoted in regard to the pending measure. At the hearing on April 16 F. E. Snow, counsel for the company, said that the establishment of inclosed transfer areas, construction of new stations on rapid transit lines and issue of stocks and bonds would be under the supervision of the Public Service Commission as in the past, with the exception of the $3,000,000 rehabilitation and reserve funls.

Governor McCall's views upon the measure will be sought before the next hearing.

Opportunities in the Ordnance Department

Two statistical engineers are needed by the Control Bureau, Ordnance Department, Washington. Each position calls for a man who is keen, an analyst, with vision, accomplished in the compilation of reports and statistics, and able to put himself in the reader's place. He should be a college or technical graduate and from thirty-five to fifty years of age.

There is also an opportunity for two men along the same line but with less experience and younger. Four men are also wanted experienced in cost keeping and bookkeeping, able to do the work themselves but with skill and initiative to get at the principles and analyze the work. They must be over the draft age. There is an opportunity here for men both with and without college degrees. Women college graduates with mathematical ability and actual practical experience in such work as bookkeeping and statistics and able to make charts of various kinds are also desired.

Anyone taking one of these positions will have the satisfaction of knowing that he or she is greatly helping the government. Applications should be addressed to Chief of Personnel of Control Bureau, Chief of Ordnance Department, Washington, D. C.

Paper for B. C. Employees

The British Columbia Electric Railway, Vancouver, B. C., has begun the publication of the *B. C. Electric Employees' Magazine.* The first issue is dated April. 'It contains eight pages. The purpose of the publication is explained in an editorial in part as follows:

"Probably the story of *The Employees' Magazine's* birth will explain its appearance best. The need of a medium of communication between the numerous employees and departments of the company was voiced first by the executive of the office association. The suggestion was later placed before the management of the company and fully approved, with the result that this medium has been placed at the disposal of the employees by the company in which to print news and exchange views on current affairs about the company.

"The magazine, of course, is not confined to the Vancouver employees, the object being that all employees, even in the most isolated points of the company's territory—at Lake Buntzen, along the Fraser Valley, in the substations, and so forth—should share in the making up of and benefits from the magazine."

Cleveland Men Present Wage Request

Want an Increase of 25 Cents an Hour in Wages—Other Demands

The terms that will be demanded in their new contract with the company by the motormen and conductors of the Cleveland (Ohio) Railway were presented on April 15 by the representatives of the men.

The officers of the company also desire changes in the contract and they constitute rather a radical departure from those to which the men have been accustomed. One of them is that the company be permitted to employ women as drivers and conductors on an equitable basis with men. Another is that employees of the company shall not be required to become members of the union. The first is based upon the shortage of men, and the second upon the desire of the company for an open shop contract. The company wants to be relieved of the task of assisting union officials in the collection of dues and suggests a rearrangement of the seniority lists and schedules.

WHAT THE MEN ASK

The men demand an increase of 25 cents an hour in wages; that 40 per cent of total runs be completed in eleven hours, 40 per cent in twelve hours, and 20 per cent in thirteen hours; that the minimum day be eight hours instead of five hours; that there be an eight-hour schedule Sundays and holidays; that night runs be eight hours with pay for ten hours; that time and one-half be paid for overtime; that tickets, transfers and money for change be furnished by the company instead of the men; that vestibules be heated; that a discharged employee be reinstated when the complaining passenger fails to appear against him within three days; that a real emergency must exist for posting emergency runs; that pay of employees commence when they report at their own stations instead of stations to which they are transferred in case of change of runs; that men be permitted to wear colored glasses; and that men be paid for time spent in court as witnesses in accident cases where the company is not directly involved, providing they make reports of such accidents.

These demands will be discussed at once, but it is generally thought that arbitration will be required to reach a settlement.

The changes suggested by the company would tend to make the contract more liberal and provide for such emergencies as may arise out of the war.

Result of Shipyard Transportation Survey

Development Planned Calls for Expenditure of $9,000,000 for Additional Traffic Facilities

In the investigation made from Feb. 22 to March 29 under the direction of A. L. Drum for the Shipping Board for the purpose of improving and enlarging the local passenger transportation service to all the shipyards on the Atlantic Coast in order adequately to serve the present employees and to determine the extent and reduce as far as possible the expenditures for new housing for the shipyard forces, traffic surveys and plans were made for improving the transportation facilities for twenty-eight shipyards now employing 70,100 men and requiring an increase of 67,000 men. At these shipyards and the adjacent war industries 96,400 men are employed. The total men required to be engaged on the work of ship building and adjacent war industries work will be nearly 200,000 at the following locations: Savannah, Newport News, Baltimore, Sparrows Point, Camden, Gloucester, Newark Bay, Staten Island, Newburgh, N. Y., Port Jefferson, L. I., Fore River and Squantum at Boston, Portsmouth, N. H., Groton and Bath, Me.

TRANSPORTATION VS. HOUSING

The investigation developed that most of the shipyards requiring additional housing were on marshy land and subject to unhealthy conditions, so much so that it was necessary to locate any new housing from 1 to 2 miles distant from the yards and consequently requiring electric railway or steam railroad transportation for the men. In many instances some new housing is necessary. Permanent houses will usually require local transportation and will cost on an average of $1,500 per man for the houses. For barracks located near the shipyards the cost is about $350 per man. Estimates show that where about 2 miles of track extension are necessary from existing lines to the shipyards and a full complement of cars, substations, feeders and carhouses is required the investment averages about $150 per man to be transported. These figures indicate the economy of developing existing transportation facilities over the making of large investments in temporary or permanent housing, even should the railway extension eventually be abandoned, because the cars and power supply, representing less than one-half the investment for even barracks would be available for future use.

THE NEWARK DEVELOPMENT

The total development planned consists of increasing ferry boat service with existing boats, increasing steam railroad service with existing rolling stock, and making electric railway extensions and adding cars and power supply at a total cost of about $9,000,000. This includes $2,400,000 to be provided by the Pennsylvania Railroad and the Hudson & Manhattan Railroad for extending the Hudson Tube service to the Lincoln Highway at Port Newark, N. J., where it will serve 50,000 men, placing 30,000 of these within sixteen minutes of Cortlandt Street, New York, twenty-six minutes of Herald Square and thirty-one minutes of the center of Brooklyn.

After planning to utilize the existing housing to its utmost capacity by improving the transportation facilities the next effort was to permit the use of these transportation facilities to their fullest extent by spreading the shifts at the shipyards from one hour to one hour and one-half in order to secure two round trips in the morning and evening with each car in the service. The management of the shipyards are now working out plans for spreading their shifts an hour and thirty minutes.

LABOR SHORTAGE A PROBLEM

The shortage of motormen and conductors for this peak load transportation service for the shipyards, due to the loss of men who went from the electric railways to the shipyards at rates of wages the electric railways cannot afford to pay, creates a serious difficulty. In this connection it has been suggested that arrangements be made with shipyard managements to permit old and trained electric railway men to operate cars to and from the shipyards, these men to be paid for this service by the railways and to work during the interval in the shipyards.

Electric Carries Secretary Daniels

The Chicago, North Shore & Milwaukee Railroad hauled a distinguished party from Chicago to the Great Lakes Naval Training Station and back on April 10. Secretary Daniels of the Navy Department was in Chicago on that day and was scheduled to speak at the evening meeting of the United States Chamber of Commerce, but wanted to visit the Training Station in the afternoon.

In company with members of the Chicago Liberty Loan Committee, he was met by M. J. Feron, general superintendent of the railway, and boarded a special train of two cars at the elevated station at Adams Street and Wabash Avenue, Chicago. One car was an observation car, and the other a diner in which luncheon was served to the party en route. The trip to the Training Station was made in about an hour. After the inspection of that post by the Secretary, he returned in the same way to the stock yards in South Chicago, which were also inspected.

The Chicago, North Shore & Milwaukee Railway is doing a large passenger business to both Fort Sheridan and the Great Lakes Training Station from Chicago and Milwaukee.

Carhouse Destroyed by Fire

Ninety-four Cars Burned at Boston With Loss of $250,000 Covered by Insurance

Ninety-four cars owned by the Boston (Mass.) Elevated Railway and one sprinkler car owned by an outside concern were destroyed by a fire on April 7 which gutted the westerly section of the Clarendon Hill carhouse of the company, in the western part of the city of Somerville, Mass. The fire started about 6.35 p.m. and the flames spread so fast through the section of the building destroyed that only one car was saved.

TYPES OF CARS DESTROYED

The section of the building destroyed was a wooden structure about 250 ft. square and two stories in height. Of the cars destroyed, seven were of the semi-convertible type, one was a modern trailer of the double-truck type, and ten were of the articulated type. The others were mostly 25-ft. and 20-ft. box cars. Five service and sand cars and sixteen snowplows were destroyed.

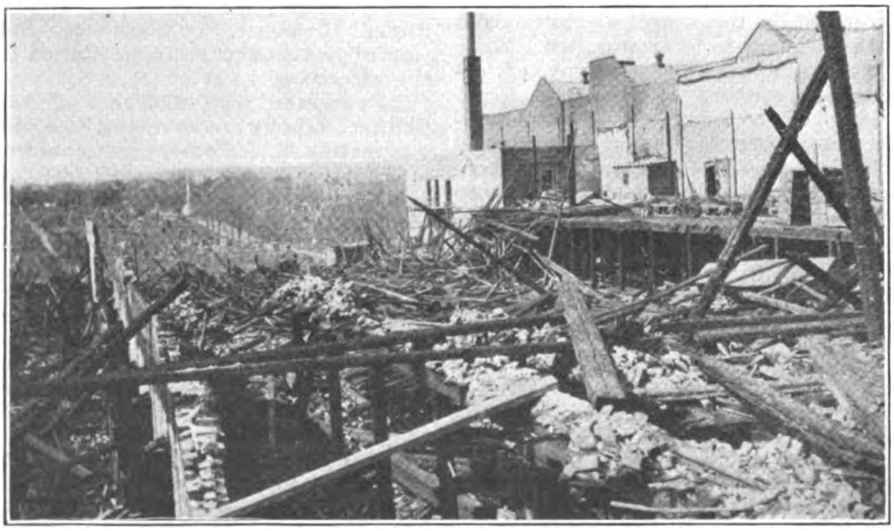
The newer section of the carhouse, built in 1911 of brick and concrete, withstood the flames as indicated in the accompanying illustration, and none of the cars housed in it was damaged.

The company handled the rush-hour traffic of the following morning by rearranging the service between Arlington Heights and Sullivan Square terminal for an additional transfer at Arlington Center.

On account of the destruction of tracks in the wooden section of the building, it became necessary to store cars on the street outside the Clarendon Hill carhouse, and the shortage of large cars resulting from the fire also made it necessary to press some smaller units of rolling stock into service, especially in handling the rush-hour traffic.

WILL NOT REPLACE EQUIPMENT NOW

The cause of the fire is not known. In a statement to the public the company estimated the total loss at about $250,000. This is probably covered by insurance. It is not expected that the company will purchase any new passenger equipment at present to replace that destroyed, but it will probably be in the market in the near future for snowplows.



REMAINS OF CLARENDON HILL CARHOUSE

Subway Survey Funds Sought

The City Council of Cleveland, Ohio, has been requested by the Cleveland Rapid Transit Commission to issue bonds to the amount of $100,000 to secure funds for the preliminary survey and investigation for subway terminals at the Public Square and underground tracks in the congested business district. The work will be begun just as soon as funds are provided.

Union Terminal for Oakland Mole

Creation of a union railway terminal at the Oakland mole to accommodate trains of the Southern Pacific, Western Pacific and Santa Fe Railroads, thereby releasing a large amount of equipment for other service while cutting down the expense of operating three terminals, is being planned by the engineering department of the three railroads. It is part of the working out of Director-General McAdoo's plans for the operation of the railway systems of the country as a unit, rather than as independent lines, and the impending change is one of the most radical steps taken since the government assumed charge of the operation of the railroad properties.

The union terminal proposal calls for a combination of the ferry services of the three transcontinental lines at the San Francisco bay terminal, combined and systematized handling of freight, combined stations at Richmond and in East Oakland, and the elimination of all unnecessary duplication of service. It has not been announced how the new move will affect the ferry service of the San Francisco-Oakland Terminal Railways (electric). This problem will be worked out in connection with the concentration of passenger and freight service from the interior on Oakland mole.

Storage and Distribution

Coal Problems of Electric Railways Being Taken Up with Fuel Administration in Washington

Electric railway men are visiting Washington with the hope of getting straightened out some of the difficulties which have confronted them as a result of the suggestion of the storage of coal made by the Fuel Administration on March 29. They are endeavoring to point out to the Fuel Administration and other government officials the necessity of making miners and coal operators responsible for the production of clean coal. Philip J. Kealy, president of the Kansas City Railways, has been one of these visitors to Washington, and he has been endeavoring to point out, for the benefit of all the electric railway companies which might be laboring under the same difficulty as that of Kansas City, that it is impossible to store bad coal more than four weeks because of the danger of spontaneous combustion.

ZONE SYSTEM COMPLICATES MATTERS

The zone system of distribution recently ordered by the National Fuel Administration, in the opinion of some electric railway operators, complicates the practical execution of the recommendation for the storing of large quantities, issued by the Fuel Administration on March 29. The question of contract and the time within which these contracts were to expire enter into the question of storage. Complaint is also being made in Washington that some of the public utilities are not receiving the attention needed in the way of coal shipments.

P. H. Gadsden, in charge of the War Board of the American Electric Railway Association, is constantly in touch with the Fuel Administration, and at the office of Dr. Garfield it was said to a representative of this paper that his advice on the subject of the troubles of electric railways is constantly being sought.

George Ade Lifts His Voice

The man or woman who needs to be convinced in 1918 that our cause is just and our motives clear is not worth bothering over.

We are too busy these days to stop and try to pump blood into shellfish.

Our present occupation is to sort out the quick from the dead.

Every resident of the U. S. A. is to be tagged, either as an asset or a liability.

This is no time for pinching and piking.

Be a true sport. Clean every pocket. Throw your bank roll on the table and say to Uncle Sam, "Take any part of it."

Is it true, as reported, that this weather finds the cold feet not in the trenches, but propped against baseburners in our most respectable sitting rooms?

Let us hope not.—GEORGE ADE.

News Notes

Wage Increase in Urbana.—The Kankakee & Urbana Traction Company, Urbana, Ill., has increased wages from 28 cents to 30 cents an hour for trainmen who have worked less than two years and from 30 cents to 35 cents an hour for men who have served longer than two years.

Wage Increase in Harrisburg.—Increases of 2 cents an hour for all employees have been announced by Frank B. Musser, president of the Harrisburg (Pa.) Railways, and C. H. Bishop, president of the Valley Railways, Lemoyne, Pa. Both increases are effective at once.

Report on Traffic in Bethlehem.—Delos F. Wilcox, New York, N. Y., engaged by the Chamber of Commerce of Bethlehem, Pa., to make a survey of electric railway conditions in that city and vicinity, has submittd a complete report which will probably be used on June 5 when the complaint of the city of Bethlehem vs. the Lehigh Valley Transit Company will be heard.

Lake Shore Cars Burned.—Fire destroyed six interurban cars in the carhouse of the Lake Shore Electric Railway at Beach Park, Ohio, on the morning of April 15. The loss is about $72,000. Three of the cars were practically new. They were valued at $14,000 each. The fire is supposed to have originated from a stove in one of the cars. The company's fire apparatus finally subdued the blaze.

Officers of Wisconsin Electrical Association.—Owing to several typographical errors in the list of officers elected at the recent meeting of the Wisconsin Electrical Association and reported in the issue of April 6, the list is repeated: President, John St. John, Madison; first vice-president, Raymond H. Smith, Madison; second vice-president, W. C. Lounsbury, Superior; third vice-president, A. C. Babson, Watertown; secretary-treasurer, J. P. Pulliam, Milwaukee.

Bus Application Put Over.—The application of the Fifth Avenue Coach Company for a change in routes and six months' extension of its temporary permit was laid over by the Board of Estimate during the week ended April 13 until May 10. Representatives from Harlem asked that a crosstown line be operated on 125th Street. Borough President Dowling pointed out that there was an electric railway on the street and the best thing to do was to ask the company to increase its service.

Government Starts Welding School.—A course in oxy-acetylene welding and cutting will be opened at the Military Trade School, Washington Barracks, D. C., on May 1. It is designed to fit men to cope with all military problems involving cutting and welding in the field. Sixty men from the First Replacement Regiment of Engineers will take up this study. They will be taught metallurgy in connection with the welding of cast iron and steel, malleable iron and steel, malleable iron and aluminum, copper and other metals, and will study gases, fluxes, torches, etc.

Interurbans Advertise Liberty Loan.—A striking and well written full page advertisement on the Third Liberty Loan has been contributed by the interurban companies of Indianapolis to the Indianapolis *News*. The companies that participated were the Terre Haute, Indianapolis & Eastern Traction Company, the Union Traction Company of Indiana, the Indianapolis & Cincinnati Traction Company and the Interstate Public Service Company. The advertisement was a most patriotic appeal to citizens of all classes to participate in the loan.

Bus Application Denied.—The Public Utilities Commission of Illinois has denied the application of the Motor Bus Company to operate a fleet of motor buses in Springfield, Ill. The commission held that transportation facilities in that city were adequate and that competition with the Springfield Consolidated Railway would work to the detriment of the public. The decision ends the attempt of union labor to operate buses in direct competition with the railway. Agitation for such service followed the strike of the railway employees a few months ago.

Safeguarding Industries from Enemies Within.—The National Americanization Committee, with headquarters at 29 West Thirty-ninth Street, New York, N. Y., is issuing suggestions on the protection of property in this country during the war. A recent bulletin entitled "Safeguarding Industries from Enemies Within" makes a series of ten suggestions such as a census of employees, appointment of watchmen, admission of visitors, etc. Although primarily intended for manufacturers, these bulletins should be of value in the protection of power plants and other portions of an electric railway system.

$24,000,000 in Chicago Traction Fund.—Payments to the city's traction fund for the fiscal year ended Jan. 31, 1918, have been made by the companies constituting the Chicago (Ill.) Surface Lines. The total was $2,036,754. This was a decrease of $710,235 as compared with the city's share in the preceding year. With this addition the traction fund reaches to a total of almost $24,000,000, representing 55 per cent of the net receipts during the last ten years and accumulated interest. If the pending ordinance is approved it is likely that this money will be used for building subways to be owned by the city and leased to the local railway companies.

United Railroads Sues San Francisco.—The United Railroads, San Francisco, Cal., filed in the Superior Court on April 8, a suit against the city and county of San Francisco in which $865,250 is asked for damages alleged to have been sustained as a result of the city's paralleling tracks on Market Street from Van Ness Avenue to Church Street. It is alleged that the city's action has caused a depreciation in the value of the United Railroads' franchise and has caused the company to suffer a loss of patronage. Attention is called to the fact that a claim for these alleged damages was filed with the Board of Supervisors last October and that the claim has been denied.

New York Giants vs. Interboroughs.—New York has had its first doubleheader. The event occurred at the Polo Grounds on April 15. The participants in the night cap were the New York Giants and the Interboroughs, composed of the champions of the league of employees of the Interborough Rapid Transit Company. The Interboroughs lost, but then consider the prowess of their opponents. The tale is told mostly in a bad first inning, in which the Giants scored seven runs. The final score was eleven to three in favor of the Giants. The Giants made ten hits against the railway men's eight, while the former made one miscue and the Interboroughs only two. In the sixth the Interboroughs mauled Rube Benton for five hits and three runs.

Programs of Meetings

Machinery Makers to Convene

A war convention of the machinery, tool and supply industry of the country will be held in Cleveland, Ohio, the week of May 13. The convention will be a joint meeting of four great national associations, the American Supply & Machinery Manufacturers' Association, the National Supply & Machinery Dealers' Association, the Southern Supply & Machinery Dealer's Association and the National Pipe & Supplies Association. The associations that plan to participate will meet to co-ordinate their efforts toward one goal, "More Ships, More Shells."

New England Street Railway Club

For the meeting of the New England Street Railway Club on April 25 an inspection visit to the new plant of the Massachusetts Institute of Technology has been arranged, starting at the main entrance under the dome, at 4 p.m., in charge of special guides. At 5.45 p.m. the club members will again assemble at the main entrance, from which point they will march to the "Tech" dining headquarters, where dinner will be served. The meeting will be held in the large lecture room on the second floor, under the dome. The speakers will be John Ritchie, Jr., of the Massachusetts Institute of Technology, and C. R. Dooley, of the Westinghouse Electric & Manufacturing Company. Mr. Ritchie will have for his subject "Training Men for War Service." Mr. Dooley will have for his subject "Training Men for Industrial Service."

Financial and Corporate

Let's Go to Hongkong!

Net Profits in Last Two Years Have Almost Equaled Capitalization of Tramway

The success of the Hongkong government in bringing the subsidiary coinage of the colony to par, the increase in the exchange value of silver and increasing traffic have resulted in making the Hongkong tramway system a veritable gold mine for its owners. The annual report for 1917 indicates that the net profits of the company, after paying all charges and interest on bonds and including the balance carried over from the previous year, reached $296,635 (U. S. gold) on a capitalization of only $395,400.

In 1916 the net profits of the company, after paying all charges and including the balance carried over, amounted to $211,800, out of which the company paid total dividends of 30 per cent and carried forward $81,300 gold. Despite the large profits the dividends for the past year amounted to only 23 per cent, the company carrying forward $205,690, or 52 per cent of its capital.

MAY BE STOCK DIVIDEND

There is considerable discussion in financial circles in Hongkong as to the reason for this very large balance carried forward, but the general opinion seems to be that it forecasts a stock dividend, which can readily be made one new share for each two old shares. It is also surmised that the company is arranging to retire a considerable amount of its outstanding bonds, which can be done to best advantage with silver exchange at its present point. The net profits for the past two years amounted to almost exactly the total capital of the company. Considerable sums have been allowed for writing off deterioration of plant.

EXCHANGE HAS HELPED

The company has operated its 10-mile line on the basis of a fare of 10 cents first class and 5 cents third class, having abolished a second-class fare of 8 cents. No transfers are permitted. In normal times this first-class fare of 10 cents, Hongkong currency, works out a little less than 4.5 cents gold. At the exchange which has obtained in the past year, however, it works out almost 7 cents gold, the third-class fare being in proportion.

Another important feature in the company's prosperity has been the fact that subsidiary silver coins in Hongkong have been brought to and maintained at par. Up to two years ago the subsidiary coins in Hongkong (the 5, 10, and 20 cent pieces) circulated at a discount of 5 to 12 per cent, as compared with the corresponding standard silver dollar. For example, it might require eleven 10-cent pieces or fares on the tramway to earn a standard silver dollar. The company's loss annually from this cause, about $20,000, has been almost entirely prevented since the subsidiary coins were brought to par.

TRAMWAY'S GROWING POPULARITY

The cost of operating the line is exceptionally low, because of the cheapness of labor and the comparatively low power required. The greatest element in the company's prosperity, however, has been the increasing use of its cars by all classes of the community. This is especially the case in first-class fares, which a few years ago were comparatively few. It has come to be the accepted thing at present for non-Chinese to use the tramway instead of jinrickshas for longer trips, and the use of the cars by first-class patrons to one of the leading golf courses, to the bathing beaches and to pleasure resorts has perceptibly increased.

Atlanta Stockholders Seek Relief

A committee of stockholders of the Georgia Railway & Power Company, Atlanta, Ga., has published in an advertisement in the Atlanta papers a pertinent statement of facts relative to the conditions which confront that company. Attention is called to the purpose of the company to apply at an early date to the Railroad Commission for its authorization of rate increases which will enable the company to continue to furnish good service to the public, and, at the same time, meet its obligations. On this point the statement said:

"The company is at the present time constructing additional water power plants at a cost of approximately $5,000,000 in order to increase the supply of power which is vital to the country's needs in the prosecution of the war and of the utmost importance to Atlanta and the State of Georgia.

"The officers of this company have been directed to make application to the Railroad Commission of Georgia for an increase in rates in all departments, it being our opinion that unless such increases are granted the company will not have resources sufficient to meet increased interest and taxes, increased cost of materials and the increased rates of wages which it must pay in order to retain or secure the men necessary to enable it to furnish its present varied services which are so essential to the community and the country in this critical time, and without the granting of which increase of rates the company will be unable to push speedily to completion its new water power plants."

Operating Costs High in Jersey

Railway Gross Shows Average Increase, but Expenses Make Higher Rates Necessary—Fuel Alone Up $2,500,000

Smaller net earnings were the result of 1917 operation by the Public Service Corporation of New Jersey, Newark, N. J., owing to the higher costs of operation. The fuel bill alone of the three operating companies was approximately $2,500,000 in excess of what it would have been for the same amount of coal at 1916 prices.

The operating revenue of the electric railway, electric light and gas subsidiaries increased $4,742,567 in the last calendar year, or 11.1 per cent. The operating expenses, however, including amortization charges and taxes, rose $4,675,514 or 18.1 per cent. The non-operating income fell off and revenue deductions of subsidiaries increased. The final result was a net increase of $2,494,561 in surplus before the payment of dividends, as compared to $2,947,693 in 1916. The company paid dividends of 8 per cent or $2,399,968.

During 1917 the operating revenues of $19,494,677 for the electric railway

INCOME STATEMENT OF PUBLIC SERVICE CORPORATION OF NEW JERSEY FOR CALENDAR YEAR 1917

Operating revenue of subsidiary companies		$47,291,342
Operating expenses, including amortization charges and taxes		30,539,369
Operating income		$16,751,973
Non-operating income		397,706
Gross income		$17,149,679
Income deductions of subsidiary companies (bond interest, rentals and miscellaneous interest charges)		12,299,838
Net income of subsidiary companies		$4,849,841
Public Service Corporation income from securities pledged (exclusive of dividends on stocks of operating companies) and from miscellaneous sources	$1,953,097	
Less expenses and taxes	223,232	$1,729,865
		$6,579,706
Public Service Corporation income deductions:		
Interest on perpetual interest bearing certificates	$1,202,986	
Interest on Public Service general mortgage 5 per cent bonds	1,875,000	
Interest on 5 per cent collateral notes	375,000	
Interest on miscellaneous obligations	343,645	
Amortization of debt discount and expense	159,238	
Sinking fund for Public Service general mortgage 5 per cent bonds	209,500	
Other contractual deductions from income	36,936	$4,202,306
Net income of Public Service Corporation and subsidiary companies		$2,377,399
Appropriation accounts of subsidiary companies:		
Amortization of new business expenditures prior to Jan. 1, 1911	$40,329	
Adjustments of surplus account (credit)	140,006	99,676
		$2,477,076
Appropriation accounts of Public Service Corporation (exclusive of dividends) (credit)		17,484
Net increase in surplus before payment of dividends		$2,494,561

department showed about the average rate of increase—6.70 per cent. As against this operating expenses showed an increase of 12.70 per cent over the preceding year, reflecting the marked rise in the cost of labor and materials. The growth in operating revenues was $1,105,672, to earn which 1,122,695 additional car miles were operated.

There was a phenomenal development in war industries during the last year in the territory served by the railway lines. The manufacture of munitions and war supplies engaged the services of thousands of men and women; existing shipyards were enlarged and new ones constructed. In addition the government caused the erection of quartermaster's and engineers' depots, cantonments and various other buildings for use of war enterprises. All of these operations necessitated the employment of large forces of men, and the transportation of these workers severely taxed the railway facilities.

The revenue from transportation increased from 31.412 cents per car mile to 32.485 cents per car mile, or 1.073 cents per car mile. Operating revenue deductions increased from 20.354 cents per car mile to 22.340 cents per car mile, notwithstanding smaller depreciation charges. The ratio of operating revenue deductions to operating revenue was 67.1 per cent. Car mileage increased 2.0 per cent. Other statistics are shown in the accompanying table.

The railway claim department in 1917 spent, including its administration expenses, $751,096, or 4.13 per cent of the gross passenger receipts. This was an increase of approximately $88,000 over the outlay for 1916. The larger expenditures are attributable to the greater volume of business done by the company and also to the vastly increased use of the highways by other vehicular traffic, especially motor cars.

The increase in kilowatt hours commercially sold by the electric light department was 90,637,616, or 32.27 per cent. The revenue from electric sales increased 18.57 per cent. The ratio of operating revenue deductions to operating revenue was 61.7 per cent, as against 58.4 per cent for the corresponding period of the year previous. The sales of the gas department increased 1,211,012,515 cu.ft., a gain of 9.77 per cent, and the revenue from sales of gas increased 8.72 per cent.

The taxes for the year 1917 amounted to $3,974,983, an increase of $1,261,924, or 46 per cent, over the previous year. Beginning with 1918 the rate of franchise tax payments will be increased 1 per cent a year until 1920, by which time the gas and electric departments will, like the railway, be paying in the form of franchise taxes 5 per cent of their gross receipts.

The fire insurance in force as of Dec. 31, 1917, amounted to $35,889,977, an increase of $2,938,941 over the corresponding period of the year previous. Premiums paid aggregated $114,507, an increase of $8,073. The average rate paid was 31.9 cents per $100 of insurance, as against an average rate of 32.3 cents for 1916.

	1917	1916
Revenue passengers	361,187,782	342,205,993
Transfers and passes	115,787,201	109,492,019
Total passengers	476,974,983	451,698,012
Percentage of passengers using transfers	21.9	21.8
Average fare per passenger (cents)	3.82	3.82
Car miles	56,087,403	54,964,708
Car hours	6,021,225	5,911,131
Passenger receipts per car-mile (cents)	32.44	31.37
Passenger receipts per car-hour (dollars)	3.02	2.92

Expenditures for the work of the welfare department, including payments made under the workmen's compensation act, amounted during 1917 to $184,277, an increase of $18,422 over the preceding twelve months. Of the total sum $98,418 was for welfare work, disbursed as follows: Insurance, $23,191; sick benefits, $27,004; pensions, $33,846, and expenses, $14,376. Most of the increase of $10,050 in the total of the foregoing items was due to additional pensions.

The cost of injuries to employees, coming within the scope of the compensation act, was $85,808, or $8,371 more than the year before. It was divided as follows: Payments required by law, $63,783; additional payments over and above those required by law, $9,374, and expenses of department, $12,650. There was a decrease of from twenty-five to twelve in the number of deaths reported during the year as compared with 1916, but the payments increased $6,669, owing to the fact that obligations for previous death claims and permanent injuries extend over a period of 300 weeks.

During 1917 the corporation expended $8,680,471 for fixed capital purposes, the net increase for the railway being $2,243,160. The two largest items for this department were $1,060,840 for cars and $479,977 for electric equipment of cars. Paving expenditures totaled $278,219.

Two Values Given for St. Louis by Mr. Allison

Engineer Engaged by City Says United Railways' Property Is Worth $48,784,490 on Basis of Money Invested, But That the Reproduction Cost Is $72,589,141

An official valuation of the property of the United Railways, St. Louis, Mo., has been made by James E. Allison, employed by the city for that specific purpose.

Mr. Allison has made the report that the actual capital invested upon which returns should be allowed is $48,784,490. Mr. Allison has also made a second valuation, that of cost of reproduction at the present time. This amounts to $72,589,141.

The estimate made by Mr. Allison of the capital entitled to a return on the basis of actual cost as of Dec. 31, 1917, shows the following totals for the various items:

COST OF PHYSICAL PROPERTY		
1. Construction cost	$32,548,016	
2. Contingencies	1,615,955	
3. Engineering	1,857,381	
4. Interest during construction	1,256,947	
5. Taxes during construction	266,267	
6. Insurance during construction	71,655	
7. Total construction and overhead		$37,616,221
8. Depreciation (wrong in principle and confiscacatory) no deduction made	....	
9. Working capital (stores and cash)	$1,250,000	
10. Real estate (not original cost)	2,410,421	3,660,421
11. Total physical property	....	$41,276,643
OTHER THAN PHYSICAL PROPERTY		
12. Cost of initial promotion	$1,000,000	
13. Cost of initial organization	224,720	
14. Capitalization of initial risk	2,000,000	
15. Cost of assembling capital (5 per cent of items 11 and 13 and $198,152 of 16.)	2,084,975	
16. Cost of consolidation	2,198,152	
17. Allowance for superseded property (amortized)	....	
18. Total cost other than physical property		$7,507,847
19. Total capital entitled to return		$48,784,490

The estimate made by Mr. Allison of the valuation of the company on the basis of reproduction cost as of Dec. 31, 1917, is as follows:

1. Construction costs (actual)	$32,548,016	
2. 20 per cent advance in prices	6,509,603	
3. Construction (reproduction)		$39,057,61
4. Contingencies 10 per cent of item 3	3,905,761	
5. Engineering 5 per cent on items 3 and 4	2,148,169	
6. Interest during construction 10 per cent on items 3, 4 and 5	4,511,155	
7. Taxes and insurance 3 per cent items 3 and 4	1,288,901	
8. Total overhead		$11,853,987
9. Total construction and overhead		$50,911,607
10. Real estate	2,410,421	
Interest on real estate, 12 per cent	289,250	
11. Working capital	1,250,000	$3,949,672
12. Total physical properties		$54,861,279
COST OTHER THAN PHYSICAL PROPERTY		
13. Promoter's reward	$1,000,000	
14. Organization	500,000	
15. Capitalization of initial risk 15 per cent of items 12 and 14	8,304,191	
16. Cost of assembling capital 3 per cent of items 12 and 14	2,768,063	
17. Total cost other than physical property		$12,572,255
18. Total reproduction cost.		$67,433,535

(Without Contractor's Profit.)

The above table is prepared without contractor's profit. This item is often allowed and if considered in this case the figures would be changed as follows:

Item		
12b. Total physical property (Item 12 plus 10 per cent of items 3-4		$59,157,617
13b. Promoter's reward	$1,000,000	
14b. Organization	500,000	
15b. Capitalization of initial risk 15 per cent of items 12b and 14b	8,948,642	
16b. Cost of assembling capital 5 per cent of items 12b and 14b	2,982,880	
Totals other than physical property		$13,431,523
Total reproduction cost		$72,589,141

The estimate of $48,784,490 is $11,145,823 less than the $60,000,000 fixed in the franchise settlement ordinance recently passed by the Board of Aldermen, while the estimate of $72,589,141 is $12,589,141 higher than the amount fixed in that ordinance. The settlement grant is now before the Mayor.

W. S. S. Sold by New York Railways

D. W. Ross, vice-president of the New York (N. Y.) Railways, who is chairman of the city transportation division of the National War Savings Committee, has organized the following executive committee for that division: J. J. Dempsey, Brooklyn Rapid Transit Company; George Keegan, New York Railways; E. A. Maher, Jr., Third Avenue Railway; F. H. Sillick, Hudson & Manhattan Railroad; W. O. Wood, New York & Queens County Railway; M. Fuhrer, secretary.

War savings stamps have been placed on sale in the general offices of the New York Railways, at 165 Broadway and 21 Park Row; also in the employees' stores at 820 Eighth Avenue and 2850 Eighth Avenue; in all recreation rooms; in the storekeepers' offices at Ninety-ninth Street and Lexington Avenue, and 148th Street and Seventh Avenue, and at other places.

The Brooklyn Rapid Transit Company has placed the stamps on sale at its main office at No. 85 Clinton Street, and at the clubhouse of the men at East New York, and the Third Avenue Railway and Hudson & Manhattan Railroad also have them on sale.

Return for Iowa Interurbans

According to the thirty-ninth report of the Iowa Board of Railroad Commissioners, just now available, the 1916 gross earnings of interurban electric railways in the State were $3,120,004 as compared to $2,923,032 in 1915. The operating expenses increased from $1,895,925 in 1915 to $1,967,476 in 1916, so that the net earnings from the operation in the last year were $1,152,527 as compared to $1,027,107 for the year preceding. The single track mileage increased from 472.48 miles to 483.31 miles, and the net earnings per mile from $2,173 to $2,384. The change in mileage was due to the addition of 23.35 miles for the electrification of the Charles City Western Railway, the elimination of some street railway mileage and other small adjustments.

More Revenues Are Needed

The operating expenses of the Indianapolis Traction & Terminal Company, Indianapolis, Ind., which leases the property of the Indianapolis Street Railway, increased $146,883 during 1917. The expenses for 1916 were $2,065,129 and for 1917 $2,212,102. The gross earnings increased only $15,757, being $3,654,683 in 1917 and $3,638,908 in 1916. At the annual meeting on April 11 the stockholders were impressed with the fact that the company must secure a fare rate to balance expenses.

Financial News Notes

Issue of Notes Authorized. The Illinois Public Utilities Commission has authorized the Central Illinois Public Service Company, Mattoon, Ill., to issue $75,000 of gold notes.

Wants to Issue Bonds.—The City & Suburban Railway, Brunswick, Ga., operating 8 miles of line, has filed a petition with the Georgia Railroad Commission for permission to issue $19,000 of bonds. The proceeds will be used to pay for extensions and improvements already made. A hearing has been set for April 23.

Jamestown Line Showed Loss.—The Jamestown (N. Y.) Street Railway operated at a loss in 1917. The annual report of the company shows that operating revenue for the year ended Dec. 31, 1917, was $110,738, with operating expenses of $119,413. The operating expenses during the previous year were only $78,983. Income from operation showed a loss of $12,117, as compared with a gain of $18,430 for 1916. Gross income showed a loss of $5,763 during 1917, as compared with a profit of $24,374 for the year before.

Hearing on Indiana Purchase Plan.—A hearing was held recently before the Indiana Public Service Commission on the application of the Terre Haute, Indianapolis & Eastern Traction Company for permission to purchase the Western Indiana Utilities Company, West Terre Haute, Ind., by paying $121,000 for the $50,000 of common and $150,000 of preferred stock. Robert I. Todd, president of the Terre Haute, Indianapolis & Eastern Traction Company, testified before the commission that the property of the Western Indiana Utilities Company was worth $121,000. The plan for the purchase was referred to in the ELECTRIC RAILWAY JOURNAL of Feb. 16, page 338.

55 Per Cent Increase in Gross in Quarter for Camp Line.—According to the New York *American* of April 17 the Piedmont & Northern Railway, Charlotte, N. C., is running up record passenger earnings owing to its Spartanburg Camp business. That paper said: "A report just to hand shows that passenger revenues in the last week of March increased 147 per cent over the same week a year ago; for all of March, 155 per cent over March, 1917, and for the first three months of the year, 131 per cent over the first quarter in 1917. Freight revenues, however, increased only 18 per cent during the quarter. Gross for the quarter was $322,150, an increase of $114,924, or 55½ per cent."

Harrisburg Traffic Gained 16 Per Cent.—During 1917 28,482,163 passengers rode on the various lines of the Harrisburg (Pa.) Railways. The total is 3,939,157 higher than in 1916, or an increase of 16 per cent. The annual report of the company for 1917, however, shows an increased cost of fuel amounting to 152 per cent and a wage increase of 27.43 per cent. The gross earnings increased $155,673 or 15.3 per cent, and net earnings increased $11,768 or 5.6 per cent. Operating expenses increased $136,520 or 28.9 per cent. The percentage of operating expenses to gross earnings was 52.05 per cent in 1917, an increase of 5.45 per cent over 1916.

Application to Issue Bonds.—The Southern New York Power & Railway Corporation, Cooperstown, N. Y., on April 11 filed with the Public Service Commission, Second District, a petition asking for authority to execute a first mortgage to the Equitable Trust Company, New York, as trustee, to secure an issue of $5,000,000 of 6 per cent ten-year first mortgage bonds and for an amendment of a prior order of the commission to authorize the immediate issue of $952,000 in bonds in exchange for outstanding bonds and the issue of $48,000 additional upon the acquisition of a like amount of the capital stock of the Southern New York Power Company, the proceeds to be used by the latter to acquire a like amount of the Deposit Electric Company. The petition states that the remaining $4,000,000 in bonds is to be issued from time to time for the acquisition of additional property and for extensions, additions, improvements and betterments to the petitioner's property or of any subsidiary corporation. The commission will give an early hearing. An offering of bonds of this issue by P. W. Brooks & Company, New York, N. Y., was noted in the ELECTRIC RAILWAY JOURNAL for April 13.

New Publication

Railway Statistics of the United States for 1918

Compared With Official Reports for 1915 and Recent Foreign Railway Statistics. Preepared by Slason Thompson, Bureau of Railway News and Statistics, Chicago, Ill. 124 pages, paper covers.

This is the fourteenth year in which Mr. Thompson has issued his well-known analyses of railway statistics. The figures are obtained from official sources, but the selections and comparisons are prepared by his bureau. The strenuous experience through which the steam railroads have passed during the last year makes this book of particular interest at this time. The figures given are by no means confined to the earnings and expenses of the roads. Collateral figures are included, such as cost of living, number of stockholders of important railway properties, public service of the railways, railway legislation, etc.

Traffic and Transportation

St. Louis Fare Case Again

Considerable Ground Covered at Hearings on April 8 and 9, but Case Goes Over to April 22

On April 8 and 9 the hearings were continued that were begun some time ago before the Public Service Commission of Missouri on the application of the United Railways, St. Louis, Mo., for an increase in fares. An adjournment was then taken until April 22.

PRESIDENT MCCULLOCH ON COMPANY'S NEEDS

On April 9 Richard McCulloch, president of the company, testified that in the next five years it will cost the company $6,700,000 to replace cars, power houses and equipment. As to a prospective wage increase, he said he felt that an increase of 10 cents an hour in the wages of the company's employees would be justified. The men have asked for an increase of about 14 cents an hour. According to Mr. McCulloch the company's net earnings for the last five years has been expended for maintenance instead of being paid as dividends and that this alone has saved the company from bankruptcy and a receivership.

James E. Allison, former engineer of the St. Louis Public Service Commission, was cross-examined at length by Judge Henry S. Priest, chief counsel for United Railways, after he had testified that the true value of a property was the amount of money it would bring if sold in the open market. Mr. Allison recently submitted to the Public Service Board an estimate that the actual present value of the company's properties is $48,000,000, and that it would cost $72,000,000 to replace the properties at present prices for material and labor. A summary of his figures is published in the department "Financial and Corporate," elsewhere in this issue.

COMPANY'S ATTITUDE ON NEW FRANCHISE

Mr. McCulloch resumed the stand on April 9. He was examined by Counselor Daues for the city, who questioned him as to whether the company would accept the recent franchise settlement ordinance. Mr. McCulloch would not say definitely that the company would reject the ordinance, but he described it as "unsatisfactory under present conditions." There was much testimony in regard to the probable future earnings of the company, about the cost of financing at this time and to the probable needs of the company in the way of capital if the financial readjustment is brought about that is required for the company to comply with the terms of the new grant.

Edward McMorrow, national organizer for the Amalgamated Association stated, the case for the employees as follows:

"We have postponed arbitration of the wage demands until after this commission acts on the fare increase, because we do not want to do anything to embarrass the company. At the same time we call attention to the fact that 30,000 people are dependent on the company's employees for their living. The company has said it is willing to give a wage increase of 5 cents or 10 cents an hour. We are asking an eight-hour day and 40 to 45 cents an hour, and I miss my guess if the men will be satisfied with less. Still, we mean to stand by the principle of arbitration. In Cleveland the men are asking for 60 to 65 cents an hour."

Maximum Fare in Cleveland

Railway There Operating at Highest Fare Provided for in Model Service-at-Cost Ordinance

The Cleveland (Ohio) Railway is now operating on the highest rate of fare provided by the Tayler grant. The change was made at midnight, April 9-10. The rate is 4 cents cash and seven tickets for a quarter, with a 1-cent charge for transfers and no rebate. The only difference between this rate and the one used for the previous week is the retention of the money received for transfers.

The officers of the Cleveland Railway said that experience of a week with the next lower rate showed that it produced less income than the one discarded before that period. This was six tickets for 20 cents and 1 cent for a transfer with no rebate. J. J. Stanley, president of the company, wanted to advance the rate to the maximum when the first of the recent changes was made, but the company was met by an injunction in Common Pleas Court. This restraining order was dissolved on April 2 by the Court of Appeals. These various moves were reviewed in the ELECTRIC RAILWAY JOURNAL of April 6, page 680.

FAILURE OF NEW RATE PREDICTED

It is predicted by some that even the highest rate provided by the franchise will not be sufficient to pay operating expenses and dividends and that the Council will eventually be asked to amend the franchise to allow an increase in fares commensurate with the growing cost of operation. The increase just made will yield additional revenue of about $600,000 a year, but much of the additional funds will probably be absorbed in the wage adjustment to be made on May 1.

Zone Fares for Lynn

Tentative Agreement on Rates Between Lynn Representatives and Bay State Street Railway

Following conferences between representatives of the city of Lynn, Mass., and W. B. Donham, receiver of the Bay State Street Railway, a tentative agreement has been reached with respect to the zone system of fares proposed by the company and now before the Public Service Commission for consideration relative to the entire system. The system for cities is accepted in principal by the Lynn representatives, but the zone limits are subject to adjustment in detail, before the schedule is put into operation. It is understood further that an effort will be made before April 26 to adjust these zone points between the particular communities affected and the company. If an agreement cannot be reached in any particular case the problem is to be left to the commission.

Subject to the foregoing, the conferees recommend immediate adoption of the zone system, and the company makes its concession only for immediate adoption of all pending schedules. The following modifications are to be made in the schedule as filed with the commission:

HOW THE FARES WILL BE FIXED

The company is to sell six tickets for 30 cents, good only on local rides but valid at all times to and from the center or transfer point in the first zone. No transfers will be issued and no rides through the center will be allowed on these tickets. The company is to sell seven tickets for 50 cents and these are to be good in exactly the same manner to and from the center of the first zone to any part of the second zone. No other all-day tickets will be issued in these two zones. Through riders and riders desiring transfers at the center of the first zone, will pay 6-cent cash fares in the first zone and 2-cent cash fares in the second zone, making a total of 8 cents.

In addition to the above tickets the company will experimentally add the following tickets designed to build up traffic in the "off-peak" hours of the middle of the day, these tickets being sold as follows: Six tickets for 25 cents good only on local rides to and from the center of the first zone. No transfers or through rides allowed on these. Four tickets for 25 cents good in the same manner to the center of the first zone from the second zone.

These "off-peak" tickets will be good as follows: From 9 a.m. to 4.30 p.m. on week-days (except Saturday). Subject to change to 4 p.m. in any locality if it becomes necessary on account of changes in industrial closing hours to avoid overlapping with the peak load. The tickets will be good from 9 a.m. to 6.30 p.m. on Saturdays, but will not be good on Sundays or holidays. None of these tickets will be good on through rides which extend outside the first and second zones.

Zone Fares Finally Win in Rhode Island

Only Governor's Signature Needed to End a Long Controversy During which Legislature Fiddled While Company Faced Bankruptcy

The zone system of fares for the lines of the Rhode Island Company was approved on April 17 by the Rhode Island Senate. The vote was eighteen to seventeen. The plan already had passed the House. It is expected that Governor Beeckman will sign the bill within a few days.

Under the act the new system will take effect on May 1 unless the railway appeals to the Public Utilities Commission for more time to get ready.

A TWO-YEAR CONTROVERSY ENDED

The action of the Senate brings to an end a controversy of more than a year in the Legislature, and one of two years before the City Council of Providence. In its plans to the City Council the company said that it was facing bankruptcy and needed financial relief. The company asked that its franchise tax be reduced and that it be relieved from the obligation to pave certain streets. The city flatly refused to extend any aid.

A year ago the company went to the Assembly for relief. On the last day of the session a bill was passed creating a special commission of three to investigate and to act. This commission was told to determine an adequate fare system and to report to the Public Utilities Commission what it thought a good plan. The bill specifically ordered the Public Utilities Commission to follow the instructions of the special board.

The commission investigated. It delayed its report until the Assembly met. Then it sent to that body a report, recommending among other things a zone system. The Public Utilities Commission, as ordered under the law, told the Rhode Island Company to put the zone system into effect on April 1. At this point the Assembly stepped in, repealed the law of a year ago and specifically ordered that there be no change in fares until the Assembly said so.

HOW THE SYSTEM WILL BE APPLIED

The Assembly then named three Senators and four Representatives as a special committee to investigate the subject and look over the special report on the zone plan. This committee brought in a majority report favoring a 6-cent fare with eighteen tickets for $1. There were two minority reports, one for the zone system signed by one man and another for State ownership signed by one man. The matter came up first in the House a week ago, and after a bitter debate, the minority report favoring zones was substituted for the majority report, and the act then passed. On April 17 the final touch was put to the bill in the Senate when it was passed in concurrence.

The zone system as ordered provides for a 5-cent zone in Providence, another at Pawtucket, one at Woonsocket, one at East Providence and one at Riverpoint in the Pawtuxet Valley. Beyond these the territory is divided into so-called 2-cent zones. A 5-cent fare is a minimum charge anywhere, however. The transfer privilege in a 5-cent zone is extended to every patron riding into that zone.

It is estimated by the company and the commission that the new plan will increase the gross income of the company about $500,000 each year.

Skip-Stopping a Habit

The world is "skip-stopping" to-day. For those who have learned the "hesitation," the "spiral sizz," "sheep dip" and the "Dowager's slump" and other forms of dansant de terpsichore, let it be understood at the outset that the "skip stop" is not a dance. It is a habit. It is the habit which motormen have of refusing to stop at certain crossings. It means cutting out useless stops by skipping stops here and there along the route of each line. Hours a day in time are saved thereby, according to traction heads. So when the motorman passes you up, do not hide a brick under your coat and wait for him to make the return trip. Just call it a "skip stop" and move up one block.—Oakland *Tribune*.

Reduced Rate Tickets Go

Withdrawal of Workingmen's Tickets Approved, but Needs Call for More Revenue Than This Will Bring

The Public Service Commission of Massachusetts issued a finding on April 16 approving the withdrawal of workingmen's reduced rate tickets on the Connecticut Valley Street Railway, Greenfield. One of the tickets, sold at the rate of fifty for $1.80, is in effect between Greenfield and Turners Falls. The other is in effect between Turners Falls and Millers Falls and is sold at the rate of twenty-five for 90 cents. Both are good only between certain morning, noon and night hours. Both are two-part tickets and are intended for use only on journeys covering all or portions of two-fare zones. The unit cash fare throughout the system is 6 cents, but tickets good at all times and in any zone are sold at the rate of forty for $2. The special workmen's tickets enable a ride to be secured for 7.2 cents which would cost 12 cents if cash were paid or 10 cents by using the ordinary form of ticket.

TICKETS MISUSED

The evidence showed that the separate halves of the workmen's tickets were misused to secure a ride for 3.6 cents within the limits of a single zone. The commission holds that the company could correct this abuse by proper precautions and the use of a suitable form of ticket. About 25 per cent of the riders between Greenfield, Turners Falls and Millers Falls use these tickets. The maximum ride is about 7 miles.

The general financial condition of the company is poor. Little or no depreciation provision has been made and maintenance has been indifferent. No dividends were paid last year and the surplus was converted into a deficit. The commission finds that the reasonable need of the system as a whole calls for even more additional income than it can possibly obtain from the withdrawal of workingmen's tickets. The average annual receipts on all lines are about $5,000 a mile; in the Greenfield division they approximate $9,000. The workmen's tickets are of long standing, but present conditions are so abnormal as to prices and wages that their retention, in the board's opinion, is not justified.

The Truth About Mexico

Mexican Newspapers Give Details of So-Called Reduction in Fares in the Mexican City

Accounts now at hand from Mexican newspapers give the facts in regard to the reports widely published in the form of a dispatch to newspapers in the United States recently about a reduction in the fares on the lines of the Mexico Tramways. In order correctly to understand the situation the fact must be kept in mind that control of the tramways in Mexico City was taken over by the government at the end of 1914, and that the lines there have been operated by the government ever since.

On Oct. 27, 1917, the government official who has charge of the system received authority from the government to raise the fares, and on Nov. 1 the rates were accordingly increased in the case of city fares from 6 cents to 10 cents (Mexican currency) and in the case of suburban fares approximately 66⅔ per cent.

These increased fares have been in force since then. They are evidently the rates that were referred to in the press dispatches to the United States as being intended for reduction, for *Excelsior* of Feb. 22 said that the department of communications and public works had under consideration a new tariff for suburban tram fares, which would be much less than those then in force, and that it was probable that the old rates, namely, 10 cents, would be re-established. The paper said that this tariff referred only to the fares outside the city and "colonies." It said that others would continue as at present. In continuing *Excelsior* said at that time:

"The manager of the tramways has solicited from the department of communications the reduction in question, basing his argument on the fact that the jitney competition has reduced almost to one-half the number of passengers who formerly took the cars. The average number of passengers at present using the trams is 4,000,000 a month, the number having previously been 8,000,000, and as fares were only increased 66 per cent, the present receipts are out of proportion to the revenue prior to the increase.

"We have been informed that the tramway company requested permission to increase the regulation speed in order that the public may give the railway cars preference over the jitneys, seeing that speed is one of the reasons why jitneys have had such a success, fares being in nearly all cases the same. This petition was not granted by the department of communications on account of the danger that would arise if trams were allowed to increase their speed, and those of the 'Agricultura' line, recently established, were ordered to reduce their speed.

"Engineer Rodriguez Gutierrez, under secretary of communications, has presented to the President of the Republic the proposed new tariff, which, if approved, will be put in force in a few days."

Six-Cent Fare in Jackson

The City Commission of Jackson, Mich., has granted a 6-cent fare in that city to the Michigan United Railways, operated under lease by the Michigan Railway. The new fare becomes operative April 24. The company showed that it could not make ends meet on a 5-cent fare under war conditions, after paying for operation, depreciation and taxes in 1917, the company had $27,214 with which to pay $97,693 of bond interest. In January and February the loss amounted to $18,868, which if kept up for the year would produce a loss of $113,208 for 1918.

The company conducted a publicity campaign through the local daily newspapers, running articles from day to day telling the facts.

Both the local daily newspapers, the *Citizen-Press* and the *Patriot*, endorsed the proposition editorially and published full and accurate news stories about it whenever there was occasion for publishing anything. The labor paper and another weekly also endorsed it. Labor unions, through their local federation, endorsed the proposed increase, and the employees of the company favored the raise.

There is a state commission in Michigan, but it has no jurisdiction in local utility rate matters, so that companies have to take their cases before the city councils.

Railway to Run Busses

The Liberty Bus Motor Company has been organized at Austin, Tex., by the owners of the Austin Street Railway to install a motor bus line between the terminus of the city railway and Camp Mabry, 3 miles distant, at which a school will be established to train automobile and radio mechanics for the War Department. The company is capitalized at $5,000. Among its incorporators is W. J. Jones, superintendent and general manager of the railway.

Washington Approves Staggered Hours

Government Department Heads and Others Indorse Suggestion—Principal Opposition Is From "Shop-Early" Advocates

Although it is too early to predict exactly what action will be taken on John A. Beeler's report (see ELECTRIC RAILWAY JOURNAL for April 6) recommending that the hours of government and other employees in Washington be staggered to relieve electric railway congestion, many favorable comments have been made on the proposition by men high in the conduct of government afffairs. Copies of the report were sent to the heads of all large departments and to the principal business interests of the city, and this will be followed by general distribution as part of Senate Document 197.

All department heads so far heard from agree that some arrangement for staggering the hours must be made, although all are not agreed that the arrangement suggested for their particular department is the best possible. The most promising hope for the adoption of the program is the fact that both the Army and Navy agree heartily in all features of the report.

SECRETARY DANIELS IN THOROUGH ACCORD

For the Navy Department the report has had the personal attention of Secretary Daniels, and in a letter to the Public Utilities Commission he says:

"Referring to your letter of March 28, forwarding section four of the report of your expert, John A. Beeler, with reference to uniform opening and closing hours of the United States government departments and other large institutions, I am in thorough accord with the conclusions of your expert as to the changes suggested in the times of opening and closing various government departments."

WAR DEPARTMENT CONVINCED

Benedict Crowell, acting secretary of war during Secretary Baker's absence abroad, writes to the commission:

"The report has been examined with interest, and it seems to afford convincing argument as to the desirability of readjusting office hours in such a way as to afford relief from the street railway congestion. In the plan suggested in the report it is not proposed, as I understand it, to change the office hours of the War Department, and, of course, it would be greatly to the convenience of this department not to make a change, but if in the working out of this problem it seems desirable for this department to share in the adjustment, it would, of course, endeavor to do its part."

Major Arthur Williams of the committee of the Army and Navy appointed to study the subject says:

"The acting chief of engineers desires me to say that this office is very much pleased to find that you have been able to make suggestions which will reduce city railway congestion and to do it along the lines which would be most acceptable to this office. I do not see how any branch of the Army or Navy can object to the propositions you make."

WAR TRADE BOARD READY

S. D. Maddock, director of Administration of the War Trade Board, says:

"I assure you that we shall be glad to co-operate in every way possible to accomplish the desired and much needed results."

This department has 1700 employees, and on account of a relocation of their office they "wonder if possibly you would not prefer to request even other changes than those stated in the proposed report."

CENSOR WANTS A FEW DAYS' NOTICE

The committee on public information, of which George Creel is chairman, replies to the commission.

"I beg to state that the committee will be glad to comply with this suggestion upon the request of your commission. We will be glad, however, to have a few days' notice in case a date is set for making these changes."

The replies quoted above are typical of those who approve the recommendations. Others are non-committal. A typical one of the few of this sort comes from Herbert Hoover, Food Administrator, as follows:

"I will be very pleased to co-operate with the Public Utilities Commission in relieving the congestion on the street railway lines; but in my opinion it is a little early to designate the opening and closing hours of the Food Administration in view of the fact that the number of our employees is so small in comparison with the number that will be employed in this neighborhood later on in the summer. Furthermore, the daylight saving bill, may automatically alter the hours of attendance, and I am anxious to see what result this change of one hour in the time will have upon our attendance here."

Several department heads are confused by the effect of the daylight saving bill on their working hours and have asked more time in which to consider the proposition. Others hold the opinion that their department is so small that they do not affect the railway load and should go their way unmolested. They fail to realize that the movements of each individual are what determines the volume of traffic.

In reply to such objections as this, the Washington *Times*, the local Hearst paper, carried an editorial on April 8, under the caption:

"Kicks Against the Beeler Suggestions. They are not fair, sporty, or patriotic, so let us all quit knocking and help the country win the war."

After full consideration of the facts presented at the public hearing on March 5 on the question of skip-stops and at conferences with the railways the Public Utilities Commission of the District is of the opinion that the adoption of the recommendations in the report of its experts will result in reducing the existing congestion on the railway lines, make faster service possible, increase the carrying capacity of the present equipment of the companies, effect a considerable reduction in the consumption of coal and at the same time serve the greatest number of people using the cars with the least inconvenience.

In consequence the members of the district commission on April 10 issued an order that the stopping places for passengers on the railways in the district are to be those given in certain exhibits in the report on the Washington traction situation made by John A. Beeler except those in the Union Station Plaza, but that nothing contained in the order is to be construed to abolish or discontinue any of the so-called fire or emergency stops required under the regulations of the department of police of the district.

The order of the commission is to go into effect on Sunday, April 21.

Mr. Taylor Makes More Appointments

A. Merritt Taylor, manager of passenger transportation of the Emergency Fleet Corporation, has made a number of appointments on the large staff he is creating to handle the problems of electric railway transportation to and from the shipyards of the country. These appointments except in the case of Mr. Welsh are in addition to those previously reported in the ELECTRIC RAILWAY JOURNAL.

G. T. Seely, assistant general manager of the Chicago Elevated Railways, has been named as assistant manager of passenger transportation.

The other staff appointments are as follows:

J. W. Welsh, electrical engineer and traffic agent for the Pittsburgh (Pa.) Railways.

M. W. Rew, chief engineer for the Pittsburgh Transit Commission, Pittsburgh, Pa.

C. F. Hewitt, private consulting engineer, Albany, N. Y.

D. C. Ainey, formerly assistant engineer with the Public Service Commission of Pennsylvania, Harrisburg, Pa.

C. G. Enz, formerly assistant chief clerk in the Department of City Transit, Philadelphia.

J. C. Thirlwall, electric railway engineer, General Electric Company, Schenectady, N. Y.

It is understood in Washington that some of the transportation difficulties of the ordnance department of the army, which were giving the government concern recently, are straightening themselves out, but that other problems may arise, in which case an arrangement has been made whereby the ordnance department will be allowed to call Mr. Taylor into consultation.

Uniform Fare Recommended for Detroit

Engineers Propose Six-for-a-Quarter Tickets Without Transfers and Five-Cent Fare With Transfers

Six-for-a-quarter fares without transfers on all the lines of the city, together with various additions and improvements in service, form the basis of a proposed agreement between the city and the Detroit United Railway submitted on April 11 to the Street Railway Commission by Barclay Parsons & Klapp.

This would mean abolition of the franchises on the 3-cent lines and the eight-for-a-quarter tickets for working men, and the establishment of a definite status for all the lines, in place of the present variegated arrangement of franchise and non-franchise, 5-cent and 3-cent lines. Three-fourths of the car riders have been paying a 5-cent fare, while one-fourth have been enjoying a 3-cent fare. This is largely due to the fact that more than 38 per cent of the revenue passengers transfer from one line to another, paying 5 cents. The proposed plan would therefore equalize the fares over the city.

Improvement in service by the addition of 100 new trailer cars and 100 cars with motors capable of drawing trailers, discarding of the small cars now in use and substitution of larger ones, revision of schedules for regularity of intervals between cars, various reroutings in the down-town section and greater loading capacity should also be secured, in the opinion of the engineers.

The possibility of an excessive income from the new fare would be prevented by a fixed maximum which the company might receive, the surplus earnings being equally divided between the city and the company. The fare would be variable with the financial condition of the company, the Street Railway Commission or the Council establishing the fare.

The operating expenses of the company have increased 16.6 per cent since 1916, the survey found. This is the ground on which a return to the seven-for-a-quarter fare (given up in December, 1917) is deemed impossible. In addition, passenger traffic was found to be less by 13,000,000 during the first three months of this year than in the same period last year. Under the fares recommended about 60 per cent of the passengers would pay 4.16 cents, and 40 per cent 5 cents.

Investigation of street car delays showed that in two days in January interference by motor trucks and other vehicles caused seventy-nine delays, involving fifteen and a half hours of time. It is suggested by the engineers that the city regulate by ordinance the use of the car tracks by vehicles, especially in the rush hours, and that railroad crossing delays be reduced in the same manner. As a means of alleviating the home-bound rush, it is suggested that the big stores in the downtown section close at varying times.

Relief for New Hampshire Company

Passenger and Freight Rates of Claremont Railway & Lighting Company Advanced

The Claremont Railway & Lighting Company, which operates passenger service from Claremont Junction to Claremont and from Claremont to West Claremont, N. H., a total distance of 6 miles, recently increased its passenger and freight rates.

The fares, previous to Nov. 1, 1917, between Claremont and either Claremont Junction or West Claremont, were 6 cents each. Books of twenty rides could be purchased for $1, or at the rate of 5 cents per ride. Books containing twenty-five rides, good for workmen on certain cars only, could be purchased for $1, or at the rate of 4 cents per ride. Books containing fifty rides, good for school children on school days and on certain cars, could be purchased for $1.50, or at the rate of 3 cents per ride. The average is about 1000 passengers a day. This constitutes about 50 per cent of the company's revenue.

In addition to this, freight is hauled from the Boston & Maine Railroad station to manufacturing plants, all but two of which are located in Claremont. The average haul is less than 1 mile. The other two plants are located at West Claremont. The rate varies from 6 mills to 3½ cents per 100 lb.

After making an appeal to the Public Service Commission, there was a hearing and an investigation. The commission almost immediately gave permission to discontinue the sale of the 4 and 5 cent tickets.

The investigation of the freight situation brought out the fact that the railway owned practically all of the side tracks on the shippers premises. These varied in cost all the way from $400, for one shipper to $15,000 for another, all of which the company had to maintain and keep free from snow.

On account of the very complicated system of handling freight, side tracks, etc., the commission was unable to render a decision for some time. On March 9, 1918, that body granted a temporary increase of 20 per cent on freight rates, to be in effect until such time as the investigation was completed and the permanent rate fixed.

Since this date, the commission has recommended that all shippers either purchase or lease from the railway the side tracks and facilities used for their particular benefit and further that the shipper maintain these tracks in repair and keep the snow removed from same.

If these tracks are purchased, this should give the company about $23,000 in ready cash; if leased, about $4,000 a year. The maintenance of these tracks and the removal of snow and ice should relieve the company of an expense amounting approximately to $2,500 a year.

The final decision as to rates is expected about May 1.

Transportation News Notes

Six-Cent Tariff Suspended.—The Public Utilities Commission of Illinois has suspended until July 29 the proposed new tariff of the Rockford City Traction Company, increasing its cash fare from 5 cents to 6 cents and abolishing certain concessions on tickets.

Other Fare Increases in Scranton.—Notice of a fare increase to 6 cents in the city has been filed with the Public Service Commission of Pennsylvania at Harrisburg, Pa., by the Scranton & Binghamton Railroad and the Scranton & Binghamton Traction Company.

Accident in Chicago Suburbs.—Two passengers were killed and more than twenty injured on April 14 when a Chicago & West Town Railway car was demolished by a fast freight on the Indiana Harbor Belt Line railroad in the outskirts of La Grange.

Advertising Campaign in Dallas.—The Dallas (Tex.) Railway is entering on a campaign of publicity, in which newspaper advertising is being used, with the object of educating the public to a fuller realization of the benefits to be derived from the service furnished by the company.

Buffalo Jitney Measure Passed.—The Council of Buffalo, N. Y., has adopted the jitney bus ordinance proposed by Mayor Buck. It provides for a license fee of $15 for a car of five passengers and $3 for every additional passenger. When application is made for a license, the applicant must state over what routes it is proposed to operate the jitneys.

Time for Meeting Schedule Order Extended.—The Brooklyn (N. Y.) Rapid Transit Company has been granted an extension of time until April 29 in which to comply with the order of the Public Service Commission for the First District in regard to the posting of schedule and other data in cars. The order of the commission was referred to in the ELECTRIC RAILWAY JOURNAL for March 9, page 481.

New Kansas City Folder.—The Kansas City (Mo.) Railways has published "Where to Go in Kansas City," a folder of easy trips from the Union Station by street car, showing where to go and what to see in Kansas City, with a map and guide of the lines of the company. The company says: "It is the aim and purpose of the management to give Safety and Service to its patrons. Helpful criticism is welcomed."

Monongahela Company Raises Fares.—The Monongahela Valley Traction Company, Fairmont, W. Va., on April 1 advanced its fares on the lines in the interurban zones in the territory at Fairmont. The rate is raised from 5 to 6 cents for each zone, which from Fairmont to Clarksburg advances the fare from 55 cents to 66 cents. This does not include the war tax. The rate in the city limits remains unchanged.

Fare Increase Denied.—The Public Service Commission of Indiana has denied the petition of the Ohio Electric Railway for a raise of mileage rates in Indiana from 2 to 2½ cents a mile. The company operates between the Ohio-Indiana State line and Fort Wayne, a distance of about 23 miles. Denial of the petition is appended with the statement that should the company change its service or provide better facilities the petition will be reviewed by the commission.

City May Run Jitney Line.—Mayor Baker, of Portland, Ore., has instructed City Commissioner Mann of the department of public utilities, to make plans for a line of municipal jitneys to Linnton. The former town of Linnton is without electric railway connections with Portland, and the present jitney service furnished by Stephen Carver has been the subject of much complaint by citizens of the suburb. It is stated that Mr. Carver will relinquish his Linnton franchise without contest.

Revising Cincinnati Skip Stops.—W. C. Culkins, Director of Street Railways, of Cincinnati, Ohio, announced recently that the skip-stop plan in use by the Cincinnati Traction Company for some time had not proved as satisfactory in saving time as had been anticipated. Mr. Culkins said that some changes will be made in the system which should result in material improvement. If skip stops can finally be worked out to advantage, they will be retained permanently.

Reading Fare Hearing Awaits City Action.—The continuation of the hearings before the Public Service Commission of Pennsylvania with respect to the increase in fares put into effect by the Reading Transit & Light Company on Jan. 10 is awaiting the report of the city engineer of Reading, who is engaged in checking up the testimony presented by the company at the first hearing, on Feb. 8, reviewed in the ELECTRIC RAILWAY JOURNAL of March 2, page 435.

Extension of Skip Stop in Indianapolis.—The Board of Public Works of Indianapolis, Ind., ordered a trial of the skip-stop plan of operation on two of the main trunk lines of the Indianapolis Traction & Terminal Company to be put into effect on March 17. The improvement in the service and general satisfaction of the patrons of the lines affected has led to a further order of the board, which has just been issued, extending skip-stop operation to two additional trunk lines, effective on April 14.

Soldiers Must Pay.—The Public Utilities Commission of Illinois has decided that all soldiers and sailors must pay the regular fare of 2 cents a mile. This decision follows the filing of a petition providing that soldiers and sailors should only pay 1 cent a mile while traveling in uniform. The commission announced in the decision that it had no power under the law to discriminate in favor of soldiers and sailors and that there was no way in which the commission could grant uniformed men this privilege.

Street Car Talks in Saginaw.—In connection with its publicity campaign for a 6-cent fare the Saginaw-Bay City Railway, Saginaw, Mich., has published a booklet of talks, reproducing material previously used in its newspaper advertisements. The talks emphasize the effect of fares on service, the need of utility preservation, the higher costs, and the relief granted elsewhere. The booklets are placed in the "Take One" boxes in the cars. As soon as further talks have been printed in the daily press, another booklet will be published.

Special New Jersey Session Vetoed.—Governor Edge of New Jersey on April 12 denied the request of George L. Record, Jersey City, assistant counsel for the New Jersey League of Municipalities in the fight against the Public Service Railway Company's proposed increased fares and transfer charges, for the calling of a special session of the Legislature to enact legislation nullifying a recent decision of the New Jersey Supreme Court that contracts made between public utilities and municipalities are repealable by the State Board of Public Utility Commissioners.

Increase Authorized for Municipal Line.—The Board of Railway Commissioners of Canada has authorized the London & Port Stanley Railway, London, Ont., to increase its standard passenger tariff by 15 per cent and its freight rate on coal by 15 cents per ton. The increases are granted, the judgment states, because "it is clear that the company's rates are insufficient properly to cover the costs of operation under the conditions to-day." The London & Port Stanley Railway is operated for the city of London by a commission of which Sir Adam Beck is chairman. The road is 38 miles long and operates cars in trains.

Testimony Presented in Fare Case.—Taking of testimony on the application of the New Jersey & Pennsylvania Traction Company for authority to increase fares was completed before Utility Commissioner Slocum on April 16. The company wants to increase the fare in each of its zones between Trenton and Princeton from 5 cents to 6 cents. Frank S. Katzenbach, Jr., appeared for the company. The city of Trenton was represented by City Counsel Charles E. Bird and George L. Record. Counsel for Trenton will go over the testimony presented in behalf of the company and if there is reason for cross-examination witnesses will be recalled for this purpose. The company was recently granted permission by the Public Service Commission of Pennsylvania to increase its fares from 5 cents to 6 cents on the Pennsylvania division.

Personal Mention

W. H. Evans has been appointed electrical engineer of the Tidewater Southern Railway, with offices at Stockton, Cal.

George B. Schaeffer, Reading, Pa., has been elected president of the Allentown & Reading Traction Company, Allentown, Pa., to succeed the late Howard E. Ahrens.

Walter D. Whitney, superintendent of electrical construction of the Twin City Rapid Transit Company, Minneapolis, Minn., has had his duties enlarged to cover the underground conduit and cable systems. Mr. Whitney was born in Gloversville, N. Y., on Jan. 25, 1878. He was graduated from high school in 1898 and from the electrical engineering department of Cornell University in 1902. He worked in the shops, testing department and instrument department of the General Electric company at Pittsfield, Mass., from 1902 to 1904, and entered the service of the Twin City Rapid Transit Company on Jan. 7, 1904, on car testing work. He was appointed superintendent of electrical construction of the company in charge of electrical construction work in the power houses and substations on Oct. 1, 1906.

W. D. WHITNEY

Walter L. Cheney, nominated by Governor Whitman of New York for appointment to the Public Service Commission of the Second District of New York, has been confirmed by the Senate. Mr. Cheney succeeds the late William Temple Emmett.

William D. Wallace has been appointed engineer of maintenance of the Terre Haute Division of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind. Mr. Wallace was graduated from Rose Polytechnic Institute of Terre Haute, and has been connected with the company for a number of years as engineer in the lighting and power department. In his new position he succeeds Lieut. Robert F. Scott, Jr., who is now in France in the railway transportation division of the American Expeditionary Forces.

J. G. Miller, manager of the Manitowoc & Northern Traction Company, Manitowoc, Wis., has received orders to report to the president of the Baltimore Dry Dock & Shipbuilding Company, Baltimore, Md., for special duty in connection with the government work there. The company at Baltimore is controlled by the Clement C. Smith interests, which operate the Manitowoc property.

J. C. Thirlwall, has resigned from the railway and traction engineering department of the General Electric Company, to accept a position with A. Merritt Taylor, in the passenger transportation department of the Emergency Fleet Corporation. Mr. Thirlwall is unusually well equipped for this work because of his operating and manufacturing experience and his progressive ideas. The latter have been set forth by him in various technical discussions, particularly in his article entitled "Operation of Frequent Service Cars in Large Cities" published in the September 22, 1917, "More Service at Less Cost" issue of the ELECTRIC RAILWAY JOURNAL. Mr. Thirlwall joined the staff of the General Electric Company in 1912 after serving for nine years in the mechanical department of the Brooklyn (N. Y.) Rapid Transit System, the last three years in charge of one of the elevated maintenance shops.

C. W. Squier has resigned as assistant electrical engineer of the Public Service Commission for the First District of New York, to become a member of the editorial staff of the ELECTRIC RAILWAY JOURNAL. Mr. Squier has been a frequent contributor to the columns of this paper in the past, his articles including a series on car equipment defects during 1916-1917 and the series of articles on car equipment, now being published, in the monthly "Mechanical Issues" of the ELECTRIC RAILWAY JOURNAL. Mr. Squier was graduated from the University of Michigan in 1898. For four years he was with the General Electric Company as designer of control apparatus, later becoming head designer of multiple-unit train control of the company. He was also connected with the Sprague Electric Company as designing engineer at the time that this company was the pioneer in multiple-unit control apparatus. In 1904 he went to England and was electrical engineer on railway apparatus for the British Westinghouse Electric & Manufacturing Company, and while there designed that company's type "T" line of railway controllers which has since remained standard for tramway work. Mr. Squier returned to this country and entered the Pittsburgh works of the Westinghouse Company at the time the first New Haven single-phase locomotive was introduced. He followed the testing and equipping of these locomotives as engineer. In 1908 he became engineer for the mechanical department of the Brooklyn Rapid Transit System and remained with that company for eight years or until he went with the New York Public Service Commission, two years ago.

T. C. Ruhling, superintendent of underground construction work of the Twin City Rapid Transit Company, Minneapolis, Minn., since May, 1905, resigned from the company on April 15 to accept the position of superintendent of distribution of the Kansas City Light & Power Company, Kansas City, Mo. Mr. Ruhling was born in New York City on Aug. 8, 1875. He was connected with the National Conduit & Cable Company on construction work in 1897 and 1898 and was with the Bell Telephone Company, New York City, in 1899 on construction work. He served with the National Conduit & Cable Company on underground construction work from 1900 to the spring of 1905, when he entered the service of the Twin City Rapid Transit Company.

T. C. RUHLING

Obituary

John Brown Whelan, disciplinary officer of the Detroit (Mich.) United Railway, died on March 9.

Howard E. Ahrens, president of the Allentown & Reading Traction Company, Allentown, Pa., is dead.

Fred S. Parker, general manager for the Brainerd (Minn.) Street Railway, is dead. Mr. Parker was born in Milwaukee, Wis., sixty years ago. He was at one time an engineer for the Great Northern Railroad.

Capt. Henry N. Brooks, whose death in France of pneumonia has just been announced, was a member of the United States Engineers' Reserve Corps. Captain Brooks was an electrical engineer with James N. Hatch, consulting engineer, Chicago, Ill., at the time of enlisting. He went to France last December, and was stationed in a small village as engineer, depot officer, in charge of a large engineer supply depot for the American army. He was a graduate of the engineering college of Cornell University in the class of 1888, and was one of the pioneers in the electrical railway engineering field. One of his first undertakings was as an electrical engineer on the electrification of the car lines in Philadelphia in 1892 and 1893. During his career he also operated an electric railway property in Florida, and was at one time employed in electric railway work by the Westinghouse Electric & Manufacturing Company. He afterward had charge of the construction of the interurban line from Grand Haven to Grand Rapids, Mich. He was for eight years electrical engineer for the firm of Sargent & Lundy, Chicago. He had been with James N. Hatch for two years prior to his enlistment in the army last June. Mr. Brooks' father was the late Admiral William B. Brooks, United States Navy. His brother, Col. John C. W. Brooks, was retired from the army a few years ago, and is now professor of military tactics at the Canadian Institute.

Charles W. Wason, widely known in interurban railway circles, died at his home in Cleveland, Ohio, on April 15. He had not been well since his retirement from business about ten years ago. Mr. Wason was born in Cleveland on April 30, 1854. He was graduated from Cornell University in 1872, and in 1887 he entered the employ of the East Cleveland Railway Company as electrical engineer and purchasing agent, positions which he held for five years. Having established a reputation in railway work, Mr. Wason had no trouble in organizing a company to build the first section of an interurban road with which he hoped to connect Cleveland and Buffalo. This is known as the Cleveland, Painesville & Eastern Traction Company, of which he served as president for many years. In 1896 he was elected president of the Northern Ohio Traction & Light Company and under his administration the Cleveland-Akron division made rapid strides. Later he became a director of the Cleveland Railway, Detroit (Mich.), United Railway and the London (Ont.) Street Railway. Mr. Wason retained his interests in electric railways, but turned his attention to independent telephone development and became a director of the United States Telephone Company, the Cuyahoga Telephone Company and the Federal system. He is survived by his widow and two daughters, Mrs. Harold S. Edwards, Dedham, Mass., and Mrs. John A. Rithet, Victoria, B. C.

Construction News

Construction News Notes are Classified under each heading alphabetictlly by States.

An asterisk (*) indicates a project not previously reported.

Franchises

Bellaire, Ohio.—The Wheeling (W. Va.) Traction Company is operating in Bellaire, Ohio, without a franchise pending the renewal of the grant which expired on March 28.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—The Board of Public Utilities has ordered the Pacific Electric Railway immediately to double-track its line between Wilmington and Long Beach.

Union Traction Company, Coffeyville, Kan.—It is reported that the Union Traction Company will not construct its proposed extension from Collinsville to Nowata at present, owing to scarcity of labor and material.

***Wichita, Kan.**—John Madden and W. I. Funk are reported interested in the construction of a new interurban line from Wichita to Arkansas City, via Derby, Mulvane, Belleplaine and Winfield.

Interborough Rapid Transit Company, New York, N. Y.—By direction of the Public Service Commission for the First District, the Interborough Rapid Transit Company placed the last section of the Jerome Avenue elevated branch of the Lexington Avenue subway in operation on April 15. On June 2, 1917, service over this line was begun between 149th Street and Kingsbridge road. Operation between the latter point and the northern terminus of the line was retarded owing to the non-completion of Interborough power house substations.

Southern Public Utilities Company, Charlotte, N. C.—Considerable reconstruction work will be done by the Southern Public Utilities Company in Winston-Salem.

Public Service Railway, Newark, N. J.—This company through the United States Shipping Board, on account of the Submarine Boat Corporation, Port Newark Terminal, N. J., will construct a two mile, double-track extension in Hamburg Place, on a private way, and Avenue R to Port Street, the Corporation's shipyards. The franchise has been applied for as noted in last week's ELECTRIC RAILWAY JOURNAL, and the contract for the construction, which will include 4000 ft. of trestle, was let this week, and is to be pushed to completion in ninety days.

City Railway, Dayton, Ohio.—This company reports that it expects to renew about 5000 ft. of track and paving this year.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—This company reports that it expects to construct about 1 mile of track this summer.

Texas Electric Railway, Dallas, Tex.—The City Commission of Dallas, Tex., has rescinded the contract that was entered into several months ago with the Texas Electric Railway providing for the construction of two interurban electric railways out of Dallas, as a part consideration of the granting of a new franchise to the company. The proposed lines were each to be not less than 30 miles long and their cost was estimated at about $2,000,000. The existing war situation and the inability of the company to obtain construction material are given as the causes for the rescinding of the contract.

Seattle (Wash.) Municipal Railway.—On April 12 the Board of Public Works, Seattle, Wash., opened bids for construction of the trestle portion of Seattle's Municipal Street Railway from First Avenue South and Washington Street to Railroad Avenue; South on Railroad Avenue south and Whatcom Avenue to Walker Street, a total distance of 1½ miles. The low bid for the work and furnishing materials was submitted by D. W. Rutherford, Tacoma, at $42,262. Lester Monahan, Seattle, bid $61,204. The contract will be awarded on April 19 and will undoubtedly go to D. W. Rutherford. The job entails the placing of 78,000 lin.ft. of fir piling and 652,000 ft. of lumber. Bids for laying ties, track and overhead construction will be called for by the Board of Public Works, C. B. Bagley, chairman, at an early date.

Power Houses and Substations

Havana Electric Railway, Light & Power Company, Havana, Cuba.—This company has placed contracts for railway substations equipment consisting of two 2000 kw. rotary converters, 6 phase, 60 cycles, 450 r.p.m., with six 750 kva. single phase oil insulated self-cooled transformers, 13,200 volts to rotary voltage, and switch and control equipment. The awards were made to the Westinghouse Electric & Manufacturing Company through the Westinghouse Electric Export Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Rolling Stock Buying Active

Orders and Specification Inquiries for New Cars More Plentiful—Enlarged and Improved Equipment

Car builders have not complained so much about the lack of orders as the manufacturers and sales agents of supplies and accessories. Government requirements have superseded in a dominating measure the regular business in the various lines of the railway industry with the car manufacturers, who, in many instances, have almost turned over their entire plants to that work. It has become manifest, however, to repeat the remarks of a number of supply men, that the traction roads were not only a necessary and essential factor in the social, financial, commercial and industrial life of the nation, but their maintenance at the highest efficiency should receive the attention due its importance.

For a long time this supreme factor seems to have been lost sight of, not only by government officials, who are directing, if not controlling, about everything, but by the public and the traction companies themselves. Of the many attempts to have fares increased all over the country it is not required to mention here. The question has received adequate treatment elsewhere and frequently. The point made in this department of the ELECTRIC RAILWAY JOURNAL is that in not a few instances electric railway properties have been called upon to provide enlarged transportation facilities to meet the demands of extra travel wherever cantonments, aviation fields, naval bases and other military requirements existed.

Urban and interurban traffic has also greatly increased and the railways have endeavored to make their old equipment answer. Every means have been taken to keep the rolling stock, trackage, power house, transmission lines, shops, etc., in a fair condition to meet the emergency; but, it is obvious that material will deteriorate—it cannot last forever. The deplorable condition of not a few systems have been openly criticised, and in other cases commissions have issued instructions to provide more service. The result has been that the owners and managers of not a few public utilities are coming into the market for new cars and equipment, despite the high cost and other drawbacks of a like nature. It will be noticed in the "Rolling Stock" department of the ELECTRIC RAILWAY JOURNAL that the record, beyond a doubt, proves this a fact.

The Western railways were the first to appear and place orders with the car builders, and now many Eastern companies are either buyers or making preparations with that end in view. Several important negotiations of this character are about closed or under consideration. Possibly others, whose needs cannot be longer ignored, will make known their requirements in the near future. At any rate, the car builders are in a position to fill orders on a shorter delivery than for some time, if desired, with a possibility of a still further improvement.

Snowplow Equipment Is Now in Order

Higher Prices Prevail for the Approaching Season—Deliveries and Material Are Uncertain

Along about this time of the year snowplow equipment for the fall and winter come up for consideration by the electric railways. When the representative of a leading manufacturer was questioned upon the matter he said the snowplow business was just starting. That is to say, the superintendents of the track and car equipment departments and the purchasing agents, while not exactly in the market to place orders, were nevertheless giving it some attention.

Prices would, of course, be much higher than in 1917, as might be expected with current metal conditions. Deliveries will also be later than last year, the difficulty so far being whether the raw material could be obtained when needed. The sooner the order was given the more certainty there was of getting the plows before it was necessary to put them in commission for the winter's activities.

If the buying is deferred until June or July the equipment will be harder to secure in time. Shipments from the factory were usually made in September or early in October, and therefore it would be advisable to give the ordering prompt attention at the present time. As stated above, the manufacturer in mind very emphatically remarked that prices have gone far beyond those of 1917 and may go higher—no one could tell for a certainty what the quotations may be in the course of the next few months. Even at that material is not always available, and to be on the safe side the managers of traction roads accept a hazard unless they are wise enough to anticipate their requirements.

Less Production of Coal

Shortage of Cars Available for Transporting Coal Is Principal Cause Just Now

A decrease of 1,500,000 tons or 14 per cent as compared with the preceding week marked the total output of bituminous coal during the week ended April 6, according to the last bulletin of the United States Geological Survey. The total production of bituminous coal (including lignite and coal made into coke) is estimated at 9,395,000 net tons. It is difficult to determine the rate of production per working day because of the unequal observance of Mitchell Day, April 1 (anniversary of enactment of eight-hour law,) as a holiday. Comparison of the production of Monday, April 1, of sixteen roads reporting 10 per cent of loading, with the average of the two Mondays previous thereto and Monday, April 8, indicate that Mitchell Day was equivalent to 0.4 of the regular working day.

The total production of beehive coke is estimated at 624,000 net tons, about 4 per cent decrease. The average per working day is estimated at 104,000 compared with 108,000 for the week previous.

Anthracite shipments decreased from 43,642 cars for the week of March 30 to 32,232 cars.

Table II shows the percentage of full time output produced and lost by all bituminous operators making weekly reports to the government.

TABLE I—ESTIMATED UNITED STATES PRODUCTION OF BITUMINOUS COAL AND OF BEEHIVE COKE

	Total Bituminous, Including Coal Coked		Beehive Coke (At the Mines)	
Week Ended	Total for Week	Average per Working Day	Total for Week	Average per Working Day
Mar. 23.....	10,998,000	1,833,000	665,000	111,000
Mar. 30 (a)..	10,894,000	1,816,000	649,000	108,000
Apr. 6 (b)...	9,395,000	1,566,000	624,000	104,000

(a) Revised from last report. (b) Subject to revision.

TABLE II—SHOWING PERCENTAGES OF PRESENT FULL TIME OUTPUT (BITUMINOUS MINES)

Week Ended	February 23	March 2	March 9	March 16	March 23	March 30
Produced	68.3	70.7	70.6	66.8	69.3	66.2
Cost from all causes	31.7	29.3	29.4	33.2	30.7	33.8
Cost on account of car shortage	22.3	21.1	21.2	22.9	20.6	23.3
Labor shortage or strikes	3.9	2.6	2.1	2.2	2.3	2.6
Mine disability	4.0	3.6	3.2	3.9	3.4	2.8
No market	0.6	0.9	1.7	2.3	2.8	2.9
All other causes	0.9	1.1	1.2	1.9	1.6	2.2

Temperamental Workmen at Wire Plants Troublesome

Skilled Operatives Have Peculiarities as Specialists and Have a Constant Tendency to Shift.

Besides the difficulty of obtaining early or prompt delivery of copper to the wire drawers and manufacturers, labor at these plants is not only short but at times creates embarrassing conditions. One large wire producer said the major part of the labor force were foreigners—Poles in many instances. They are skilled men, excellent artisans, but inclined to be "temperamental." The practice at this and other plants is to use the working operatives to the best advantage.

Occasionally the supply of bare copper wire runs low, and replenishment cannot always be accomplished now readily and promptly. At such periods the management shifts these men to other departments and on different tasks. This is resented. The workers prefer to follow one particular line in which they are proficient and skilled. Consequently when a shift is made to conserve time and material these workmen not infrequently "throw up" their jobs and leave for other wire plants where perhaps their specialty may be followed. The absence is usually brief, for the same procedure brings the easily ruffled workman back to his original place of employment and temporary contentment. It is said that there is continually a round of changes on this account. While this break in the plant's working personnel is a source of annoyance, the frequent holidays—mostly of a religious character—also upset the smooth running of the factory and cut down the output. One day is not sufficient to attend to these duties, but two are usually the rule and not the exception.

Fuel and Raw Material for Preferential Industries

Under the title of Preference List No. 1 the War Industries Board of the Council of National Defense, on April 10 announced that the Priorities Board had selected the industries whose operation is of exceptional importance. This is measured by the extent of their direct or indirect contribution either toward winning the war or promoting the national welfare. Therefore these industries, about forty odd in number, will be accorded preferential treatment in the distribution of fuel and in the transportation of raw materials and supplies required by them in their manufacturing operations, so that they may not be delayed or hampered in complying with priority orders issued against them governing their products.

Preference List No. 1 is not complete in itself, but provision is made for certifying additional classes of industries and also additional plants whose operations are necessary as a war measure. In the electrical field the following are listed: Plants manufacturing electrical equipment; railways; plants manufacturing locomotives, freight cars and rails, and other plants engaged exclusively in the manufacture of railway supplies; plants manufacturing machine tools; public utilities; plants printing and publishing exclusively newspapers and periodicals.

In its official order the Priorities Board states it had not undertaken to classify any industry as non-essential.

Rolling Stock

Spokane & Inland Empire Railroad, Spokane, Wash., is reported as converting four of its two-man cars to the one-man type in its own shops. The cost is approximately $800 a car.

Dayton, Covington & Piqua Traction Company, West Milton, Ohio, has recently placed an order with the Cincinnati Car Company for two new interurban cars. They consist of three compartments—baggage, smoker and passenger; are 50 ft. in length, center-entrance type and will be completed by April 20 (to-day). Taylor trucks are used, Westinghouse H. L. control and No. 532 motors. The company also expects to purchase one freight trailer within the next sixty days.

International Railway, Buffalo, N. Y., as noted in last week's ELECTRIC RAILWAY JOURNAL, has ordered thirty new cars of the G. C. Kuhlman Car Company, the specifications of which follow:

Number of cars ordered	30
Name of road	International Railway Co.
Date order was placed	Jan. 28, 1918
Date of delivery	April 1, 1918
Builder of car body	G. C. Kuhlman Car Co.
Type of car	Witt
Seating capacity	Approximately 54
Weight	35,640 lb. (estimated)
Bolster centers, length	25 ft. 6 in.
Length over bumpers	50 ft. ¾ in.
Length over vestibule	49 ft. ¾ in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 8¾ in.
Body	Semi-steel
Interior trim	Natural cherry
Headlining	Nevasplit
Roof	Plain arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Rico anti-climber
Car trimmings	Polished brass
Control, type	West K-12 A (with contactors)
Couplers	Portable type
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	Hunter
Door operating mechanism	National Pneumatic Co.
Fare boxes	Railway Company
Fenders or wheelguards	H. B. type
Gears and pinions	Railway Company
Hand brakes	Peacock
Heaters	Peter Smith forced ventilation
Headlights	Golden Glow G. M. 95
Journal boxes	Brill
Lightning arresters	Railway company
Motors, type and number	Westinghouse 506-A-2, four per car
Motors	Inside hung
Paint, varnish or enamel	Wright's inside varnish Kay & Ess outside varnish. Acme White Lead & Color Works' paint
Registers	Railway company
Sanders	Nichols-Lintern trap
Sash fixtures	Brill
Seats, style	Brill type
Seating material	Rattan
Springs	Brill (for seats)
Step treads	Feralun
Trolley catchers or retrievers	Earll No. 10
Trolley base	Railway Co.
Trolley wheels or shoes	Railway Company
Trucks, type	Brill 77-E I
Ventilators	Nichols-Lintern
Wheels (type and size)	26 in. cast iron

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio, has put in service two new passenger cars.

Lake Shore Electric Railway, Cleveland, Ohio, on Monday, had six interurban cars destroyed by fire in the company's carhouse at Beach Park, Ohio. Three of the cars were practically new and valued at $14,000 each. The loss is about $72,000.

Boston (Mass.) Elevated Railway, had ninety-four cars and one sprinkler car, owned by an outside concern, destroyed by a fire April 7. The westerly section of the Clarendon Hill car house of the company, in Somerville, was also burned. It is not expected that the company will purchase any new passenger equipment at present to replace that lost, but it will probably be in the market in the near future for snow plows.

Hudson & Manhattan Railroad, New York, N. Y., operating the Hudson River tubes and subway lines in New York and New Jersey, has the proposition of an extension to the Port Newark Terminal shipyards and the purchase of 100 cars still held in abeyance by the United States Shipping Board. The plan and purpose has been favorably recommended by the officials who made the survey.

Capital Traction Company, Washington, D. C., as reported in the ELECTRIC RAILWAY JOURNAL of March 16, ordered twenty new cars of the G. C. Kuhlman Company, delivery in July, the specifications of which are as follows:

Numbers of cars ordered	20
Name of road	The Capital Traction Company
Date order was placed	March 11, 1918
Date of delivery	July, 1918
Builder of car body	G. C. Kuhlman Car Co.
Type of car	Semi-convertible prepayment
Seating capacity	48
Weight (total)	40,000 lb. (approximate)
Bolster centers, length	20 ft. 2¼ in.
Length over bumpers	43 ft. 11¾ in.
Length over vestibule	42 ft. 11¾ in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 8 in.
Body	Wood structure, composite underfront
Interior trim	Cherry-mahogany finish
Headlining	Agasote
Roof	Monitor
Air brakes	Westinghouse Traction Brake Co.
Axles	Brill
Bumpers	Brill
Car trimmings	G. C. Kuhlman Car Co.
Control, type	GE N-35 with two contactors
Couplers	Tomlinson Automatic (O. B. Co.)
Curtain fixtures	Curtain Supply Co., Rex. rollers
Curtain material	Pantasote
Designation signs	Hunter Illuminated
Door operating mechanism	National Pneumatic Co.
Fenders or wheelguards	Parmenter
Hand brakes	Peacock
Heaters	Peter Smith single coil electric
Headlights	Electric Service Supplies 4-M-96
Journal boxes	Brill
Lightning arresters	General Electric
Motors, type and number	4 GE-247, inside hung
Paint, varnish or enamel	C. V. E. seven-day system
Registers	International R-5
Sanders	Keystone air sanders
Sash fixtures	Edwards
Seats, style	Brill "Winner"
Seating material	Cane
Step treads	Kass safety treads
Trucks, type	Brill 77 E-1
Ventilators	Deck sash openers
Wheels (type and size)	30-in. cast chilled
Special devices, etc.	Cars to be arranged and equipped for train operation

Washington Railway & Electric Company, Washington, D. C., placed an order for twenty-five cars, delivery June and July, with the G. C. Kuhlman Car Company, reported in last week's ELECTRIC RAILWAY JOURNAL, the specifications of which are appended:

Number of cars ordered	25
Name of road	Washington Railway & Electric Co.
Date order was placed	March 29, 1918
Date of delivery	June and July, 1918
Builder of car body	G. C. Kuhlman Car Co.
Type of car	30-ft. 11½ in. Prepayment body
Seating capacity	48
Weight (total)	40,000 lb.
Bolster centers, length	20 ft. 2½ in.
Length over bumpers	43 ft. 11¼ in.
Length over vestibule	42 ft. 11¼ in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	12 ft. 0 in.
Body	Wood
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Monitor
Air brakes	Westinghouse
Axles	A.E.R.A.-E-5 3¾ in. x 7 in. Journal
Bumpers	Brill channel
Car trimmings	Bronze
Control, type	K-35-General Electric
Couplers	Tomlinson automatic (Ohio Brass Co.)
Curtain fixtures	Forsythe No. 88
Curtain material	Pantasote
Designation signs	Hunter (Electric Service Supplies Co.)
Door operating mechanism	National Pneumatic
Wheelguards	Parmenter
Gears and pinions	G. E.
Hand brakes	Peacock
Heaters	Peter Smith Electric
Headlights	Golden Glow type RM-96
Journal boxes	Brill
Lightning arresters	G. E.
Motors	4-GE-200-K, inside hung
Paint, varnish or enamel	ChicagoVarnish Co.
Registers	International R-5
Sanders	Ohio Brass air
Sash fixtures	Edwards
Seats, style	Reversible
Seating material	Rattan
Springs	Brill
Step treads	Mason
Trolley base	G. E.
Trolley wheels or shoes	G. E.
Trucks, type	Brill No. 76 E I trucks
Wheels (type and size)	30 in. cast iron

Public Service Railway, Newark, N. J., to furnish rolling stock for its new 12-mile extension, now under way, to the shipyards of the Submarine Boat Corporation at Port Newark Terminal, has ordered eighteen new passenger cars of standard type, of the Cincinnati Car Company. As the entire equipment and work is financed by the United States Shipping Board, the delivery will be in ninety days on a priority order. The company has also been consulted about furnishing additional cars for its Camden lines running to the shipyards on the Delaware River. About forty-six new cars would be required, and the expenditure in the neighborhood of $1,500,000. As the company now leases all its surplus energy to the shipyards a new power house would be necessary, besides other essential facilities. It is said the plan would cost the government at least $10,000,000, and the company reports say is not giving the enterprise any encouragement. As a result of a fire in the Public Service Railway's carhouse in Camden, March 3, reported in the ELECTRIC RAILWAY JOURNAL of March 9, seven cars were destroyed, five damaged badly and six partly burned. The latter are being repaired, five are rebuilding in the Newark shops and seven new cars are to be ordered, if not already in the hands of the Cincinnati company. In addition, if the increased fare for which the company is now presenting argument before the Board of Public Utility Commissioners is granted and of which it is reasonable to believe the application will be approved, twenty-five new cars will be ordered at once. Reports are also to the effect that if various propositions now before the company go through at least 150 new cars is the total number contemplated.

Trade Notes

N. M. Garland, New York, N. Y., district manager of the Ohio Brass Company, Mansfield, Ohio, has been elected a member of the board of directors.

Havana (Cuba) Electric Railway, Light & Power Company has purchased fifty two-motor equipments, GE.-258 railway motors with K-9 controllers from Zaldo & Martinez, the General Electric Co.'s Cuban representatives.

Electrical Engineers' Equipment Company, Chicago, Ill., on April 4 gave a dinner to seventy-five of its employees and their wives, after which the entire party went in a body to hear "Billy" Sunday speak at his Lakeside Tabernacle.

Brooklyn (N. Y.) Rapid Transit Company's order for Gould slack adjusters, mentioned in the last issue of this paper, was placed directly with the Gould Coupler Co., and not through the Railway Utility Company as given in the note last week.

E. I. duPont de Nemours & Company, Wilmington, Del., have offered a series of prizes for the best photographs to illustrate the use of any of the duPont products. The offer is for photographs in each of the following six classes: Agricultural uses of explosives, fabrikoid, industrial uses of explosives, painting, trap shooting and hunting, miscellaneous.

NEW YORK METAL MARKET PRICES

	April 10	April 17
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26½ to 26¾	26½ to 26¾
Lead, cents per lb	7	6.95
Nickel, cents per lb	50	50
Spelter, cents per lb	7	7
Tin, Straits, cents per lb	*85	90
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

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* Nominal. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	April 10	April 17
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6½	6
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.50	$16.25

ELECTRIC RAILWAY MATERIAL PRICES

	April 10	April 17
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	28½ to 34½	28½ to 34½
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3½	*3½
Tie plates (brace type), cents per lb	*3½	*3½
Tie rods, Pittsburgh base, cents per lb	8	8
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanised barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanised wire, ordinary, Pittsburgh, cents per lb	3.95	3.95

	April 10	April 17
Car window glass (single strength), first three brackets, A quality, New York, discount	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount	79%	79%
Car window glass (double strength, all sizes AA-quality), New York discount	80%	80%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb	12½ to 13	12½ to 13
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl	$2.65	$2.65
Cement (carload lots), Chicago, per bbl	$2.71	$2.71
Cement (carload lots), Seattle, per bbl	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.60	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	41	42

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* Government price.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, April 27, 1918 *Number 17*

The October Convention

The American Electric Railway Association will hold its annual convention at Atlantic City this year. The dates selected are

Tuesday, Wednesday and Thursday,

Oct. 8, 9 and 10

and there will be meetings of the affiliated associations at the same time and place.

In view of war conditions there will be no exhibits.

A Challenge from the Rhode Island Company Section

IN THE FLUSH of victory after a remarkably successful campaign to organize a company section with a record-breaking charter membership, employees of the Rhode Island Company, Providence, R. I., have issued a challenge to other companies to try to beat their achievement. In order to give added force to this challenge the Electric Railway Journal will present an appropriate cup to the section which meets the terms of the challenge, for the present no restriction as to date being set. It is the hope of the editors, however, that the cup will be called for soon. There are many companies in the country which could furnish more than 200 charter members for a section if they went about it in the same spirit as that manifested at Providence. As we have pointed out before, now is the time to organize sections because if they are needed in times of peace they are more needed in times of war. The enthusiasm of the Rhode Island Company section needs to be seen to be appreciated fully, but if maintained it will furnish the motive power for many a patriotic movement. With true missionary zeal the new section wishes to see the good work spread. We hope it will not be disappointed.

Pennsylvania Railroad Adds New Link in Electrification Chain

THERE was nothing particularly exciting in the inauguration of electric service on the Chestnut Hill branch of the Pennyslvania Railroad at Philadelphia. This is true both from the technical and transportation standpoints. While not exciting, however, the event was no less significant, as a moment's consideration of the matter will show.

In the first place, within a few days after the overhead construction was made "alive," the full passenger train service was in operation. There was no preliminary or probationary period of operation. As soon as the train crews could be "broken in" on their new duties they were given their trains and began their new work without ceremony or hesitation. Thus will be a large part of the spread of electrification throughout our country. This fact was illustrated by the lack of sensation when the St. Paul Railway announced last year that it would extend by several hundred miles the electrification on its transcontinental line.

The point in all this is that while heavy electric traction apparatus is by no means standardized and possibly never will be, it has demonstrated its reliability to such an extent that there need be and is no hesitation in the electrification of track which, from economical considerations should be so equipped. A further significant fact is that after several years of experience with the equipment on the Paoli division of its main line between Philadelphia and Pittsburgh, the Pennsylvania Railroad made only minor changes in rolling stock and overhead construction, when electrifying its Chestnut Hill branch. This is added evidence of reasonable permanency in design standards.

It is true, a number of minor changes were made as a result of a more thorough understanding of the operating requirements. These, however, in no way interfere with the interchangeability of rolling stock between the two local lines.

In many ways the Pennsylvania Railroad is directly and indirectly doing as much for electrification as any railroad in the country. The Long Island Railroad was one of the first important electrifications in the world and on this and the New York terminal of the line from the South, the Pennsylvania Railroad is having valuable experience with low-voltage direct-current electrification. The railroad is also greatly interested in the single-phase system. It has a large sum of money invested in the New York Connecting Railroad which, while it will be operated by the New Haven, can properly be considered a part of the Pennsylvania System. It has also financial interests in the Norfolk & Western

Railway where the single-phase transmission system, with polyphase motors on the locomotives, has been employed successfully for very heavy haulage.

Logically in line with the Norfolk & Western electrification the railroad is experimenting with a locomotive of the same general type, but differing in details, for its Altoona division on the main line. At the Philadelphia terminal the single-phase system with motors of series characteristics is working out well. Taken all together then, it must be granted that this great railroad system is doing much in and for electrification progress. Like the grapefruit tree on which can be found at the proper season fruit in all stages of maturity, so here we find at one end the Long Island electrification seasoned by many years of efficient operation and at the other the Altoona division locomotive, still subject to certain modifications before final adoption.

Boston Relief Provisions Are Worthy of Enactment

A TRULY remarkable bill—such seems to be the character of the Boston Elevated measure filed by the joint committee on metropolitan affairs and street railways of the Massachusetts Legislature. Not all the features are novel, but the old has been improved and the novel is progressive.

In considering the bill, which was outlined in last week's issue, we shall exercise our judgment in general along broad lines, for the details are more subject to change before enactment. The bill has two main objects in view—the rendering of adequate service at cost, and the exercise of public control over operation.

As for the cost-of-service idea, the plan of a flexible fare, variable at short intervals in accordance with the fluctuations of a reserve fund, is not untried. The Cleveland Railway operates upon this basis. The Boston plan, however, provides for two noteworthy changes. In the first place, the fare schedule would be neither limited nor fixed; the public trustees would be required always to have at least four grades of fare above and below that in force, and they might regrade the schedule or change the fare basis as they saw fit. Secondly, instead of requiring the company to carry a reserve deficiency until made up from higher fare returns, the State semi-annually through its taxing power would meet any such loss, subject to reimbursement from fares. These provisions make better allowance for future contingencies and afford more sound support to the credit of the company than, for instance, do those in the Cleveland plan.

The distinctly novel feature of the bill is the creation of a board of five public trustees, three appointed by the Governor and two by the Mayor of Boston. This body would do no less than assume for at least a ten-year period the managing and operating powers of a board of directors and the rate-fixing and service-regulating powers of the Public Service Commission. A bold move? Perhaps, but this is no time for half-way measures of relief. The Boston transit situation from a financial point of view demands potent measures, even if they are unprecedented.

Not that we believe the public trustees would because of inherent virtues secure any better results than the directors and the State commission—most emphatically we say not. Blessed with the same flexible-fare plan and the same tax support, the existing bodies would accomplish as much as the trustees. But the public might be suspicious. They could be won over, but the public trustees would probably secure full public confidence more quickly than could a private board of directors. For the sake of time-saving in a critical period, therefore, the plan of public control deserves trial. A word of caution, however—the plan must be good in practice as well as in theory, and a $5000 salary seems too small to attract trustees big enough for their jobs, if they are to give all their time to the work.

Should the continuance of the system of public control prove undesirable, the bill permits a return to private control at the end of ten years, or thereafter upon two years' notice. The service-at-cost plan, however, would not be abolished but would be carried out by the company under public regulation. Such a clause was to be expected. Any lack of provision for the future scientific determination of fares would be criminal folly on the part of the Massachusetts legislators.

The proposed bill seems fair to both stockholders and the public. The stockholders would, it is true, lose one-eighth of their return in the first four years, but perhaps full justice is not possible overnight in these days, no matter how desirable. The company's precarious financial condition would be remedied, and the public would have good service at a reasonable price. The measure represents constructive effort, and while some details might be changed to advantage the suggestion, to speak broadly, promises needed results if enacted into law.

Electric Railways and the Thrift Stamp Habit

ELECTRIC railways can do a great deal to interest their employees in the habitual purchase of thrift stamps by utilizing the several means of communication between the management and the men. Those companies that have organized company sections of the American Electric Railway Association have a splendid machine already at hand. The appointment of thrift stamp committees would be a logical step. Many companies have welfare departments, many issue publications primarily for employees, all companies have bulletin boards galore scattered over their properties, etc. All of these things can be utilized provided that one or more men in the organization has an overpowering conviction of the importance of this matter and is willing to let this conviction work itself out in natural channels. There is no doubt that many railway companies have worked out W. S. S. plans which meet their needs. For example, as noted in the news columns of this paper last week, the New York Railways and the other roads in New York City are working under the auspices of the national war savings organization. Stamps are being sold in general offices, employees' stores, recreation rooms, storekeepers' offices, etc.

The idea of utilizing conductors for the sale of thrift stamps have been advanced, but it seems to be impracticable. The conscientious conductor has enough to do now without adding to his burdens. Moreover, the number of places where stamps can be obtained is so great that it would seem to be unnecessary to add to it. What is most needed is educational work to impress upon everyone the fact that it is not only a patriotic duty to purchase securities to finance this war, but that if it is not financed through loans it will be financed through taxation. The fact that educational work is needed is shown by the slowness with which the Third Liberty Loan has gone so far. As a nation we have not yet waked up to the fact that we are at war. Electric railway organizations should do their share and more than their share in awakening their country to the real situation.

It Won't Hurt to Disclose Your Savings

AN ICEBOX is no good to an Esquimau, nor concealment of figures to a public utility operator. Quite recently we learned that a certain railway, by installing car-checking devices, had saved thousands of tons of coal and tens of thousands of dollars. When we suggested publication of these savings as an incentive to other railways, the manager raised his hands in horror and cried: "Please don't unless you want to queer our appeal for a higher rate of fare. The public would not understand that our other expenses have more than counterbalanced this saving." As he had shown us these savings in confidence we had to yield to him though we certainly did disagree with his line of reasoning.

Like objection has been raised to publishing the financial results of the skip stop. In this instance less objection is offered to mentioning the coal saving itself, since that is held to prove patriotic obedience to the orders of the Fuel Administrator. Yet the railway manager seems to believe that he can conceal the fact that the skip stop also produces platform savings and other economies incidental to higher schedule speed. Why he should fear to tell the truth in these days of public service regulation and open accounting can be explained only on the theory that the "cover-up" habit has been transmitted from the Dark Ages of public utility financing.

No request for higher rate of fare is going to suffer just because the railway has frankly shown that even the savings resulting from the skip stop, the safety car or other economy has failed to absorb other higher necessary operating costs. On the contrary, most regulatory bodies are so well supplied with engineering advice that they are far more likely to delay relief to those companies which cannot prove that they have been operated economically. But when each and every record of savings made in the face of desperate conditions is put before them, they would have to be prejudiced indeed to deny relief.

Therefore, we urge every electric railway in the land not only to disclose its savings for the information of other operators, but also to publish the same figures as arguments with its own public. Let the people realize that the conscientious electric railway is doing all it can, whether alone or in co-operation with the municipality, to keep operating costs down in order to make any necessary fare increase as reasonable as possible. "Truth is mighty and will prevail."

Police Power Is Ample to Permit Utility Progress

The way ain't sunny, but don't you fret;
Cheer up, honey, you'll get there yet!

THIS is our message to electric railways in answer to the disappointing decision of the New York Court of Appeals in the Rochester fare case. The damage to electric railways in the Empire State is enormous, but it is not irreparable unless the public has lost all sense of fairness, to say nothing of self-interest.

To electric railways in most of the other states the decision is not discouraging, for in analyzing the peculiar legal conditions in New York the court points out the general principle that commission-made rates are intended to supersede casual statutory rates, and even franchise rates in the absence of a constitutional limitation. Thus the Rochester decision is not national in scope, and the many states which are not handicapped with defective or outworn laws can continue to dispense justice to deserving utilities.

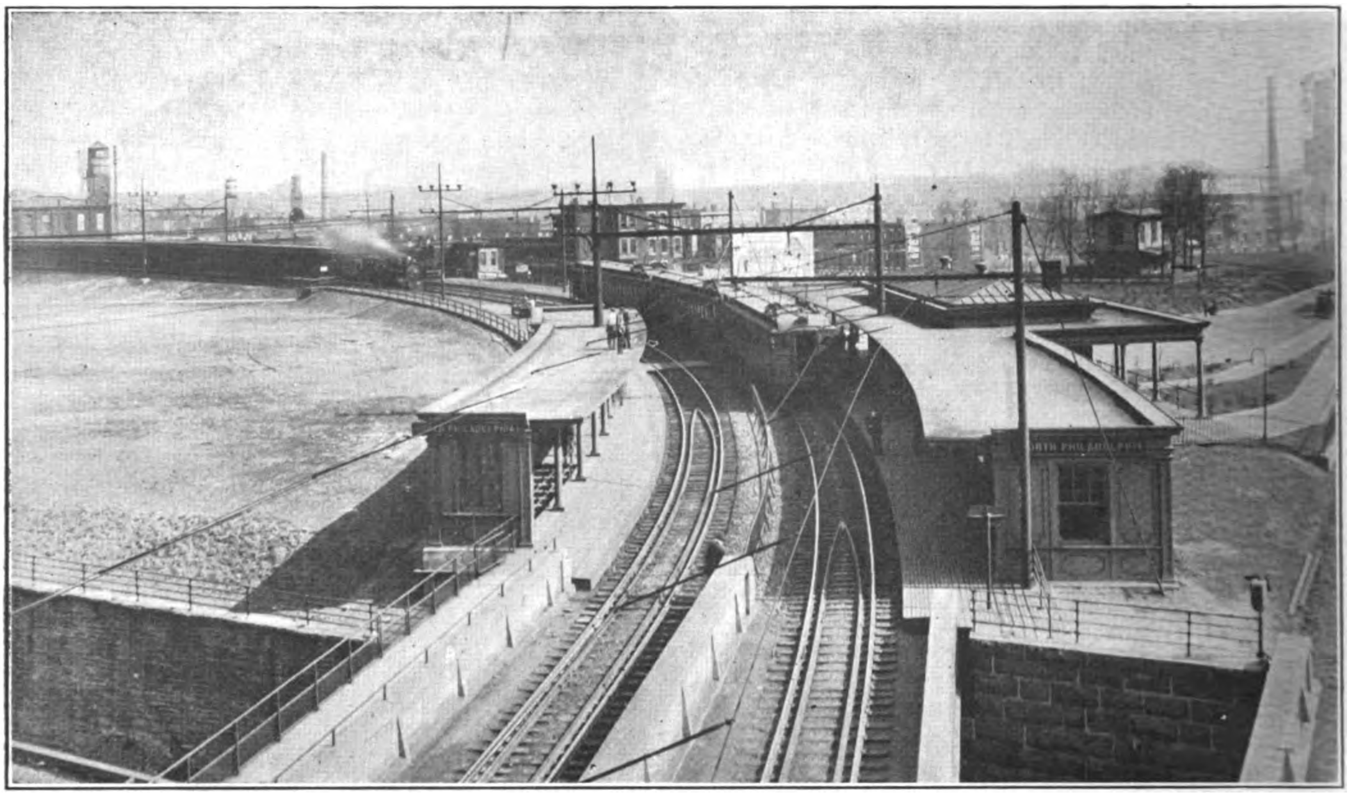
The Rochester decision is important to the industry as a whole, however, for it serves to delineate a trifle more clearly some fundamental issues in rate-making, and to point out the crass stupidity of legislatures and the general electorate in handling vital issues by implication rather than express language. According to the court's opinion, published in abstract on another page, the regulatory law in New York discloses no intention of the Legislature to deal with franchise rates.

Furthermore, although it is said to be improper to decide now how far the Legislature might go in altering franchise rates, the court remarks that the Constitution by requiring the consent of local authorities for utility operation recognizes cities as *pro tanto* independent of legislative control, even if the basic law contains no express provision for the irrevocable establishment of franchise rates.

The lack of a clear wording of the law is no worse, however, than the lack of vision on the part of the Court of Appeals. What is the police power of the State? It is the right of the State to compel the accomplishment of what is good, what is just, what is best for the people. It is a reserve power, not limited or annulled except by unmistakable words. It is the power that has made possible child-labor laws, compensation acts and workmen's insurance. It is the power which permits progress.

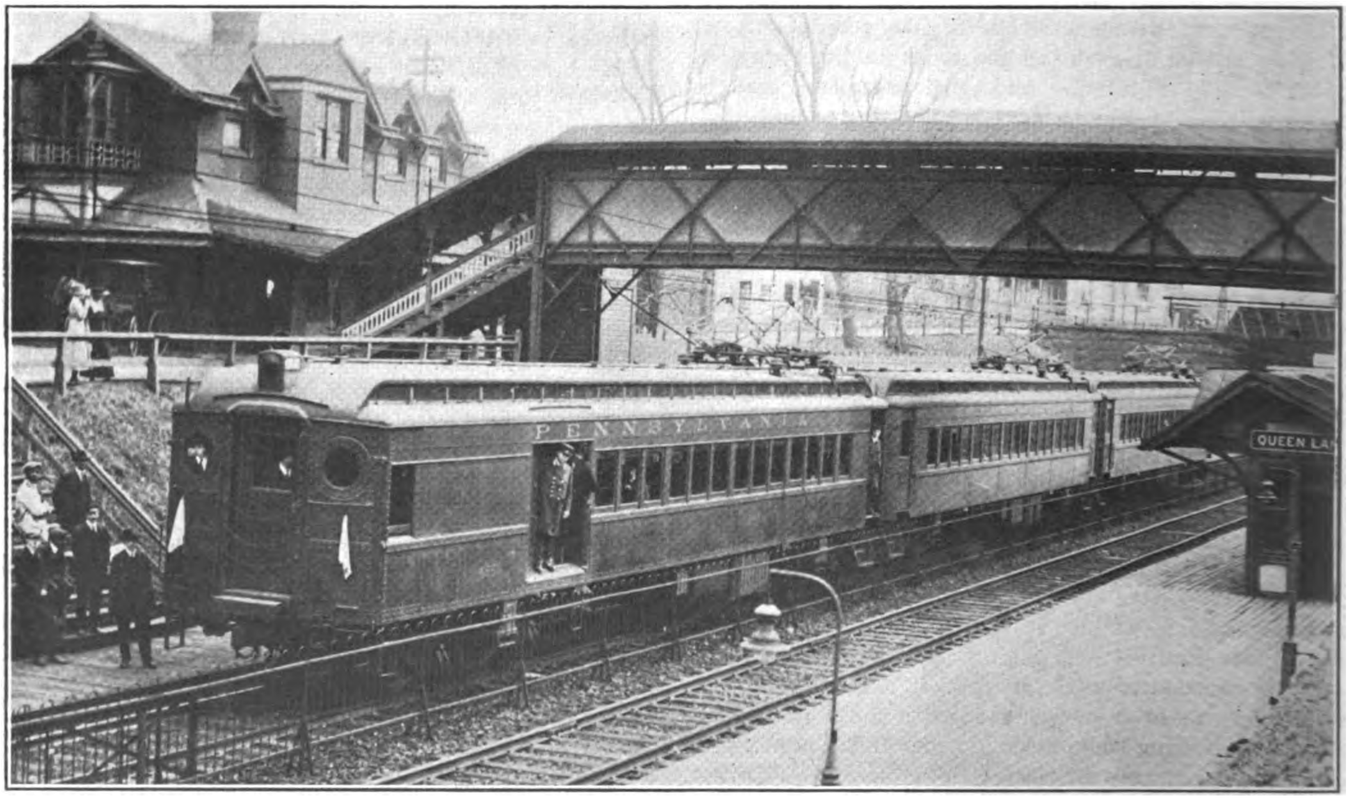
Times have changed since the New York Constitution, in 1875, was amended to provide in general language for the "consent" of cities to utility operation. Regulation has come; the theory of State paramouncy in rate-making is generally accepted—even the Court of Appeals recognizes this. Why not then, in the absence of an express contracting away of the police power, recognize the right of society to modernize rate-making in New York?

The New York commission law should be amended to provide for commission regulation of franchise rates. Such a law should be held valid. It will be, if higher judges recognize, as we are sure they will, the intent of the fundamental law to permit the state to develop in accordance with the spirit of the times when not actually forbidden, by its written word.

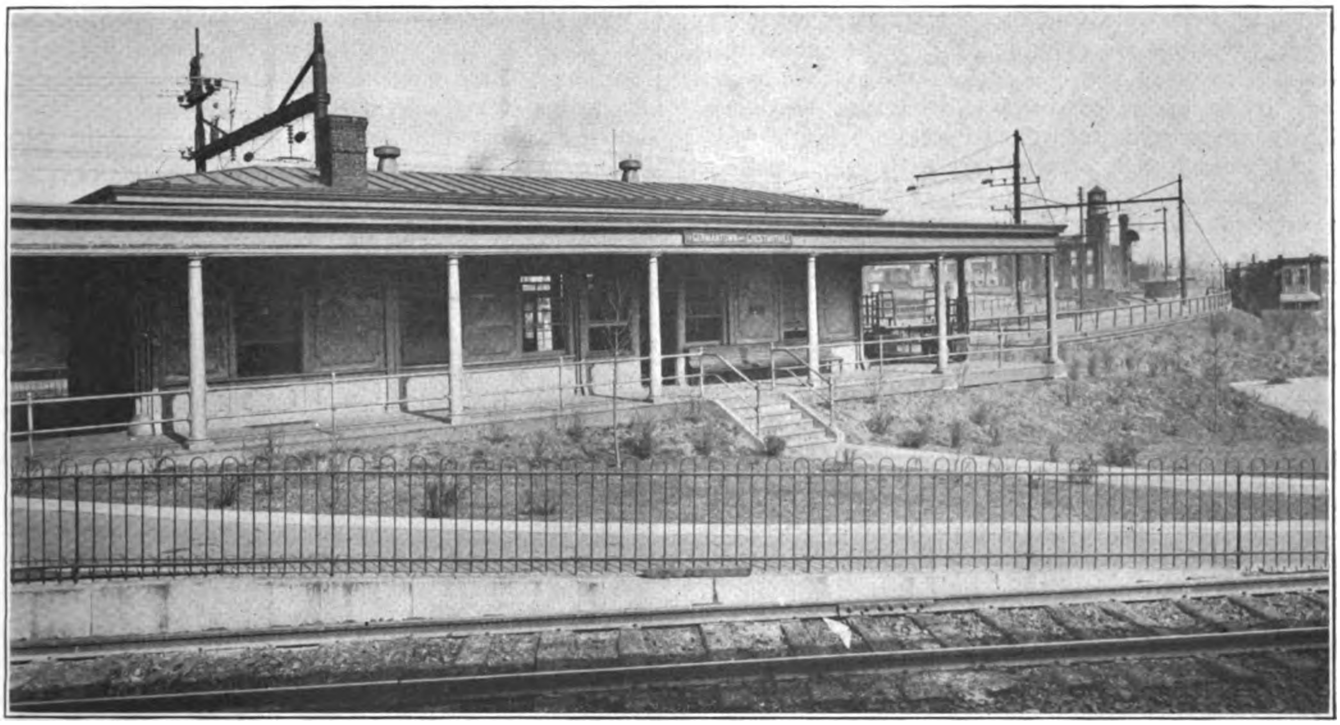

NORTH PHILADELPHIA

VIEW FROM SIGNAL BRIDGE AT NORTH PHILADELPHIA SHOWING TYPICAL METHODS OF CATENARY SUPPORT

Characteristic Views on the Latest Electrification in the Quaker City


PENNSYLVANIA
QUEEN LA

FIRST SPECIAL ELECTRIC TRAIN ON CHESTNUT HILL BRANCH, PENNSYLVANIA RAILROAD



STATION AT NORTH PHILADELPHIA WHERE CHESTNUT HILL LINE BRANCHES OFF FROM NEW YORK LINE

P. R. R. Extends Philadelphia Electrification to Chestnut Hill

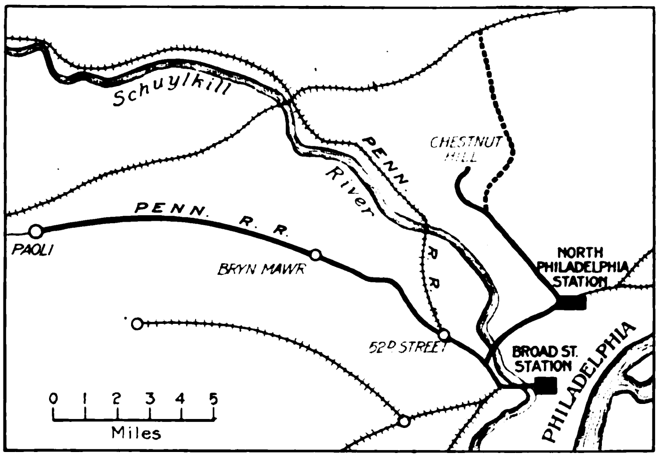
Newly Electrified Branch Taps One of Best Suburban Sections of the Quaker City—Construction Shows that Overhead for Single-Phase Railway Lines Is Approaching Standardization—Outdoor Transformer Station a Feature of This Branch

ABOUT three and a half years ago the Pennsylvania Railroad put into operation an electrified section 20 miles in length between Broad Street station and Paoli. Suburban service with multiple-unit cars only is given over this division, and the operation of the electric trains has proved to be very satisfactory. During the recent severe winter, in particular, the electrical equipment showed its capacity to handle traffic under adverse operating conditions. Soon after the completion of the Philadelphia-Paoli construction the electrification of the Chestnut Hill branch, 12 miles long between Broad Street station and Chestnut Hill, was begun. This work has now been completed and for the last few weeks the operation has been completely electric.

The Philadelphia-Paoli construction has been fully described in the ELECTRIC RAILWAY JOURNAL, particularly in an editorial article in the issue for Nov. 13, 1915, page 981, and in an article by F. G. Grimshaw, then in charge of electric operation, in the issue for April 8, 1916, page 681. In general the Philadelphia-Chestnut Hill construction is similar to that of the earlier line, but there are a number of differences and these will be pointed out in the present article.

As from North Philadelphia to Chestnut Hill this line has only two tracks, whereas the Paoli section is a four-track line, the overhead construction is somewhat simpler between these two points. However, as the Chestnut Hill trains as far as North Philadelphia use the New York division tracks it was necesary to electrify a four-track line from West Philadelphia to North Philadelphia.

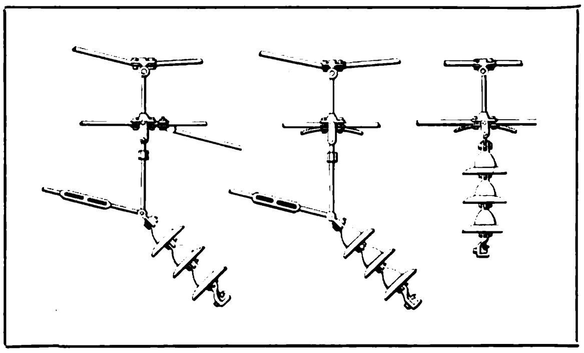
The twenty-two new cars, like the ninety-three older ones, are each equipped with two 225-hp. Westinghouse single-phase air-blast-cooled motors mounted on one truck. These are of a combined repulsion and series type, the repulsion

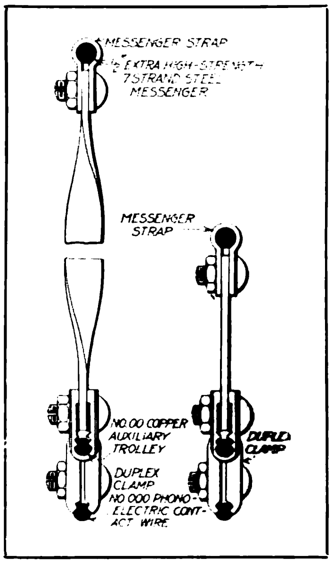


OUTLINE MAP OF ELECTRIFIED LINES OF PENNSYLVANIA RAILROAD AT PHILADELPHIA principle being utilized in combination with the series principle in starting, the series connection alone being used above a certain speed. No resistance leads are used in the armature, compensation for undesirable transformer effects being provided by the arrangement of windings entirely. Details of the motor theory can be found in the first article previously referred to. The motors on the new cars are the same as those on the older ones, but modifications have been made in the control and in the other auxiliary apparatus.

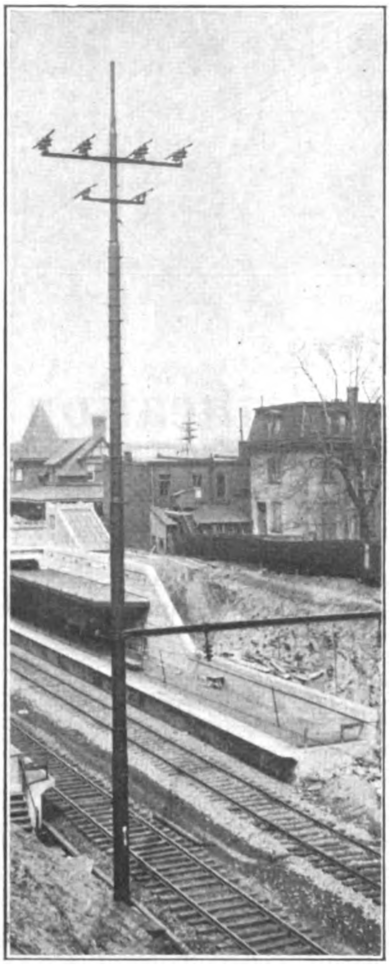
As can be seen in the simplified wiring diagram on the opposite page, when compared with the diagram shown on page 982 of the issue of this paper for Nov. 13, 1915, reactance is used in place of resistance in controlling the current in the motor circuits. This change results in a smaller energy loss during acceleration.

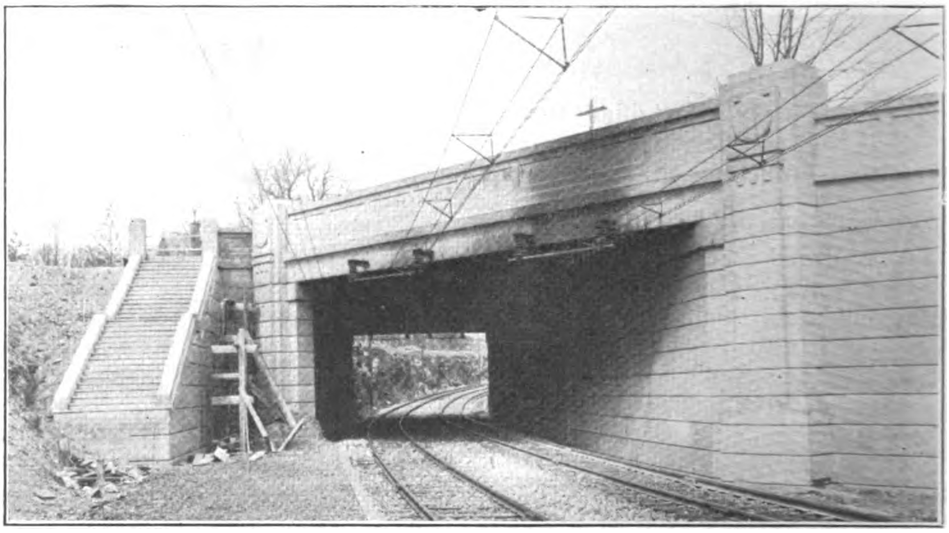
Another difference is in the omission of the line switch, the equivalent protection against failures of the high-tension apparatus being afforded by means of the air-operated pantograph in conjunction with the excess-current and the no-current relays. For this automatic operation of the pantographs relays are connected into the high-tension circuits through instrument transformers, one to cause the pantograph to be pulled down in case of excess current in the secondary circuit, and the other in case of failure of voltage on the line.




MESSENGER STRAP
½ EXTRA HIGH-STRENGTH 7 STRAND STEEL MESSENGER
MESSENGER STRAP
NO. 00 COPPER AUXILIARY TROLLEY
DUPLEX CLAMP
NO 000 PHONO-ELECTRIC CONTACT WIRE
DUPLEX CLAMP

DETAILS OF MESSENGER SUPPORT ON CROSS-SPAN CONSTRUCTION, AND OF LONG AND VERY SHORT STRAP HANGERS WITH SECTIONS THROUGH WIRES



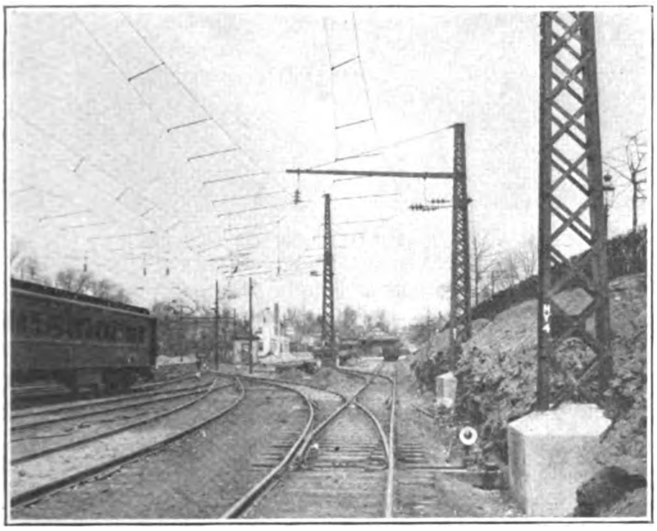


NEW STATION CUT AT HIGHLAND AVENUE, WITH SPECIAL HEAVY OVERHEAD CONSTRUCTION IN FOREGROUND. CROSSING UNDER CHELTON AVENUE, SHOWING METHOD OF ANCHORING INSULATOR SUPPORTS IN CONCRETE OF BRIDGE

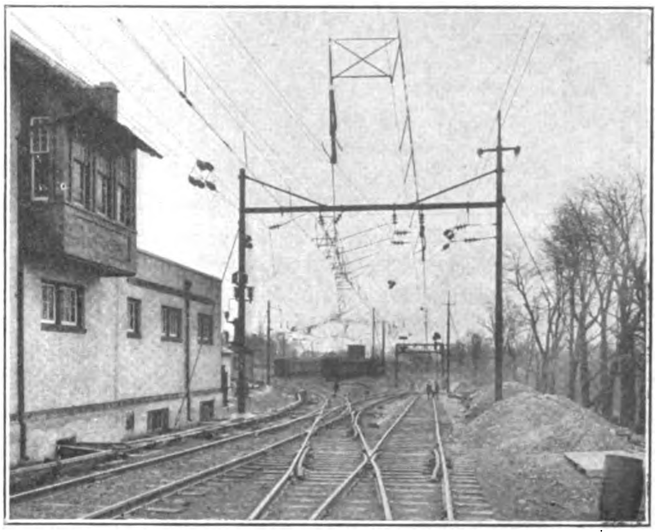
With the diagram is given a table showing the sequence of switch operation on the several controller positions. These may be briefly reviewed as follows: The motor starts with partial voltage from the transformer secondary and with auxiliary fields, main fields and armatures in series. The armatures are also connected to a part of the transformer secondary independently, giving an equivalent of the short-circuit connection in the earlier motor. This is the "inverse-fed" connection. From the third position on the switch *S* is open, cutting out this extra armature circuit, the main motor circuit and the auxiliary field circuit being fed from different sections of the transformer secondary. This is the "doubly-fed" connection. The preventive coils, which are indicated by the vertical looped lines in the diagram, are connected in various combinations on successive controller positions in such a way as to limit the current to desired values.

When the armature is operating with short-circuit the motor is operating in part as a repulsion motor, giving it good starting characteristics. This repulsion, or inverse connection, is used up to 15 m.p.h. and it permits an acceleration of the rate of 0.85 m.p.h.p.s. on level track. From this point on to the full-voltage series, or doubly-fed, connection the acceleration is 1.1 m.p.h.p.s. Full speed is approximately 60 m.p.h. on level track.

In the earlier cars the air compressor and the blower for cooling motors, transformers and preventive coils were driven from the same motors. In the new cars the drives are separate. The blower, which has a capacity of 6000 cu.ft. of air per minute at 5½ in. static pressure, is driven by a 7½-hp. motor. The compressor, which has a capacity of 25 cu.ft. per minute against 100 lb. air pressure, is driven by a 5½-hp. motor.



CHESTNUT HILL YARD SHOWING LATTICED POLES SUPPORTING CATENARY STRUCTURE

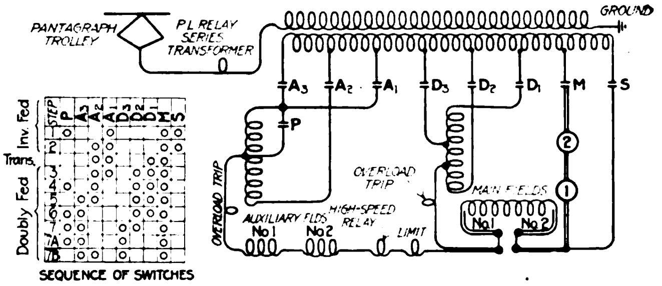


CHESTNUT HILL YARD AND MAIN TRACK LOOKING TOWARD NORTH PHILADELPHIA

In connection with the control equipment, for the purpose of simplifying the interlock circuits which prevent the possibility of damage through incorrect operation of switches, a drum-type interlocking switch is used rather than separate interlocks on contactors. This operates in a manner similar to the standard PK control and greatly simplifies the unit-switch construction. These interlock circuits do not appear in the simplified general wiring diagram printed below. All of the control apparatus is placed around the edge of the car for case of inspection and maintenance.

Practically no change has been made in the transformers except that an improved insulation has been used so as to increase the resistance to moisture.

In the earlier cars the lighting circuit was taken from taps in the transformer windings. Now a motor-generator set, used also for battery charging, supplies lighting current at 32 volts. The output capacity of this machine is 638 watts.



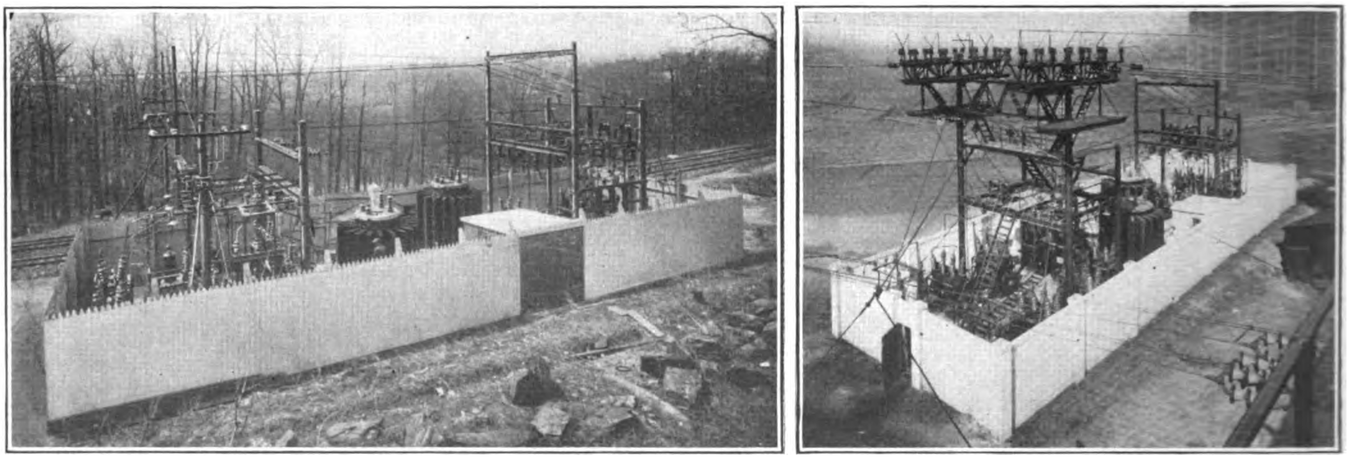
SIMPLIFIED ELECTRIC CIRCUIT DIAGRAM AND CHART OF SEQUENCE OF SWITCHING OPERATIONS

Like that on the main line the overhead construction on the Chestnut-Hill branch is of the familiar single-catenary type. From a steel catenary messenger hangs a secondary copper messenger parallel with the track. Hangers of strap steel, twisted to minimize the swaying effect of wind blowing across the track, connect the two messengers. The contact wire is hung from the secondary messenger by means of bronze clamps.

The messenger wire is supported on insulators from overhead structures of several types, depending upon the characteristics of the respective parts of the line. Cross-catenary, bracket, or special lattice-truss cross supports are used, depending upon the local requirements. Especial care was taken to design structures which would interfere with the views of signals as little as possible. Photographs have been reproduced to show characteristic methods of supporting the messenger wire.

Tubular construction with guys may be considered standard, but a variety of pole sizes was necessary in the interest of economy. Each pole was designed for its particular location, and butt diameters from 16 in. down to 9⅝ in. were utilized. In one of the photographs is shown a very high pole with the butt of the larger diameter mentioned. The supports used on the double-track, section between North Philadelphia and Chestnut Hill are mostly of the bracket type, with the brackets, or crossarms, built up of 4-in. channels placed back to back. These are clamped close at the outer end and are spread out to surround the pole, being attached thereto by means of iron saddle clamps, one on each side, or forged steel bands. The poles are cross-latticed for stiffening. The bracket arms are braced by means of two steel sag rods. They are extended on the side away from the track for the purpose of carrying two signal transmission wires.

To prevent swaying of the contact wire, on tangent construction, in heavy winds, a new steady brace has been developed. This consists of two wood stick insulators carried from the lower end of a rigid three-shell porcelain insulator clamped to the bracket



GENERAL VIEW OF ALLEN LANE TRANSFORMER STATION AND GENERAL VIEW OF NORTH PHILADELPHIA TRANSFORMER STATION

structure. From the lower end of the stick insulator, light metal rods are attached to the main messenger at the suspension insulator and to a clamp connecting the secondary messenger and the contact wire. These "steadies" as they are called are placed every three poles in certain locations and closer in exposed places to prevent swaying of the catenary in extremely high winds.

The main messenger is of ½-in. double-galvanized seven-wire strand. It is of extra-high-strength steel, the breaking strength being 27,000 lb. and the elastic limit 60 per cent of this. Elongation is from 4 to 15 per cent in 24 in. This wire was furnished by John A. Roebling's Sons' Company. The wire in the cross spans is of ¾-in. strand, with nineteen wires, with the same general specifications.

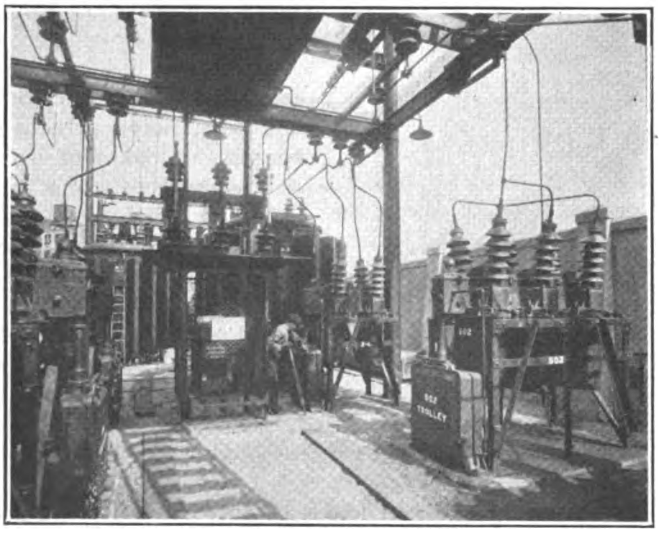
In supporting the messengers three-shell suspension insulators, made by the Locke Insulator Manufacturing Company, similar to those used on the Paoli electrification are installed. A No. 00 grooved copper wire was used for the secondary messenger, clamped to the No. 000 grooved contact wire below. For the contact wire copper alloy (Phono-Electric) was used. Several drawings are reproduced to show the details of construction.

The section break used on the Chestnut Hill branch as on the Paoli division is of the air type. This has been found to operate practically sparklessly.

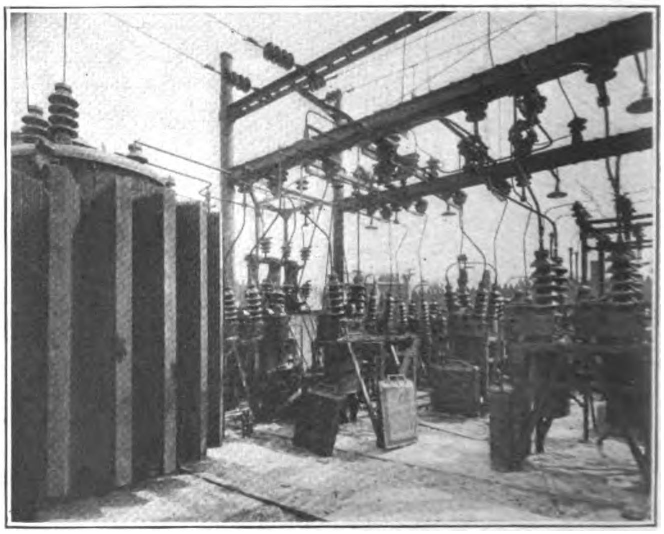
The transmission line wires are of aluminum and are carried on crossarms made of two angle irons, placed back to back, and attached to the poles above the catenary supporting bracket or other structure. The wires are carried on Locke pin-type insulators. At crossings under highway bridges the wires are carried overhead, not under the bridges as in the Paoli electrification. Restricted clearances make the location under the bridges impossible in many places and, while this is a more expensive construction it is easier to maintain the line when the overhead crossings are used. It also simplifies the matter of crossing foreign wires. At points of crossing streets and foreign wires special safety construction is provided at the insulators. Clamps are used to hold the wire, and plates are provided to take the arc in case of a break.

Two Outdoor Transformer Stations on the Chestnut Hill Branch

Power for this electrification, like that for the Paoli section, is furnished by the Philadelphia Electric Company from its Christian Street power plant. The power is transmitted to the receiving substation at Arsenal Bridge at 13,200 volts, 25 cycles, and here the



INTERIOR OF NORTH PHILADELPHIA TRANSFORMER STATION LOOKING TOWARD 44,000-VOLT END



INTERIOR OF ALLEN LANE TRANSFORMER STATION LOOKING TOWARD 11,000-VOLT END voltage is stepped up to 44,000. Three-phase-two-phase transformers are provided at this substation. The new load is normally carried on one of the phases and the Paoli load on the other of the two-phase circuit. This balances the load on the generators to better advantage. It will be remembered that special phase-balancing machines were required in connection with the Paoli electrification.

Two new 6000-kva. transformer stations have been provided, one at North Philadelphia, where the track branches from the line to New York, and one at Allen Lane, near the Chestnut Hill end. These new substations are of the outdoor type, in contrast to the indoor type used on the Paoli line. Power for the Philadelphia end comes partly from the West Philadelphia station, which also supplies part of the Paoli line. Photographs of the exterior and interior of both substations have been reproduced to show the general features of design, which are as stated briefly in the following paragraphs:

Each substation consists of three main sections. The first section contains the 44,000-volt apparatus, and is located at one end of the inclosure. The second section at the opposite end of the inclosure comprises the 11,000-volt equipment; while between these sections is the transformer and control section. The control equipment is housed in a fireproof structure at one side of the inclosure.

Two 44,000-volt transmission lines from the West Philadelphia substation enter the outdoor substation on a high steel structure. The feature of this is a group of Burke horn-gap switches which permit complete isolation from the high tension.

From these switches bare copper tubes or wires lead to a lower high-tension steel structure, thence to the electrolytic lightning arresters in series with horn gaps. From the arresters the circuits lead through the oil switches to the high-tension buses over the transformers. At the high-tension end of the inclosure are a potential transformer and an operating transformer for supplying switch operating power. The 11,000-volt end of the transformer station is provided with oil switches and lightning arresters like the 44,000-volt end.

On the switch structures the busbars are of copper tubing, but between structures solid or stranded copper wire is used. Both sets of buses are sectionalized in each transformer station, and in connection with the 11,000-volt oil switches provision is made to cut in resistance during the opening of the breaker.

DESIGN AND SUPERVISION OF CONSTRUCTION

The Chestnut Hill branch extension, like the Paoli line, was designed and the construction carried out by Gibbs & Hill, New York City, consulting engineers to the Pennsylvania Railroad.

The International Railway, Buffalo, N. Y., has placed in operation the first of its new all-steel interurban cars which were bought for the Buffalo-Niagara Falls line. These cars are being built by the G. C. Kuhlman Car Company. The total number to be supplied is forty. An illustrated description of these cars appeared in the issue of the ELECTRIC RAILWAY JOURNAL for March 3, 1917, page 378.

Too Easy to Get Into the Union

Union Membership Should Mean Special Ability—Discipline as Enforced in Boston by Joint Board—Promotion by Seniority Undesirable

IN AN abstract on the report by John A. Beeler on the Boston Elevated Railways, published in the Feb. 9 issue of this paper, it was possible to summarize only Mr. Beeler's conclusions in regard to the equipment and corporate and financial conditions. He expressed also some interesting opinions on the labor situation and says that the labor union has possibilities which it does not realize. He continues:

"I am inclined to believe that it is too easy to get into the union. Practically the only qualification is employment by the company. Union labor has a great opportunity to develop a brand of quality that would be sought after by the public and by the companies; to make the word 'Union' synonymous with efficiency, courtesy, and good salesmanship, to create a demand for the particular product which they are able to supply. If this were done, representatives of the union would less frequently visit the office of the manager to present a brief for the petty shortcomings of some careless or incompetent workman. Instead, in the conduct of its internal affairs and by the application of its own standards of membership, the union would itself go far to prevent such occasions from arising.

"The company can help in this matter by doing everything in its power to remove all basis for the fear that discipline is being used as a means of undermining the organization. The important thing is that management and men should be able to meet on a common ground of co-operation in the work of the company, and that both should realize that courtesy, good nature and loyal, efficient work really pay. The men are naturally inclined this way, and only systematic effort on the part of the management and of their own leaders is needed to produce the desired results.

"When all employees are brought to a keen realization of the fact that they are part and parcel of one big Boston Elevated family better results are bound to accrue. The hearty co-operation of all the employees is as important to the success of the enterprise as any other one thing. Until it can be secured, neither men, company, nor public will enjoy the full benefits obtainable from Boston's transportation system.

"It is now generally conceded that organization of capital and of labor are both desirable if rightly used. Capital has perfected business organizations that are wonderfully effective. The most successful of these aim at maximum efficiency in the manufacture and marketing of the product and the improvement of its quality. By wise salesmanship, attractive advertising and the employment of affable, courteous representatives, demand is increased and the scope of operations enlarged.

"The methods which have proved their worth for capital are just as desirable for labor. It has been said that an impecunious street railway is a poor public servant. It is just as poor an employer. The men can in no way do more to further their own ends in the present instance than by doing everything in their power to help the company serve the public well and to conduct its affairs in the most efficient way. It is perfectly natural and right for employees to desire to obtain full value for the work which they do, and that is why they have organized, but this is only the first step. The men will not gain the full benefit from the organization unless they use it as a means of improving the quality of their product and the effectiveness of the part which they play in the company's business."

DISCIPLINE AS ENFORCED BY A BOARD

Discussing the company's method of enforcing discipline by means of a discipline board, Mr. Beeler says: "This board is one of the unique features of the management. It is composed of four members appointed by the president and handles all cases involving labor disputes. The function of this board is to see that fair and just methods are uniformly practiced without fear or favoritism. Cases are brought to the attention of the board only in the event of the failure of the department heads to arrive at a satisfactory settlement with the employee.

"Discipline is adversely affected," Mr. Beeler goes on to say, "if the time elapsing between an offense and the decision of the board is not brief, as prompt decisions have great value in matters of this nature. In the meanwhile the employee involved should be suspended.

"Discipline is not what it should be," according to Mr. Beeler in another part of the report. "This lack is especially noticeable in carhouses removed from division headquarters. In some instances the division office is not even located at a carhouse. The division superintendents carry all the authority, and the station masters, who are in constant touch with the men, are little more than clerks. The division chief inspectors, who are virtually assistant superintendents, are also located at division headquarters, thus concentrating the authority that should be more widely distributed.

"There is opportunity for the improvement of cooperative action between the minor officials of the various divisions, when they realize that division lines should never stand in the way of the welfare of patrons, the company's interests or the responsibility of the employees. Opportunity also exists for marked improvement in the *esprit de corps* within the divisions. If it were possible for the officials and men to understand and see each other's side of the various phases of the operations, by giving closer attention to these matters, better results would follow, benefiting both men and management."

Mr. Beeler also points out that "the organization of the rapid transit lines is much better adapted to the maintenance of discipline than that of the surface lines, since the district supervisors, being located at the operating stations, should be in close touch with the men. Having the necessary authority and disciplinary power, they can command respect and obedience. The full measure of this is not in evidence at present, since the supervisors do not keep in sufficiently close personal touch with the men."

PROMOTION BY SENIORITY

Discussing the company's agreement with the union in regard to promoting men according to seniority, Mr. Beeler thinks that "the rule undoubtedly works to advantage for the platform employees. Here all men of a given classification are engaged in the same kind of work, and it is merely justice to allow the senior man in service to have the pick of the available runs. In the shops and other departments the seniority rule does not give the same excellent results. The character of the work in different classifications differs so widely that promotion by seniority places men in positions that they are not qualified for. The tendency is to make the individual a 'Jack of all trades and master of none.' On this account the company is unable to give the same remuneration it would if the men could receive consistent training along one general line of work. True, a probationary period is provided for, but it is often difficult or distasteful to prove that a man is incompetent. To do this would require so much of the time of those in charge that their energies would be dissipated from the legitimate channels of their work.

"An instance will illustrate the condition. A man, for many years a carhouse foreman and shifter, in which position he did well, bid on a vacancy as pitman and was appointed. He was not adapted to the work and proved inefficient, but seniority required giving him a trial. Under the circumstances, it was difficult to prove him incapable, although he was plainly unfitted for this work. In spite of this fact he has twice since then been promoted, and is now in the highest paid class.

MERIT OR QUALIFICATION SHOULD GOVERN PROMOTIONS

"The remedy for this condition is to abrogate the seniority rule so far as it affects transfer from one craft to another, and provide for promotion by merit or qualification. This would not only benefit the men in the shops and carhouses, but be to the advantage of the platform men, who frequently have to operate equipment that has not been carefully adjusted."

In another section of the report on the subject of jitneys, Mr. Beeler claims that "one generally overlooked reason for jitney success that should be well noted by employees of street car lines is the fact that jitney operators are very largely working for themselves. To a certain extent they have in their own crude way studied the art of salesmanship. They are seldom surly or gruff. They want the money, and by various little acts of courtesy many of them have been quite successful. Affable and accommodating manners cost but little and mean much in the conduct of any business."

Electric Locomotives Make Good Showing on Norfolk & Western

In the twenty-second annual report of the Norfolk & Western Railway, covering the year ended Dec. 31, 1917, the data of maintenance of steam and electric locomotives, covering repairs, retirements and depreciation, are given in terms of cost per 1000 tons hauled 1 mile. For the year 1917 this cost was 32 cents for the steam locomotives and 10 cents for the electric locomotives, as compared with 29 cents and 8 cents respectively for the preceding year.

The cost of freight movement in the electric zone during the month of October, 1917, when the conditions were normal, was stated to be 26 per cent less than if steam power alone had been used.

New 50-Ton Electric Locomotive for Swiss Mountain Climbing

A Narrow Gage Locomotive With Very High Rating Per Ton of Weight—Requirements Stipulated 11.2 M.P.H. on Heaviest Grade

A NEW type of electric locomotive which presents some rather unusual features has been placed in service on the St. Moritz-Tirano Line of the Bernina Railroad in Switzerland. The demands made of the manufacturers, Brown, Boveri & Company, Baden, were exceptionally severe. The purchaser called for a locomotive capable of starting a 110-ton train on the most severe grades of this line and of maintaining speed of 11.2 m.p.h. on these grades. Moreover the weight per axle was limited to 8.6 tons (17,200 lb.). The length of the line is 23 miles, 16¾ miles having an average grade of 7 per cent, as well as numerous curves with a minimum radius of 131 ft. Power is drawn from an overhead contact line at 750 volts, direct current.

The motors on this locomotive are designed for use as generators on the down-grade trips, energizing the electric track brakes and providing rheostatic braking for the engines. The locomotive and cars are also fitted with Hardy vacuum brakes.

It was first attempted to use two motors of 310 hp. each for this service, but this was found undesirable as in winter it is necessary to use this locomotive as a snowplow and to operate it at very low speed. The original plan was therefore changed, and four motors of 155 hp. each were substituted to provide the desired low speed with all motors in series. The maximum speed of the train on level track is 31 m.p.h.

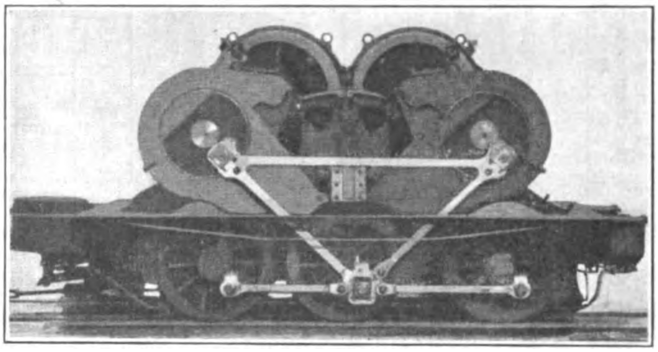


FIG. 3—MOTOR MOUNTING AND CONNECTING ROD DRIVE

The details of construction are shown in the general views, Figs. 1 and 2. The central portion carries the track brakes, and is so arranged that it is always pulled by the leading motor truck but is never pushed by the following truck. It carries eight magnets capable of exerting a total vertical force of 45,760 lb. This system of braking the heavy engine on this road has proved very satisfactory, and despite the exceptionally trying conditions during the past winter not a single accident has occurred.

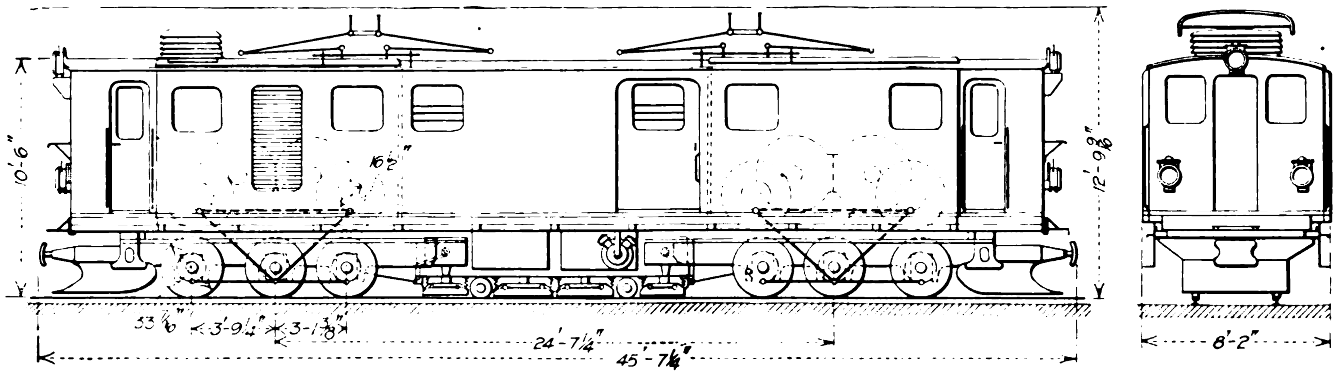


FIG. 1—GENERAL STRUCTURAL DETAILS OF LOCOMOTIVES

The motors are mounted in pairs on each truck as shown in Fig. 3. Each motor is geared to an intermediate shaft through gears with spring-mounted rims to absorb the shocks at starting. The power is transmitted to the driving wheels by means of connecting rods.

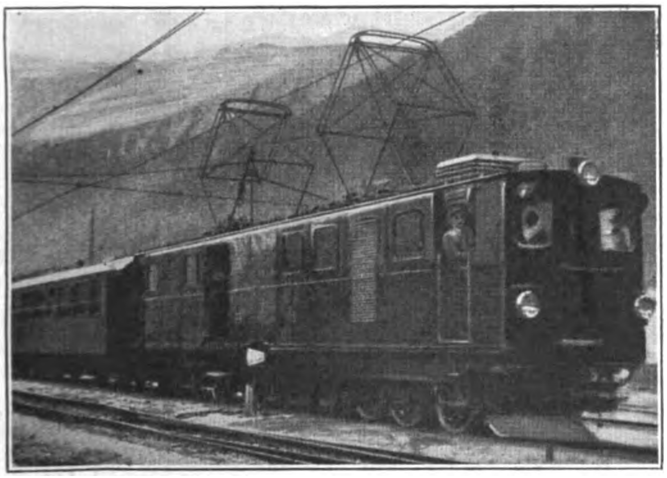
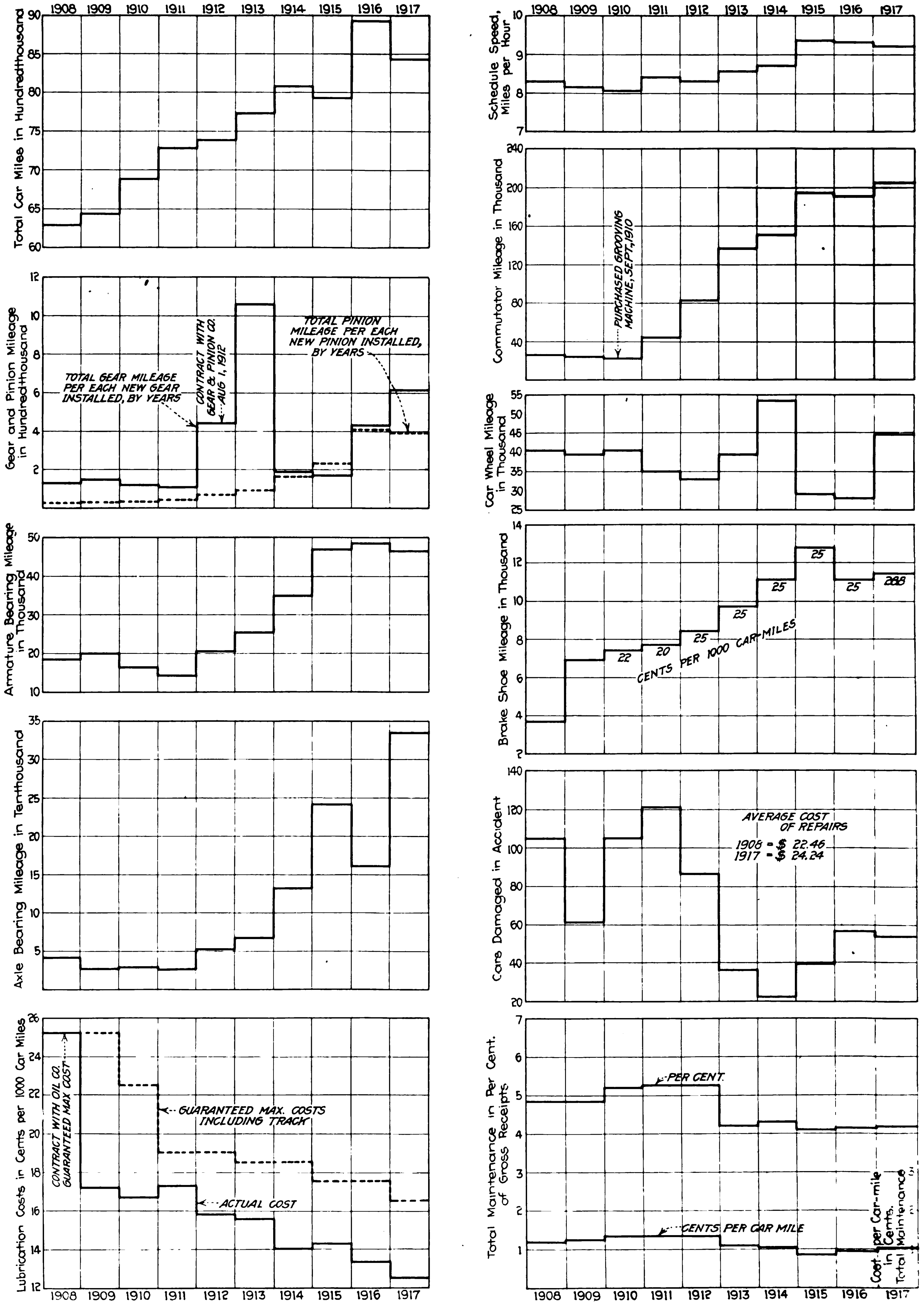


FIG. 2—LOCOMOTIVE HAULING 110-TON TRAIN

The locomotive, completely equipped with snowplow and all necessary equipment and tools, weighs 46.86 tons, of which 28.16 tons is the weight of the mechanical parts and 18.7 tons that of the electrical equipment. In the middle of the locomotive, between the two equipment sections, is a freight compartment of 3.3 tons capacity giving a maximum weight for traction of 50.16 tons.

In power per ton of weight this new engine is said to be the most remarkable of any of the narrow-gage type built so far. Its output on an hourly rating basis is 17 hp. per ton of weight. The gage is 39.37 in. (1 meter).

Further details of this locomotive are given in the issue of *Schweizerische Bauzeitung* for Feb. 23, 1918.



GRAPHS SHOWING ANNUAL RESULTS OF OPERATIONS OF EQUIPMENT ON MEMPHIS STREET RAILWAY
(See left-hand scale of each figure for individual caption)

Maintenance Records That Prove Invaluable

Memphis Street Railway Keeps Elaborate Records of the Performance of Its Equipment Based on Systematic Inspection—Efficiencies Checked Up Every Three Months—Tables and Graphs Show Comparative Results by Years

THE value of complete records of the operation and maintenance of the different parts of car equipment is indicated in the following outline of the method used by the mechanical department of the Memphis (Tenn.) Street Railway, of which A. D. McWhorter is superintendent of equipment and overhead lines. This company has prepared elaborate maintenance records, based upon careful and systematic inspections, covering a period of several years, and it is believed by the company that without question the results obtained entirely compensate for the work involved. In no other way than by recording the service secured can a check on the efficiency of operation be determined. This involves the compiling of a large number of data on an extensive property, but as will be seen from the methods used in Memphis, these can be arranged in very convenient form.

PASSENGER CAR EQUIPMENT											
Type and Service	No. Cars	Serial Number	Manufacturer	Date Built	Length of Body	Length Overall	Type of Truck	Brakes	Motors	Controllers	Seating Capacity
Single-Truck, Closed, Motor..........................	38	107 to 144	Brill	1901	20 ft.	30 ft.	Brill 21-E	Hand	2 GE 800	K & K-2	Long. 30
Double-Truck, Open, Trailer..........................	19	700 to 718	Kuhlman	1905	13-bench	42 ft.	27 GE-1	Hand	——	——	Cross 56

FORM USED IN KEEPING DATA ON PASSENGER-CAR EQUIPMENT, MEMPHIS STREET RAILWAY

Some of the earlier methods used by the Memphis Company in keeping maintenance records were outlined and illustrated in an article published in the issue of the ELECTRIC RAILWAY JOURNAL for April 10, 1915, page 121.

As certain facts relative to the equipment should be borne in mind when considering the results obtained, the company keeps one record form filled in with data on all its passenger cars. This is shown in the blank reproduced in part on this page.

The maintenance record compiled in detail appears in tabular form as a "comparative statistical report of shop operation." This report is completed each year. The figures are entered for each month and a summation is made at the end of each period of six months and at the end of the year. Annual and semi-annual figures for the preceding year are also entered, together with figures to indicate whether there has been an increase or decrease with respect to each item. As one of these tables is too large to permit of reproduction, only a statement of the different items included are given here. These are listed as they appear in the table:

1. Passenger Car-Miles. Figures obtained from the statement of car-wheel mileage issued monthly from the auditor's office. Separate entry is made for each of the following: Single-truck, double-truck and maximum-traction-truck cars, double-truck trailer and total motor car-miles.

2. Schedule Speed. Obtained by dividing the total car-miles by the total number of car-hours, the latter being obtained on request from the auditor's office.

3. Number of Cars Turned Out. (*a*) *Machine Shop.* Figures obtained from the daily report turned in by motor and truck department foremen, and include all cars brought into the shop for repairs by motor and truck department. (*b*) *Carpenter Shop.* Figures obtained from carpenter-shop foreman's record of cars turned in and out each month and include all cars which received general repairs, repair on account of accidents, etc. (*c*) *Paint Shop.* Figures taken from monthly record of paint-shop foreman and include all cars brought in for regular painting, "touch-up" jobs, etc.

4. Armatures Brought into Winding Room for Repairs. These include all armatures removed from motors for bearing renewals, field repairs or for any other cause. When a motor is opened up the armature is taken to the winding room for inspection, where it is blown out and probably painted, string band is installed, etc. A separate entry is made for each type of motor, including compressor motors, and also of the total repairs made per month, armatures wound and fields used.

5. Gears Used. Classified according to the type of motor on which they were installed. Total monthly figures are also given and the average mileage of each for six months. Figures are obtained from the monthly statement of materials issued from the storeroom. The average miles are calculated by multiplying the single-truck and maximum-traction-truck motor car-miles by two and the double-truck motor car-miles by four, adding the product and dividing by the number of gears used during the period.

6. Number of Pinions Used. Same record kept as for gears.

7. Commutators. Number turned, as indicated from winding-room report, and average mileage of each for six-month period. The latter is calculated by multiplying the single-truck motor car-miles by two, the maximum-traction motor car-miles by three and the double-truck motor car-miles by five, adding the products and dividing by the number of commutators turned.

8. Bearings Used. (*a*) Number of pairs of armature bearings, taken from the daily reports of motor repairs, and an average mileage of each, which is obtained by multiplying the single-truck and maximum-traction-truck motor car-miles by two, and the double-truck motor car-miles by four, adding the product and dividing by the number of pairs of bearings used. (*b*) Number of axle bearings used. Also obtained from the daily report and the average miles, obtained by multiplying the single and maximum-traction-truck motor car-miles by four, and the double-truck motor car-miles by eight, adding the product and dividing by the number of axle bearings used during the period.

9. Cost of Car Lubrication Per 1000 Car-Miles, in Cents.

Efficiency Report of the Memphis Street Railway, Mechanical Department

NOTE: Memphis & Lake View Ry. Co. Operation Included in this Report	CAR-MILES			
	Month of December		Year to Date	
	1917	1916	1917	1916
PASSENGER CAR-MILES				
Double truck motor	333,280	353,667	4,188,888	4,366,021
Max. trac. truck motor	82,635	99,518	1,122,045	1,168,797
Single truck motor	185,550	218,429	2,567,329	2,822,343
Double truck trailers	37,480	50,611	532,867	587,021
Total passenger	638,945	722,225	8,411,129	8,944,182
SERVICE CAR-MILES				
Double truck motor	2,049	2,368	41,531	43,943
Single truck motor	1,439	787	16,453	13,027
Double truck trailers	184	645	6,902	5,227
Single truck trailers	......	181	2,760	6,515
Total service	3,672	3,981	67,646	68,712
Total passenger and service	642,617	726,206	8,478,775	9,012,894
Total motor-miles	1,880,564	2,061,608	24,333,330	25,648,190
Total air-brake-miles	417,964	455,553	5,352,464	5,578,761
Total wheel-miles	4,392,980	4,932,060	57,484,032	60,740,764
Passenger car schedule, speed miles per hour	8 70	9 30	9.20	9.40

CAR EQUIPMENT						
Passenger Cars		Seating Capacity	Age, Years	Motors		Age, Years
Number	Type			Number	Type	
	Closed					
83	Double truck, 4 motor	44	12	50	G. P. 201-I	3
25	Max.trac.truck,2motor	48	3	2	West. 101-B	5
11	Single truck, 2 motor	36	5	156	G. E. 80	11
96	Single truck, 2 motor	30	16	154	G. E. 57	12
25	Double truck trailers	54	4	144	G. E. 67	13
	OPEN			18	G. E. 1000	18
73	Single truck, 2 motor	50	14	264	G. E. 800	18
19	Double truck trailers	54	13	16	West. 69	18
332	Total			804	Total	
..					AIR COMPRESSOR	
	SERVICE CARS			25	West. D-1-F	3
				1	West. D-2-EG	11
9	Double truck, 4 motor			4	West. D-1-EG	8
10	Single truck, 2 motor			4	Nat. Brake DD-4	8
4	Double truck trailers			38	Nat. Brake A-4	10
7	Single truck trailers			36	Nat. Brake AA-4	13
				13	Nat. Brake AA-1	15
				1	Nat. Brake B-2	13
30	Total service cars			122	Total air compressor	
362	Total passenger and service cars			926	Totalmotorandaircompr.	..

Service Performance of Material and Parts	MONTH OF DECEMBER						YEAR TO DATE						Remarks
	1917			1916			1917			1916			
	Units Installed	Service Mi. per Unit Installed	Cost per M Miles	Units Installed	Service Mi. per Unit Installed	Cost per M Miles	Units Installed	Service Mi. per Unit Installed	Cost per M Miles	Units Installed	Service Mi. per Unit Installed	Cost per M Miles	
Railway armatures, wound	1	1,880,564	......	1	2,061,608	.....	34	715,686	.....	23	1,115,139	.....	
Air compr. armatures wound	0	....	......	0	....	.....	16	334,529	.....	12	464,900	....	
Fields, used	0	....	......	7	294,512	.....	69	430,229	.....	77	333,092	.....	
Commutators, renewed	1	2,298,528	......	0	....	.....	12	2,473,816	.....	19	1,349,905	.....	
Commutators, turned	8	287,316	......	9	229,067	.....	145	204,729	.....	166	154,146	.....	
Gears, new	0	....	......	3	687,203	.....	40	608,333	.....	58	442,210	....	
Pinions, new	4	470,141	......	6	343,601	.....	62	392,473	.....	63	407,114	.....	
Wheels, 33-in., new	91			137			1033			1835			
Wheels, 24-in., new	8	36,305	.1000	8	27,248	1000	58	44,630	.1000	90	27,647	1000	Mileage guaranteed
Wheels, 21-in., new	22			46			197			272			
Brake shoes, 25 lb. ea., new	188	11,322	.31600	525	9,394	.2500	5032	11,424	.28856	5462	11,121	.2500	
Armature bearings, pairs	36	52,238	......	34	60,635	.....	522	46,616	.....	525	48,853		
Motor bearings	.....	752,226	......	22	187,419	.....	144	337,962	.....	312	164,091	.....	
Journal bearings, lb. each, average	39	112,640	......	37	133,297	.....	385	149,309	.....	264	230,078		
Lubrication	.....	....	.1931	.....	....	1603	.....	....	.1504	.....	....	.1669	
Trolley wheels, 4-in. copper	156	3,878	......	125	5,373	.....	1943	4,085	.....	1373	6,087		

Car Changes	MONTH OF DECEMBER				YEAR TO DATE			
	1917		1916		1917		1916	
	Number	Car-Miles per Change	Number	Car-Miles per Change	Number	Car-Miles per Change	Number	Car-Miles per Change
Chargeable to carhouse	49	13,040	37	19,492	470	17,896	413	21,653
Not chargeable to carhouse	26	24,575	30	24,074	164	51,287	131	68,265
Total cars changed off line	75	8,519	67	10,779	634	13,267	544	16,439

Payroll, Total Force, Acts. 29B-32-35-36-38-39-66	MONTH OF DECEMBER		YEAR TO DATE	
	1917	1916	1917	1916
Total number men on roll	107	119	110	117
Average rate per hour	2496	.2324	.2418	.2259
Total amount of payroll	$7326.25	$7529.50	$85,955.85	$84,749.10

Maintenance of Cars and Equipment Cost	MONTH OF DECEMBER				YEAR TO DATE				
	1917		1916		1917		1916		
	Amount	Per M. C. M.	Amount	Per M. C. M.	Amount	Per M. C. M.	Amount	Per M. C. M.	
Superintendence, Act. 298	$526.00	0.849	$496.52	.7048	$5,833.78	0.713	$25,192.94	0.5923	
Passenger cars, Act. 32	4,463.62	7.205	4,500.24	6.3883	61,113.93	7.475	62,930.74	7.1773	
Service cars, Act. 35	433.71	0.700	15.71	0.223	2,145.80	0.262	2,468.49	0.2815	
Elect. equipment, Act. 36	1,427.38	2.304	1,109.59	1.5751	20,465.75	2.503	16,452.43	1.8764	
Shop tools and mach., Act. 38	64.02	0.103	1.83	0.0026	541.51	0.066	207.71	0.0237	
Shop expense, Act. 39	584.14	0.943	279.76	0.3971	5,743.90	0.702	4,778.65	0.5451	
Total	$7,498.87	12.104	$6,403.65	9.0902	$95,844.67	11.721	$92,030.96	10.4963	
Memphis & Lake View Railway	203.46	10.000	217.51	10.0000	2,408.52	10.000	2,449.31	10.0000	
Total	$7,702.33	12.051	$6,621.16	9.3990	$98,253.19	11.600	$94,580.27	10.4894	
Buildings and structures, Act. 25B	87.06	0.141	236.84	0.3262	2,161.63	0.264	2,625.26	0.2912	
Carhouse employees, Act. 66	2,620.70	4.230	2,733.90	3.7695	30,248.90	3.700	28,854.10	3.2014	
Total	$2,707.76	4.371	$2,970.74	4.0957	$32,410.53	3.964	$31,479.36	3.4926	
R. & R. expenditure	None		None		None		None		Mchl. dept. only
R. & R. reserves	$7,961.78		$11,073.90		$75,635.86		$89,714.54		For all depts.
R. & R. total bal. reserves	168,995.38		126,969.10						For all depts.
Apportionment for maintenance and R. & R. reserve	13%		13%		13%		13%		

FORM OF QUARTERLY EFFICIENCY REPORT FOR CHECKING MAINTENANCE OF EQUIPMENT

Data obtained from the monthly statement of lubricants consumed, issued by the auditor.

10. Car Wheels Used. Monthly figures obtained from the auditor's statement of car-wheel-miles and cost, and average mileage of each, which is figured from the total wheel-miles shown on the monthly wheel statement and the number of wheels used during the period.

11. Trolley Wheels Used. Same data as for car wheels.

12. Brakeshoes Used. Same data as for car wheels and in addition the monthly cost per 1000 car-miles.

13. Cars Relieved. Figures compiled from the daily report of cars changed on lines. (*a*) Those chargeable to carhouse with equipment failures. Separate reports are made of failures of different equipment as fender, mechanical air brake, electrical air brake, hand brake, wheel, circuit breaker, controller, motor, miscellaneous and monthly total failures. (*b*) Those not chargeable to carhouse, including cars relieved from service on account of accidents, for different type of equipment, etc., in fact all changes made over which the shop has no control. Separate entries are made under the following headings: Doors, accident, collision, split switch, trolley, broken glass, different type, no trouble, monthly totals which are not chargeable to carhouse, total number of cars changed, and cars off track.

14. Cars Damaged in Accident, and Cost to Repair. Costs are obtained from the auditor upon completion of the shop order which is issued covering repairs to car when damaged by accident or collision.

15. Daily Average Number of Eighteen-Hour Cars for Both Single-Truck and Double-Truck Cars. This item is calculated by dividing the total number of car-miles by the product of the schedule speed and the number of days per month times eighteen.

16. Maintenance. Average number of ten-hour men per day and cost per car-mile. Costs are obtained from the auditor's monthly statement, and the number of men by dividing the total number of man-hours per month by ten times the number of days in the month. These figures are entered quarterly and are made on separate accounts for maintenance of passenger cars, service cars, electric equipment and shop expenses.

17. Total Maintenance. In per cent of gross receipts, for a six-month period.

18. Carhouse Employees. Average ten-hour men per day. Record entered quarterly of number of men and cost per car-mile.

19. Total Shop and Carhouse Force. Figures are entered quarterly of the number of ten-hour men per eighteen-hour car-day and the average rate per hour. The former is obtained by dividing the total number of ten-hour men per day by the total number of eighteen-hour cars daily, and the latter by adding the rates of the entire payroll and dividing by the number of employees.

In addition to the comparative statistical report, an efficiency report is made out, the form of which is reproduced on the opposite page. It was developed in the beginning of the year 1917. It is in a large degree a duplicate of the report just outlined, but it is made up quarterly and is valuable in affording a means to check up frequently the operation and performance of various materials.

From the annual figures on the large comparative statistical report, graphs are plotted to show at a glance the result of operation over a period of years. Some of these are reproduced on page 806. These graphs are neatly drawn on 8½-in. x 11-in. sheets of cross-section paper and are kept on file in the superintendent's office.

Portland Revises Merit and Demerit System

Infractions of the Rules Are Divided Into Four Classes—A Tabulation Is Given of the Offenses in Each Class

ON JAN. 23, 1918, the Portland Railway, Light & Power Company, Portland, Ore., put into effect a revision of its merit and demerit system for transportation employees. The former schedule had been in use for a number of years. The new schedule classifies infractions of the rules in four divisions, according to the seriousness of the offenses.

Class A covers disregard of rules and regulations of the milder kind, carelessness and poor judgment. In such cases the attention of the offender is called to the error or omission by the inspector, superintendent or other person in authority. Repeated offenses in this class or any undue accumulation of various offenses in this class, indicating general negligence or indifference, are subject to reprimand by the division superintendent, and if the practice is continued subject the offender to suspension for one day. The list of offenses under Class A follows:

Class A

Punching transfers improperly.
Accepting transfers improperly.
Carelessness in filling out transfer envelope.
Failure to cancel tickets and transfers.
Carelessness in taking out wrong transfers.
Failure to announce car-destination or transfer points.
Incomplete peak-load report.
Wrong train cards.
Signs displayed wrongly.
Carelessness regarding ventilation.
Carelessness regarding heating car.
Carelessness regarding lights.
Carelessness regarding signs.
Conductor riding inside car.
Failure to keep car reasonably clean.
Failure to keep platform and steps clean.
Slouchiness in appearance.
Rear curtain down.
Failure to report mail.
Headlight on rear end.
No sander or fender pin.
No pick-up rope or stick.
No link or pin.
No car replacer.
Failure to report car when storing in carhouse.
Power under circuit breaker.
Rear fender down.
Sliding wheels.
Throwing switch from moving car.
Too fast over special work.
Striking curves too fast.
Failure to test fender.
Failure to sound gong.
Failure to test hand brakes.
Starting or stopping car with jerk.
Raindrops on window.
Reversing motors unnecessarily.
Carelessness regarding use of sand or sand boxes.
Running with trolley off wire.
Trainmen off duty talking with motorman.
Failure to carry standard watch.

Class B covers the more serious and inexcusable infractions of the rules, regulations, etc. Offenses as listed in this class are subject to the following disciplinary procedure:

First time, caution by inspector.

Second time, reprimand by division superintendent.

Third time (or an undue accumulation of various offenses in this class), a minimum suspension of one day, the offender being also required to report to the superintendent of city lines who will consider the man's entire record and determine the disciplinary action to be taken.

While first offenses in this class are not entered on the individual's record at the general office, it is expected that cautions by inspectors will be respected by the men and accepted in the proper spirit. Inspectors, on the other hand, are instructed not to be arbitrary, over-bearing or overzealous in the performance of their duties. The detailed offenses follow:

Class B

Bunching fares.
Missing fares.
Taking wrong impression on register.
Leaving key in register.
Keeping tab on register.
Carelessness in making returns.
Failure to have necessary change.
Failure to give proper signal.
Failure to answer signal.
Delay in leaving terminal.
Carrying passengers beyond destination.
Carelessness regarding caring for lost articles.
Failure to read notices.
Entertaining lady friend.
Using profane language.
Ignoring transfer signals.
Reading paper when car is running.
Leaving car.
Carelessness in handling of car.
Passing at curve.
Passing on facing point of switch.
Failure to make safety stop.
Abusing equipment.
Carelessness in running through fog.
Following leader too closely.
Exceeding speed limit.
Carelessness when passing schools or fire stations.
Arriving at carhouse ahead of time.
Smoking while operating car.
Incivility.
Unnecessary delay.
Failure to assist in blockade.
Poor judgment in continually stopping for passengers when having a full load and followed by another car for same destination.

All cases of a decidedly serious nature come under Class C. The procedure is that a thorough investigation is made, after which the findings are submitted to the superintendent of city lines, who brings up each case at the weekly meeting of division superintendents. If the trainman is found to be at fault the minimum suspension will be as noted in the list under Class C.

Class C

Days Suspension	
1.	Starting without signal.
1.	Giving signal too soon.
1.	Starting on wrong signal.
1.	Derailing car carelessly.
2.	Collision with vehicle.
2.	Running into open switch.
2.	Failure to report derailment.
2.	Backing into car.
2.	Disregarding rule on derail switches.
2.	Disregarding rule on bridges.
2.	Disregarding rule on switching back.
2.	Conductor riding on front end of car.
2.	Leaving ahead of time.
2.	Running ahead of schedule.
2.	Leaving car.
2.	Running by passenger.
2.	Allowing passenger to step from moving car.
3.	Collision at switch.
3.	Collision at crossing.
3.	Collision at curve.
3.	Failure to flag crossing.
3.	Failure to stop at railroad crossing.
3.	Reckless running.
3.	Irregular fare registration.
3.	Delay in filing accident report.
6.	Failure to report accident.
6.	Running without permission of superintendent.
6.	Disregarding rule on block signals.
6.	Disregarding rule on protection of train.
7.	Rear-end collision.
7.	Head-on collision.
10.	Dishonesty.
10.	Refusing to obey order.
10.	Inexcusable accident.
10.	Drinking.
10.	Gambling.
10.	Unbecoming conduct.

The days of suspension have to be served at the foot of the extra list and not as a vacation, as the men are required to report once or twice a day without pay.

In addition to the classified offenses in the preceding three classes there is a fourth class, called Class D, which covers failure to report for duty. Failure so to report is penalized as noted below:

Class D

Previous to 10.00 a.m., reporting within thirty minutes after the regular reporting time, one day at the bottom of the extra list.

Failure to report within thirty minutes after the regular reporting time, but reporting at the next designated reporting time, two days at the bottom of extra list.

Failure to report at the first designated reporting time after having missed, but reporting at the second designated reporting time, three days at the bottom of the extra list.

One day will be added for each regular and designated reporting time that passes thereafter until the man receives ten days, which will be sufficient cause for his removal from the list.

After 10 a.m. reporting within thirty minutes after regular reporting time, two days at the bottom of the extra list.

Failure to report within thirty minutes after regular reporting time, but reporting at the next designated reporting time, three days at the bottom of extra list.

Failure to report at the first designated reporting time after having missed, but reporting at the second designated reporting time, four days at the bottom of the extra list.

One day will be added for each regular and designated reporting time that passes thereafter until he receives ten days, which will be sufficient cause for the removal from the list.

No trainman is considered excused unless his name is marked off on the working list.

Of course, continued disregard of rules or orders, disloyalty to the company or to the country, dishonesty and other very serious offenses are considered sufficient cause for discharge.

As with other companies individual records are kept of the performance of the men, and each man is permitted to have an abstract of his own record.

Welding Keeps Equipment Off the Sick List

R. L. BROWNE, engineer Metal & Thermit Corporation, presented a paper on welding with "thermit" before the New York Railroad Club at its meeting on April 19. The address was illustrated with lantern slides and moving pictures showing how machines of different types were welded and how the various processes of preparing the parts for welding, making the molds and preheating the members to be welded were carried out. Mr. Browne stated that the widest field for the application of this type of welding is found in the repairs to steam locomotives, but that electric railways are finding it very useful in rail welding. The greatest economies are produced in welding large parts, such as are used in connection with rolling mill equipment. Demonstrations of pipe and plate welding were given at the close of the meeting.

In the discussion of the paper, W. E. Simons, Wilson Welder & Metal Company, discussed electric welding and gave some figures to show the saving that could be obtained in metal and labor by using welded joints in sheet metal work instead of mutilating the plates by punching holes in them and then riveting the joints. A large field for sheet metal welding is in the construction of steel car bodies.

Coal Zoning Plan Embarrasses Railway

The Kansas City Railways is among the large coal users in its district seriously embarrassed by the zoning of coal distribution. The company had contracts with Illinois companies, service under which was embargoed on March 30. The company had about 25,000 tons of coal on hand, three weeks' supply. It is now receiving from Kansas mines just about enough to meet its daily demands. Any interference with this movement even this summer will cause a drain on the reserve. The Kansas coal is costing nearly $1 a ton more than the
is able only to get screenings so far.
coal cost under the Illinois contract, and the company

Commissions Without Power in New York

Rochester Decision of Court of Appeals Holds That Regulatory Law Is Defective as Regards Grant of Control Over Franchise Rates—Also Raises Doubt About Power of Legislature to Remedy Situation Owing to Constitutional Clause

THE decision of the New York Court of Appeals in Quincy *v.* the City of Rochester, a preliminary mention of which was made in the ELECTRIC RAILWAY JOURNAL of April 13, has now been released for publication. In this decision the highest court in the State rules that the public service commission law makes no provision for the regulation of rates fixed in franchises. Furthermore, although it expresses the impropriety of now deciding the point, the court intimates that in view of the constitutional requirement in New York for municipal consent to utility operation, franchise rates are unalterable except with municipal permission. The court thus raises the doubt whether the Legislature has power to grant relief from franchise restrictions.

STATUTORY RATES CAN BE CHANGED

After explaining the local details of the Rochester case the Court of Appeals takes up the question of whether the jurisdiction of the Public Service Commission is limited by the Rochester charter amendment of 1915 fixing a 5-cent fare.

On this point the court says:

"The policy of the State is said to be that the Public Service Commission should deal with the regulation of rates of fare charged by railroad corporations without limitation or restraint, and with the power to increase as well as decrease such rates. (People ex rel. N. Y. & N. S. Traction Co. *v.* Public Service Commission, 175 App. Div. 869; People ex rel. Ulster & D. R. R. *v.* Public Service Commission, 171 App. Div. 607,611; affd., 218 N. Y. 643.)

"The section [Section 49, subdivision 1, of the public service commission law], read as a whole, is susceptible of no other natural interpretation than that the Legislature has, for greater certainty, expressly included in its general delegation of powers, the power of the commission to reduce a maximum rate *fixed by the Legislature.* The purpose of the Legislature was to provide for the regulation of statutory fares by a board which may be expected to pass equitably upon conflicting claims with its single purpose the common good, even where a maximum rate had been fixed by the Legislature.

"The case of Willis *v.* City of Rochester (219 N. Y. 427) merely upheld the charter amendment as a constitutional exercise of the legislative power to fix rates. Rates so fixed by special statute are still subject to regulation by the Public Service Commission. The jurisdiction of that body over such rates is not to be reduced by implication. The Legislature merely fixed the rate *pro tempore.*"

In regard to the consent required by the Constitution the court states in part:

"The power of the local authorities to impose as a condition to giving consent to the construction and operation of a street railroad that a stipulated rate of fare should be charged has been repeatedly upheld. (People ex rel West Side St. Ry. Co. *v.* Barnard, 110 N. Y. 548; Kittinger *v.* Buffalo Traction Co., 160 N. Y. 377, 391, 392; Public Service Commission *v.* Westchester St. R. R., 206 N. Y. 209; People ex rel. Frontier Elec. Ry. *v.* City of North Tonawanda, 70 Misc. Rep. 91; Allegheny City *v.* Millville, A. & S. J. Ry., 159 Pa. St. 411.) But these cases dealt with the question of local power over the corporation and not with the question of general legislative power over the municipality. The question presented is this: The consent of the local authorities being obtained, what jurisdiction has the Legislature conferred upon the Public Service Commission to regulate rates by increasing the rate agreed upon without such consent?

"It has been held that the Legislature may, by virtue of its general power over municipalities, regulate the mode and manner in which the consent of the local authorities to the construction and operation of street railroads shall be given, and may regulate and limit by statute the conditions upon which it may be given. (Matter of Thirty-fourth St. R. R., 102 N. Y. 343; Beckman *v.* Third Ave. R. R., 153 N. Y. 144, 152; People ex rel. S. S. Traction Co. *v.* Wilcox, 196 N. Y. 212.) Regulations are so made in certain cases by the railroad law, Section 173, but that section expressly provides that nothing therein contained shall be construed as modifying or affecting the terms of the contract between the City of Rochester and the street railroad, and it looks to the future and does not attempt to regulate consents already granted.

THE CONSTITUTIONAL POINT INVOLVED

"The Constitution does not expressly provide that the municipality may irrevocably establish rates for the entire period of a franchise, and it has been held invariably and in a legion of cases that such power to establish rates is not essential to the consent of local authorities and will not be implied and that the Legislature is at all times supreme in the matter. (Home Telephone & Tel. Co. *v.* City of Los Angeles, 211 U. S. 265; Arlington Board of Survey *v.* Bay State St. Ry., 224 Mass. 463; State ex rel. Webster *v.* Superior Court, 67 Wash. 37; L. R. A. 1915, C. 287; State ex rel M. S. R. R. *v.* P. S. C., 168 S. W. Rep. 1156; City of Manitowoc *v.* M. & N. Traction Co., 145 Wis. 13; City of Dawson *v.* Dawson Tel. Co., 137 Ga. 62; City of Woodburn *v.* Public Service Commission, 82 Ore., 114; L. R. A. 1917, C 98; Collingswood Sewerage Co. *v.* Borough of Collingswood, 91 N. J. L.).

"In all such cases, the question was one of unrestricted legislative power, policy and discretion over a city or town where the local authorities were held to be mere instrumentalities through which the State exercised its sovereign power. The paramount power of the Legislature over the subject of fares was upheld in the absence of a constitutional limitation.

"But our Constitution, by requiring the consent of the local authorities, recognizes that our municipalities are *pro tanto* independent of legislative control, exercising some fragment of power, otherwise legislative in character, which has been thus irrevocably transferred by the fundamental law from the Legislature to the locality. The grant by the municipality of authority to use the streets is not a mere privilege or gratuity. Once accepted, it becomes a contract which neither the State nor its agencies can impair. (People *v.* O'Brien, 111 N. Y. 1.)

"It is urged by the appellant . . . that the Public Service Commission has no jurisdiction over the subject-matter of rate regulations in the city of Rochester because the Legislature has no power to alter the rates fixed by consent of the company and the local authorities. It is, however, unnecessary and, therefore, improper to decide at this time what the limits of legislative power are in this connection. The delegation of legislative power to commissions and other administrative officers and boards need not be assumed if the general words from which such delegation may be inferred are not reasonably so construed."

COMMISSION LAW IS DEFECTIVE

The court then states that the public service commission law and the railroad law deal with maximum rates of fare established by statute but make no reference in terms to rates established by agreement with local authorities. In the court's opinion, it is impossible to find a word in the statutes which discloses the legislative intent to deal with the matter of rates fixed by agreement with local authorities. The authority of the commission to regulate rates in such cases and thus to extinguish an undoubted power of the local authorities should fairly appear before it is assumed to exist. It follows that the Public Service Commission is without jurisdiction and that an absolute writ of prohibition should be awarded against it.

The court divided five to two on the question of the regulatory law being defective, but one concurring judge gave the opinion that the reserve police power of the Legislature had not been contracted away.

Financial Relief Is Blocked

Court Decision Destroys Most Fare Increases in New York—Cuts Off General Relief on Most Pending Applications

SINCE the foregoing decision of the Court of Appeals in the Rochester case was handed down on April 5, the death rate among electric railway fare increases in New York State has been terribly high. Up to the time of the decision the Public Service Commission for the Second District of New York had received thirty-one applications and had granted ten increases. Six other cases were reaching their final stages. Most of the cases, however, have not been able to stand the shock of the decision.

SEVEN OUT OF TEN INCREASES ANNULLED

The first announcement of the commission after the decision was to the effect that the 6-cent fares authorized for the Hornell Traction Company, the Ithaca Traction Corporation and the Orange County Traction Company were apparently not affected. The Waverly, Sayre & Athens Tranction Company, however, had voluntarily withdrawn its 6-cent schedule.

To four other companies that had since about Dec. 1, 1917, received permission to charge higher fares, the commission issued orders to show why the increases should not be annulled. Three companies, the Glen Cove Railroad (6 cents), the Northport Traction Company (6 cents) and the Huntington Railroad (6 cents), did not appear on the return of the orders but restored their 5-cent fares. New tariffs were filed on April 18.

The fourth company, the Hudson River & Eastern Traction Company, objected at the hearing to the revoking of the order permitting it to charge a 7-cent fare. Counsel for the company argued that its franchise did not come within the prohibition of jurisdiction set by the Court of Appeals. Decision was reserved by the commission, and a few days later the company filed a tariff announcing a reduction to the old 5-cent rate.

Two other fares of 7 cents had been granted, in the cases of the Peekskill Lighting & Railroad Company and the Putnam & Westchester Traction Company. These cases had been reopened last February, partly on the ground of a franchise fare restriction, and after the Court of Appeals finding the commission reserved decision. The Peekskill company, however, has filed a 5-cent tariff.

MOST OF PENDING APPLICATIONS INVOLVE FRANCHISES

The commission also sent out notices for a public hearing on April 18 on the pending petitions of twenty-one electric railways. The companies included the following:

Albany Southern Railroad.
Auburn & Syracuse Electric Railroad.
Corning & Painted Post Street Railway.
Elmira, Corning & Waverly Railway.
Elmira Water, Light & Railroad Company.
Empire State Railroad Corporation.
Fishkill Electric Railway.
Geneva, Seneca Falls & Auburn Railroad.
Hudson Valley Railway.
Kings Consolidated Railroad.
New York & Stamford Railway.
New York State Railways.
Schenectady Railway.
United Traction Company.
Westchester Street Railroad.
Syracuse & Northern Electric Railway.
Empire United Railways, Inc.
Rochester, Syracuse & Eastern Railroad.
Buffalo, Lockport & Rochester Railway.
Poughkeepsie & Wappingers Falls Railway.
Buffalo & Lake Erie Traction Company.

At the hearing Charles E. Hotchkiss, New York, N. Y., representing the carriers, stated that all legal remedies had not yet been exhausted, and that there was under consideration an application for a reopening of the decision in the Rochester case. He suggested that the commission in the meantime reserve decision as to the dismissal of the various applications.

The petitions were then taken up one by one, to ascertain the franchise questions involved. The Buffalo & Lake Erie Traction Company said that there are some fare restrictions and asked that the case be set down for April 29. The Albany Southern Railroad's application was set down for April 25. The corporation counsel of Rensselaer said he desired to introduce the village franchise.

The Corning & Painted Post Street Railway stated that there are fare limitations in Corning and Painted Post. On the Elmira, Corning & Waverly Railroad there is one franchise limitation, and it was asked that the case be held for hearing on notice. The Elmira Water, Light & Railroad Company said that there are no franchise restrictions.

The Empire State Railroad Corporation testified to seemingly no rate restrictions in Oswego, Fulton, Syracuse and Auburn. The Fishkill Electric Railroad has no restriction as to fare. There was no appearance for the Geneva, Seneca Falls & Auburn Railroad.

The Hudson Valley Railway asked that the case be continued with privilege to file an amended petition. It was said there are two instances of fare restrictions, in Saratoga Springs and Glens Falls. City representatives claimed the existence of a fare restriction in Fort Edward.

The New York & Stamford Railway stated that there are some fare restrictions and some modifications of the franchise agreements. Port Chester representatives stated that there is no question but that the Court of Appeals decision applies to that village. This case had been started before the commission, and after several franchises had been introduced by villages interested, the commission declared the case closed. City counsel asked for a reopening of the Poughkeepsie & Wappingers Falls Railway's application in order to submit a franchise limiting the fare. The request was granted by the commission. This case had been closed but not decided.

The Schenectady Railway said that there are some franchises with limitations and asked leave to withdraw its application. The corporation counsel of Albany asked to have the application of the United Traction Company continued with leave to amend the petition. The Court of Appeals decision, he said, does not dispose of the case. The corporation counsel of Troy averred that there are a number of franchise restrictions on the company's lines in Troy.

The Westchester Street Railroad testified to a multiplicity of franchises and some restrictions, and asked that the case be reserved. The Syracuse & Northern Electric Railway said that it operates in Syracuse under a traffic agreement. This also applies to the Rochester, Syracuse & Eastern Railroad and in Rochester to the Buffalo, Lockport & Rochester Railway. Some restrictions exist in the case of the Auburn & Syracuse Electric Railroad.

The Kingston Consolidated Railroad Company is probably affected on one division, and there was a request to hold the case open. The New York State Railways stated that Syracuse is not involved in the court decision. There are some franchise restrictions in Oneida and on one or two lines in Utica. Little Falls seems to have a franchise restriction, but there is none in Rome.

The hearing, therefore, served to establish the fact that most of the pending applications, in whole or in part, involve franchise rates. Only three companies asserted that no franchise limitations upon fares exist. In the case of the United Traction Company, there seem to be no franchise limitations for its Albany lines, just as there are none for the Syracuse lines of the New York State Railways.

Conference on War Topics

Southwestern Association Has Two-Day Conference Instead of Usual Convention—Thorough Study to be Made of Possibilities of Using Texas Lignite as Fuel

THE fourteenth annual convention of the Southwestern Electrical & Gas Association was held in Galveston on April 15 and 16, but, on account of war conditions, the executive committee arranged for a "conference" rather than a convention. All public entertainment was cut out, the convention was limited to two days, and few formal papers were read. The program of the convention in all three of its sections, namely, gas, railway and electric light and power, was arranged to include a discussion of the topics made most important by war conditions. These topics were, as a whole, fuel, labor-saving machinery and apparatus, the general labor question, legislation and methods of increasing net earnings either by increased rates or decreased costs of operating.

While the attendance was not—and was not expected to be—as large as at previous conventions, more than 150 members were in attendance.

The association decided that it would held local meetings of the chairmen of the three sections three times per year, in different portions of the State, and invite the attendance of all adjacent members. This arrangement will virtually have the effect of three sub-conventions held during the year, located geographically so that the distance to be traveled by each member will be quite small. These meetings will occupy only one day each.

The only other actions taken were the decision to appoint a committee—the names not yet determined—to investigate and report on the use of Texas lignite both as a fuel and for gas making, the researches to be made in conjunction with the University of Texas, and the appointment of another committee to investigate the establishment by the association of two or more post-graduate scholarships on chemistry and electricity at the University of Texas so that the problems of fuel, lubrication and water purification may be under continual research at the University and their results accessible at any time to any of the members of the association. In his annual address President Morris said, in part:

PRESIDENT'S ADDRESS

"We of the utility business are behind other manufacturing and distributing plants in the use of labor-saving machinery. With the sole exception of firing our boilers we have been plodding along with the same proportion of labor to our output as we have for years past. It is true that we have greatly increased the size of our generating, transmitting and distributing units, and have thus indirectly decreased the proportion of labor to output that has been in most cases a resultant not fully considered in the investment because the reason has been to obtain greater efficiency and economy in our apparatus. If by the expenditure of $500 we make a net saving of only 10 cents per day in labor we have made an annual saving of $36.50, a sum which is more than 7¼ per cent on the investment. To make this saving is almost as good as to buy a Liberty Bond and nearly as patriotic, for we have released nearly $40 worth of actually useless labor, and as the government is in serious need of labor at this time every cent's worth wasted is a crime.

"The question of fuel in Texas is a complicated matter, because we have four fuels locally available—coal, lignite, natural gas and oil. The distances in the State are so great that freight and pipe line costs are a large factor. The necessities of the national government are such at this time that not only the mine prices have been raised on coal, but freight rates in some cases have been advanced. It seems probable that the use of oil as fuel may be still further restricted in the future to an extent which will make it too costly or too uncertain for the use of public utilities.

"There has come at least one bright spot in the gloom surrounding the public utilities at this time and that is the recognition which they have received at the hands of the government. No one can read the letters of our President and our Secretary of the Treasury or the reports of the Comptroller of the Currency and not feel that our efforts have not been fully appreciated."

OFFICERS ELECTED

The officers for the ensuing year elected were president, W. A. Sullivan, general manager Shreveport Railways; first vice-president, Burr Martin, general manager Texas Electric Railway; second vice-president, E. S. Fletcher, assistant general manager Texas Power & Light Company; third vice-president, A. Hardgrave, vice-president Marshall Electric Company; secretary, H. S. Cooper; treasurer, J. B. Walker.

The executive committee is made up of the president, vice-presidents and H. C. Morris, R. Meriwether and W. B. Head, Dallas; J. C. Kennedy, Brenham; S. R. Bertron, Jr., and F. D. Murphy, Houston; F. J. Storm, Amarillo; W. B. Tuttle, San Antonio, and G. H. Clifford, Fort Worth. The usual advisory committee was also elected.

V. W. Berry, Northern Texas Traction Company, Fort Worth, was appointed chairman of the railway section for the ensuing year.

New Four-Motor Multiple-Unit Cars at Dayton

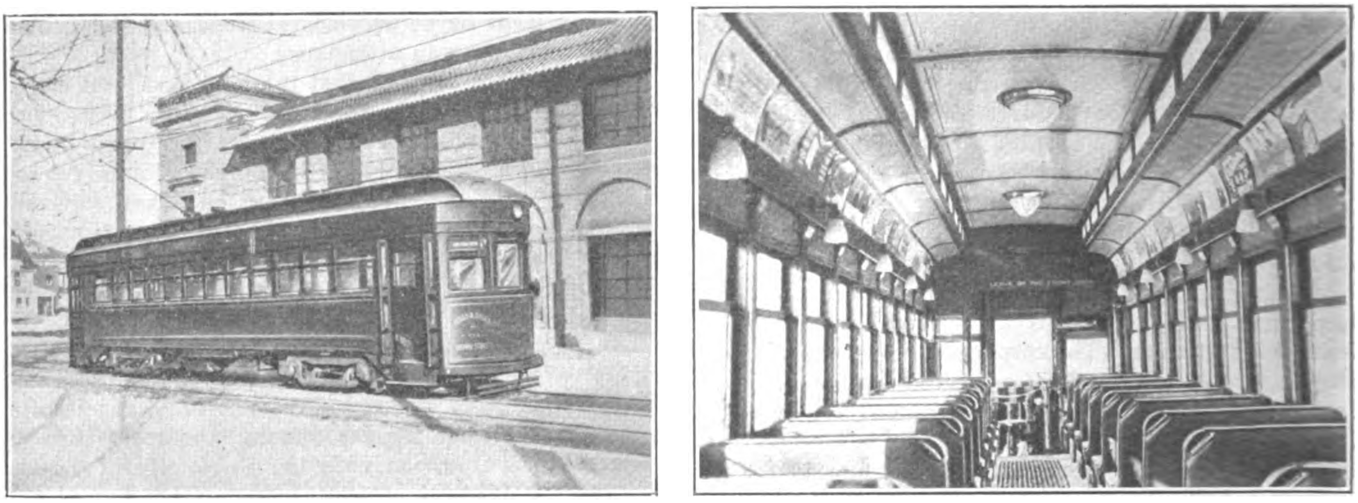
Oakwood Street Railway Builds New Cars for Train Operation Equipped with Safety Devices of Home Design

THE Oakwood Street Railway, Dayton, Ohio, has recently built in its shops five double-truck, multiple-unit passenger cars which in many respects are quite similar to other double-truck equipment built by this company. The new cars are 44 ft. 9 in. long overall, 8 ft. 3 in. wide and seat forty-four passengers. They are of wood construction with steel underframe and steel sheathing, and have the appearance of very heavy cars for city service. They actually weigh a little less than 19 tons each complete. Experience with somewhat similar equipment convinced the company that the long life of a conservative car would more than offset the economies afforded by an extremely lightweight car.

Four-motor equipments were chosen on account of a stretch of track which contains a number of curves and heavy grades. On more than a mile of this the average grade is a little over 6 per cent and the maximum 8½ per cent. The motors are Westinghouse 323-V with HL unit-switch, multiple-unit control. The cars are now being operated singly, as they are not yet equipped with electrical couplers. General Electric straight air brakes, with the automatic feature, are used, with compressors of the CP-27 type.

The cars are equipped with standard C-50-P trucks having a 6-ft. 1-in. wheelbase and 30-in. rolled-steel one-wear wheels arranged for inside-hung motors. The distance between truck centers is 22 ft. the trucks being placed as far apart as possible to give the car an easy riding quality. The 20-in. wheels give a 12-in. height for the first step, and 11-in. steps to the platform and from the platform to the car floor. The floor is ramped 2½ in. in 5 ft. at each end of the car.

The door-operating mechanism and door-signal system is of the company's own design and make. Hand operation is used, the front or entrance doors being controlled by the motorman and the rear doors by the conductor. It is so provided that the doors on both



EXTERIOR AND INTERIOR VIEWS OF NEW MULTIPLE-UNIT CAR FOR OAKWOOD STREET RAILWAY sides of the car can be controlled from the conductor's position, in order that on the second car of a two-unit train the front doors can be used for both entrance and exit. In the design of the door-operating mechanism, the main object was to eliminate all unnecessary apparatus and to provide all possible space over the life guard by placing as few parts as possible under the platform. With the equipment used only one of the double doors is operated from beneath the car. This door transmits motion to the step through a set of small bevel gears and operates the second door with sprocket and chain across the top. The doors are not interlocked with the control circuit, but with the cars operated either singly or in trains a signal lamp mounted in front of the motorman gives him a clear indication when all the doors are closed and a red light when either door is open.

The illuminated destination signs and the fare boxes used are also of the company's own manufacture. The fares are dumped into a hopper by means of a foot treadle and no register is used. This leaves the conductor's hands free to issue transfers, tickets and change and gives him additional time to inspect fares. There is an advantage in this as the tickets of five additional companies are honored.

The seats were furnished by Hale & Kilburn, ten crosswalk-over seats on each side and two box longitudinal seats in opposite corners, the spaces opposite the cross seats being open to allow easy entrance and egress of passengers. The electric heaters, controlled by thermostats, and the passengers' buzzers are furnished by the Consolidated Car Heating Company. The lighting system consists of three hemispheres in a deck, each containing two 23-watt Mazda lamps, and six lamps of the same size on each side mounted on wall brackets and provided with shades.

Radial Trucks for Power Saving and Better Riding

THE practicability of the radial truck, particularly for medium-length cars, has been demonstrated now in quite a number of installations. A recent example is that of the Hutchinson (Kan.) Inter-Urban Railway which in 1917 equipped the car shown with a radial truck from the Philadelphia Holding Company. The car exclusive of trucks weighs 10 tons and is 33 ft. long over all and 21 ft. over the corner posts. It was found that a car of this weight and dimensions could not be handled properly by the original trucks of 7-ft. 10-in. wheelbase. So much oscillation developed in fast running that the front wheels would leave the rail entirely and take out across country.

INTERURBAN CAR EQUIPPED WITH RADIAL TRUCKS

James E. Humbert, general manager of this railway, reports that since installing the radial truck the car rides like a double-truck car over the roughest sort of special work; runs at maximum speed on interurban track without trouble; uses less energy, takes the shortest curves and binds so little that it will start on the first point from a dead stop in the middle of a 45-ft. radius curve.

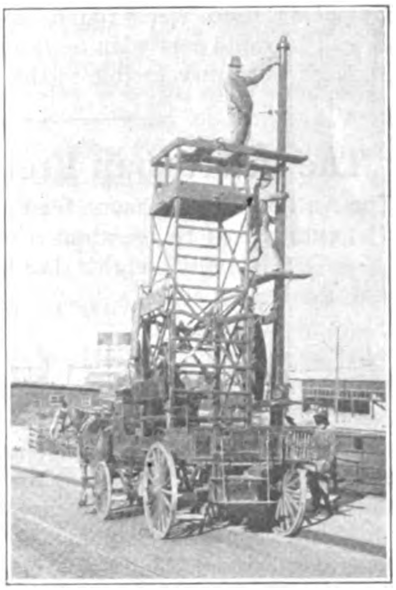
Pole Painters' Tower Wagon With Three Platforms

Cheaper Labor Can Be Used on a Safe Structure—Through Use of This Wagon Much Time Is Saved and Accidents Are Prevented

BY S. L. FOSTER

Chief Electrician United Railroads of San Francisco

IN ORDER to paint iron poles expeditiously the United Railroads of San Francisco equipped one of the ordinary Trenton two-section tower wagons for this work. The swinging leaf was removed and the top of the tower was provided with a floor and railing on which were mounted two sliding boards for the topmost man. These boards can be pulled out on either side of the wagon to permit reaching all sides of the pole. The second man from the top is provided with a single adjustable hinged platform with movable projecting arm on which he can stand in getting at his part of the pole. This platform is supported by hinged iron struts without bolts or nuts. The third man from the top has a similar hinged platform but it is suspended by chains. The fourth man, the foreman of the crew, paints his part of the pole standing on the ground and attaches the conspicuous "Paint" sign on the finished pole in addition to his usual duties of supervision.



POLE PAINTERS AT WORK WITH TOWER WAGON, UNITED RAILROADS OF SAN FRANCISCO

After each man has brushed, scraped, sandpapered or chipped his part of the pole as conditions require and has painted it, the top man steps back onto the top of the tower and withdraws his two boards from around the pole. The second man steps down onto the front of the wagon back of the driver's seat and assists the third man to drop the second platform and lift up the third platform until it lies against the tower. Here it is fastened securely by a hook in a link of the chain suspension. There are platforms on either side of the tower for the two intermediate painters.

With this method of painting there is no climbing up and down ladders as succeeding poles are painted. There is a minimum of danger of men falling and ladders slipping or being struck by outsiders or vehicles as the men have stable platforms to stand on. A cheaper class of workmen can also be employed on such a safe structure.

The time occupied in painting one 30-ft., 5-in., 6-in., 7-in. tubular pole is usually not more than six minutes on second coating work.

Before this tower passes along the pole line all of the poles have their bases scraped and painted with red lead for a foot or more. This red-leading of the pole bases is done by one man on foot who precedes the tower crew by a week or more.

When workmen are painting poles, all metal parts in their reach are covered, including crossarms, iron pins, pole bands, iron links and the make-ups of the stranded span or guy wires.

All ornamental cast-iron rings at joint insertions and all cast-iron base castings were broken off the iron poles in San Francisco years ago and the use of such accessories was dispensed with except on two main streets where elaborate cast-iron ornamentations were recently installed for franchise reasons. The ornamental rings previously used were found to harbor moisture and to lead to rapid corrosion of the pole, while their inside surfaces were inaccessible to the painters.

The Interurban Freight Terminal

The Author Cites Reasons for Congestion at Terminals and Makes Suggestions for Improvement of Electric Freight Handling Methods

By THOMAS B. MCMATH
Chief Engineer Indianapolis Traction & Terminal Company, Indianapolis, Ind.

INTERURBAN freight handling differs from steam railroad freight handling in several ways. Steam roads have a great number of cars available, and they permit the freight to remain for a considerable time in the car, which need not be set at the freight house until it is convenient to unload it. There are always several cars available at the platform for loading material bound for as many destinations. Congestion in the freight house can largely be avoided by a systemmatic and careful agent.

Interurban freight cars, on the other hand, are not numerous, and the trains seldom consist of more than a motor and a trailer. The fact that the motor car, and generally the trailer also, must be loaded and unloaded on schedule imposes the most impressive difference from steam railroad practice.

An ordinary freight car makes about 25 miles per day, due to the time spent in yards and the great time allowance for loading and unloading, while interurban freight car mileage must be about 120 per day.

If freight is offered at the interurban freight house throughout the day, it must be placed on the floor until the train arrives and is unloaded. All freight offered after the train leaves must be held for the next train. This requires a greater amount of floor space than in steam railroad practice. The house floor space should be approximately four times the car floor area. The floor area, therefore, in an outbound freight house open all day to receive freight should be not less than double the car floor area of all the cars to be loaded during a day at that house. This is assuming that but one freight shipment per day is available to any destination, and that this train remains only two hours to unload and be reloaded.

Inbound freight presents a worse condition in that it remains on the floor twice as long as the outbound freight and requires twice the floor space of the latter. The problem of handling inbound freight depends largely upon the rapidity with which the consignee calls for his shipment, and this is largely beyond the power of the agent to control or regulate. The investment in freight terminals for interurban roads is so great in proportion to the tonnage handled that it seems to be a mistake to follow the customary methods of handling. It is considered prompt if freight is removed from a steam railroad terminal in forty-eight hours, but in most cases the road has consumed the time of at least three or more days in transporting it. Comparing this with forty-eight hours to remove freight from a car that was loaded, taken to the destination and unloaded in six or eight hours, as on an electric railway, it will clearly be seen that forty-eight hours' free time given in an interurban freight house to unload a car is desperately slow. In proportion, only five and one-third hours' free time should be allowed. The customary time allowance is not giving the interurbans fair treatment and is depriving many customers of service that would be available if the hauling could be speeded up.

It seems that the English freight system has features to commend it and should be adopted. This consists of making the freight delivery direct to the consignee by having a transfer company take the inbound freight direct from the car or freight house to the place of business of the consignee—in other words, the service which is done in the United States by express companies. This transfer company could also call for outbound freight, and thus by giving attention to train schedules, could save time and floor space loading. This change in the system for handling freight has been considered by the War Council at Washington, and it is to be hoped that some favorable conclusion can be reached.

The present congestion in freight of the steam roads has thrown freight to the interurbans that is overtaxing their facilities to such an extent that efficiency in handling is out of the question. Large increases in facilities are financially impossible, but the remedy just suggested would permit an increase of 30 per cent in efficiency, without requiring any expenditure of capital and should be applied. The hardship to the customer in depriving him of the privilege to haul his own freight at his convenience would be more sentimental than actual. The benefit to the community in the increase in freight capacity and the shortening of the time of freight in transit would surely compensate for this loss in the privilege of delay in unloading.

It is also probable that such a system of freight delivery would decrease freight claims very materially, as shortage and breakage would be known immediately,

Will Regulation Meet New Needs?

Commission Counsel Raises Question Whether Municipalities Are to Pass on to Extension of Control Over Utilities

IN AN ADDRESS recently delivered before the Boston Chamber of Commerce, William L. Ransom, counsel Public Service Commission for the First District of New York, discussed various aspects of the relation between municipalities, electric railways and the public. Besides relating some of the experiences in New York City in connection with rapid transit construction and operation, he raised some important questions in regard to the future of public utility regulation.

According to Mr. Ransom, the electric railway industry has to meet increasing costs of operation, and the question is squarely raised whether the system of commission regulation and municipal franchise requirements, based upon the idea of curtailing rates and augmenting service, can be made now to operate flexibly in the opposite direction. Will the public wish intraurban fares to be raised, or will they seek an extension of municipal development in preference thereto? In Mr. Ransom's opinion, the country has a regulatory mechanism adapted to the disposition of complaints when made, rather than to constructive, affirmative, anticipatory handling of public utility problems.

As far as the legal barriers are concerned which stand in the way of the flexible working of regulation, Mr. Ransom conceived that they can be overcome, perhaps tardily but eventually, if the period of rising costs is prolonged and patriotic needs are found to require some abridgment of service. He believed, however, that the acceptable solution of this question of power is far from assurance that a plan of public control devised to protect the public from rates too high will prove a practicable means of protecting the public from rates so low as to destroy the capacity of the companies to serve the public in an adequate way.

PUBLIC CANNOT CONTINUE INDEFINITELY TO GET SOMETHING FOR NOTHING

The question whether a 5-cent fare should be continued on urban transportation lines is not, in the last analysis, one of public or private ownership. Mr. Ransom averred that no change in either ownership or operation can alter an economic formula of relationship between fares and expenses. The public cannot permanently get something for nothing or a public service long for less than cost, under any plan of ownership, operation or control that has been or can be devised. The cost of furnishing service must be borne either wholly by the fare-paying passenger or partly by the fare payer and partly by the taxpayer.

In regard to the surface lines in New York City, Mr. Ransom stated that these will never fulfill their function except as they are co-ordinated with the rapid transit lines on some basis protecting the public from the taking over of deteriorated and unnecessary properties at excessive cost, and then are radically readjusted and reorganized to meet their place in a modern transit plan.

Not later than the close of the war, in his opinion, will come the starting of plans for additional transit lines, into which the surface lines will be closely linked, and also an agitation for new contracts, in which the principal of municipal development and municipal responsibility will be much further extended. Moreover, the transportation utilities will be more closely correlated with the supply of such services as light, power and heat, for the better distribution of non-peak uses, greater economy in central station use of fuel and greater stability of supply to essential industries.

In closing, Mr. Ransom remarked that "the defiant manager of medieval cast of mind and the meticulous lawyer with his ignorance of the past ten years of judicial decisions are giving way to the remedial expert—the broad-minded specialist in public point of view—who faces facts unflinchingly, seeks points of agreement rather than divergence, realizes that controversies carry no passengers and would prefer a plan of operation to a law suit." This is as it should be stated Mr. Ransom, for the public utilities of to-day call for the highest qualities of constructive statesmanship.

(*Concluded from page 816*)

and while it is still possible to place the responsibility and apply preventive remedies. Stealing might also be materially lessened if shortages were promptly noted.

If the business address of the consignee was put upon all bills of lading, and the acceptance of freight was made dependent on such address, the trouble in sending out notices as under the present conditions would be greatly decreased. Notices could be mailed immediately upon receipt of the shipment, and, if desirable, notices of bulky receipts could be made by telephone to help relieve congestion. As a concrete suggestion for improvement, why not require the receiving agent to make out a postal card notice simultaneously with the original way-bill? These cards could follow the shipment in the hands of the conductor, and the receiving agent would simply have to apply postage and mail the cards immediately on arrival of the car.

An increase in the number of trailers would not be prohibitive. This might permit a more frequent service to major towns in carload lots, instead of loading all on a local freight train. These steel cars could be loaded at the convenience of the agent, and similarly unloaded at their destination. They could be hauled behind passenger trains and set out at their destination with a minimum delay to passenger service.

KEEP DRIVEWAYS CLEAR

The driveways provided for vehicles are generally entirely inadequate and materially slow down the rate of freight movement when congested. The agent, of course, is not apt to consider the raising of such blockade as a part of his duty, especially since it affords some relaxation for an overtaxed set of men in the freight house. Interurban freight house design should provide driveways wider than for a steam road house of the same dimensions and should always include a separate exit.

A comprehensive study of the freight problem by those interested should indicate other possible economies and means to greater efficiency, which could be used to the ultimate benefit of both customer and carrier.

Massachusetts Suburban Lines Losing

Commission Chairman Says that the Experiment of Extending City Service into Country Districts Has Been Disastrous

THERE is little doubt that the suburban and interurban service in Massachusetts has for a long time been furnished for less than its legitimate cost, in the opinion of F. J. Macleod, chairman Massachusett's Public Service Commission. Mr. Macleod expressed such a belief in an address on April 8 before the Economic Club of Brockton.

According to the speaker, electric railways in Massachusetts have undertaken the disastrous experiment of trying to extend to the country districts the ordinary type of city service. About the only company of the purely interurban type is the high-speed line formerly known as the Dartmouth & Westport, which is now consolidated with the Union Street Railway and operated on a private right-of-way between Fall River and New Bedford. That line has proved exceedingly profitable, and it may be that similar lines could be successfully operated between adjacent cities in other parts of the Commonwealth.

But the type of interurban transportation which is commonly furnished in Massachusetts, Mr. Macleod averred, has proved a serious drain upon the financial resources of the companies in the past, and it is extremely doubtful that it can be made profitable under any scale of rates. It may be possible to increase substantially the present revenues from these lines by placing their rates on a mileage basis, but so long as they operate an irregular and undependable service over public ways at a speed of 10 or 12 m.p.h. they cannot expect to charge railroad rates and compete successfully with present interurban railroad service.

Undoubtedly a serious error of judgment was made by those who conceived and carried out the various schemes of consolidation resulting in the present hybrid and diversified electric railway systems in Massachusetts. Their delusion, however, was a common one during the era immediately following electrification. Moreover, the policy pursued by the companies received not only the approval but the active encouragement of the Legislature and other public authorities.

Up to the present time, Mr. Macleod said, the lines operated outside of the thickly settled urban districts have been run at a substantial loss, and their continued operation has been possible only because their operating deficits have been met out of funds needed for maintenance and depreciation charges on city lines. The deficiency has been made up at the expense of the properties and of the investors. Such being the situation, the practical question arises as to what is going to be done about it.

The first problem is to determine whether all existing electric railway facilities are to be preserved. There is no doubt that a considerable portion of the present railway mileage in Massachusetts cannot be made self-supporting by any possible increase of rates. The fact that a line ought never to have been built, however, does not necessarily mean that it can now be abandoned to advantage. If a line earns enough to pay the additional operating cost and a return upon the salvage value of the property, there is no financial gain in abandoning it, even if it must remain to some extent a drag upon the remainder of the system.

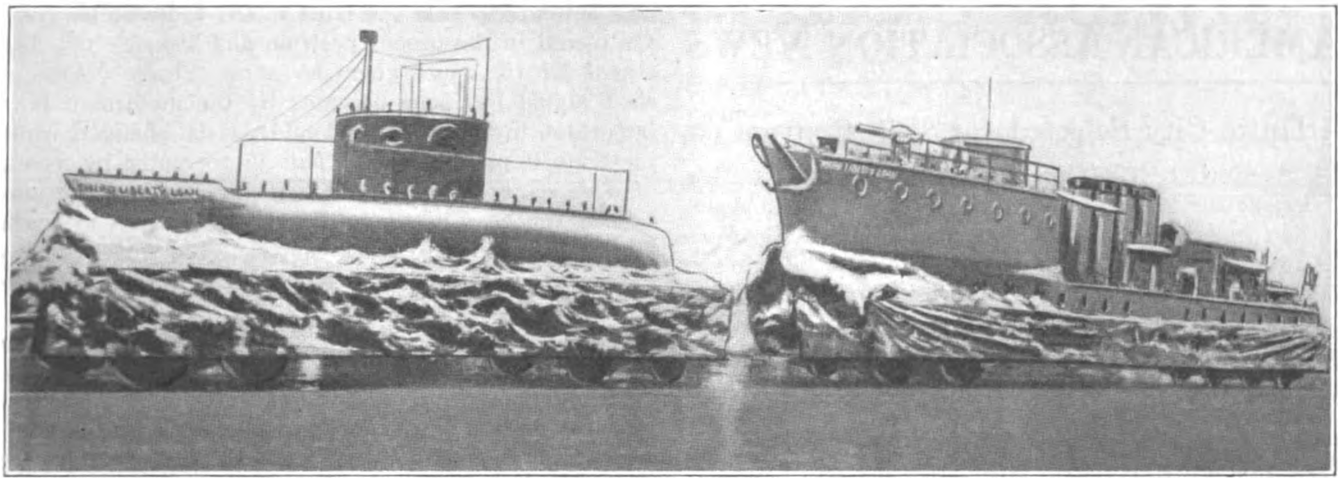
Where lines do not now earn and cannot be made to earn even that amount of revenue—and there are a large number of lines of that character—Mr. Macleod believed that the company can neither be forced nor reasonably be expected to carry such lines any longer at its own expense. If they are to be retained, the loss in operation must be met either by a direct contribution from the communities served or by a higher rate of fare upon the more prosperous lines. That is not a problem as between the company and the public, but one involving the difficult task of determining a proper distribution of the benefits and the burdens of transportation as between different communities served by the same system. In any event, the proper cost of the service which is retained must in some way be borne by the public.

NO DEFINITE STANDARD FOR MANAGEMENT

In the practical application of this principle, Mr. Macleod said, it is necessary to determine to what extent the actual expenditures of the company represent the legitimate cost of operation. In making this determination it is necessary to eliminate all return upon watered stock or other speculative securities, the interest upon indebtedness representing wasteful or improper expenditures, and losses due to mismanagement or inefficiency of operation, all of which should rightly be charged against the stockholders. This is the most difficult problem in regulation because of the absence of any definite standard which could be used as a basis for determining mismanagement or inefficiency. Continuing, Mr. Macleod said:

"Electric railway managers, like all the rest of us in our own business affairs, may have made honest and carefully considered decisions which for the moment seemed to be wise, but which in the light of experience have proved to be mistaken. It is easy to be wise after the event, but it is given to no man to read the stars and guess the riddle of the future. The fact, therefore, that an electric railway has made mistakes is not in itself a proof of mismanagement. It must have sinned against the light and gone ahead with the danger signal brightly burning. Just where the line is to be drawn between justifiable error and mismanagement must remain in many cases a question of individual judgment and discretion, upon which honest men may reasonably differ."

No increases in rates, Mr. Macleod said, should be allowed unless the legitimate need of such increases is clearly demonstrated. Any attempt on the part of the companies to force unwarranted and arbitrary increases should be vigorously resisted, both by the commission and the public at large. On the other hand. if an increase of rates is shown to be just and reasonable in order to respond to the increased cost of operation, there is no sound reason why it should provoke any greater resentment than the higher prices the public is obliged to pay at the present time for practically everything else. Electric railway service, judged by any reasonable standard of relative values, is the cheapest thing in the market to-day.



FLOATS MOUNTED ON TRUCKS OF UNITED RAILWAYS, ST. LOUIS, AND USED IN THIRD LIBERTY LOAN DRIVE

Boosting the Third Liberty Loan

THE electric railways of the United States are behind the Third Liberty Loan to the last ditch. Many of them are in dire straits financially, but when it comes to backing Uncle Sam in this world conflict, and standing behind the boys in the front-line trenches, the railways are there as a unit.

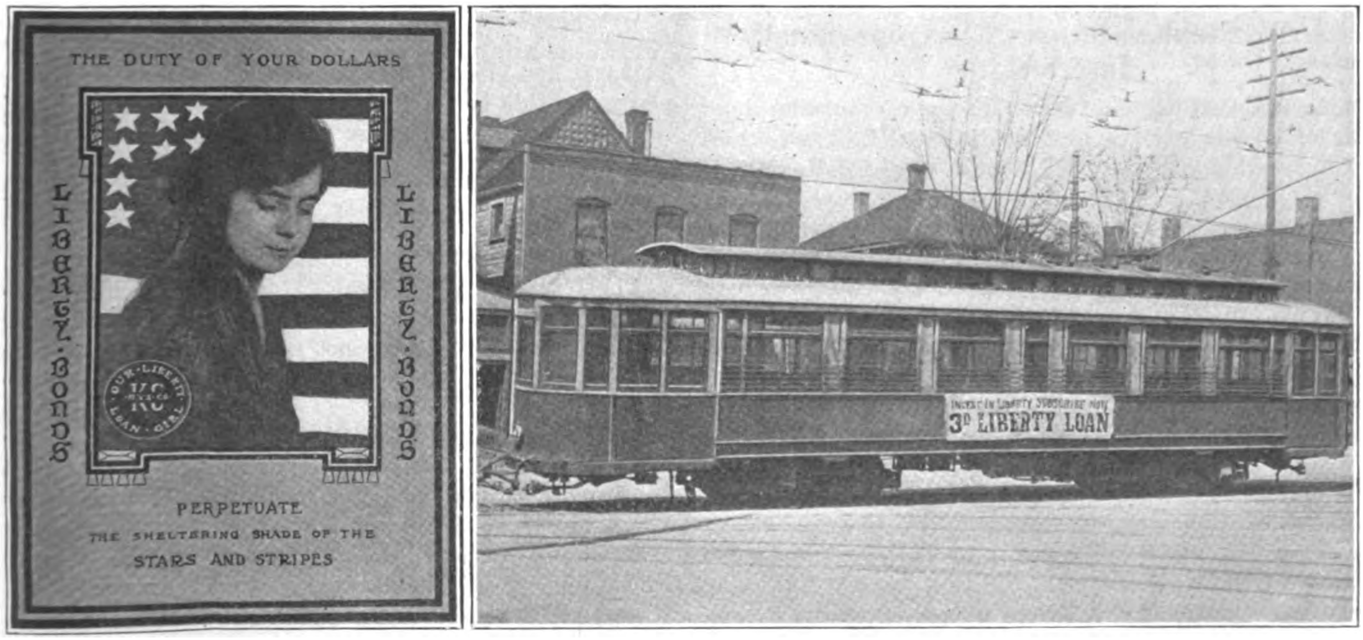
Examples of patriotic co-operation in the Third Liberty Loan campaign are shown in the accompanying illustrations. One is a cover design of the Kansas City *Railwayan,* the weekly publication of the Kansas City Railways; another shows the advertising carried by the city cars of the same company, while the third is a pair of floats mounted on trucks of the United Railways of St. Louis.

This and the preceding Liberty Loan campaign have demonstrated the value of electric railway company publications of one kind and another in spreading information, kindling enthusiasm and inducing definite action. A model use of such an opportunity was the letter on the loan by General Manager A. D. Mackie, which occupied the first page of last Saturday's *Springfield* (Ill.) *Utilities News.* It was addressed to employees but its appeal is to a wider circle.

An attractive feature of a recent issue of the *Railwayan* was the following acrostic:

Liberty for all.
Integrity of home.
Buy victory—Buy "war savings" and "thrift" stamps.
Every miser helps the Kaiser.
Raise your quota to make up for the dollar slacker.
Two bits a day—the patriot's way.
You cannot act as though we were at peace.

Lend your money to Uncle Sam.
Others give their lives! What will you give?
America needs your help! Be true to democratic principles.
No power can stay a German victory but real sacrifice.



PATRIOTIC COVER OF THE "RAILWAYAN" (K. C. RYS.) AND BANNER MOUNTED ON SIDE SHEATHING OF CITY CARS OF SAME COMPANY

AMERICAN ASSOCIATION NEWS

Atlantic City Selected for 1918 Convention

AS ANNOUNCED on the editorial pages in this issue the annual convention of the American Association and the affiliated associations will be held at Atlantic City, N. J., during the second week in October. There will be no exhibits. According to the tentative program so far prepared, the American Association meeting will open on Tuesday afternoon, Oct. 8, and close on Wednesday afternoon. The affiliated associations will meet Wednesday and Thursday mornings.

The Engineering Association committee on program, consisting of Martin Schreiber, Newark, N. J., chairman; E. R. Hill, New York City, and C. L. Cadle, Rochester, N. Y., met in New York on April 18 and prepared a tentative program. This was presented on April 19 at a meeting of the Engineering Association executive committee. The executive committee of the Transportation & Traffic Association also met on April 23 for the purpose of planning a program. Neither this nor the engineering program will be announced for some little time as conditions in the field are so variable as to warrant a postponement of the final plans. It was decided that in neither of these associations will any of the regular committee work be taken up for the present.

The T. & T. Association committee meeting was attended by L. C. Bradley, Houston, Tex.; W. H. Collins, Gloversville, N. Y.; R. P. Stevens, Youngstown, Ohio; L. H. Palmer, Baltimore, Md.; J. J. Dempsey, Brooklyn, N. Y.; H. B. Potter, Boston, Mass., and E. B. Burritt, New York City.

Those at the Engineering Association committee meeting were F. R. Phillips, Pittsburgh, Pa.; W. G. Gove, Brooklyn, N. Y.; C. S. Kimball, Washington, D. C.; C. L. Cadle, Rochester, N. Y.; and E. B. Burritt, New York City.

J. W. Stephenson on "Electropneumatic Interlocking"

IN HIS PAPER on "Electropneumatic Interlocking" delivered before the Chicago Elevated Railroads company section meeting last month (see E.R.J., March 30, page 635), J. W. Stephenson, signal engineer of the companies, said some very interesting things regarding interlocking in general and on the Chicago property in particular. For instance, at Lake and Wells Streets tower on the Union Loop, 912 cars pass through in one hour and the number of lever movements in the tower per day averages 7700. An interlocking plant is provided at this point, as it would be too much to expect a man to do this work without such assistance.

Mr. Stephenson explained to the section, with the aid of lantern slides, that an interlocker is a collection of levers in a machine, so interconnected that the movement of functions will occur only in a predetermined way, in order to prevent the setting of conflicting routes. Movements in the machine take place as follows: (1) The signals and trips on all opposing routes are set in the "stop" position. (2) The switches, movable point frogs and the trips in the route to be given are placed in the proper position and locked. (3) The signal for the route given is set at "clear." After a clear signal has been accepted by the motorman it is important that the route should not be changed while the train is passing over. This is prevented by means of a detector bar of steel lying close against the outside of the head of the rail and long enough to reach from truck center to truck center of the wheels. This is connected to the switch and locking device and supported by clips which raise it above the top of the rail. The bar cannot move when a car wheel is standing upon it or rolling over it.

Mr. Stephenson divided the several methods used in interlocking into four types; mechanical, electric, electromechanical and electropneumatic. He said that for conditions on the elevated property the electropneumatic interlocking was especially well suited. In any system simplicity and rugged construction of parts is a great factor in maintenance. Mr. Stephenson called attention, however, to the importance of the human element in successful maintenance. In applying the company's motto "Keep traffic moving," 2 per cent of success is due to ingenuity and 98 per cent to hard work. Success depends upon having replacement parts ready, testing for trouble before it happens, systematically inspecting plants, etc. "What we need in these strenuous times is the man who shows signs of wear at the knees rather than at the seat of his pants."

Capt. E. J. Blair Addresses Section No. 6

THE meeting of the Elevated Railroads (Chicago) section, held on April 20 with an attendance of 125, was of a patriotic character. Capt. E. J. Blair of the 311th Engineers, electrical engineer of the company, described the training at Camp Grant and gave much information regarding conditions on the western battle front in France. Capt. Hart E. Fisher of the Medical Reserve Corps took up the medical side of the work in the army.

The Third Liberty Loan was the other prominent feature of the discussion. A report showed that $200,000 had already been subscribed by company employees to this loan. Patriotic hymns and other music were interspersed with the talks.

Manila Section Growing Apace

AT THE MEETING of joint company section No. 5, held at Manila on Feb. 12, the membership committee presented the names of fifty-three applicants. Of these forty, or 75 per cent, were from the transportation department. This increase brought the membership to 197.

At this meeting P. Castillo, carhouse starter, spoke on "Some of the Duties of a Carhouse Starter," and M. Fariñas, traffic inspector, spoke on "Trainmen as Witnesses." At the March 5 meeting the speaker was I. G. Obligacion, chief clerk transportation department, whose topic was "The Menace of the Transfer." Abstracts of the papers mentioned, and of the accompanying discussion, will be given in a later issue of the ELECTRIC RAILWAY JOURNAL.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Agree on Use of Union Button

This Matter a Problem for Kansas City Railways After Sympathetic Strike Settlement

When the employees of the Kansas City (Mo.) Railways who did not join the strike returned to work on March 29, they were advised in the cases of union men not to wear their buttons in conspicuous places. This suggestion was made in order to avoid possible violence from strike sympathizers who might resent more the presence of union men on the cars than they would the presence of non-union men.

Later an agreement was signed in the nature of a statement to employees, covering the whole button subject. At the same time, a statement was made signed by W. D. Mahon, president of the Amalgamated Association, to the effect that future disputes and the making of a new contract in August should be settled by conciliation or arbitration, and that there should be no strikes.

The agreement signed by Col. Philip J. Kealy, president of the Kansas City Railways, and Mr. Mahon in so far as it relates to the use of the button is as follows:

"President Mahon's understanding was that upon their return to work the men would be permitted to wear their organization buttons, whereas the company's position was that it was necessary to discontinue the wearing of buttons in order to avoid taunts, threats of violence and intimidation being made to those men who continued to operate their cars during the past four or five days. In a sincere endeavor to furnish immediate service to the public, the following agreement has been reached:

Provisions of the Agreement

"1. The men will return to work immediately with the liberty of wearing their buttons.

"2. The order of the company prohibiting wearing of buttons is hereby revoked. The intent of the company in issuing said order, that is, that the men who continue their work will be protected from intimidation, taunts and violence, is met by the assurance of Mr. Mahon that there will be no discrimination raised against any employee who does not wear the button. It is also further understood that employees who did work during the present controversy and are members of the organization shall have the right to wear their button and that the members of the association will do everything within their power to create harmony and establish a good feeling between all employees and the general public.

"This provision as to the wearing of buttons shall not be compulsory, but every member of the organization has the absolute right to wear it or not to wear it, as he desires.

"It is further agreed and understood that the consent of the company to revoking its order and permitting the wearing of the button is conditioned upon President Mahon's assurance that discrimination, threats of violence or injury shall be discontinued, and if, in the future, this condition shall not be fulfilled, then the right to continue wearing the button shall be a matter of arbitration.'"

That the railway had gaged correctly the possible trouble from the wearing of union buttons was indicated in an attack on a car the day following the end of the strike. Three men threw stones at the end of a car manned by a union conductor who had worked during the general strike. The motorman on this car was a union man who had not worked.

$500,000 for Improvements

Dallas City Commission Sanctions Expenditures Under Service-at-Cost Grant of Dallas Railway

The City Commission of Dallas, Tex., has approved applications covering proposed improvements to be made by the Dallas Railways amounting to approximately $500,000. These improvements are to be made in accord with provisions of the service-at-cost franchise which stipulated that improvements of this amount should be made on the lines in the city. Among the improvements which have been approved are the following projects:

Purchase of twelve one-man cars to take the place of obsolete equipment, $64,710.

Special track work at Cantegral and Bryan Streets, to enable trailers to be operated over the Bryan Street line, $12,805.

Rebuilding 80 ft. of double track on Colorado Street at the intersection of Marsalis Avenue, made necessary by the paving of Colorado Street, $1,920.

Purchase of a concrete mixer and other equipment for track construction work, $16,655.

Special track construction work at Commerce and Lamar Streets, to permit routing the Oak Cliff cars to Elm Street via Lamar from Commerce, necessary under the plan to route the Oak Cliff cars for crosstown lines, $20,720.

Removal of single track on Columbia Avenue, Beacon and Tremont Streets from Garrett to Fulton Street, so that double track may be put down, $76,860.

Cleveland Wage Discussion

Proposals and Counter Proposals Made, but Prospect Is That Resort Will Have to Be Made to Arbitration

At a second wage conference on April 19 John J. Stanley, president of the Cleveland (Ohio) Railway, made two new wage offers to the motormen and conductors, who are demanding an increase of 25 cents an hour, when their present contract expires on May 1. The first includes an increase of 5 cents an hour and a bonus of 5 cents an hour for all who worked between Nov. 1, 1917, and May 1, 1918, and are now employed by the company. This is practically the same offer made to the men last November. The contract is to run for one year from May 1.

This would mean a waiver by the company of its demand for an open shop and the employment of women, with a continuance of existing agreements on other issues. It would be a waiver by the men of their demands for a change in the working hours.

As an alternative proposition, Mr. Stanley suggested that men be employed as motormen and women as conductors, the men to have an increase of 10 cents an hour and the women to receive the present wages of the men, from 32 to 35 cents an hour. All male conductors physically able and competent would be shifted to positions as motormen.

Should both offers be rejected, Mr. Stanley demands that the issues be submitted to arbitration, with an increase in wages of 2 cents an hour pending the decision of the board of arbitration. The men fixed upon the night of April 22 to consider these proposals, with the exception of the one relating to women conductors. The exception was made because this was not included in the original letter on the proposals.

The employment of women as conductors was discussed at a conference on April 20 between Mr. Stanley and the representatives of the men. The men argued that a sufficient increase in the wage scale would induce men to seek employment with the road. Mr. Stanley made his proposition with regard to women a part of the original offer submitted on April 19.

The men replied to Mr. Stanley by stating that they would willingly cooperate in securing women for conductors if a material increase in wages did not supply enough men.

The executive board of the union notified Mr. Stanley that his proposition would be submitted to the men, but that it would probably not be accepted.

Hundreds of applications have been received from women for jobs on the cars.

Fare Should Be Flexible

President McCulloch Declares that Ideal Ordinance Should Permit Readjustments Under Changing Conditions

Richard McCulloch, president United Railways, St. Louis, Mo., in an address before the City Club on April 19, stated that the proposed compromise ordinance for his company lacks the ideal feature of a flexible fare provision. The course of this ordinance, which was signed by the Mayor on April 10, has been followed from week to week in these pages.

Mr. McCulloch did not indicate positively what the company would do about accepting the ordinance, but he expressed a hope that it would be accepted by "both parties." The company has one year in which to file an acceptance, or six months after the end of the war if hostilities last longer than a year.

OUTLINE OF ORDINANCE

According to Mr. McCulloch, the principal features of the ordinance are as follows:

1. The franchise rights of the United Railways are validated until April 12, 1948.
2. The company is required to reduce its outstanding mortgage indebtedness and capital stock to the capital value established in the ordinance.
3. A board of control, consisting of one member appointed by the city and one member appointed by the company, shall pass upon all proposed extensions, additions and betterments, and on all charges to capital account. In the event of disagreement a third temporary member shall be appointed by the St. Louis Court of Appeals.
4. The city has the right, after the expiration of ten years, and at any five-year period thereafter, to purchase the railway system at its then capital value.
5. The capital value of the property is established at $60,000,000, plus the cost of any additions or betterments made to the property after the taking effect of this ordinance. This capital value is subject to a valuation to be made by the Missouri Public Service Commission.
6. At the expiration of the franchise, if the city grants a new franchise to another party, the city shall require this grantee to purchase the property of the company at its then capital value.
7. The rate of fare is established within the city limits at 5 cents for adults and 2½ cents for children, with the provisions that if, and when, the Missouri Public Service Commission or other legally constituted rate-making authority shall have the jurisdiction lawfully to alter these rates, then the rate of fare shall be such as shall be lawfully ordered by such authority. Free transfers are required under the same conditions.
8. The company is authorized to haul mail, express and freight under certain conditions, and may install switch tracks from its main lines for this purpose.
9. The standards of service prescribed by the Missouri Public Service Commission in its order of May 4, 1915, are written into the ordinance.
10. The company is required to pay the unpaid mail tax and interest accrued thereon (approximately $2,300,000) in ten annual payments, the first payment being due within thirty days after the final approval of the ordinance by the city of St. Louis.
11. The United Railways is required to pay one-half of 1 per cent of its gross receipts in lieu of mill tax and all franchise taxes. This tax may be increased at any time during the life of the franchise to not exceeding 3 per cent of the gross receipts.
12. All net earnings in excess of 7 per cent of the capital value may hereafter be required by ordinance to be paid to the city as a franchise tax, or may be applied by the board of control for the reduction of fares or the reduction of capital value.

ORDINANCE IS NOT IDEAL

In Mr. McCulloch's opinion, the ordinance is not ideal from the standpoint of either the city or the company. It is, however, probably the best compromise that can be agreed upon at the present time. Continuing, Mr. McCulloch said:

"Under the circumstances a referendum vote on this ordinance, which was passed by the Municipal Assembly by a vote of twenty-eight to one would merely serve to delay a settlement which is a fairly good solution of a difficult problem. The city would be put to the expense of an election, and the company would be delayed at least six months in adjusting its affairs. No one would profit by this delay. The settlement is not an ideal one, but it is one which we hope will be accepted as a compromise by both parties.

"If you ask me to suggest the terms for an ideal franchise, I would begin by stating that with absolute regulation should come absolute protection. The only manner in which such protection can be afforded is by establishing a flexible rate of fare, which may be adjusted automatically from time to time, so as to guarantee always good service, fair wages and a sure return upon the investment. This is service at cost, and if the terms are sufficiently attractive, and if the methods of fare adjustment are not too slow and clumsy, all the capital necessary can be produced."

Perpetual Franchise in Covington

Federal Supreme Court Decides in Favor of South Covington & Cincinnati Street Railway

On April 15 the Supreme Court of the United States handed down a decision in the case of the city of Covington, appellant, vs. South Covington & Cincinnati Street Railway which came before the court as an appeal from the District Court for the Eastern District of Kentucky. The question at issue was whether the franchises of the company had expired.

Testimony showed that in December, 1869, an ordinance was passed by the city granting to Edward F. Abbott and others "all the right and authority that it [the city] had the capacity to grant, to construct, hold and operate a street railroad upon and along" certain streets. Soon after, the Covington & Cincinnati Railway, the predecessor of the present company, was organized.

The city claimed that in a previous street railway franchise to the Covington Street Railway, an entirely different corporation, granted in 1864, the city had declared "all contracts made under the provisions of this ordinance shall be for the term and period of twenty-five years," and that this limited the Abbott grant. The Supreme Court held otherwise, however. Under subsequent ordinances the South Covington & Cincinnati Street Railway acquired the property of the Covington Street Railway, but the Supreme Court held that this also did not affect its perpetual franchise in the streets covered by the Abbott grant.

The court laid stress upon the authority of Owensboro vs. Cumberland Telephone & Telegraph Co., 230 U. S. 58, whose authority it pronounced complete. The opinion of the court was delivered by Justice Holmes.

Justice Clarke presented a dissenting opinion, based partly upon his construction of the grant to Abbott and also because he held that the city did not have authority from the Legislature to make the grant claimed.

Puts Himself In the Other Man's Place

Head of Claims Department Becomes Motorman for Experience So As to Help Him in His Court Work

The testimony of the motorman is usually the first and most important information desired by the claims department in accident cases, and it is frequently essential that the attorney get an accurate understanding of the motorman's viewpoint.

In order to facilitate this, F. M. Hamilton, superintendent of the department of accident investigation of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has completed the course of training prescribed for motormen and does, in fact, operate a car through the city streets frequently enough to "keep in practice."

He says that the advantage which this gives him in discussing accidents with motormen has been notable, and it has become known among the company's men that statements about the action of brakes, the distance required to bring a car to a stop, etc., will be questioned intelligently by the legal department.

In addition to a better understanding of the motorman's point of view, experience in operating the car enables the attorney to present his case more convincingly when questions arise in the court, and altogether the expenditure of the time required to become proficient as a motorman is pronounced an excellent investment.

Moderation in Toledo

Railway Men, Recognizing Problems of the Company, Against Hasty or Insistent Action

It was reported that the motormen and conductors of the Toledo Railways & Light Company, Toledo, Ohio, issued an ultimatum on the evening of April 17 in which the company was given forty-eight hours to decide upon an increase of 10 cents an hour in the wage scale. Afterward officers of the union stated that the action was not intended as an ultimatum, but that the men are anxious to arrive at a settlement just as soon as possible.

Frank R. Coates, president of the company, said that the men should have an increase in consideration of the prevailing high prices of every necessity, but the company could grant the demand only on condition that the city consent to a raise in the rate of fare to 8 cents.

On the evening of April 18 Federal Mediator A. L. Faulkner, Cleveland, addressed the Central Labor Union. He declared that the only way the company could grant an increase was by securing a higher rate of fare. He believed the recent audit of the books to be correct. That investigation showed that the high cost of materials and operation has so increased the company's expenses that it could not pay the men more without additional income. Mr. Faulkner advised the labor organizations to take the lead in seeking permission for an increase in the rate of fare as a means for securing sufficient funds to allow the company to grant the men's demands. Mr. Faulkner advised against a strike.

The men were to vote upon the question of a strike after this meeting. The Central Labor Union approved their contention, but advised moderation in the steps taken to enforce their demands. The men discussed the question in a broader manner at their meeting and decided to delay action pending plans for placing the question of higher rates of fare and lighting service before the voters for consideration.

Arbitration in Minnesota

Submission of all labor disputes in Minnesota to arbitration during the period of the war is ordered by the Minnesota Public Safety Commission in an action taken following conferences of representatives of both employees and employers with Governor J. A. A. Burnquist. The order merely makes effective an agreement by both employers and employees, secured by the Governor's activities.

The order of the Public Safety Commission follows recommendations submitted by the board of arbitration made up of Raymond F. Schroeder, St. Paul, representing organized labor, and Robert F. Pack, Minneapolis, representing employers of labor, after a series of conferences with Governor Burnquist to carry out a plan initiated in a recent proclamation issued by the Governor.

An amiable adjustment of the differences between the Twin City Rapid Transit Company, Minneapolis, and its employees, providing for restoration of former employees, is being made through the State board of arbitration and conciliation.

Detroit Men to Arbitrate

The strike of the trainmen in the employ of the Detroit (Mich.) United Railway, declared on April 25, will be settled by arbitration. The men had demanded an increase in wages which would have aggregated about $1,000,000 for the year. Operations of the railway are said to have been pretty completely suspended during the few hours the men were out.

Civic Associations Would Aid

Propose to Help Portland Company by Securing Elimination of Charges Not a Part of Railway Operation

The City Council of Portland, Ore., on April 16 voted to submit to the voters at the special election on May 17 the question of opening a way for the elimination of paving, bridge tolls and other charges now imposed on the Portland Railway, Light & Power Company. These charges enter into the general burden on the company which finally made necessary a 6-cent fare.

CIVIC ASSOCIATION'S HELP MOVEMENT

The measure has been prepared by eight civic organizations of the city which are striving in a fair way to bring about a return of the 5-cent fare. It is merely an enabling act giving the City Council power to eliminate these charges if such action is considered advisable or reasonable. The act itself does not alter the charges, but places in the Council's hands the power to take such action or to reinstate the charges. The act carries a provision for a special tax levy of four-tenths of a mill ($112,000) to make up for the city the revenue that would be lost by such an arrangement.

L. M. Lepper, secretary of the East Side Business Men's Club of Portland, in a letter to the Public Service Commission of Oregon, informed the commission that committees representing eight civic clubs of Portland have drawn amendments to the Portland city charter for the elimination of certain charges required of the company, to the end that the fare be set back to 5 cents. The letter further stated:

"If the City Council places such amendments on the ballot at the coming election, and they are voted by the people, enabling the Council to eliminate such charges, and the Council does eliminate them, and conditions remaining as they are at present as to prices, upkeep, etc., then and in that event, when so eliminated, will you, the Public Service Commission, now indicate and promise that immediately upon such elimination and relief to the company, you will order fares back to 5 cents?"

COMMISSIONERS STATE THEIR ATTITUDE

In two answers to Mr. Lepper's communication the Public Service Commission made plain its attitude as to the reduction of fares in the city of Portland, in the event of passage of the city charter amendments. The commission in effect declares that action by it will depend largely upon conditions existing at the time the amendments go into effect.

One of the answers is signed by Commissioners Miller and Corey, as a majority of the commission, and the other by Commissioner Buchtel. After reciting the query from Mr. Lepper as to the commission's attitude, Commissioners Miller and Corey say, in part:

"The increased fare was ordered only after we had satisfied ourselves that such increase was absolutely necessary to preserve the integrity of the property for the use of the public and prevent the company going into bankruptcy. No allowance whatever was made for a return on the company's investment, nor was sufficient increase allowed to provide for extra operating costs.

"During the period of the war, or until conditions again become normal, the company must forego any interest on the money now invested in this utility and share with the public the burdens imposed by present unusual situations.

"If it is right, just and proper for the rider to continue to pay for paving, bridge tolls, free transportation of city employees, license taxes, etc., assessed against the company, then no effort should be made to remove such burdens, but if on the other hand it is not fair and equitable for the patrons of the company to pay such charges, then they should be removed.

"Should the company be relieved from the necessity of paying these above mentioned charges, this commission will take full and complete cognizance thereof and make such reductions in fares as reductions in operating costs or increase in revenue will permit, bearing in mind the necessity of maintaining the present rate of wages paid to employees, the existing conditions and adequate service.

"Whenever it becomes possible to order the return to a 5-cent fare we will gladly do so."

Commissioner Buchtel states if it develops that a 5-cent fare is sufficient for successful operation of the company he will not hesitate to move to have it reinstated.

Railway Conservation Study Proposed

The commercial economy board of the Council of National Defense has arranged with Addis Whitney, Boston, Mass., to come to Washington in the near future to study and report on opportunities in conservation among the public utilities of the country as a war measure.

The board, of which A. W. Shaw, Chicago, Ill., is chairman, has been instrumental in bringing about various economies in different industries, notably among department stores, laundries, etc., by eliminating overlapping deliveries, preventing the return of goods sent on approval, etc.

Mr. Whitney has made a preliminary visit to Washington for conferences with officials and has returned to his home in Boston. It is expected in Washington that two or three weeks will be required for his study. Mr. Shaw states that the survey to be made by Mr. Whitney will take in possibilities of conservation in the use of capital, material, etc., used by the electric railways.

News Notes

Mayor Signs St. Louis Ordinance.—Mayor Kiel of St. Louis, Mo., has signed the ordinance extending the franchise of the United Railways to April 12, 1918. An outline of the terms of the measure made by President McCulloch of the company is published elsewhere in this issue.

Wage Increase in Omaha.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has granted a voluntary increase in wages of 2 cents an hour to the operating force of the company, and has authorized the readjustment of the wages of the other employees of the company. This is the third voluntary increase of wages made by the company since the war began.

Wage Advance in Honolulu.—A voluntary increase was made on April 1 by the Honolulu Rapid Transit & Land Company, Honolulu, H. I., in the wages of its platform men. The scale formerly ranged from 30 cents for the first year to 40 cents for the eleventh year, an advance of 1 cent each year. The increase of 1917 added 10 per cent to these rates. The rates just adopted range from 35 cents for the first year to 45 cents for the eleventh year.

New Offices for International Railway.—Executive offices of the International Railway, Buffalo, N. Y., which have been located on the eighth floor of the Ellicott Square Building for almost twenty-five years, will be moved on May 1 to the Littell Building at Franklin and West Huron Streets. All of the company's other offices with the exception of those located at the Virginia Street station will be moved to the new location.

Wage Increase Asked in Worcester.—Conductors and motormen in the employ of the Worcester (Mass.) Consolidated Street Railway have presented to the management of that company a request for an increase in wages and a readjustment of the working conditions. While the terms of the request have not been disclosed, it is believed the men ask for a minimum of 30 cents an hour. The wages now range from 28½ to 34½ cents an hour.

Wage Arbitration in Dubuque.—The threatened strike of the railway employees of the Dubuque (Iowa) Electric Company has been prevented, both sides agreeing to submit the question to arbitration. The men are asking for a wage increase of approximately 25 per cent. Governor Harding has appointed Judge S. F. Prouty, Des Moines, as arbiter for the Dubuque Electric Company and Judge M. C. Chambers, Dubuque, as arbiter for the men. These two will decide between themselves upon the third arbiter.

Gross Receipts Tax Suit.—On April 20 arguments on the demurrer of the Puget Sound Traction, Light & Power Company against the suit of the city of Seattle, Wash., to collect $72,443, as 2 per cent of the gross receipts of the company's earnings for 1917 was heard in the Superior Court. A similar action in 1916, in which judgment was granted against the company, is on appeal before the Supreme Court. This year the company offered to pay the amount if relieved of other obligations under its franchise. The city of Seattle refused the offer.

Cincinnati Franchise Revision Hearings May 11.—Public hearings for a discussion of terms which shall go into a revision of the franchise held by the Cincinnati (Ohio) Traction Company will be started on May 11 by the committee on street railroads of the Council under the terms of a resolution drawn up at a meeting of the committee for submission to the City Council. The resolution recites that the Council has had up for consideration the matter of revising the terms and conditions of the franchise, as provided by law and that this revision "is not yet completed."

Sir Adam Beck Favors Utility Monopolies.—Sir Adam Beck, chairman of the Hydro-Electric Power Commission of Ontario, Canada, presented a strong argument before a committee of the United States House of Representatives in Washington on April 15. In speaking before the joint special water-power committee of the House, on the so-called "administration" water-power bill now under consideration by that body, the chairman of the Ontario Commission described some of the difficulties which have confronted the public and the public utilities in and around Ontario in recent years, and some of the work that has been done and some that remains to be done in developing electrical energy.

Wage Discussion in Salt Lake.—Negotiations are pending looking to the settlement of differences about wages and working conditions existing between the Utah Light & Traction Company, Salt Lake City, Utah, and its employees. The principal point of difference appears to be over the use of one-man cars. The company has demanded that this point be discussed with that of the proposed wage increase. The men deny the right of the company to inject this point into the discussion at this time. The company has requested that the question be submitted to arbitration along with the wage matter.

Wage Advance and Increase in Fares Suggested.—James J. Barrett, federal commissioner of conciliation, who has been in Des Moines, Iowa, in an effort to settle the wage dispute between the master builders and their laborers, has filed a report with the City Council in which he states that he has investigated the wage conditions of the employees of the Des Moines City Railway and thinks that their request for an increased wage should be granted. In his opinion that section of the City Railway's franchise which provides six-for-a-quarter tickets should be eliminated and a straight 5-cent fare established. Mayor Thomas Fairweather states that the only way the franchise can be changed as to rates is by a vote of the people.

Kansas City Police Reinstated.—An echo of the strike of August, 1917, of the employees of the Kansas City (Mo.) Railways was heard at the city hall recently when the Board of Police Commissioners reinstated twenty-eight policemen. These men were discharged during the strike for refusing to ride on cars with strike breakers. It will be remembered that in several cases policemen had refused to protect electric railway property against strike breakers, and had failed to make arrests of strikers and sympathizers who were threatening and actually committing depredations and attacking employes of the company. During the recent sympathetic strike the police promptly gave all the protection possible with the number of men in the service. In this case the work of the police was supplemented by troops from the Missouri National Guard.

Programs of Meetings

National Association of Manufacturers

The National Association of Manufacturers will hold a meeting in New York on May 20-22. The headquarters will be at the Waldorf-Astoria Hotel.

National Electric Light Association

The thirty-fourth annual meeting of the National Electric Light Association will be held at the Hotel Traymore, Atlantic City, on June 13 and 14.

This will be a strictly business meeting, without entertainment of any kind. It will concern itself entirely with the vital problems of the industry arising out of the war. No papers will be read. Reports from committees and individuals and discussions will be confined to matters of major importance, and the brief two days will allow no time for the usual helpful discussions on general topics relating to the progress of the art.

National Lumber Manufacturers' Association

The sixteenth annual meeting of the National Lumber Manufacturers' Association, postponement of which was noted in the ELECTRIC RAILWAY JOURNAL, issue of April 6, will be held on May 20 and 21 at the Congress Hotel, Chicago.

Postponement of the meeting as originally arranged for April 8 and 9 has been due to an unanticipated call from Washington upon the leaders in the lumber manufacturing industry. There is a possibility of further postponement as the lumber manufacturers' association takes the stand of Washington first and annual meetings second, but it is believed that no further delay will develop to prevent the program from being carried out on May 20 and 21.

Financial and Corporate

Receivers for Pittsburgh

Messrs. Callery, Stewart and Fagan Will Manage Affairs of Much-Harassed Electric Railway

James D. Callery, H. S. A. Stewart and Charles A. Fagan were appointed receivers for the Pittsburgh (Pa.) Railways on April 23 by Judges W. H. S. Thomson and Charles P. Orr in United States District Court. They organized during the afternoon and made temporary arrangements for the operation of the company's property.

WHO THE RECEIVERS ARE

Mr. Callery is chairman of the board of directors of the Pittsburgh Railways. He has been made chairman of the receivers. Mr. Fagan is a leading attorney. Mr. Stewart is vice-president of the Fidelity Title & Trust Company, Pittsburgh. He was an associate of the late C. L. Magee in the building of many of the railways now included in the system of the Pittsburgh Railways.

After the receivers had organized, Mr. Callery made the following statement:

"There is misapprehension as to the receivers representing particular interests. All the receivers represent the stockholders of the company, its creditors and the public. There is every reason to believe that there will be harmonious action to protect all these interests. We shall hold daily meetings and in a few days will likely be ready to announce the policy which will guide us. Our work to-day was merely to make temporary agreements for the carrying on of the customary business to the end that the service to the public shall not suffer any interruption by reason of the change in control."

The system will continue to be operated under P. N. Jones as general manager. Other officers and employees of the Pittsburgh Railways were appointed to positions necessary to be filled immediately under the receivership. The negotiations for a new wage scale will be continued as heretofore.

In addition to the appointment of Mr. Callery as their chairman and that of Mr. Jones as general manager of the operation of the railway system the receivers on April 23 appointed J. L. Foster treasurer to succeed C. J. Braun, Jr.; E. E. Ebranz secretary, and J. A. Meade auditor. The continued employment of subordinate clerks and other employees was provided for.

It is reported that S. L. Tone will be retained as consulting engineer.

Present for the Pittsburgh Railways at the hearing in court were President S. L. Tone, Manager Jones and Attorneys D. W. Smith and A. W. Robertson. Attorney George B. Gordon was on hand for the American Brake Shoe & Foundry Company of Delaware and the St. Louis Car Company, St. Louis, Mo., in whose names the application for the receiver was made.

In the order appointing the receivers the court directed them to give bond in the sum of $25,000 each. This they did later in the day.
question.

Refinancing in Washington

Slowness in Organizing War Finance Corporation Embarrassing to Utilities—Capital Issues Committee Reduces Minimum

The delay in the organization of the War Finance Corporation, the enabling act for which was recently signed by President Wilson, has been seriously worrying a number of large public utilities having finance maturities on May 1. Reports reaching Washington show that between $15,000,000 and $20,000,000 of utility securities will in all likelihood go by default on May 1 unless there is assistance from governmental sources.

Undoubtedly the administration recognizes this fact, and in spite of the demands for time made upon many of the leading officials in connection with the Liberty Loan campaign, is taking steps to complete the organization of the War Finance Corporation. On April 25 it was reported from Washington that the nominations of four men to be directors of the corporation had been decided upon and would be announced shortly.

At its meeting April 23, the capital issues committee of the Federal Reserve Board adopted the following resolution:

"Resolved, that, effective immediately, this committee reduce from $500,000 and over to $100,000 and over the minimum of security issues of industrial and public utility corporations that it will consider."

This action is taken by the committee in furtherance of its policy heretofore expressed of adapting its methods to those prescribed for the guidance of the capital issues committee created by the war finance corporation act which, in Section 203, provides that the committee may consider applications of $100,000 and over.

The committee has heretofore observed the $100,000 minimum only with respect to municipal issues. Its action on Tuesday will tend to relieve the embarrassment of those desiring to issue at this time securities the aggregate of which is above the minimum prescribed by the statute and yet below the minimum heretofore considered by the existing committee.

Inland Empire Faced Hard Problems

Interurban Passenger Situation Improved in 1917, but Poor Crops Hurt Freight Traffic

That the private ownership of automobiles for pleasure purposes has reached its peak is intimated in the annual report of the Spokane & Inland Empire Railroad, Spokane, Wash., for the calendar year 1917. The slight decrease in interurban passenger earnings, only 1.6 per cent, as compared to large decreases in previous years, is taken as a favorable sign.

EVEN FREIGHT EARNINGS DECREASE

The freight earnings on the interurban lines decreased $42,098, or 12 per cent, during 1917. The decrease was due almost entirely to the poor grain crop caused by the unusual condition of a late, cold spring and a hot, dry summer. The grain traffic handled was approximately 819,747 bushels, as compared to 1,390,168 bushels for the previous year. During the latter half of 1917 the shipment of lumber was seriously curtailed by the car shortage, and the company has been short of sufficient equipment to handle the business offered.

The territory served by the interurban lines has a better crop prospect than last year and the prices fixed by the government guarantee a good return, so that a large movement of agricultural products may be expected. There is also a good prospect of a heavy movement of lumber during the coming season, provided the necessary supply of equipment can be obtained to handle it.

The revenue from the operation of the street car lines in the city of Spokane showed an increase of $4,542 or 1 per cent as compared with last year. The increase in revenue from other sources amounted to $28,022 or 40.7 per cent, owing largely to rental received for equipment held by foreign lines on account of the congestion of traffic in Eastern states. The total railway revenue decreased $15,095 or 1.2 per cent.

OPERATING EXPENSES CLIMB

The operating expenses show a substantial increase in every department except cost of power, which fell off $56,244 or 55.8 per cent. As the contract with the Washington Water Power Company has expired, the company's lines are now operated entirely by power from its own station. The total expenses rose $20,583 or 1.8 per cent.

The net revenue from railway operations, therefore, fell off $35,649 or 34.1 per cent. The revenue from auxiliary operations also decreased 24 per cent, while taxes and income deductions rose 7.2 per cent and 5.7 per cent respectively, so that the net return of the year was a deficit of $462,001 as compared to $359,953 in 1916, an increase of 28.4 per cent.

The Adamson law forced heavy increases in wage schedules of motormen and trainmen, and the company made voluntary increases in the compensation of other employees to meet the high cost of living and to equalize the compensation of its employees with that paid by other lines.

COMPARATIVE INCOME STATEMENT OF SPOKANE & INLAND EMPIRE RAILROAD FOR CALENDAR YEARS 1917 AND 1916

	1917 Amount	1917 Per Cent	1916 Amount	1916 Per Cent
Freight	$ 307,946	25.1	$ 350,045	28.2
Passenger	352,297	28.7	357,859	28.8
Street railway system	469,712	38.3	465,170	37.5
Other revenue	96,952	7.9	68,928	5.5
Total railway operating revenue	$1,226,909	100.0	$1,242,005	100.0
Way and structures	$ 296,539	24.2	$ 293,594	23.7
Equipment	295,470	24.1	254,556	20.5
Power	44,533	3.6	100,778	8.1
Conducting transportation	384,074	31.3	354,245	28.5
Traffic	17,836	1.4	17,120	1.4
General and miscellaneous	124,441	10.1	121,059	9.7
Transportation for investment—credit	5,030	0.4	4,045	0.3
Total railway operating expenses	$1,157,864	94.4	$1,137,311	91.6
Net revenue from railway operations	$ 69,045	5.6	$ 104,694	8.4
Auxiliary operations—net	86,689	7.1	117,824	9.5
Net operating revenue	$ 155,734	12.7	$ 222,518	17.9
Taxes accrued	121,467	9.9	113,356	9.1
Operating income	$ 34,267	2.8	$ 109,162	8.8
Other income	4,667	0.4	4,616	0.4
Gross income	$ 38,934	3.2	$ 113,778	9.2
Deductions	500,936	40.8	473,731	38.1
Deficit	$ 462,002	37.6	$ 359,953	28.9

Grant Park Road Sold for Junk

The sale of the property of the St. Louis, Lakewood & Grant Park Railway, St. Louis, Mo., an electric line which operated over the Gravois road and in St. Louis County, was approved on April 17 by the Circuit Court. The road was sold for junk recently by a receiver appointed by the court, to M. Hoffman & Company, who bid $20,527 for the steel rails and other equipment, including three cars. The railroad, of which Henri Chouteau was president, was placed in the hands of a receiver last winter on petition of Mrs. Margaret Milford and other creditors, who held a large amount of bonds issued by the company. The line had not been operated for some time.

Electric Railway Statistics

Returns for January, 1917 and 1918, Show Great Decrease in Net Earnings, Especially in East

A comparison of electric railway statistics for January, 1918, with figures for the corresponding month of 1917, made by the information bureau of the American Electric Railway Association, indicates an extraordinary decrease in net earnings and operating income. This condition is particularly noticeable in the East, where the severe weather, as well as the curtailment of service due to fuel shortage, disastrously affected both the earnings and the expenses.

Data for January, representing 7670 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicate a decrease in operating revenues of 0.29 per cent, an increase in operating expenses of 12.59 per cent and a decrease in net earnings of 24.38 per cent. Data representing 5753 miles of line show an increase in the amount of taxes paid of 4.55 per cent and a decrease in operating income of 37.91 per cent.

REASONS FOR SHOWING

The returns from the city and interurban electric railways, as shown in detail in the accompanying table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups shown, all indicate a considerable increase in operating expenses, while only one, the Western, displays an increase in operating revenues. As pointed out above, this condition is largely due to both the unusually severe winter and the acute fuel shortage which the Eastern district in particular has had to face. Returns for the latter group indicate a decrease in earnings of 2.29 per cent, an increase in operating expenses of 13.80 per cent and a consequent decrease in net earnings of 33.33 per cent.

As compared with the Eastern group, the Southern and Western have done comparatively better, though even the South shows a decrease in net earnings of 12.65 per cent, and the West one of 6.20 per cent.

OPERATING RATIO CLIMBING

The operating ratio for all groups has increased, particularly that of the Eastern district. The operating ratio for the country as a whole has increased from 65.19 per cent in 1917 to 73.60 per cent in 1918.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR JANUARY, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
		Per Mile of Line				Per Mile of Line				Per Mile of Line				Per Mile of Line		
	Amount, January, 1918	1918	1917	% Increase Over 1917	Amount, January, 1918	1918	1917	% Increase Over 1917	Amount, January, 1918	1918	1917	% Increase Over 1917	Amount, January, 1918	1918	1917	% Increase Over 1917
Operating revenues	13,239,752	$1,726	$1,731	†0.29	$8,517,827	$1,580	$1,617	†2.29	$1,051,146	$1,248	$1,259	†0.87	$3,670,779	$2,555	$2,417	5.7
Operating expenses	$9,744,672	1,270	1,128	12.59	6,531,970	1,212	1,065	13.80	672,583	799	745	7.25	2,540,119	1,768	1,578	12
Net earnings	3,495,080	456	603	†24.38	1,985,857	368	552	†33.33	378,563	449	514	†12.65	1,130,660	787	839	†6
Operating ratio, per cent	1918, 73.60; 1917, 65.19				1918, 76.69; 1917, 65.84				1918, 63.99; 1917, 59.19				1918, 69.20; 1917, 65.31			
Average number of miles of line represented	1918, 7,670; 1917, 7,534				1918, 5,391; 1917, 5,322				1918, 842; 1917, 788				1918, 1,437; 1917, 1,424			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$9,351,628	$1,625	$1,642	†1.04	$5,614,239	$1,361	$1,412	†3.61	$457,543	$1,266	$1,247	1.52	$3,279,846	$2,592	$2,506	3.6
Operating expenses	7,177,903	1,248	1,110	12.43	4,597,148	1,114	982	13.44	287,681	796	692	15.03	2,293,074	1,812	1,641	10
Net earnings	2,173,725	377	532	†29.14	1,017,091	247	430	†42.56	169,862	470	555	†15.32	986,772	780	859	†19
Taxes	660,671	115	110	4.55	414,786	101	95	6.32	39,931	110	110	....	205,954	163	161	1
Operating income	1,513,054	262	422	†37.91	602,305	146	335	†56.42	129,931	360	445	†19.10	780,818	617	698	†11.6
Operating ratio, per cent	1918, 76.76; 1917, 67.58				1918, 81.88; 1917, 69.57				1918, 62.88; 1917, 55.49				1918, 69.91; 1917, 65.65			
Average number of miles of line represented	1918, 5,753; 1917, 5,668				1918, 4,126; 1917, 4,058				1918, 361; 1917, 358				1918, 1,266; 1917, 1,252			

† Decrease.

Ware & Brookfield Sold to Junk Dealers

The property of the Ware & Brookfield Street Railway, Ware, Mass., was sold at auction on April 22 to the Swift-McNutt Wrecking & Junk Company, Boston, for $51,000. The road comprises 11 miles of track and a carhouse built in 1917 at a cost of about $30,000. The property was built twelve years ago at a cost of about $200,000. Service was furnished between Ware and West Brookfield, 7 miles, and between Ware and Gilbertville, 4 miles. J. Edward Brooks, Milton, Mass., was the principal stockholder. The road has lately been operating at a loss of nearly $1,000 a month; service was discontinued on Feb. 3, 1918. John F. Lambert, superintendent of the road for eleven years, has been retained by the wrecking company to supervise the removal of the material. The purchasers plan to dismantle the poles, tear up the tracks and dispose of the whole equipment as junk. Ware and the surrounding towns are said to be greatly disturbed at the prospect of losing the road, and it is expected that an effort will be made to reach an agreement whereby operation can be resumed and continued.

Regina Municipal Line Losses

The Regina (Sask.) Municipal Railway during 1917, according to the certified figures of auditors, showed receipts of $321,727 and operating expenses of $199,572. The operating surplus, therefore, amounted to $32,154, but after taking into account fixed charges of $96,066 the company had left for the year a deficit of $63,912. The company recently put into effect changes in fares estimated to give increased revenue of $31,700. During the discussion in connection with these changes it was stated before the City Council that the cost of carrying a passenger was 6.57 cents, while the receipts were only 4.6 cents.

Financial News Notes

City Protests Abandonment.—A protest by the city of Sapulpa, Okla., against the abandonment of certain portions of the urban lines of the Sapulpa Electric Interurban Railway was heard on April 6 by the State Corporation Commission. The case was taken under consideration by the commission.

Receiver for Small Road.—Following the filing of a suit by the Sheldon Coal Company, one of the creditors, in the Lewis County Superior Court on April 16, the Washington Electric Railway was placed in the hands of Dan Bush as receiver by Judge Reynolds. This property is now understood to be included in the system of the North Coast Power Company, Vancouver.

Woodstock-Sycamore Line Quits.—The Woodstock & Sycamore Traction Company, organized ten years ago and operating gasoline cars between Sycamore and Marengo, Ill., has been dissolved and the ties, rails and equipment will be sold for junk. The road as originally planned was to extend from Sycamore to Woodstock, but only the portion between Sycamore and Marengo, a distance of 25 miles, was constructed.

Foreclosure Decree Signed.—The decree of foreclosure in the Northern **Electric Railway** litigation was signed on April 16 by Federal Judge M. T. Dooling. Simultaneously, the court appointed United States Commissioner Francis Krull special master to sell the physical properties of the system at auction in Sacramento at a date to be agreed upon later. The sale, however, is expected to take place in six weeks. The company operates 217 miles of electric railway from Chico, Cal., as a center. The affairs of the company were reviewed in the ELECTRIC RAILWAY JOURNAL of April 6, page 676.

Massachusetts Railway Suspends.—The Plymouth & Sandwich Street Railway, Plymouth, Mass., has discontinued service. The road was built a number of years ago, but six years ago a franchise was secured to extend the lines to Sandwich. At that time the town agreed to subscribe to the capital stock to the amount of $50,000, to be paid when, in the opinion of the Selectmen, the road was built, fully equipped and operated. Nothing was done for about five years, when last fall the road was finished as far as Sagamore station. The company then called upon the town for the $50,000. The town refused, and the matter went to court. The court finally upheld the town.

Dan Patch Prospects Brighter.—Reorganization of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, the Dan Patch line, took definite form recently when residents along the line turned over $15,000 in cash, the second payment on the $25,000 indemnity bond required by the court to guard against a drop in the value of the material used in the line as scrap should that part of the property about which the present action hinges eventually have to be sold as junk. A similar sum will be paid within thirty days on the purchase price of $250,000. It is expected that by the time payments are completed every resident along the Dan Patch will be interested in the property as a stockholder. The new organization contemplates operating both divisions of the road, including the 14-mile cut-off between the Auto club and the Luce Line junction, as well as the main line to Northfield. The cut-off has not been operated under the existing receivership. W. L. Harris, John B. Irwin, Minneapolis; W. F. Roche, Lakeville, and R. H. Benham, comprise the reorganization committee.

Electric Railway Monthly Earnings

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.					
1m., Feb., '18	$67,485	*$51,493	$15,992	$19,942	†$3,950
1m., Feb., '17	68,776	*40,521	28,255	18,933	9,322
12m., Feb., '18	887,921	*520,282	367,639	230,385	137,254
12m., Feb., '17	844,757	*475,477	369,280	217,077	152,203
BATON ROUGE (LA.) ELECTRIC COMPANY					
1m., Feb., '18	$19,847	*$10,644	$9,203	$3,717	$5,486
1m., Feb., '17	18,821	*8,685	10,136	3,513	6,623
12m., Feb., '18	234,074	*122,512	111,562	43,071	68,491
12m., Feb., '17	215,983	*101,794	114,189	42,148	72,041
BROCTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.					
1m., Feb., '18	$7,192	*$8,536	†$1,344	$1,328	†$2,672
1m., Feb., '17	7,714	*8,709	†995	1,161	†2,156
12m., Feb., '18	122,336	*124,212	†1,876	15,145	17,021
12m., Feb., '17	123,986	*112,804	11,182	13,379	†2,197
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.					
1m., Feb., '18	$137,791	*$106,144	$31,647	$30,565	$1,082
1m., Feb., '17	102,594	*68,653	33,941	32,062	1,879
12m., Feb., '18	1,422,833	*1,211,754	211,079	361,669	†150,590
12m., Feb., '17	1,246,829	*844,466	402,363	362,786	39,577
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO					
1m., Feb., '18	$347,374	*$263,064	$84,310	$54,119	$30,191
1m., Feb., '17	316,318	*224,677	91,641	44,961	46,680
12m., Feb., '18	4,085,333	*3,055,742	1,029,591	576,221	453,370
12m., Feb., '17	3,613,172	*2,219,872	1,393,300	520,107	873,193

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Feb., '18	$80,408	*$44,520	$35,888	$12,851	‡$26,183
1m., Feb., '17	73,006	*39,179	33,827	9,783	24,044
12m., Feb., '18	950,583	*529,923	420,660	143,591	‡303,137
12m., Feb., '17	848,403	*454,299	394,104	109,456	284,648
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.					
1m., Feb., '18	$311,063	*$224,992	$86,071	$66,648	$19,423
1m., Feb., '17	268,158	*172,293	95,865	63,969	31,896
12m., Feb., '18	3,742,457	*2,602,427	1,140,030	789,726	350,304
12m., Feb., '17	3,131,624	*1,913,180	1,218,444	759,411	459,033
JACKSONVILLE (FLA.) TRACTION COMPANY					
1m., Feb., '18	$66,003	*$47,244	$18,759	$17,030	$1,729
1m., Feb., '17	53,931	*37,312	16,619	15,493	1,126
12m., Feb., '18	716,590	*488,380	228,210	190,752	37,458
12m., Feb., '17	637,103	*429,440	207,663	185,495	22,168
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.					
1m., Feb., '18	$42,254	*$63,085	†$20,831	$15,762	†$36,593
1m., Feb., '17	54,793	*51,350	3,443	15,444	†12,001
12m., Feb., '18	871,251	*714,234	157,017	187,610	†30,593
12m., Feb., '17	816,699	*579,192	237,507	186,476	51,031
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., Feb., '18	$577,581	*$327,385	$250,196	$177,792	$72,404
1m., Feb., '17	459,908	*243,101	216,807	181,016	35,791
12m., Feb., '18	6,240,740	*3,745,515	2,495,225	2,145,385	349,840
12m., Feb., '17	5,568,929	*3,030,719	2,538,210	2,178,685	359,525

*Includes taxes. †Deficit. ‡Includes non-operating income.

Traffic and Transportation

Strang Line Seeks Increase

Kansas Institution Forced to Appeal to Public Service Commission for Fare Increase

A hearing was held in Olathe, Kan., on April 16 by the Public Utilities Commission of Kansas on the application of the Missouri & Kansas Interurban Railway, operating 22 miles of line, for an increase in rates to a straight 3-cents-a-mile basis.

How the Company Has Fared

The company's petition and arguments urged that immediate relief was needed to prevent a complete withdrawal of service within the next few months. The plea is one of emergency, and the company did not go into the matter of valuation. It had suggested to the commission that it send engineers to go over the line, and accountants to examine the books, preliminary to the hearing, to get independently of the petition, the information that would disclose the necessity for the higher rates. The commission answered that this was unnecessary, in view of the short time intervening between the appeal and the hearing.

The property was bonded about five years ago for $30,000 a mile. It has always paid its interest, and each year, until 1917, put some surplus back into the road, a total of $21,000 having been so disposed from 1913 to 1916. In 1917 the revenue from passenger service was about $94,000 and from freight about $16,000. That year the company put about $2,000 into renewals and showed a deficit of about $700. No dividends have ever been paid, but business had developed to a point where this could probably have been done. Then came the unusual conditions resulting from the war.

Two Cents a Mile Ppesent Charge

The railway has been operating with a 2-cents-a-mile rate on through traffic. Its largest business, however, was from the people who had homes along the line. There were eight zones between Olathe and Kansas City—about 2½ miles in each zone, in which there were 5-cent fares, and from which toward either terminus there was an additional 5-cent fare from the point of origin. In many cases there were two or three stations in each zone. The company also sold commutation tickets, the price being based on twenty-five trips a month at half fare for the round trip. The tickets for use between Olathe and Kansas City sold for $10 and those between nearer points and the city at the same relative price of 1 cent a mile. Books with a smaller number of trips a month were sold on the basis of 1½ cents a mile, the distances, however, being figured by zones. One result of the system was that it is difficult now to estimate the distances traveled by the holders of books.

The company has encountered perhaps even more than the usual difficulties of electric railway operation during the past year. The inability of the Kansas City Railways to provide all the current the line needed last winter made necessary the withdrawal of its through cars from Olathe. In addition the company had before this been forced to shut down its own generating station at Overland, because of the shortage of natural gas. Its plant at Olathe requires replacement in the near future.

Three Cents a Mile Suggested

The company represented to the commission that a straight 3-cents-a-mile rate would probably reduce the traffic 15 per cent, but would yield a possible passenger revenue of $124,000 a year. This, with the $16,000 freight business, would provide revenue sufficient for necessary renewals and replacements, and the maintenance of service.

Ten One-Man Cars for Use on Middlesex & Boston

Before the Massachusetts Public Service Commission at Boston on April 17, G. M. Cox, vice-president and general manager of the Middlesex & Boston Street Railway, stated that ten one-man cars will be placed in service on the road in the near future. Six new cars of this type are to be delivered in the latter part of May, and the company is to rebuild four cars for one-man operation.

The commission has authorized the use of such cars on ten lines. The six new cars weigh about 6½ tons each. The old cars which are to be rebuilt weigh about 9½ tons. All the one-man cars will be equipped with safety devices.

The use of these cars represents the company's best effort to render service without tearing up tracks. On the Lexington-Woburn line it is estimated that the saving by operating a one-man car will total $1,940 a year, exclusive of the power economies. Mr. Cox said that he was informed on a recent trip to the Brockton & Plymouth Street Railway that the two one-man cars in service on that road are saving materially in power compared with the ordinary two-men cars. He emphasized his belief that the removal of tracks was against the best interests of the State and said that existing lines were an asset even for occasional use by nonresidents of the territory in which the company operates.

Return to Five-Cent Unit

Large Massachusetts Company Wants This as Basic Fare With Short Outside Zones

The Massachusetts Northeastern Street Railway, Haverhill, Mass., has filed with the Public Service Commissions of Massachusetts and New Hampshire a new tariff asking that the same be made effective on May 15.

The company's present tariff is on the basis of 5-cent fares except as to its Haverhill-Lawrence line, and a number of sections in Haverhill and Lawrence where limited distances can be traveled on 5-cent tickets. Under this tariff the company's passenger revenue increased 8.7 per cent for the year ended Dec. 31 but its operating expenses increased $109,168, or 18.2 per cent, and for the first three months of the present year the company has failed to earn operating expenses, to say nothing of its taxes and other fixed charges.

The new tariff proposes a return to the 5-cent unit of fare for all sections on the system except as to the lines along the shore from Plum Island to Hampton Beach. It is a combination of the present collection arrangement and the mileage zone plan which the management considers best adapted to its particular situation and business, and which it hopes will meet with public favor.

The plan in general is to establish 5-cent fare sections approximately 2½ miles in length except as to the mileage in cities and towns with relatively dense population where the sections and haul will be longer for the single fare.

About midway between the 5-cent limits or collection points, 2½-cent fare points will be established, to which a passenger may ride upon a 2½-cent check or ticket when used in connection with one or more 5-cent fares or tickets, so that one full fare section and one-half of the next adjoining section can be traversed for 7½ cents or two and one-half sections for 12½ cents, and so on. It will still be necessary to collect at every 5-cent fare point at least when open cars are used, but instead of the passenger being required to pay 12 cents as at present, for a continuous ride in any part of two sections, it will be possible for him to cross a collection point on the payment of 7½ cents by the use of a ticket. These 7½-cent tickets will be placed on sale at points convenient for patrons, in blocks of ten for 75 cents.

Free transfers will be issued at various centers allowing passengers to ride limited distances on other lines of the company, and it is proposed to continue the sale of workingmen's tickets good in certain specified hours, and in certain specified sections at 75 per cent of the full tariff rate.

The establishment of the short, or intermediate, zones will automatically eliminate many so-called "lap overs" where passengers are now being carried beyond a regular fare point without additional charge, and except as to the elasticity necessary to adjust a fare point to some local condition calling for special consideration, and for the longer sections in the more populous areas, the intention is as nearly as possible to charge on a mileage basis, and by the introduction of new zones on various routes as indicated in the tariff to equalize distances and remove any discrimination that exists at present.

Filling the Market Basket

Interurban Road Aids Its Employees to Purchase Supplies of Foodstuffs at Wholesale Prices

The Missouri Short Line, Kansas City, Mo., since Feb. 1 has been operating a system of supplying its employees with several items of groceries at practically wholesale cost. The principal foodstuffs distributed thus are potatoes, meat, sugar, bacon and canned goods.

An arrangement was made with a jobbing house for the purchase of groceries and meats ordered by the men. Each week a list of items with their prices is posted at the main office, at the carhouse in North Kansas City, and in St. Joseph. The men make up their orders in consultation with their wives and bring baskets to the carhouses in North Kansas City where the groceries are delivered on one of the company's freight cars.

SAVING 25 TO 35 PER CENT

Orders are received and goods delivered every two weeks a few days before the semi-monthly pay day. The men are permitted to sign an order which, when passed by the head of the workmen's department, is received and charged against the amount the man has coming to him in the form of pay. The train dispatcher in North Kansas City occupies the day when deliveries are made in keeping track of them. His time is charged against the goods and the cost is distributed among the purchasers. The men save from 25 to 35 per cent on the cost of their groceries. In addition they do not have to run a grocer's bill and always get good quality and full value, even disregarding the discount they receive. More than one man has declared that the facilities thus provided are equivalent to a raise of $10 a month. For some time trainmen have been in the habit of buying butter and eggs from farmers along the route who patronize the Missouri Short Line.

J. R. Harrington, vice-president and general manager of the Missouri Short Line, is pleased with the reception of the plan by the men. The supplies for the men are procured from a wholesaler in Kansas City, Kan., who does not deal with any of the merchants along the railway. Even those local merchants who might feel that they had cause to be aggrieved at such an arrangement, apparently do not take the matter as having any personal application to themselves.

London Applies for Higher Fares

Canadian Company is Conducting Publicity Campaign—Public Co-operation is Being Created

The London (Ont.) Street Railway has appealed to the City Council for an amendment to its franchise (granted March 8, 1895) permitting it to charge increased fares. The company does not specify the increase desired, but asks the Council to conduct an investigation to determine what increase is required.

The present fares of this Canadian company are as follows: workmen's tickets, nine for 25 cents; regular tickets, seven for 25 cents; children's tickets, two for 5 cents; children's cash fare, 3 cents, and regular cash fare, 5 cents.

In connection with its application, the company is conducting an aggressive publicity campaign, under the direction of Glenn Marston, New York. This is designed to acquaint the public with the problems the company has to solve, and show why the increase in fares is essential to the maintenance of good service.

The campaign has been under way for several weeks. Daily advertisements, such as those reproduced herewith, have been published in each city newspaper, comparing the company's increased cost of living with that experienced by every individual in the city. The papers have shown considerable interest in the question and each day interview officials of the company in regard to points which are brought up in street discussion.

A large number of letters dealing with the fare question have been written to the papers and published by them. An interesting feature of these letters is the fact that only one of them has stated that fares should not be increased. Nearly all of the writers appear to recognize the necessity of the increase and are willing it should go into effect provided some pet hobby of the individual is inserted in the contract for the increase.

The company publishes a four-page bulletin, entitled *Street Railway Service*, which normally appears twice a month. Publication is now weekly and will continue to be so during the discussion of the fare question. Distribution of the bulletin is secured through "Take One" boxes placed at convenient points in the car.

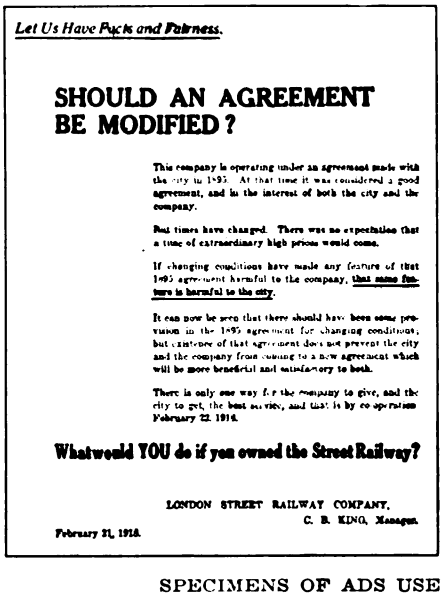
Regular-sized street-car cards are used generally for the company's safety slogans. The safety cards have been replaced by cards reading "Higher Fares? Read the Ads in the Papers."

TWO SLOGANS ARE USED

Two standard slogans are used in the advertisements. The first one, "Let us have facts and fairness," has been referred to in nearly every communication sent to the papers. It has had the desired effect of keeping hysteria and plain "knocking" out of the discussion.

The second slogan, "What would you do if you owned the street railway?" is an effort to get the public to consider the problem from a personal point of view. It seems to be serving its purpose admirably, as is indicated by the public correspondence in the newspapers. Practically all the letters written to the papers contain suggestions which, in the eyes of the writers at least, are constructive—a clear indication that the people are giving their electric railway problem real consideration.

Aside from its direct effect on the fare situation, the publicity campaign has already developed a feeling among the people that the interests of the public are best served by looking to the interests of the company. There exists a spirit of co-operation which was largely lacking before the railway took the patrons of the company into its confidence.



Let Us Have Facts and Fairness.

SHOULD AN AGREEMENT BE MODIFIED?

This company is operating under an agreement made with the city in 1895. At that time it was considered a good agreement, and in the interest of both the city and the company.

But times have changed. There was no expectation that a time of extraordinary high prices would come.

If changing conditions have made any feature of that 1895 agreement harmful to the company, that same feature is harmful to the city.

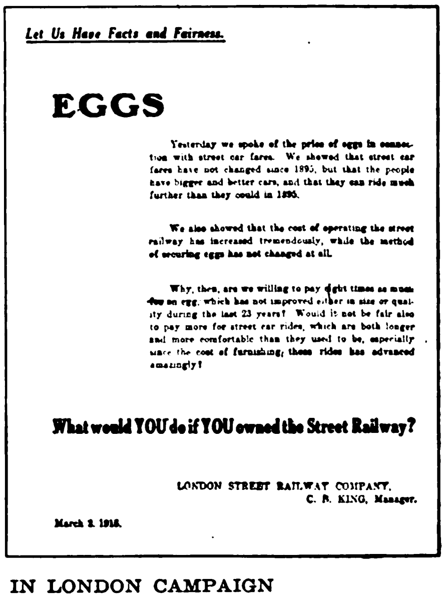
It can now be seen that there should have been some provision in the 1895 agreement for changing conditions; but existence of that agreement does not prevent the city and the company from coming to a new agreement which will be more beneficial and satisfactory to both.

There is only one way for the company to give, and the city to get, the best service, and that is by co-operation
February 22. 1918.

What would YOU do if you owned the Street Railway?

LONDON STREET RAILWAY COMPANY,
C. B. KING, Manager.

February 21, 1918.



Let Us Have Facts and Fairness.

EGGS

Yesterday we spoke of the price of eggs in connection with street car fares. We showed that street car fares have not changed since 1895, but that the people have bigger and better cars, and that they can ride much further than they could in 1895.

We also showed that the cost of operating the street railway has increased tremendously, while the method of securing eggs has not changed at all.

Why, then, are we willing to pay eight times as much for an egg, which has not improved either in size or quality during the last 23 years? Would it not be fair also to pay more for street car rides, which are both longer and more comfortable than they used to be, especially since the cost of furnishing these rides has advanced amazingly?

What would YOU do if YOU owned the Street Railway?

LONDON STREET RAILWAY COMPANY,
C. B. KING, Manager.

March 2. 1918.

SPECIMENS OF ADS USED IN LONDON CAMPAIGN

Skip Stops for Pittsburgh

Commission Orders Their Installation—660 Ft. the Average Distance—Stops to be Marked by Signs

In an order issued on April 11 the Public Service Commission of Pennsylvania instructed the Pittsburgh Railways to install skip stops on three of its routes. The order says in part:

"The investigation of the operation of the lines on the Penn Avenue-Butler Street throat shows that the delays and congestion are partly due to the practice of having stops at or in nearly every block. The study of the traffic shows that a number of these stops can be eliminated without interfering to any degree with the convenience of the public and that this elimination will be likely to add to the regularity and speed of the service. The commission will, therefore, order the company to install stops in accordance with the schedule as set out in the order of the commission, which provides for about eight stops per mile, corresponding to 660 ft. between stops, substantially in accordance with the latest and best recognized street railway practice for large cities and in keeping with the contemplated order of the United States fuel administrator, reading as follows:

"'*Bulletin No. 11, Electric Service Applied to Fuel Conservation*'

"'The regular passenger stopping places for electric railways should be spaced so as not to exceed eight per mile in urban districts and six per mile in suburban districts. On interurban lines the regular passenger stopping places shall not exceed four per mile. Where safety stops are necessary they shall, so far as practicable, be combined with the passenger stops.'

"Furthermore, good practice dictates that the stopping places shall be clearly defined by suitable signs. The railway company will be ordered to erect signs in advance at the proposed stopping places so that the public may be thoroughly informed as to the changes to be made in the operation."

Later in its report the commission states that these stopping signs shall consist of a circular disk with white background upon which is to be painted in black the words "Car Stop" and which, with its attachments, is to be suspended from the trolley wire at and over the place where the car stops.

Zone Fares in Rhode Island May 1

The zone system will go into effect on the lines of the Rhode Island Company on May 1, the Legislature having authorized the company to establish this plan under the control of the Public Utilities Commission.

A. E. Potter, general manager, states that a ticket system will be used on the suburban and interurban lines. When a passenger pays his fare he will state his destination, and pay full fare thereto, receiving a ticket properly punched by the conductor.

This system is to be used on the following lines: Providence-Buttonwoods, Providence-East Greenwich, Providence-Narragansett Pier, Providence-Riverpoint, Riverpoint-Rocky Point, Providence-Danielson, Providence-Chepachet, Providence-Woonsocket, Pascoag-Woonsocket, Pawtucket-Cumberland Hill, Pawtucket-Crescent Park, Providence-Riverside, and the Warren and Bristol.

On the lines where the fare is less than 10 cents, some other system is to be used. Just what that system will be has not been decided.

Basis of Hartford Fare Appeal

City Cites Wherein It Believes Commission Erred in Recent Six-Cent Case

The appeal of the city of Hartford, Conn., from the decision of the Public Service Commission of Connecticut in sustaining the 6-cent fare on the lines of the Connecticut Company is returnable to the Superior Court at Hartford on May 7.

In the reasons given for the appeal the corporation counsel of the city states that the commission erred in finding facts relating to the price paid by the Consolidated Railway and the New York, New Haven & Hartford Railroad for street railway properties; in finding facts concerning prices that were contrary to evidence; in treating the Connecticut Company as a unit for the purpose of determining whether or not the 6-cent fare was reasonable; that the commission erred in finding that the 6-cent fare was reasonable in Hartford when admittedly certain of the railway lines within the city limits could be operated profitably on a 5-cent basis and when, so far as appeared from evidence, all the lines within the limits of the city could be operated at a profit on a 5-cent unit of fare.

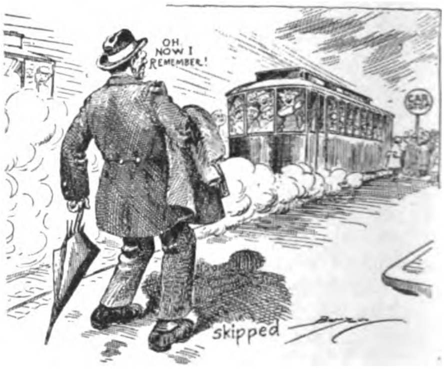
It is held that no data were submitted showing receipts from operations of lines in the carriage of passengers in Hartford; that the 6-cent fare is not a solution of the difficulties of the Connecticut Company; that there were no facts before the commission to determine whether the Hartford lines were operated at a profit or otherwise; that the commission erred in failing to require the Connecticut Company to rearrange its zone system with a view to fairness to all classes; that an error was made by the commission in ruling that the 6-cent fare was reasonable at a minimum fare for the short rider; that the commission erred in considering the property of the Connecticut Company as a whole notwithstanding the fact that it leases lines from the Connecticut Railway & Lighting Company and from the Shore Line Electric Railway.

The testimony presented before the commission in this case was reviewed at length in the ELECTRIC RAILWAY JOURNAL, and the decision of the commission was abstracted in the issue of this paper for March 30, page 620.

Skip Stops in Washington

Smooth Inauguration of Plan in National Capital—Federal Trade Commission Staggers Hours

The skip-stop plan for the city of Washington, D. C., as proposed by John A. Beeler, was put into practice on April 21. The public was thoroughly informed through the newspapers that the change was to be made and that cars would stop only at the "car stop" signs. These are circular signs painted yellow, with "Car Stop" in black letters. In some cases they are carried on the trolley poles either in the middle or at the side of the street, and in other places on an iron post about 6 ft. high. A saving in running time of 15 per cent is expected.



Skip Stops according to Washington *Star*

The Washington *Evening Star* for April 21 had a good humored cartoon, reproduced herewith, on the working of the new plan. The Washington *Times* described the inauguration as follows:

"There were some kicks because of the confusion in locating car stops; some complaints over the locations; the inevitable grouches that go with changes of any kind; but on the whole reports from the public appeared to indicate that the people, who are adjusting themselves to all sorts of overturning in their lives, regarded the skip-stop plan as about the best thing they have had imposed on them.

"The greatest satisfaction was over the saving of running time. The schedule on every line in the city has been shortened, and motormen and conductors like the change so well that they put 'pep' into their work, and there was acceleration in every direction. Motormen at last found opportunity to pull throttles wide open and make some real time, and they did it with a vim. The conductors entered into the spirit of it and even the passengers stepped more lively than usual in getting on and off the cars."

The Public Utility Commission will now probably soon take up the proposed plan of staggered hours for the different government bureaus and departments. The Federal Trade Commission has already begun this reform by voluntarily changing its opening hours from 9 a. m. to 8:30. It has 400 workers.

Transportation News Notes

Kansas City Hearing April 29.—The hearing on the application of the Kansas City Railways for an increase in fares has been set by the Public Service Commission of Missouri for April 29.

Skip-Stop Plan at Dayton Will Be Retained.—The City Commission at Dayton, Ohio, has decided that the skip-stop plan adopted by the street railways shall be retained as a means of conserving fuel.

Six-Cent Fare Wanted in Taylorville.—The Central Illinois Public Service Company, Mattoon, Ill., has applied to the Public Utilities Commission of Illinois for a 6-cent fare in Taylorville and for the elimination of commutation books.

Final Milwaukee Hearing Begun.—The final hearing was begun on April 8 on the application of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to the Railroad Commission of that State for the readjustment of its fares covering the entire system in Milwaukee County.

Higher Fares Indicated for Suburban Line.—The March statement of the Columbus Railway, Power & Light Company, Columbus, Ohio, indicates that the fare on its Westerville line will have to be increased. The working capital of $25,000, which is the fare indicator, has dropped to about $15,000.

West Penn Will Charge Six Cents.—The West Penn Railways, Pittsburgh, Pa., has filed with the Public Service Commission a revised tariff schedule. in which it is proposed to increase fares from 5 to 6 cents. The new tariff will become effective on May 11. The company operates 339 miles of line.

Operation of Trailers Suggested.—The Administrative Board at Richmond, Va., has written to Thomas S. Wheelwright, president of the Virginia Railway & Power Company, requesting that trailers be added to all cars of the company during the hours when the congestion is greatest.

Hearing on South Bend Rates April 26.—April 26 was set as the date for the hearing before the Public Service Commission of Indiana at Indianapolis, Ind., on the application of the Chicago, South Bend & Northern Indiana Railway for permission to increase its interurban rates from 2 cents a mile to 2½ cents.

Agree on East Cleveland Fares.—The Cleveland (Ohio) Railway and the officials of East Cleveland have agreed upon a rate of fare of 5 cents, with the payment of 1 cent for transfers, for service between Cleveland and East Cleveland. It is believed the managers of the city will accept the franchise. The grant will then have to be submitted to a vote of the electors.

Increase in Fare Wanted in Battle Creek.—The Michigan Railway has filed a petition with the City Commission of Battle Creek, Mich., for an increase of cash fares to 6 cents and the abolishment of the six-for-a-quarter tickets. The company has recently been authorized to charge a 6-cent fare in Jackson. This authorization was noted in the ELECTRIC RAILWAY JOURNAL of April 20, page 787.

Six-for-a-Quarter Tickets Go.—The Charlottesville & Albemarle Railway, Charlottesville, Va., April 16 was authorized by the State Corporation Commission to eliminate the six-for-a-quarter tickets and raise the labor and school pupil tickets from 2½ to 3 cents. The Council of the city of Charlottesville raised no objection and admitted the jurisdiction of the Corporation Commission.

New Sunday, Holiday and Excursion Fares.—The Southern New York Power & Railway Corporation, operating from Mohawk to Oneonta through Richfield Springs and Cooperstown, has filed with the Public Service Commission of the Second District of New York a new tariff schedule, effective on May 30 and continuing in effect until Oct. 1, 1918. The new tariff affects special Sunday, holiday and week-end excursion fares between various local stations for the season of 1918.

Omaha Feels the Pinch.—In announcing the increase in the pay of its employees referred to elsewhere in this issue of the ELECTRIC RAILWAY JOURNAL the Omaha & Council Bluffs Street Railway, Omaha, Neb., issued a statement in which it said: "From the total increases of wages to our men during the last two years, together with the increased cost of every article purchased by the railway, it may be seen that prompt relief must be sought either in an increase of fares, or in other directions, in order to enable the company to meet its financial obligations."

Short Colorado Road to Increase Fares.—The Denver & South Platte Railway, operating 5 miles of road between Denver and Littleton, has made application to the Public Utilities Commission of Colorado for an increase in fare from 5 cents to 10 cents between Englewood and Littleton. Commutation books containing twenty-five fares are to be sold for $1.50, thus reducing the cost per ride to 6 cents. Under the new arrangement the fare from Denver to Littleton will be 11 cents, if the commutation plan is used. The new rates will go into effect on May 10 unless protest against them is entered with the commission.

Portland Fare Appeal Filed.—The city of Portland, Ore., on April 5 filed in the Supreme Court its appeal in the 6-cent fare case, in which the city is appellant and the State Public Service Commission respondent. The case involves the question of the jurisdiction of the commission, as the result of an order allowing the Portland Railway, Light & Power Company to increase its fares from 5 cents to 6 cents. The commission won the unanimous decision of the six judges in the lower court. Appeal was filed through W. P. La Roche, city attorney. A hearing will not be held on the Portland appeal until the Supreme Court returns from Pendleton, where the Eastern Oregon session will be held the first week of May.

Protests Johnstown Increase.—City Solicitor Tillman K. Saylor, acting for members of the Council of Johnstown, Pa., and the citizens' protest committee, has filed with the Public Service Commission a complaint against the new tariff of the Johnstown Traction Company. Mr. Saylor says that 5-cent fares "yield ample return on the capital invested, if the business of the company is properly managed," and asserts that the proposed 6-cent rate is "excessive, unjust and unreasonable." It is further alleged that the company has failed to extend its lines and improve its service as demanded by the transportation needs of the community. The new tariff went into effect on April 14.

Application to Dismiss Refused.—A decision has been rendered by the Public Utilities Commission of Maine overruling the motion of Guy H. Sturgis, attorney general, to dismiss the application of the Cumberland County Power & Light Company for an increase in its passenger fares to 6 cents on electric roads in Portland and vicinity. The effect of this ruling is to require the remonstrants, represented by the attorney general, to prepare and submit their case. The preparation would necessitate the testimony of an engineer for valuation purposes, the reasonableness of the creation of central and outside zones, the matter of not charging for transfers and the curtailment of service. In March the commission suspended the proposed rates until June 7 in order to allow the protestants to examine the company's evidence and employ experts.

Increase in Evansville Fare Approved.—The Public Service Commission of Indiana has granted the petition of the Public Utilities Company, Evansville, Ind., for the elimination of ticket fares, and has authorized the company to charge a straight 5-cent cash fare, with the usual transfer privileges, and to suspend the sale of tickets at the rate of six for 25 cents until the further order of the commission, but not exceeding a period of two years. The investigation of the commission showed that the company was confronted with a deficit estimated at $35,000 for the year 1918, and that the relief asked would only meet a part of the added costs of operation. It was assumed by the commission that with a normal increase of traffic, the establishing of a straight 5-cent fare would yield an increased revenue of $45,000 for the year, which, however, it was estimated would not meet more than 50 per cent of the increased cost of operation.

Legal Notes

Illinois.—*Payment to Parent Does Not Satisfy Judgment in Favor of Child.*

A father has no right by reason of the parental relation to the custody of the estate of his minor child. Hence, a payment to the father of a judgment rendered in favor of the infant does not satisfy the judgment. (Paskewie vs. East St. Louis & Suburban Ry., 117 N. E. Rep., 1035.)

Kentucky.—*Better Terminal Facilities, Made Necessary by Modern Conditions, Do Not Require Additional Franchise.*

Where a single spur track was put in when horsepower was used by a street railway before the adoption of the present Constitution requiring franchises upon public streets to be sold to the highest bidder, a subsequent consent by the city to a double spur track with a loop, necessary on account of the substitution of motor power, was not the grant of an additional franchise, but the conforming of an old turnout to modern conditions, to which the street railway possesses a property right. (City of Dayton et al. vs. South Covington & Cincinnati St. Ry., 197 S.W., 670.)

Kentucky.—*Assessment Against Electric Railway for Oiling Street Is Valid.*

The oiling of city streets being a permanent improvement, preserving and making the streets more lasting for the purpose of travel, a reasonable part of the cost thereof may be assessed against an electric railway using such streets. (Henderson Trac. Co. vs. City of Henderson, 198 S.W. Rep., 730.)

Massachusetts. — *Injury to Person Who Climbed Over Barrier Across Street Under Repair.*

Where barriers erected by a city indicated that a street had been temporarily withdrawn from public travel by reason of repairs, a street railway company is not bound to anticipate the presence of pedestrians on such street, or that they will stumble over such paving and fall in front of a car. (Conners vs. Worcester Consol. St. Ry. Co., 117 N. E. Rep., 334.)

Massachusetts.—*Falling Window Not Necessarily Caused by Negligence of Company.*

In an action against a street railway for injuries when an open window of its car fell on a passenger's arm, evidence held insufficient to show that the window was raised and improperly fastened in place by a servant of the street railway and not by some person for whose act it would not be responsible. (Murphy vs. Boston El. Ry., 118 N. E. Rep., 191.)

Massachusetts. — *Commission Has Power to Change Rates Specified in Original Grant.*

Whether the Bay State Street Railway should be permitted to withdraw six-for-25-cents commutation tickets over the Slade's Ferry Bridge at Fall River, issuance of which was made a condition by the city of Fall River to the grant of a location to the road's predecessor, was a question to be decided according to the judgment of the Public Service Commission, based on the evidence of the company's financial condition and ability to serve efficiently the public, dependent on the maintenance of its entire system. (City of Fall River et al. vs. Public Service Commission et al.; Same vs. Bay State St. Ry. Co., 117 N.E. Rep., 915.)

New Jersey.—*Township Cannot Compel Construction of Part of Line if Legal Obstacles Prevent Its Construction Complete.*

A municipal ordinance authorized the construction of a street railroad from terminus to terminus but the company found it would be unable to obtain the permission of a steam railroad to cross its tracks. Held that the township authorities could not demand from the court a mandamus to compel the construction of the road in two unconnected sections, separated by the steam railroad in question. (Hamilton Township vs. Mercer County Trac. Co. et al., 102 At. Rep., 3.)

New Jersey.—*Municipalities Enjoined From Moving Turnout.*

Municipal corporations are not, as respects public rights, within statutes of limitations, but in exceptional cases the court may hold the public estopped, if right and justice require.

A street railway company, acting under ordinance in constructing its railroad, changed the location of one of its turnouts from the point designated in its authority to another point a considerable distance away, where, however, its location could have been authorized originally. The railroad and turnout, thus constructed, were maintained and operated for twelve years without any protest from the municipalities, or the landowner in front of whose property the turnout was constructed. Held, that the municipalities, both of which ordered the removal of the turnout, be perpetually enjoined from removing it. (Trenton & Mercer County Trac. Corp. et al. vs. Inhabitants of Ewing Township et al., 101 At. Rep., 1037.)

New York.—*Rights at Crossings Defined.*

"At crossings, neither the street car nor the pedestrian has a paramount right of way. Between crossings the car has the right of way." (Goldstein et al. vs. Union Ry., 167 N. Y. Sup., 837.)

New York.—*Persons Liable for Damage from Charged Telephone Wire.*

Where a railway company, maintaining a telephone wire, knew that the heavily charged wire of a light and gas company had sagged upon the telephone wire, the railway company and the light and gas company were in pari delicto as to the killing of a third person's horse by coming in contact with electricity from the railway company's telephone wire, which burned in two and fell to the ground. (Hudson Valley Ry. Co. vs. Mechanicville Elec. Lt. & Gas Co., 166 N. Y. Sup., 816.)

Pennsylvania. — *Paving of an Improved Kind Required.*

An ordinance granted a street railway company the right to use the streets as a right-of-way provided that it should be required at the time of the construction of the railway to pave the streets between its tracks and for a distance of 24 in. outside of each rail with material or pavement similar to that then in use or which might in the future be used or adopted by the municipality, and keep and maintain the same in good condition, so that driving on, off, or across the tracks should be safe. At the time of construction of the road the municipality's streets were macadamized, and defendant macadamized the streets between its tracks. Thereafter the municipality ordered repaving of certain streets with vitrified brick, and defendant thereupon paved its portion of such streets with the same material. Subsequently the municipality ordered the paving of other streets with vitrified brick and notified defendant to pave its portion. Defendant refused, on account of its financial condition. Held that, as the streets were in need of construction and repair, specific performance of the contract was properly directed. (Chambersburg Borough vs. Chambersburg & Gettysburg Elec. Ry., 101 At. Rep., 922.)

New Publications

Coal: The Resources and Its Full Utilization

By Chester C. Gilbert and Joseph E. Pogue of the Division of Mineral Technology, United States National Museum. Paper, twenty-six pages.

This is a reprint of Part 4 of Bulletin 102 of the United States National Museum, Smithsonian Institution.

The Employment Department and Employee Relations

By F. G. Henderschott and F. E. Weagly. The LaSalle Extension University, Chicago, Ill. Paper, sixty pages.

This pamphlet describes the organization and the duties of an employment department, the functions of the employment manager, his relation to other departments, the sources of labor supply and the scientific method of selecting men for jobs. Practical questions of transfers, promotion and general welfare are also discussed. The pamphlet is a good guide to the modern handling of employment problems.

Personal Mention

Charles H. Session has been named a member of the Public Utilities Commission of Kansas.

Arthur McGee has been appointed master mechanic of the Indiana Railways & Light Company, Kokomo, Ind., to succeed I. H. Montgomery.

Walter Harris has resigned as master mechanic of the Central California Traction Company to accept the position of master mechanic with the Portland, Eugene & Eastern Railway, Portland, Ore.

Charles R. Detrick, secretary of the California Railroad Commission, has resigned. Rudolph A. Pabst, who has been assistant secretary for some time, will perform the duties of secretary for the present.

H. S. Murphy has been appointed engineer of distribution of the Philadelphia (Pa.) Rapid Transit Company to succeed J. H. M. Andrews, who was called into service last August with the Pennsylvania National Guard.

George D. Powell has been promoted to the position of office engineer in the maintenance of way department of the Union Traction Company of Indiana, Inianapolis, Ind. Mr. Powell has been draughtsman in that department since last August.

E. C. Pfenning, secretary of the City Light & Traction Company, Sedalia, Mo., has been transferred to a similar position with the Montgomery Light & Water Power Company, Montgomery, Ala. Allen O'Bannon, general bookkeeper at Sedalia, succeeds Mr. Pfenning.

S. R. Humbert has been appointed superintendent of transportation of the Indiana Railways & Light Company, Kokomo, Ind., to succeed F. O. Pense, who has been appointed superintendent of the Oakland Coal Company, which has been formed to mine coal for the railway and light company.

Charles E. Cox, for the last fifteen years with the Urbana & Champaign Railway, Gas & Electric Company, (Illinois Traction System) Champaign, Ill., has resigned to give his entire attention to an automobile business in which he is interested. Mr. Cox has served as cashier, auditor and office manager for the local utility company in Champaign, Ill. He will continue to be located in that city.

A. G. Carson, former manager of the Eastern Wisconsin Electric Company at Fond du Lac, Wis., has been appointed assistant to the vice-president of the Wisconsin Public Service Company, Green Bay, Wis., and will for the present assume the duties performed previously by J. G. Miller at Manitowoc, Mr. Miller having been ordered to Baltimore as noted in this paper for April 20.

George A. Post has announced his intention to retire as president of the Railway Business Association. Mr. Post has been president of the association ever since its organization. The principal purpose of the association in the past has been to promote good relations between the railways and the railway supply companies and to educate public opinion and public officials regarding railway questions.

Ainslee A. Gray, formerly editor of *Electrical Review* and more recently in the advertising business in Chicago, has been commissioned major in the ordnance department of the United States Army. Major Gray will establish a bureau to supply information to ordnance manufacturers and their employees through the trade press, the government believing it desirable to keep in touch with manufacturers in this manner.

Rollo Keesler has been appointed division engineer for the Anderson division of the Union Traction Company of Indiana, Indianapolis, Ind., to succeed Bob Custer. Mr. Keesler has been office engineer in the maintenance of way department of the company since 1912, except for a few months' absence. Prior to becoming connected with the Union Traction Company he was for two years with the National Tile Works and for two years with the American Steel & Wire Company as draftsman.

George Alan Green, chief engineer and superintendent of the Fifth Avenue Coach Company, New York, N. Y., has been made a major in the British Tank Corps now in active service in France. He left the coach company last spring to become a captain in the Tank Corps, and has in the last year participated in practically every tank "show" on the western front, including the Cambrai attack. Major Green returned to the front last month after a short furlough, during which he visited New York.

C. Nesbitt Duffy, vice-president and general manager of the Manila Electric Railway & Light Company, Manila, P. I., and also president of the Manila Merchants' Association, recently presided at a reception given in Manila in honor of Paul S. Reinsch, United States minister to China. In addition to the duties called for by these two offices, Mr. Duffy is also president of the Friendly Sons of St. Patrick in Manila, and at the annual banquet of that society on March 17, 1918, introduced several novel features. One of these was that none of the banqueters knew who the speakers would be until they were presented by the toastmaster. This added to the interest of the occasion.

A. R. Piper, general freight agent of the Brooklyn (N. Y.) Rapid Transit Company, has been appointed lieutenant-colonel of the Quartermaster's Corps of the National Army and depot quartermaster in command of the New York depot, being advanced from the rank of captain, with which, in April, 1917, he was called back into active service by the President, and skipping entirely the intermediate rank of major. Colonel Piper was born at Fort Wadsworth, Staten Island, in 1865. He was graduated from West Point and served ten years in the regular army. He retired from active service in June, 1899, and since then has been employed in civil pursuits until recalled into the army. In March, 1904, he became general superintendent of the American Railway Traffic Company, a subsidiary of the Brooklyn Rapid Transit System, and subsequently general freight agent of the South Brooklyn Railway.

Lewis A. Armistead, an assistant to M. C. Brush, president of the Boston (Mass.) Elevated Railway, has been commissioned a first lieutenant in the officers' reserve of the Engineer Corps, U. S. A., and detailed to a regiment now being recruited to operate the military railways in France. Mr. Armistead has been in the company's service more than twenty years, for the past few years also having been assistant to the vice-president and to the chief of maintenance. A great grandson of Daniel Webster and a grandson of Gen. L. A. Armistead, who was killed in Pickett's charge at Gettysburg, Lieutenant Armistead personally saw service as a private in the Sixth Massachusetts infantry during the Spanish war, and was in action at Guanita, Porto Rico. He has been actively identified with the operation of the rapid transit and surface lines of the Boston company since the beginning of the present co-ordinated service.

Edmund G. Simons, assistant transit commissioner of Pittsburgh, Pa., has been called into active service as first lieutenant in the Engineer Reserve Corps. Mr. Simons was graduated from Union College, Schenectady, N. Y., in 1905. He has had experienced which fits him particularly well for this type of service. Approximately eleven out of the thirteen years since he left college have been spent on construction work as follows: One year ship canal construction, one year general contracting, two years sub-aqueous tunnels, four years steam and hydroelectric power station building and three years railroad construction in China. The remaining two years have been spent on studies for the relief of transit problems in Chicago and Pittsburgh.

Morse W. Rew has resigned as chief engineer of the Pittsburgh Transit Commission to become an assistant to A. M. Taylor, who is in charge of the division of passenger transportation of the Emergency Fleet Corporation. Mr. Rew was graduated from Grinnell College, Iowa, and from the Massachusetts Institute of Technology in the class of 1909. After completing his course at the latter he remained two years as an instructor in civil engineering. Following this he held a position as designing engineer in the department of bridges, and in the port director's and Transit Commission's office in the city of Boston. From Boston Mr. Rew went to Cincinnati as designing engineer for the Transit Commission there. Later he became principal assistant with the Cincinnati Commission, but resigned from that place in 1916 to become chief engineer of the Pittsburgh Transit Commission. Both in Cincinnati and Pittsburgh Mr. Rew supervised extensive traffic surveys and studies which fit him for the patriotic and important work that he is now to undertake in the interest of the government.

Obituary

Luther Kountze, head of Kountze Brothers, prominent New York bankers, is dead. Mr. Kountze was formerly in business in Denver, Col., and is said to have been president of the first street railway built in that State.

Edwin P. Seitz, line foreman of the Mahoning & Shanango Railway & Light Company, Youngstown, Ohio, was fatally injured recently when he came into contact with high voltage wires while doing some switching at the Lowellville substation of the Sharon Steel Hoop Company. Four days after the accident Mr. Seitz died.

Rufus Franklin Emery, aged forty-eight, secretary and treasurer of the Westinghouse Air Brake Company, an officer and director of several other important corporations, died suddenly on April 11 while seated at his desk in his office at the Air Brake works in Wilmerding. Mr. Emery was born near Boston. He became affiliated with the various Westinghouse Company interests in 1891.

Charles L. Wight, former auditor of the Des Moines (Iowa) City Railway, died on April 4 in Dallas, Tex. Mr. Wight retired from active work several years ago and his illness continued over a period of about three years. In addition to his connection with the Des Moines City Railway, Mr. Wight had been identified with electric railway work in Toledo, Chicago and several other cities.

Bernard Gallagher, a director in many corporations and a retired building contractor, died in his eightieth year at his home in Brooklyn on April 19. Mr. Gallagher was president of the Brooklyn, Queens County & Suburban Railroad, and of the Metropolitan Engineering Company, and a director of the Brooklyn Heights Railroad, the Brooklyn Rapid Transit Company, the Edison Electric Illuminating Company of Brooklyn, the Kings County Electric Light & Power Company, the Manufacturers' Trust Company, the New York Consolidated Railway, the New York Municipal Railway and a number of other corporations.

Construction News

Recent Incorporations

Chatham County Traction Company, Savannah, Ga.—A charter has been granted to the Chatham County Traction Company for the construction of an electric line from a connection with the Savannah Electric Company's line at the intersection of Augusta Avenue with Lathrop Avenue, Savannah, to Port Wentworth, about 6 miles. Capital stock, $150,000. The incorporators include H. C. Foss, secretary of the Savannah Electric Company; W. W. Osborne, A. A. Lawrence, David S. Atkinson and Edmund H. Abrahams, all of Savannah. [April 6, '18.]

Wichita-Southern Interurban Railway, Wichita, Kan.—Incorporated to construct a line from Wichita to Derby, Mulvane, Belle Point, Arkansas City, Winfield and other points. Capital stock, $2,000,000. Incorporators: Schuyler Jones, David Alter, W. I. Funk and C. S. Drake, all of Wichita. [April 20, '18.]

Franchises

Mobile, Ala.—The Mobile Light & Railroad Company will ask the City Commission for a franchise to construct a single track connecting with the track now on Charleston Street at the intersection of St. Emanuel Street, southwardly along St. Emanuel Street to Texas Street and westwardly on Texas Street to connect with the line on Cedar Street, in order to provide the workers now employed in the shipbuilding plants in the southern part of the city with better street car facilities.

Covington, Ky.—The Cincinnati, Newport & Covington Railway now holds a perpetual franchise over all Covington streets that its line traverses, except those of the old town of Latonia. The decision of the United States Supreme Court in this case is referred to elsewhere in this issue.

New York, N. Y.—Officials of the New York & Queens County Railway are considering the proposition of applying to the Board of Estimate for a franchise to construct an extension from the Shell Road through Roosevelt Avenue to connect with the Alburtis Avenue station of the Corona elevated line. This application for a franchise will supersede the application now before the board for a permit to build an extension of the company's lines from Kingsland Avenue to the Alburtis Avenue station.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—A new line is being built by the Pacific Electric Railway from the mouth of Quarry Canyon to the mouth of San Dimas Canyon, about 1 mile.

Woodstock & Sycamore Traction Company, Genoa, Ill.—Operation has been abandoned on the line of the Woodstock & Sycamore Traction Company between Sycamore and Marengo, and the rails, ties and equipment are being sold as junk.

Chicago, Lake Shore & South Bend Railway, Michigan City, Ind.—It is reported that the Chicago, Lake Shore & South Bend Railway will extend its lines in Indiana Harbor to that section of the city north of the canal.

Fort Madison, Ia.—Preparations will soon be made for the construction of the proposed line from Fort Madison to Nauvoo. C. W. Petsch, St. Paul, Minn., is the promoter of the line. [Aug. 12, '16.]

St. Louis & Illinois Railway, St. Louis, Mo.—Installation of trolley wires and additional tracks to permit the operation of street cars on the Free Bridge before June will commence in a couple of weeks, is the announcement made by Director of Public Utilities Hooke, following the issuance of a permit to the St. Louis & Illinois Railway. Two one-man cars will be placed in service at first on a fifteen-minute schedule. Other cars will be added as they are required. The permit obliges the company to build twelve blocks of tracks in East St. Louis within six months, and to use the interurban loop in St. Louis within thirty days after its completion. [March 16, '18.]

Public Service Railway, Newark, N. J.—The Public Service Railway, on account of the United States Shipping Board for the Emergency Fleet Corporation, will erect two pay-as-you-enter terminals and loops at the South Camden and Gloucester shipyards, which will provide loading space for ten cars and storage accommodations for thirty cars. The cost of the work will be defrayed by the government.

Trenton, N. J.—The City Commission of Trenton is seeking the aid of the federal government in the plan to equip a direct trolley system between Trenton and Tullytown and Bristol, Pa., to the center district of Trenton, which co-operation is made possible through the enactment of recent legislation by Congress. The City Commission wants the New Jersey & Pennsylvania Joint Bridge Commission to grant a franchise to the Trenton, Bristol & Philadelphia Street Railway to lay a system of trackage over the lower Delaware River bridge in South Trenton in the event of the federal government lending its approbation to the projected plan.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District recently received bids for the installation of tracks, including the furnishing of part of the track materials for the extension of the Interborough subway in Flatbush Avenue and Eastern Parkway, Brooklyn, and for the Nostrand Avenue branch of the same line. The contract also provides that if the government agrees to release the necessary steel for the construction of Route No. 31—the Livonia Avenue elevated extension of the Eastern Parkway line—so that the track installation there may be begun by the time the work in Flatbush Avenue, Eastern Parkway and Nostrand Avenue and also on the so-called Brighton Beach connection is completed, that work will be included. The Brighton Beach connection, so-called, begins at Malbone Street and the present Brighton Beach line in Brooklyn and extends as a subway under Flatbush Avenue contiguous to the Interborough subway and thence under the Flatbush Avenue station of the Long Island Railroad and under St. Felix Street and Fulton Street to a connection with the Fourth Avenue subway. It is believed that the Brighton Beach line and the Eastern Parkway line will be ready for operation by or about the end of the year and the Nostrand Avenue line a short time later. The lowest bid received was from Holbrook, Cabot & Rollins Corporation and George W. McNulty, New York, at $600,569. A tabulation of the recent bids received by the commission for the construction of Route 49, Section 3, the last section of the Culver line in Brooklyn, showed the lowest bidder to be the Bethlehem Steel Bridge Corporation, whose total bid based on alternative contract forms were for one type $432,100, for another type $419,020, and for a third type $427,860.

New York & Queens County Railway, New York, N. Y.—Justice Van Siclen has denied the petition of the New York & Queens County Railway which asked for a suspension until after the war of the mandamus order compelling it to extend its Flushing Avenue line in Astoria from Ehret Avenue to Jackson Avenue, Corona. The work was to begin on April 1 and be completed by Aug. 31 this year.

Guelph (Ont.) Radial Railway.—A report from the Guelph Radial Railway states that the company will place contracts within the next three months for the reconstruction of about 2000 ft. of track with Lorain 335-80-lb. T-rail, concrete construction.

Hull (Que.) Electric Railway.—This company proposes to construct 7000 ft. of new double track on Montcalm Street and Chelsea Road, Hull.

Rhode Island Company, Providence, R. I.—City Engineer Bronsdon has been requested by R. H. Flannery, Director of Housing for the United States Shipping Board, to submit estimates of the cost of extending the Rhode Island Company car line from Eddy Street through Ernest Street, across Allen's Avenue and on to the municipal dock at Field's Point, a distance of slightly more than a mile. It is practically assured that the federal government will finance the cost of the extension, as a convenience to the hundreds of employees who will soon be at work at the government boiler factory and at the ship outfitting plant of the Lord Construction Company there.

Dallas (Tex.) Railway.—The City Commission of Dallas has approved an application covering proposed improvements to be made by the Dallas Railway amounting to approximately $500,000. This is part of the proposed expenditure of $1,000,000 referred to elsewhere in this issue.

Rutland Railway, Light & Power Company, Rutland, Vt.—Announcement has been made by the Rutland Railway, Light & Power Company that, following out its general policy of conservation, it will discontinue its branch trolley line from Castleton Corners to Lake Bomoseen and will dismantle the road and remove the rails, part of which will be used in repair work and the balance sold.

Seattle (Wash.) Municipal Street Railway.—A proposal to extend the Seattle Municipal Street Railway from First Avenue South on Washington Street to Third and Fourth Avenues, with a spur on Third Avenue and a landing platform on Yesler Way, submitted by Councilman Oliver T. Erickson, chairman of the city utilities committee, is receiving serious consideration. The cost of the extension is estimated at about $85,000. City Engineer Dimock recently announced that construction work on the line, which will extend to the shipyard district, will begin immediately and that, barring unforseen delays in the arrival of the nevessary materials or in the condemnation proceedings, will be ready for operation within six months. The line, according to present plans will extend from First Avenue South and Washington Street to the West Waterway, where it will connect with the Lake Burien line, known as Division C. In case the city utilities committee favors the proposal of Councilman Erickson, work on the elevated section from Fourth Avenue to First Avenue South on Washington Street will proceed apace with other construction proposed. The city engineering department has recommended to the Board of Public Works that the bid of D. W. Rutherford, of Tacoma, of $42,262 for the construction of the trestle portion of the line from Holgate Street to Washington Street, be accepted. A call for bids for track and overhead construction will be made by the Board of Public Works in the near future.

Shops and Buildings

Connecticut Company, New Haven, Conn.—Improvements will be made by the Connecticut Company to its freight house on Pratt Street, Meriden, which will greatly facilitate the handling by the company of incoming and outgoing shipments.

Boston (Mass.) Elevated Railway.—Within a few weeks the Boston Elevated Railway will open its new Everett terminal on Broadway opposite Thorndike and Washburn Streets. It is probable that most of the Everett and Malden cars will enter this terminal.

Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.—A contract has been awarded to C. A. Thompson, Biloxi, by the Gulfport & Mississippi Coast Traction Company for the construction of a station at U. S. Naval Training Camp at a cost of $3,000.

Northern Ohio Traction & Light Company, Akron, Ohio—Work has been completed on the new terminal building of the Northern Ohio Traction & Light Company at Main and Federal Streets, Akron, which has been under construction for the past year. The company will move into its new quarters May 1.

Lake Shore Electric Railway, Cleveland, Ohio.—Fire recently partially destroyed the carhouse of the Lake Shore Electric Railway together with six coaches. The loss is estimated at $50,000.

Nipissing Central Railway, North Cobalt, Ont., Can.—This company will construct an addition to its carhouse.

Norfolk & Western Railway, Bluefield, W. Va.—Plans are being made by the Norfolk & Western Railway to reconstruct its machine shop in Wilcoe which was recently destroyed by fire.

Power Houses and Substations

Selma (Ala.) Traction Company.—It is reported that extensive improvements will be made by the Selma Traction Company to its power plant.

Manchester Traction, Light & Power Company, Manchester, N. H.—A contract has recently been awarded by the Manchester Traction, Light & Power Company for the construction of a power house and dam in the Greggs Falls district of Goffstown. French & Hubbard, Boston, are the engineers.

Nova Scotia Tramways & Power Company, Halifax, N. S.—It is reported that the Nova Scotia Tramways & Power Company contemplates the purchase of new cars, electric equipment and generating machinery.

Choctaw Railway & Lighting Company, McAlester, Okla.—It is reported that the Choctaw Railway & Lighting Company will construct an electric system in Hartshorne.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

G. E. Business Jumps

The Orders Received in 1917 Increased $77,000,000 or 45 Per Cent—Sales Billed Rose $62,000,000

In the calendar year 1917 the volume of business of the General Electric Co., Schenectady, N. Y., far exceeded that of any previous year. The value of orders received, compared with those of the preceding four years, was as follows:

	Electrical and Mechanical	War Munitions	Total
1917.......	$246,778,491	....	$246,778,491
1916.......	167,169,058	$2,416,000	169,585,058
1915.......	98,385,891	33,980,000	132,365,891
1914.......	83,748,521	....	83,748,521
1913.......	111,819,142	....	111,819,142

A substantial portion of the large increase of $77,193,433 or 45.5 per cent. for the last year consisted of orders for ship propulsion and other apparatus placed by and for the United States government; but the increase extended to nearly every line of the company's product. Higher prices were also a factor in the larger total value of orders.

The amount of sales billed in 1917, as shown in the accompanying statement, was $196,926,317, an increase of $62,684,027 or 47 per cent. The large increase in sales during the last two years has made it necessary to add to manufacturing facilities to an extent entirely without precedent. During the year $22,320,895 was expended for land, buildings and other structures, tools, machinery and smaller equipment and fixtures. In view of the prevailing high prices of all material and other unusual conditions, the sum of $13,287,249 was charged against income and general reserve as depreciation and additional plant reserves, resulting in a net increase, in the book value of plant and equipment, of $9,033,645. Expenditures of $13,000,000 for further plant extensions, to be completed in 1918, were authorized.

The large increase in the volume of orders naturally involved corresponding increases in merchandise inventories and in customers' notes and accounts receivable. After the deduction of reserves, the merchandise in factories, district warehouses and elsewhere has a net book value of $81,851,310, an increase of $30,690,671 for the year. Customers' notes and accounts receivable, after the deduction of reserves, are carried at a net book value of $38,406,993, which is $11,590,695 more than the balance outstanding at the close of 1916.

INCOME STATEMENT OF GENERAL ELECTRIC COMPANY FOR CALENDAR YEAR, 1917

Net sales billed......................		$196,926,317
Cost of sales billed, including all operating, maintenance and depreciation charges..................		167,921,777
		$29,004,540
Interest and discount......	$1,433,317	
Income from securities.....	2,661,150	
Sundry revenue...........	417,822	4,512,290
Net income		$33,516,830
Interest on debentures.....	$571,645	
Interest and discount on notes payable...........	541,357	1,113,002
		$32,403,828
Excess profits tax, estimated..........		5,500,000
Profit available for dividends........		$26,903,828
Dividends on stock:		
8 per cent cash	$8,120,648	
1 per cent cash "Red Cross".............	1,015,078	
2 per cent stock..........	2,030,156	11,165,882
Net surplus for the year.............		$15,737,946
Surplus, Jan. 1, 1917..............		34,160,753
Total surplus........................		$49,898,699

The additional capital absorbed in plant extensions, inventories and customers' accounts amounted to $77,602,262, in order to provide for which, in part, the company issued short term notes. The balance outstanding on Dec. 31 was $27,757,721. It is expected that with the return of normal business conditions, sufficient cash will be released by a reduction in inventories and customers' notes and accounts to provide for two note issues aggregating $25,000,000.

On Nov. 24, 1917, the board of directors declared, in addition to the regular cash dividend, a semi-annual dividend of 2 per cent, payable in stock at par. This action was taken in view of the large surplus from accumulated earnings covering a period of years, invested in manufacturing facilities, working capital and other assets, against which no stock had been issued. The directors preferred, rather than to increase the rate of cash dividends, to adopt the policy of paying semi-annual stock dividends at the rate of 4 per cent per annum, payable in January and July, in addition to the regular 8 per cent cash dividends.

The federal taxes for 1917, including the income tax at 6 per cent $1,789,508, which was absorbed in cost of sales, and the estimated excess profits tax of $5,500,000, will amount to $7,289,508.

For a number of years it has been the practice of the directors to provide against contingencies by setting aside substantial reserves. An examination of these reserves has made it clear that a proportion of them is unlikely to be used for the purpose originally intended, and this amount, estimated at about $12,000,000, has been set apart as a general reserve against all assets of the company other than its plant investment.

Railway Material Deliveries

Embargoes Are Suspended at Times—Release Orders on Shipments Are Issued and Sought

Occasionally the freight embargoes lift or are suspended temporarily. When this occurs, and shippers and consignees of electric railway material are on the lookout, goods which have been awaiting such an opportunity slip through and reach their destination. Not always, however, without mishap. A carload of gears and pinions consigned to a New York City company came through on a release order last week under these circumstances. It had been urgently needed for some time, and every chance to get it through was eagerly watched. Generally speaking, deliveries on gears and pinions are easier, prices remaining unchanged.

Another shipment of gears and pinions from a Western point, consisting of four distinct orders, was placed in the same car. Somewhere en route the contents were transferred to another car and sent over another line. Of course, the transhipment was effected without ceremony, not to say without the slightest regard for the various invoices and their arrangement by the indifferent trainmen. On arrival in New York the consequences of such carelessness were apparent. Everything had been thrown into the car helter-skelter, and a general mix-up was the result. It took two days to straighten out the tangle. Shipments of splicing sleeves, trolley ears, high-tension porcelain insulators, frogs, cross-overs, headlights, couplers, rail bonds and tools, unless special, are being made out of stock. Delivery is from two to four weeks to all Eastern points, subject to the delays of existing embargoes. It is believed that the recent order of the War Industries Board, which places these items in Preference List No. 1 only when intended for concerns engaged directly or indirectly in the production of war material, will expedite shipments to those roads in which the government is especially interested as regards transportation of workmen engaged in government work. Prices remain steady and no increase is anticipated.

A recent order of the Public Service Commission for the First District of New York for the discontinuance of turnstiles on the Brooklyn Rapid Transit Company's elevated system, is accepted with every evidence of satisfaction by the fare-box people. They now argue that the field is open for the general adoption of their devices to supersede the condemned turnstiles on the company's station platforms.

Orders Should Be Placed For Coal Supply

Any Modification in Zoning Plan Will Restrict Rather Than Enlarge Source of Supply

In a statement urging the immediate placing of orders for coal supply the U. S. Fuel Administration says:

"The Fuel Administration has been advised that coal consumers in some sections of the country are withholding their orders for coal in the expectation that the zone of distribution may be altered in a way that will broaden their sources of supply. It should be distinctly understood by coal producers, coal dealers and coal consumers that the regulations carrying out the "zoning order" of the distribution of coal consumption were adopted in conjunction with the Railroad Administration, after the most careful study of the whole problem.

"Any modification of the zoning plan that may be made will be in the direction of further restriction rather than toward enlarging sources of supply.

"War demands for coal as the year advances may demand still further restrictions of the consumer's freedom to choose coal.

"There should, therefore, be no further delay upon the part of coal dealers and coal consumers in placing their orders for their coal supply. Patriotism demands that orders be placed at once in order that the railroads may realize the exact transportation movement demanded for coal, and in order that production may be maintained at a maximum."

Standard Catalog Sizes

Conference Called by Committee of Purchasing Agents' Association —Differences of Opinion

Catalogs intended for preservation by purchasing agents are to be limited to one size hereafter, according to plans laid by the National Association of Purchasing Agents. A committee of that association has called a conference to discuss the matter in the La Salle Hotel, Chicago, on May 22.

At the Pittsburgh convention of purchasing agents the size 8½ in. x 11 in. was tentatively adopted with the proviso that it should be adhered to unless good reasons appeared for changing it. The committee has had the matter up with 575 associations, representing various industries and trades, and 287 trade paper publications. There seems to be quite a difference of opinion on this subject.

It has been urged also that the purchasing agents consider either now or in the very near future the matter of standardization of the sizes of other printed matter.

The first object will be to settle definitely upon the size for catalogs. After that has been accomplished if there is subjects may be discussed to good advantage, because after all the purchasing agent is vitally interested in anything that will reduce the cost of doing business. Standardization is bound to produce favorable results.

The conference is open to everyone. Every association representing industry in any form is invited to send repre- any time to spare some of these other sentatives to discuss these various phases with the committee. The desire of the committee is to have all facts before it reaches a decision, so that after it has arrived at a conclusion there will be no cause for objection. Those interested are requested to communicate with the chairman of the committee, W. L. Chandler, care Dodge Sales & Engineering Company, of Mishawaka, Ind.

Western Electric Company Staff Changes

Western Electric Company, New York, N. Y., announces the appended changes in its organization staff: W. P. Hoagland, sales manager, Chicago, Ill; G. T. Marchmart, sales manager, Richmond, Va.; J. H. Symonds, stores manager, Minneapolis, Minn.; George M. Dunn, manager, Philadelphia, Pa.; Jerome D. Kennedy, assistant contract sales manager, Hawthorne, Ill.; Joseph L. Ray, manager, Pittsburgh, Pa.; Howard W. Hall, Southern district manager, Atlanta, Ga.; Jay B. Odell, succeeds Mr. Hall in Richmond, Va.; Clark H. Minor, special to China and Japan; Fred B. Gleason, contract sales manager, New York, N. Y.; Henry L. Grant, sales department, New York office.

Rolling Stock

Nova Scotia Tramways Power Company, Halifax, N. S., is reported as contemplating the purchase of cars, equipment and generating machinery

Monroe (La.) Municipal Street Railway has been authorized by a vote of the Council to purchase four rebuilt cars from the Shreveport (La.) Railways for $13,000, as referred to in the ELECTRIC RAILWAY JOURNAL of April 6.

Washington Water Power Company and the **Spokane Traction Company, Spokane, Wash.,** are remodeling more of the two-man cars into the one-man cars for use on city lines. The former is having 40 of its cars remodeled and the latter is having five remodeled, all of which are expected to be put into service soon. With the inception of one-man cars on two of its lines the Washington Water Power company is changing from 15 to 10-minute service.

Public Service Railway, Newark, N. J., on account of the U. S. Shipping Board for the Emergency Fleet Corporation will erect two pay-as-you-enter terminals and loops at the South Camden and Gloucester shipyards, which will provide loading space for ten cars and storage accommodations for thirty cars. The cost of the work will be defrayed by the government.

Brooklyn (N. Y.) Rapid Transit Company, which has asked for specifications on fifty new center-entrance trail cars, the opening of the bids being deferred several times, as noted in the ELECTRIC RAILWAY JOURNAL, will, according to official advices, dispose of the entire matter Monday, April 29.

Philadelphia (Pa.) Railways, practically abandoned, has been rehabilitated, as mentioned in the ELECTRIC RAILWAY JOURNAL of April 6, and will build a double-track extension over the Penrose Ferry Road, to the Hog Island shipyards. Additional cars will be furnished by the United States Shipping Board Emergency Fleet Corporation, which also assumes financial responsibility for the entire program. The rolling stock is not new, but is being obtained from the surplus equipment of another system.

Miami (Fla.) Traction Company is reported as in the market for gasoline or kerosene motor cars.

Dallas (Tex.) Railways will purchase twelve one-man cars at a cost of $64,710, in accordance with approval granted by the City Commission under the service-at-cost franchise.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., having placed an order with the St. Louis Car Company, as mentioned in the ELECTRIC RAILWAY JOURNAL of April 13, for 25 new cars, furnishes the specifications that follow:

Number of cars ordered	25
Name of road	Ft. Wayne & Northern Ind. Co.
Date order was placed	April 8, 1918
Date of delivery	Aug. 15, 1918
Builder of car body	St. Louis Car Co.
Type of car	Semit-convertible
Seating capacity	34
Weight (total)	15,000 lb.
Length over bumpers	30 ft. 0 in.
Length over vestibule	18 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 0 in.
Body	Semi-steel
Interior trim	Birch and cherry
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse Traction Brake D. H. 10
Axles	Open Hearth Steel
Bumpers	Channel
Car trimmings	Bronze
Conduits and junction boxes	Crouse-Hinds
Control, type	K 63 B
Couplers	Shackle bar pocket
Curtain fixtures	Ring 88
Curtain material	Pantasote
Designation signs	Keystone
Door operating mechanism	St. Louis Car Co.
Fare boxes	Cleveland
Gears and pinions	Gen. Elec. Co.
Hand brakes	Peacock, no staff
Heaters	Peter Smith Electric
Headlights	Golden Glow
Journal boxes	St. Louis Car Co.
Lightning arresters	G. E.
Motors, type and number	G. E., 258, inside hung
Paint, varnish or enamel	Railway Co.'s Standard
Sanders	O. B. valves, Keystone traps
Sash fixtures	O. M. Edwards
Seats, style	Hale & Kilburn, cross and longitudinal
Seating material	Rattan
Step treads	Feralun
Trolley catchers or retrievers	O. B. catcher
Trolley base	U. S. 15
Trolley wheels or shoes	6 in. wheel
Trucks, type	St. Louis Car Co. No. 113 B
Ventilators	Garland
Wheels (type and size)	26-rolled steel
Special devices, etc.	Forsyth beadless brass sash

Trade Notes

Russell A. Griffin, for fourteen years manager of the Western Electric Company's pole department at the New York office, on April 1 became vice-president of the National Pole Company, Spokane, Wash., with headquarters in New York.

Robert S. Blake, formerly connected with the Condit Electric & Manufacturing Company, Boston, Mass., as its Pittsburgh, Pa., representative, is now district manager for the Duquesne Electric & Manufacturing Company, with its Chicago office at 230 South La Salle Street.

Perry Ventilator Company, Boston, Mass., has received the order for ventilators in the fifty new center-entrance trail cars to be ordered by the Brooklyn (N. Y.) Rapid Transit Company, according to an agreement with the Public Service Commission of the First District.

Thomas M. Cluley, who has been associated with the Union Electric Company for the last twenty-two years, has joined the forces of the W. A. McCombs & Co., Pittsburgh. The McCombs Company manufactures safety switches and is territorial representative of a number of well known manufacturers.

Laco-Philips Company of 131 Hudson Street, New York City, has placed upon the market a glass product under the trade name of "Laco-daylite," which, it claims, will permit correct determination of color values. It is made by chemically treating plain glass and comes in standard sizes and shapes for all reflectors on the market. It is designed for places where color values or accurate measurements are especially important.

Herbert A. Jackson has been elected president of the Chicago Pneumatic Tool Company of Chicago, to succeed W. O. Duntley, resigned. Mr. Jackson has for some time been connected with the Bethlehem Steel Corporation and was more recently head of its Boston office. He has had charge of the sales in that territory, and it is considered probable at Chicago that he will readjust the sales methods of the Chicago company.

J. D. Elsom has joined the staff of the Economy Electric Devices Company, Chicago, as engineer. He will be engaged in the engineering work preliminary to and during the installation of energy saving campaigns using the Sangamo watthour meter, for which the above company has the exclusive sales. Mr. Elsom has been engaged in similar work for the Railway Improvement Company for the past five years, previous to which time he was with the Chicago Railways Company as engineer of equipment. Other railways with which Mr. Elsom was connected directly following his engineering studies at college were the Metropolitan Street Railway, New York, and the New York Central, electrical department. His headquarters will be at the general office of the Economy Electric Devices Company, Old Colony Building, Chicago.

New Advertising Literature

Magnesia Association of America, Philadelphia, Pa.: Anniversary advertising portfolio, entitled "85 Per Cent Magnesia," for 1917.

Roth Brothers & Company, Chicago, Ill.: Circular describing the Rothmotor forge blowers. Other electrically operated machines are also illustrated in the circular.

Bailey Meter Company, Boston, Mass.: Bulletin No. 41, entitled "How to Save Coal," illustrates and describes the Bailey boiler meter, with a partial list of concerns having it in use.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.: Catalog 1-A, February, 1918, superceding catalog 1-A dated May, 1916, which illustrates and furnishes a detailed description of the company's lightning arresters.

Guaranty Trust Company, New York, N. Y.: Pamphlet entitled "Banking Service for Foreign Trade," explaining the bank's facilities in this department. Copies may be had on application.

Ohio Brass Company, Mansfield, Ohio: Supplement No. 1, Feb. 1918, containing additions and improvements to the O-B materials listed in general catalog No. 16. The new types and improvements on various railway material and line equipment are described in comparison with former models.

NEW YORK METAL MARKET PRICES

	April 17	April 24
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26¾	26¼ to 26¾
Lead, cents per lb	6.95	6.90
Nickel, cents per lb	50	50
Spelter, cents per lb	7	6.87½
Tin, Straits, cents per lb	90	90
Aluminum, 98 to 99 per cent., cents per lb	*32.10	*32.10

* Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	April 17	April 24
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6¼	6
Zinc, cents per lb	5¼	5¼
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.25	$16.25

ELECTRIC RAILWAY MATERIAL PRICES

	April 17	April 24
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	28½ to 34½	28½ to 34½
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	....	$65.00
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	8	8
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount	79%	79%
Car window glass (double strength, all sizes AA quality), New York discount	80%	80%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	12½ to 13	12½ to 13
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl	$2.65	$2.65
Cement (carload lots), Chicago, per bbl.	$2.71	$2.71
Cement (carload lots), Seattle, per bbl.	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.60	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	42	43½

* Government price.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, May 4, 1918 *Number 18*

Working and Fighting Must Go Hand in Hand

BEFORE we have gone very much farther in the present war those who are legitimately behind the lines must realize that their work is just as essential as that of the men in the trenches. Uncle Sam will give to millions of effective men the privilege and duty of working in this country while he sends other millions to France. If those who stay at home are to contribute their proportionate part to the winning of the war they must somehow get a firm conviction that they are in the fight to the finish. This is more difficult to do than it is for the men in the trenches because our soldiers are closer to the actual firing and trench digging. With the right spirit, however, a man can be just as much a patriot while twirling a controller handle, collecting fares, repairing a trolley wire, scraping a turbine bearing or winding a motor armature as he would be in bayoneting a Hun. There is less thrill to it, of course, but the two acts are intimately related.

Electric Railways Must Move More Freight

In the conviction that electric railway track is not being effectively used at the present time, and that its use in transporting freight is essential to the truest economy of expenditure of our national resources, the editors of this paper have arranged for a comprehensive analysis of the subject. Next week's issue will be largely devoted to the possibilities of hauling more freight on electric railway lines.

For every man-hour of actual fighting at the front there must be hundreds of man-hours of work behind the lines. Fighting is intensive, behind-the-line work is extensive. Just as an apple is small compared with the tree which produces it, so the firing line is quite limited in extent compared with the millions of square miles of territory backing it up. It seems so obvious that the war must be won at home as well as abroad that the appalling and disheartening indifference which still exists is hard to explain.

Dr. Charles A. Eaton, of the Federal Service Section of the Emergency Fleet Corporation, in the course of his recent visits to the large shipyards was accosted by a burly ship carpenter. The latter asked the doctor what he thought he was looking at, and the doctor diplomatically replied: "A sturdy New England ship carpenter." The man replied "No, sir, you are looking at a blithering idiot who, until now, has not realized that in working at his trade here he is backing up his boy on the firing line." Probably thousands of men in the electric railway field have not yet awakened to the same realization. It is high time that they should do so.

Put All War Transportation and Housing Under One Head

THOSE who spend even a few days in Washington will begin to appreciate the difficulty of so vast a machine finding or co-ordinating itself overnight. While every man is burning to do his best, it would be a miracle to find no multiplication of effort!

At present the Ordnance, the Quartermaster's, the Labor and the Navy departments are grappling with the problems of local transportation as it affects their own workers. The Navy Department, for example, recently commandeered the defunct electric railway at Cape May, N. J., and set it to work. There have been occasions when Uncle Sam sent four different sets of representatives to look over a situation, each set quite ignorant of the doings of the others. Naturally the first comer seizes all the facilities in sight, much to the grief of the tardier departments.

Now with the formation of the passenger transportation service section of the Shipping Board there is available a government agency with a personnel drawn directly from the electric railway and related fields. As its basic assignment is to relieve our direst need—to help produce ships, ships and more ships—this section should be entitled to primacy in securing transportation relating to the building and equipping of shipyards and ships. It would be manifestly injurious to the national welfare to have the scores and possibly hundreds of utilities that are involved subjected to contradictory orders of different departments.

But we may go a step further than this co-ordination of coastal properties. If one section of local transportation specialists can do this best it should also be held responsible for inland electric railway transportation in serving cantonments, aviation fields, manufacturing and supply centers, etc. The Director-General's staff, as at present constituted, has no electric railway specialists on it, despite the fact that we have nearly 50,000 miles of electric railways. This has resulted in overlooking some valuable electric railway freight and passenger handling facilities. In one state, for example, an electric interurban has not been used for camp transportation despite lower fare and better facilities. There must be many cases like this, regardless of the opportunities of enlarging the rolling stock and extending the track of electric carriers at small outlay for big results. Obviously all problems of this character can be solved by co-operation between the service section and the Director-General's staff without disturbing the steam trunkline and big terminal functions of the latter.

We believe it would also be eminently desirable to have the housing experts work hand in hand with the service section. Before going to the trouble and delay of getting thousands and thousands of tons of building material and countless workmen, it is but commonsense to let the transportation specialist determine if it is possible to transport the workers from near-by communities where many have lived for years. Let us bear in mind that 1000 tons of railway material may do more to improve the present industrial situation than 100,000 tons of housing!

Union Leaders Should Translate Words Into Deeds

THE Amalgamated Association of Street and Electric Railway Employees of America recently took pride in publishing letters written by President Wilson, Secretary Daniels and other government officials in appreciation of the patriotic "declaration of policy" adopted by its general executive board. This declaration strongly emphasized the sacredness of contracts in the present crisis.

One paragraph of the policy said: "Our contracts with employing companies must be observed by our membership. We demand contract observance by the companies, and it is our duty to render strict observance in return. Wherever controversies arise between our local divisions and employing companies, ample means are provided in the contracts and in the laws of our association for adjustment, without resort to drastic acts that repudiate obligations and are in contravention of the laws that the members of this organization have pledged themselves to abide by."

The Amalgamated Association undoubtedly acted in good faith when it adopted this declaration of policy, but principles are sometimes difficult to put into practice. Striking evidence of this is found in the international headquarters of the association, Detroit, where last week a few score of employees broke off negotiations with the local railway and called an immediate strike, thus violating their arbitration agreement. The rebels have now gone back to work, and all differences are to be submitted to federal mediators. The incident is so important, however, that those responsible for the welfare of the Amalgamated Association cannot afford to pass it by.

Actions speak louder than words, and the sincerity of the Amalgamated leaders will be believed in or doubted as they punish or overlook such outbreaks as that in Detroit. In a recent editorial we urged labor leaders to keep a firm hand on employees who repudiate arbitration agreements. Again we say that it is not enough merely to urge employees to keep their contracts. While there seems to be no excuse for revoking the charter of the Detroit "local" in this case, the officials of the union should take drastic action against the recalcitrant members.

Inflexible Fare and Other Defects of Proposed St. Louis Franchise

THE city authorities of St. Louis need not feel that they have overstrained the civic conscience by approving the ordinance which was recently offered to the management of the United Railways Company. They are to be congratulated, perhaps, on having taken steps to settle the long pending controversy over franchise rights, but they must not be surprised if the security holders do not rush enthusiastically to accept a proposition which offers peace at a price involving the wiping out of a possible $40,000,000 of capitalization. Besides all this, the ordinance, according to the company's contention, does not provide for any extension to the life of existing grants.

The new ordinance, as outlined in the April 27 issue of this paper, is a compromise which, if it does appeal to the investors, will probably do so because it removes a cloud on the title which has interfered with financing and because its acceptance would pave the way to better public relations. The management refers to it as a "fairly good solution of a difficult problem." If an acceptance is filed within the time allowed, this action may be taken as evidence that the "price of peace" is more agreeable than a prolonged controversy between the city and the company would be.

In scaling down the capitalization of the St. Louis property, the authorities have followed the example set in Chicago, Cleveland and other places where compromises were reached by sacrificing the investors. This form of public policy, even when based on expert judgment, is not to be highly indorsed. The money placed in these properties by street railway pioneers should not be recklessly wiped out by city mandate merely because equipment has been discarded as obsolete. Investors must be compensated for every dollar put into a property. Otherwise there will be discouragement tending to hold back capital from a progressive management.

The St. Louis ordinance is not abreast of the times in regard to the provision for rates of fare. Our old friend "Nichol Coyne" is still retained as the standard until such time as the State commission may see fit to raise or lower the price of a ride. This must have been a disappointment to fair-minded students of transportation charges, who appreciate that the flexible fare based on a service-at-cost plan is the modern solution of this problem. Perhaps when the time arrives when it is necessary to accept or reject the franchise the State commission will have given a favorable reply to the petition of the company for the right to charge a higher fare.

City authorities who are called upon from time to time to grant new franchises or to amend old ones will do well to approach such undertakings with minds unbiased by political considerations or prejudice against corporations. The settlements which they arrange will have an effect for many years not only on the people who have put their money into these utilities but on that portion of the public which uses the cars, because in the last analysis service can be supplied only to the extent that it is possible to pay for it out of the fares collected. An inflexible rate of fare will not render flexible service.

A Cartoonist Needed to Portray the Situation in New York State

Now that you've got it
What are you going to do with it?
Cartoonist Goldberg.

IT WOULD take a Goldberg to do real justice to the electric railway situation as it has developed in Rochester, Syracuse, Utica and other cities served by the New York State Railways—and in numerous other municipalities where the authorities joined in every possible measure to prevent the street car companies getting increased revenue with which to meet the increased costs of service.

If it were not so serious a matter, one might smile—momentarily—with the genial cartoonist, whose whimsical pictures have pierced with keen understanding the true inwardness of so many commonplace events by a few deft pencil strokes. Very often in life we strive might and main for something which, when we get it, becomes a problem instead of a joy. We realize upon its attainment that we really didn't want it at all, and we're about as happy with it as the toad that swallowed the bumble bee.

It is now nearly nine months since the electric railway companies of New York petitioned the Public Service Commission for increased revenues, placing before the commission an absolutely complete line of testimony bearing upon every pertinent feature of the case. This testimony went practically unchallenged. The city officials, under the leadership of the Mayors' Conference, finally secured a victory in the Court of Appeals, whose decision, in brief, was this: that under the present public service commission law an electric railway company whose fares are limited by contract or franchise, cannot secure an increase in such fares through the commission. It must be obtained through the local authorities.

The victory seems to be of the Pyrrhic variety. The employees of the New York State Railways have made demands for increased wages. Conferences of the employees, union leaders, city officials and officials of the companies make clear that the demands of the employees are justified. The companies' figures of revenues, expenses, etc., show plainly that the enormous wage increases demanded cannot be granted without increased revenues.

Now come various city officials making statements to exactly the above effect. Mayor Walter R. Stone, of Syracuse, is quoted by the *Post-Standard* in the following language:

> The justice of the men's demands for more money is apparent. The company claims it can't concede the increase with increased revenues. I believe that some common ground can be reached by free discussion of the factors in the case by the officials of the cities affected together with representatives of the company and of the men.
>
> So far as the city is concerned, we must have good service. We must insist that capable men be retained to operate the cars. The company must keep its trackage in shape and must take care of its share of the pavements in the streets. It is true that the present revenue of the lines does not warrant increases and will not allow the company to carry on essential improvements. Some arrangement should be made to increase their revenue.

Governor Whitman is quoted in the Syracuse *Journal* as saying to Owen Lynch, president of the Trolley Men's Union:

> I know the employees of the trolley lines in your city are not getting money enough to meet their necessary living expenses, and I also know that the railway company is not receiving income enough to enable it to increase the wage rate of its employees. In view of the decision of the Court of Appeals, I am now unable to assist the trolley workers in their critical condition.

Stewart F. Hancock, corporation counsel of Syracuse, is quoted in the Syracuse *Post-Standard* as having made the following statement:

> I believe that the employees of our street railways are entitled to a substantial increase in wages. The employees have said that they are willing that the truth of the company's contention be settled, either by the Public Service Commission or by arbitration. We have said, I now repeat, that as one of the six cities served by the New York State Railways, we are not only willing but anxious that the question be determined. We believe that at the present time efficient street railway service is necessary not only for the good of the city, but for the good of the country.

President Lynch said:

> More employees are leaving the trolley service daily. Some of them have been working on the line for twenty-five years. It is hard for them to give it up and accept employment in shops where they are not familiar with the operations. They will be forced to abandon operations on the lines if not granted the wage increase. All we ask is a square deal on the part of the public. If the accounts of the railroad officials can be proved to be correct, I see no reason why city officials should not be willing to grant a 6-cent far or 2 cents for transfer charge, in order to restore standard conditions of service.

The above statements need no interpretation. They admit the whole case of the railways. Confirmation of the accuracy with which they outline the situation is found in the statement that the Syracuse property this week was obliged to discontinue the operation of one car on each of its lines, owing to its inability to procure the labor at the price it is able to pay.

Nevertheless, the facts in relation to trolley service in the great upstate cities of New York were just as clear last August as they are now, nine months later. No facts have been concealed; no facts can be concealed. The accounts of all of the railway companies are kept in forms prescribed by law. They are sworn to; they are checked by public service officials. There is no line of business, not even municipal or state affairs, concerning which the general public has available so much and so accurate information as it has about the business of the public utility companies.

The city officials who fought the fare increases now admit the justice of the position taken by the railways almost a year ago. The railways have been forced to go on, month after month, incurring losses that were just as well understood in 1917 as they are in 1918. The difference is this: In 1917 the city officials could not be brought to admit that the municipalities cannot be prosperous without efficient public utility service and that public utilities cannot be efficient without prosperity. When their prosperity is reduced and fare increases are refused, the public's service must necessarily be reduced.

A wise public will now begin to appreciate that the efforts of the Mayors' Conference to prevent increased fares have served only to injure the public which they so vociferously declared they were trying to protect. If it is true that their opposition to fare increases was based largely upon political motives, they would be dull, indeed, not to see that their political shotgun has utterly missed fire.

Traffic Study in Pittsburgh

City's Sharp Changes in Grade and the Natural Barriers Around Its Business District Make Transportation Problems Difficult — Traffic and Industrial Surveys Help to Suggest Remedies—Elevated and Subway Line Proposed

E. K. MORSE, transit commissioner of Pittsburgh, has made an extended report on the existing transportation facilities of that city. Briefly, the report recommends the passage of very strict parking regulations for automobiles, the widening of several streets and a rapid transit program to be carried out in two sections. The first line to be built would consist of 1 mile of subway and 12 miles of elevated double track, from the central business district out Penn Avenue to the East End. The report suggests that these lines be municipally owned but operated by the same company that operates the surface car system, provided a satisfactory agreement between the city and the operating company can be reached. If not, the city should build and lease the lines to another private company or, as a last resort, could operate them itself. A brief abstract of some of the salient features of the report follow.

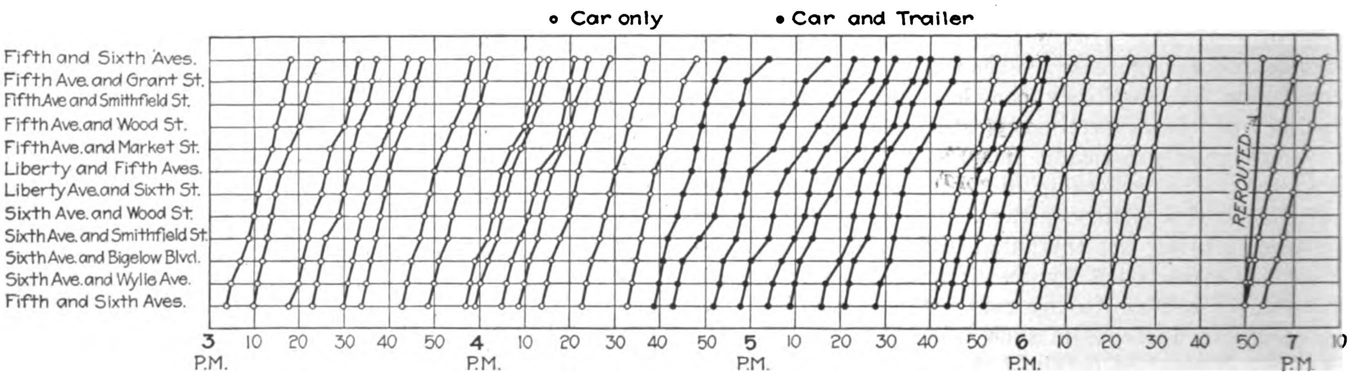


FIG. 1—DISPATCHER'S CHART FOR TYPICAL DOWNTOWN ROUTE IN PITTSBURGH, SHOWING EFFECT OF CONGESTION DURING RUSH HOURS

TOPOGRAPHICAL FEATURES OF PITTSBURGH

Transportation conditions in Pittsburgh are complicated by the succession of ridges and valleys on which the city is built. The business section at the western end of the peninsula formed by the Allegheny and Monongahela Rivers is level but contains only 218 acres, of which only 124.6 acres are actually used for mercantile and manufacturing purposes, the rest being taken up by streets, wharves and railway terminals. Although there are a number of districts within the city scantily populated because of the steep hillsides, the population per acre is twenty-two and one-half, and the city is fifth in density in the United States among the large cities, being exceeded only by Baltimore, New York, Boston and Milwaukee.

The electric railway problem in Pittsburgh is more difficult than in the average city, for the following reasons: first, the main arteries of travel from the residential to the business district are comparatively few in number because of the hilly nature of the country; second, the topography precludes straight streets; third, the streets in existence are far too narrow; fourth, the grades are excessive, there being hardly a car line in the city that at some point does not have a grade of more than 5 per cent and many of the lines have grades as high as 9 per cent; fifth, the amount of thinly settled territory and the fact that many of the lines draw their business from territory on one side only prevent traffic from developing to the extent that would otherwise obtain; sixth, the arrangement and narrowness of the streets in the central district and the awkwardness of the loops due primarily to this narrowness cause congestion and delay both to street car and vehicular traffic.

The surface railway collected on an average week day in 1916 a total of approximately 761,000 fares. Only about 12 per cent of the passengers used transfers, as the transfer privilege is somewhat limited. The rides per capita per year is 217, which is low compared with other large cities of the country.

The electric lines in the Pittsburgh district are operated by the Pittsburgh Railways with approximately 600 single-track miles of street and interurban line, of which about 300 miles lie within the city limits of Pittsburgh. The tracks were built and are owned by a great number of separate corporations whose properties are leased to the Pittsburgh Railways. The terms of these leases vary from a fixed lease for 999 years to a lease for one year with a privilege of cancellation by either party on a month's notice after its expiration. Most of the leases are for 999 years.

TRAFFIC SURVEY

A traffic survey was undertaken and many interesting data were compiled. The congestion in the central business district in the afternoon rush hour is clearly shown by Fig. 1, which is a dispatcher's chart for a typical route and shows the elapsed time between stops for the cars passing around the loops in the central business district. Most of the lines which reach the business district are looped back there. It is possible from this chart to determine the points at which time is lost by observing the change in direction of the lines.

The load in the direction opposite to the rush travel is very light. Fig. 2 gives a chart for a typical line, the Bloomfield Line. The distances in miles are given from the center point of the downtown loop. The solid line shows the maximum morning and evening cars, the dotted line the average for the rush hours.

A traffic count showed that the average length of ride on the Pittsburgh Railways within a 5-cent fare limit is less than 3 miles.

To conduct the traffic count, a table of types of cars and seating capacities was furnished to each inspector, and his duty was to determine either the number of empty seats, if the seats were not entirely taken, or the number of passengers standing, if all the seats were filled, or the number of empty seats and number of passengers standing if there were both, as was sometimes the case. From the figures thus obtained, the total number of passengers could be quickly determined. As a check on the accuracy of the inspectors' counts, supervisors boarded every tenth or twelfth car and counted the passengers from the inside. It was found that in no case was there an error of more than 5 per cent. Upon these and other data obtained the suggestions in the report are based.

VEHICULAR SURVEY

A survey of the vehicles entering the central business district was made on July 2, 1917. Men were stationed on every street entering the central business district, so that a complete cordon was thrown around it, and no vehicle entered or left without being counted. The duration of this survey was twelve hours, from 7 a.m. to 7 p.m. Fig. 3 shows the vehicles entering and leaving, the lower line showing the number of vehicles remaining in the district at any hour. A count was also made of the number of vehicles passing certain busy corners, as well as of the number of vehicles parked on the principal streets and the time parked. Many were found to be parked for five, six and seven hours, although the limit allowed by ordinance is thirty minutes.

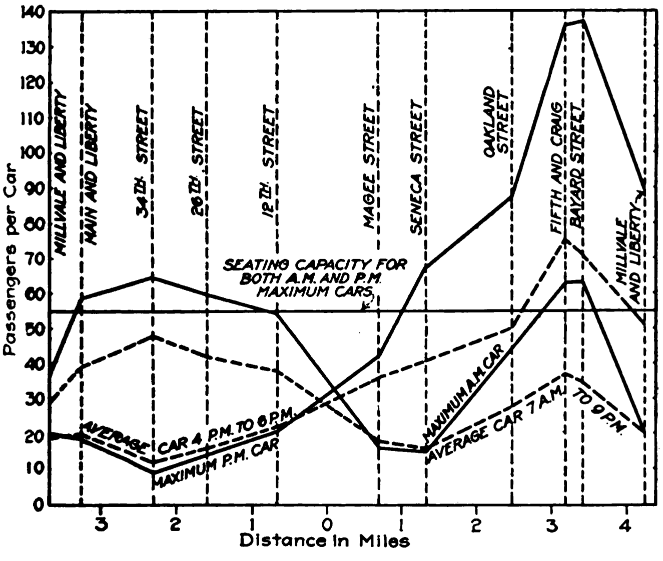


FIG 2—CHART SHOWING TRAFFIC ON TYPICAL ROUTE IN PITTSBURGH, DISTANCES IN MILES BEING GIVEN FROM THE CENTER POINT OF THE DOWNTOWN LOOP

TABLE SHOWING PERSONS ENTERING BUSINESS DISTRICT ON TYPICAL DAY

Persons traveling on street cars	165,452
Persons traveling on steam railroads	30,930
Persons traveling in automobiles	37,805
Persons walking	47,816
Total	282,003

Surveys were also made of those who entered the business district by railroad and by walking and the hours. The table above shows the total.

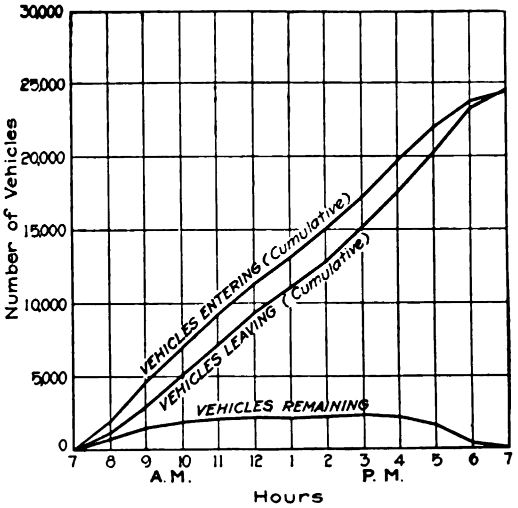


FIG. 3—CHART SHOWING NUMBER OF AUTOMOBILES ENTERING AND LEAVING PITTSBURGH BUSINESS DISTRICT ON JULY 2, 1917

Of this total 78.4 per cent was counted and 21.6 per cent was estimated.

INDUSTRIAL SURVEY

An industrial survey was also made to determine the extent to which transportation facilities were required by workers going to their work. In Pittsburgh, the largest group of persons forming the traffic of the day is composed of the employees of the industrial and commercial establishments; consequently, a survey of the movements of this group was considered of greater value than any other single study of traffic conditions. The method followed was as follows:

The city was divided into sixty-five sections, the boundaries of the sections being natural, such as ravines, hills, etc., or halfway between parallel car lines. Each section received a key number. Loose-leaf tally sheets were printed for the different sections, and small reproductions of the city map, divided into these sections, were made as recording sheets. With this material squads of three men were sent to the offices of employers where they were permitted to see the employment lists, or in some cases only, lists of the addresses of the employees. The first man read the address, the second, who had expert knowledge of the city map, located the address and called off the section number, and the third made one tally on the proper tally sheet. The Chamber of Commerce had paved the way for this survey and had explained that it would not be used in any way to injure either the employer or the employee, as no record of names was to be made. This explanation brought complete co-operation, and in no

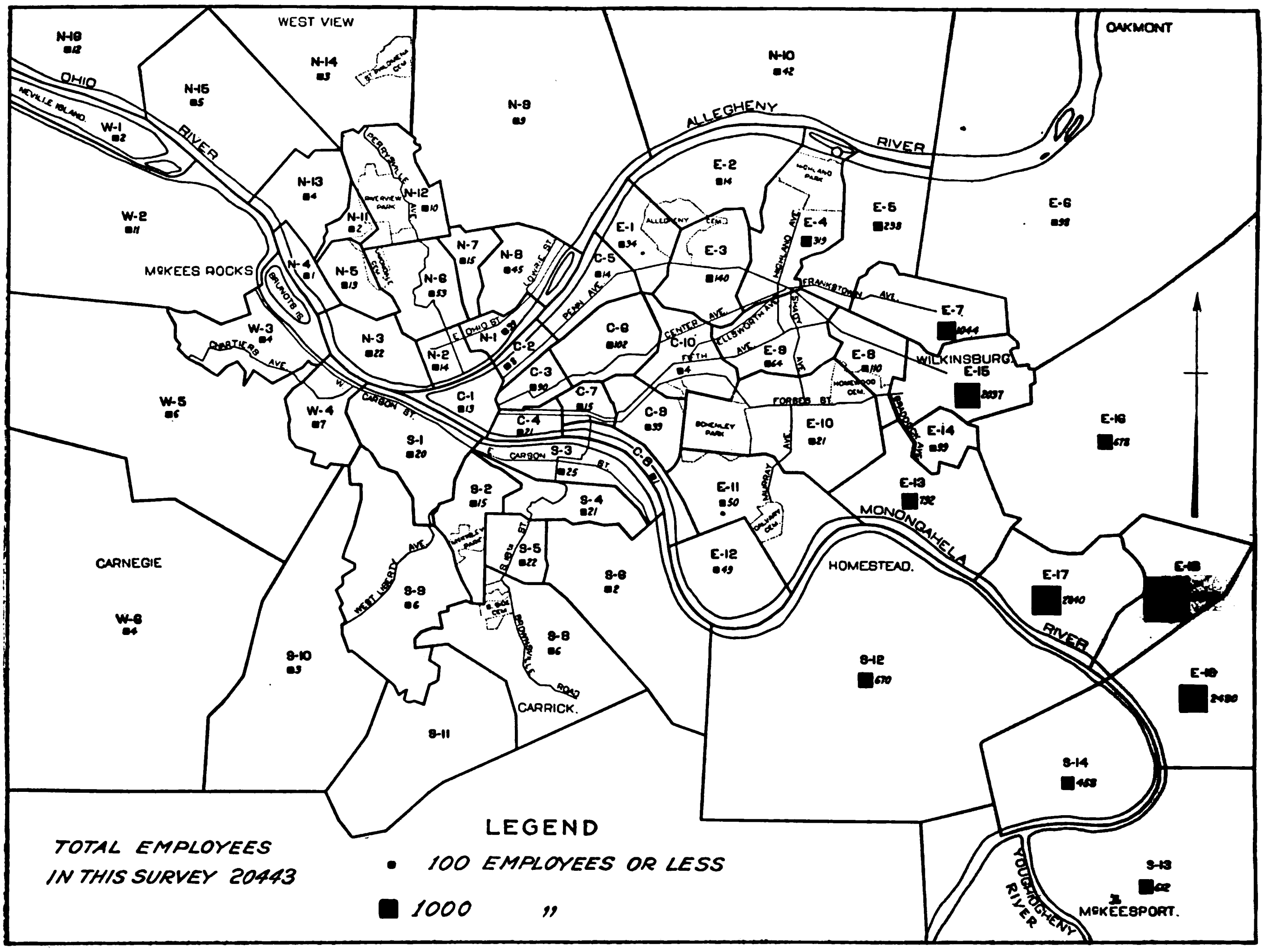

WEST VIEW
OAKMONT
N-16 12
N-15 5
N-14 3
N-9 9
N-10 42
OHIO RIVER
NEVILLE ISLAND
W-1 2
W-2 11
N-13 4
PERRYSVILLE AVE
RIVERVIEW PARK
N-12 10
N-11 2
N-7 15
N-8 45
N-4 1
N-5 13
N-6 53
McKEES ROCKS
BRUNOTS IS
W-3 4
CHARTIERS AVE
N-3 22
N-2 14
N-1 39
E. OHIO ST
LOWRIE ST
C-5 14
PENN AVE
C-6 102
C-2 8
C-3 90
C-1 13
W-4 7
W-5 6
W. CARBON ST.
C-4 21
C-7 15
S-1 20
E. CARSON ST.
S-3 25
S-2 15
S-4 21
C-8 39
C-9 BL
ALLEGHENY RIVER
E-1 34
ALLEGHENY CEM.
E-2 14
HIGHLAND PARK
HIGHLAND AVE
E-3 140
E-4 319
E-5 238
E-6 98
FRANKSTOWN AVE.
E-7 1044
CENTER AVE.
C-10
ELLSWORTH AVE.
FIFTH AVE.
4
E-9 64
SHADY AVE.
E-8 110
HOMEWOOD CEM.
WILKINSBURG
E-15 2037
FORBES ST.
SCHENLEY PARK
E-10 21
BRADDOCK AVE
E-14 39
E-16 678
E-11 50
MURRAY AVE.
CALVARY CEM.
E-13 732
MONONGAHELA RIVER
E-12 49
HOMESTEAD.
E-17 2040
E-18
E-19 2490
CARNEGIE
W-6 4
S-10 3
WEST LIBERTY AVE.
S-9 6
S-5 22
S. 18th ST.
S. SIDE CEM.
BROWNSVILLE ROAD
S-8 6
S-6 2
CARRICK.
S-11
S-12 670
S-14 453
S-13 402
McKEESPORT.
YOUGHIOGHENY RIVER
TOTAL EMPLOYEES IN THIS SURVEY 20443
LEGEND
● 100 EMPLOYEES OR LESS
■ 1000 "

FIG. 4—THE CITY WAS DIVIDED INTO SIXTY-FIVE SECTIONS FOR THE INDUSTRIAL SURVEY—THIS CHART GIVES THE LOCATION OF THE RESIDENCES OF THE EMPLOYEES IN THE INDUSTRIAL PLANTS IN SECTION E-18

case were the requested data refused. Altogether, 274,000 employees were checked and the following totals were obtained:

TABLE SHOWING DISTANCE TRAVELED BY PERSONS GOING TO EMPLOYMENT

Data on Travel of Employees:	
Number of employers	700
Number of employees	274,083
Number traveling from 0 to 1 mile	122,223 or 44.6%
Number traveling from 1 to 2 miles	69,132 or 25.2%
Number traveling from 2 to 3 miles	26,906 or 9.9%
Number traveling from 3 to 4 miles	41,146 or 7.7%
Number traveling from 4 to 5 miles	15,167 or 5.6%
Number traveling from 5 to 6 miles	9,709 or 3.5%
Over 6 miles	9,700 or 3.3%
Average length of ride:	
Disregarding fare zone:	
1-mile walk	2.95
2-mile walk	4.12
Within 5-cent fare zone:	
1-mile walk	2.20
2-mile walk	2.86

The census of population for the district covered by this industrial survey, taken late in 1916, is 1,160,000 persons. This estimate was used for the summer of 1917 when the survey was made. On the basis of one person in every three as an industrial worker or student in the advanced schools, the total number of such persons would be 386,700. The check located 274,000 persons in all, or 70 per cent of the estimated number of industrial workers.

The final four significant lines in the table above give the distance which the employees ride, computed under two different assumptions. The last two lines give the average distance ridden for a 5-cent fare, assuming, in the first, that all persons living within 1 mile, and in the second, that those living within 2 miles, walk to their places of employment. The two lines under "disregarding fare zone" give the average distances traveled under the same two assumptions as to walking but regardless of the fare paid. They are of interest primarily as giving the average ride of the entire community, which is about the same as in Chicago where, however, a single fare covers the entire area. In these four lines the method of transportation is not taken into account, but owing to the preponderating percentage of persons using the electric lines, they give a measure of the proportion of riders paying two fares.

RECOMMENDED MEANS FOR REDUCING CONGESTION

The report first takes up the subject of the parking of automobiles and says that although the prohibition of all parking is considered too drastic it suggests:

That no vehicles shall park on any street within the central business district for more than thirty minutes at one time.

That no vehicle shall park on either Oliver Avenue or Sixth Street at any time.

That no vehicles shall park within the hours of 7 a.m. to 9 a.m. and between 4 p.m. and 6 p.m. on any street on which street cars operate in the central business district except at specified places.

The report calls attention to the growth of heavy automobile traffic and recommends that the width of trucks, the overhang of loads and the carrying capacity of the wheels should be limited by ordinance.

Within the central business district it also recommends the removal of encroachments on the sidewalk, the restriction of loading and delivery operation of the sidewalks to certain hours and the enlarging of sidewalk intersections where the lines of flow of pedestrian travel meet and form areas of maximum congestion and consequent discomfort to pedestrians. This can be done by taking a triangle at the intersection of two sidewalks from the building at that corner, as shown in Fig. 5, and by supporting the second story of the building on a column. Such a plan will involve the loss of only a small triangle from the ground floor space and can be made at comparatively small cost.

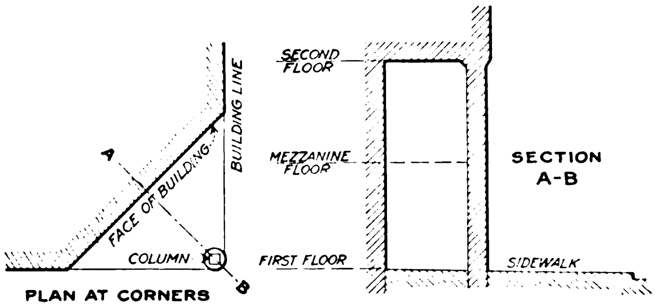

A
FACE OF BUILDING
BUILDING LINE
COLUMN
B
PLAN AT CORNERS
SECOND FLOOR
MEZZANINE FLOOR
FIRST FLOOR
SECTION A-B
SIDEWALK

FIG. 5—SUGGESTED PLAN OF INCREASING SIDEWALK AREA AT INTERSECTIONS OF SIDEWALKS

Outside of the business district plans are suggested for widening thoroughfares and rebuilding bridges.

SURFACE CAR REROUTING

A considerable portion of the report is devoted to proposed changes in car routes. In general, they are based on the following objects:

1. To shorten the average time of looping.
2. To assign to the short routes the loops extending farthest into the business district and to the long routes the shortest possible loop.
3. To combine as many as possible of the short routes by changing them to through routes across the district.
4. To establish a steam railroad station shuttle and belt around the district which will accept transfers from both through and loop routes.
5. To restrict the transfer privileges on the new through routes in the downtown district to transfers among themselves and to the shuttle and downtown belts, since the through routing proposed involves a loss to the railway of the fares of people at present crossing the district.
6. To have transfers given from the shuttle and downtown belt lines.
7. To combine as far as possible the separate routes operating over any trunk line into a single route, thereby supplying more frequent service to the passenger leaving the business district, even though requiring him to transfer from the trunk line.

The report also says that while it is advisable to retain the zone system of fares, an effort should be made to arrange those fares equitably so that the average length of ride determines the zone limits, also that

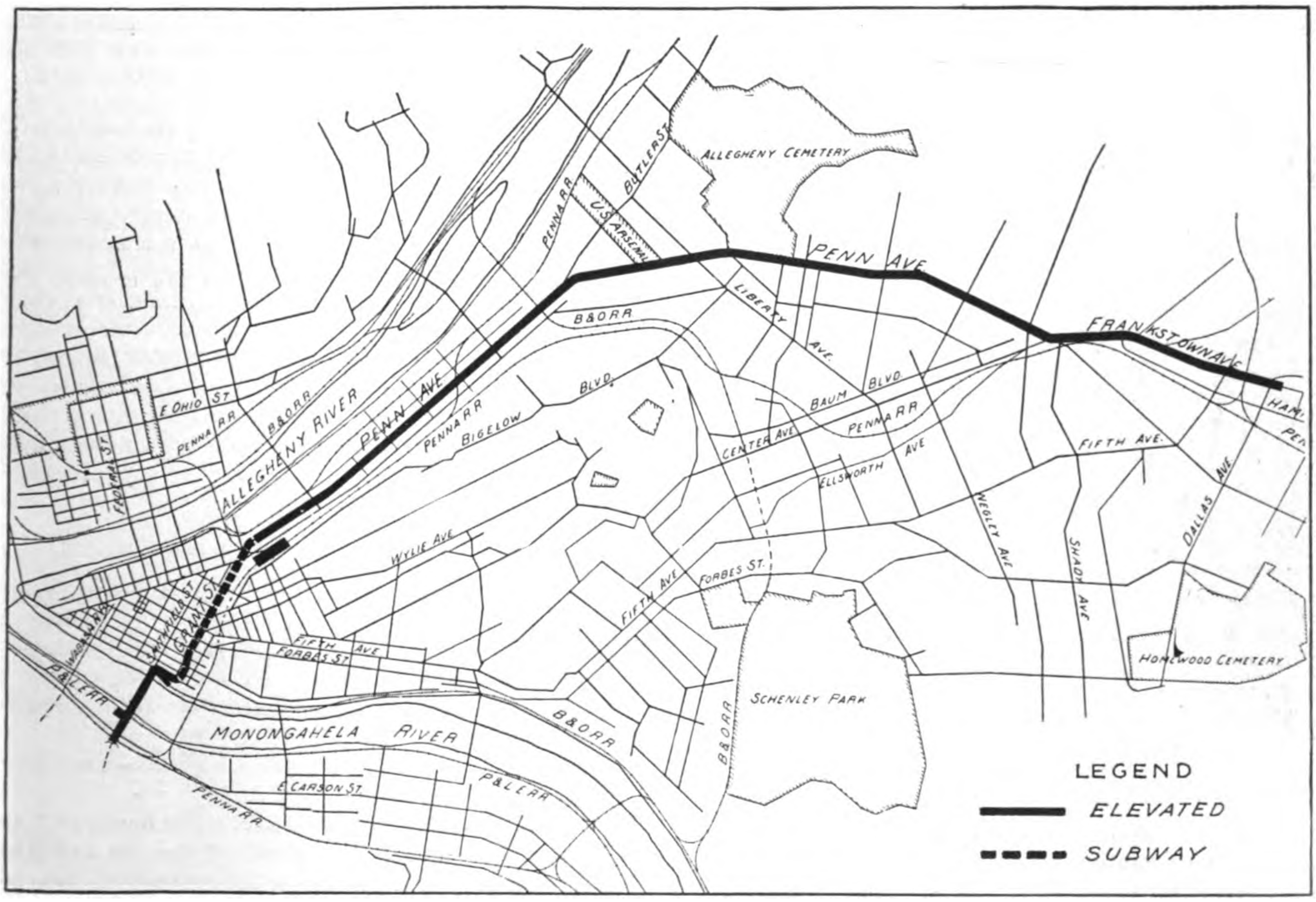

ALLEGHENY CEMETERY
BUTLER ST
PENNA R.R.
U.S. ARSENAL
PENN AVE
LIBERTY AVE
B&O R.R.
FRANKSTOWN AVE
HAM.
PEN.
BLVD.
BAUM BLVD
PENNA R.R.
E OHIO ST
PENNA R.R.
B&O R.R.
ALLEGHENY RIVER
PENN AVE
PENNA R.R.
BIGELOW
CENTER AVE
ELLSWORTH AVE
FIFTH AVE
NEGLEY AVE
SHADY AVE
DALLAS AVE
WYLIE AVE
FORBES ST.
FIFTH AVE
HOMEWOOD CEMETERY
GRANT ST
FIFTH AVE
FORBES ST
P&LE RR
MONONGAHELA RIVER
B&O RR
SCHENLEY PARK
B&O RR
E. CARSON ST
P&LE RR
PENNA RR
LEGEND
ELEVATED
SUBWAY

FIG. 6—PROPOSED RAPID TRANSIT ROUTE NO. 1—ITS ESTIMATED COST IS A LITTLE MORE THAN $7,000,000

where there is a conflict of interest between routes serving city territory only and routes serving boroughs outside the city, the routes serving city territory only should receive preference.

RAPID TRANSIT PLANS

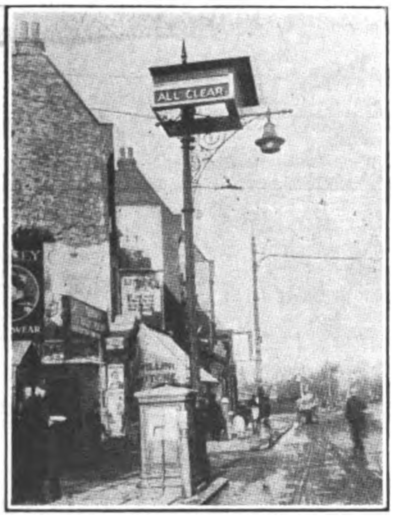
The general principles laid down under which the rapid transit system should be constructed and operated have already been outlined. Fig. 6, page 845, shows proposed route No. 1. Route No. 2, proposed for later construction, begins at Allegheny, crosses under the central business district by Diamond Street, and then goes east by Forbes Street, Fifth Avenue, Ellsworth Avenue, and Frankstown Avenue, to the East End, and is largely subway. The report says that Route No. 1 has the advantage of first low cost and soon being self-supporting and recommends its earlier construction.

The elevated railway structure proposed is with ties embedded in ballast and supported on a concrete floor. The extent of elevated track is defended on the ground that very few localities have sufficient density of population to support a rapid transit system built entirely as subway. Modern practice, it is explained, approves the construction of subways in congested districts only.

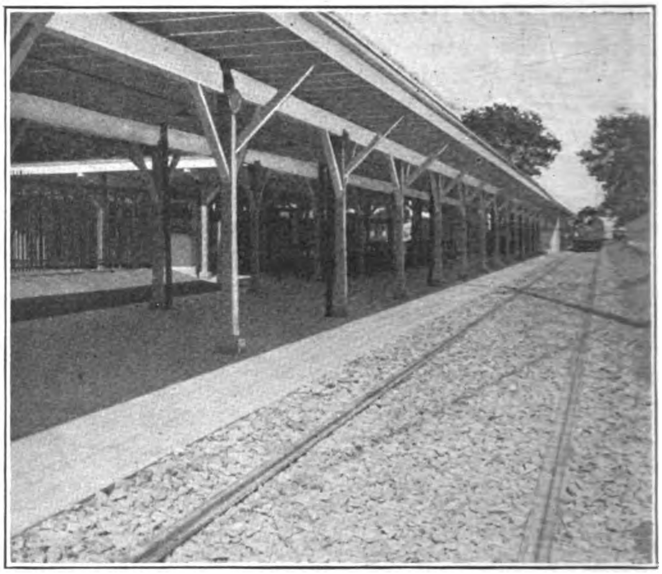
The report discusses the suggestion of a downtown subway loop to care for the surface cars but rejects it because it will accomplish the removal of only part of the street cars from the surface, while it would not save time for the average rider nor increase the length of ride to be obtained for a single fare. Moreover, it will cost $5,000,000, or nearly as much as the first rapid transit line proposed, and will be a burden upon the city as it will earn no additional revenue.

Air-Raid Warning Sign in Croydon

A WARNING sign has been devised by T. B. Goodyer, general manager Croydon (England) Corporation Tramways, for use on the occasion of enemy air raids. As indicated in the accompanying illustration, Mr. Goodyer's experiment utilizes a tramway pole and illuminated letters. A light box framework is divided horizontally into two chambers, each having a set of electric lights. When an alarm is received, a man switches on the lights illuminating the "Take Cover" lettering. As soon as the information comes that the German raiders have been driven back to sea, this group of lights is switched off and those behind the "All Clear" sign are switched on. The box has a canopy which renders the illumination invisible from above.



TRAMWAY AIR-RAID SIGNAL IN CROYDON

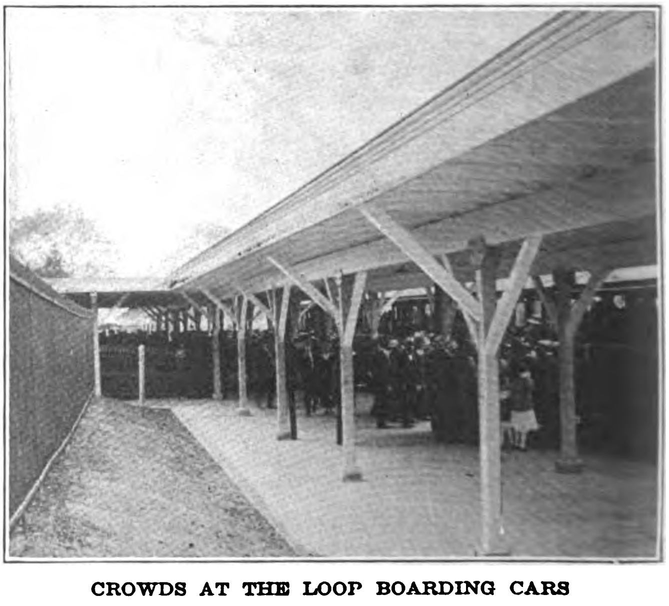


VIEW OF PREPAYMENT AREA AT LOADING STATION

Handling Crowds at Ohio State Fair Grounds

New Loop Track with Prepayment Area Solves Large-Crowd Problem of Columbus Railway, Power & Light Company

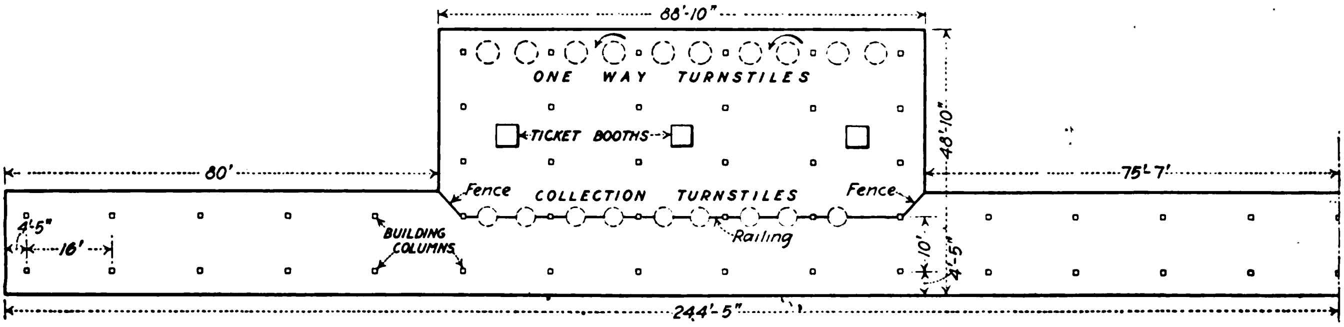
IN ORDER to provide better service for the immense crowds in attendance on various occasions at the State Fair Grounds, the Columbus Railway, Power & Light Company, Columbus, Ohio, has built loading and unloading stations and a loop track there which has worked out with entire satisfaction. The loop was completed in time for use during the State Fair held in August last year, and the company was quite generally complimented by the citizens and visitors regarding the improved facilities. During that event 106,000 people were transported to and from the grounds in five days, three of which were days of considerably heavier traffic than the others. It was expected that the new facilities would be tested to a greater extent during the National Dairy Show in October, when the crowds are usually very much larger, but on account of the un-



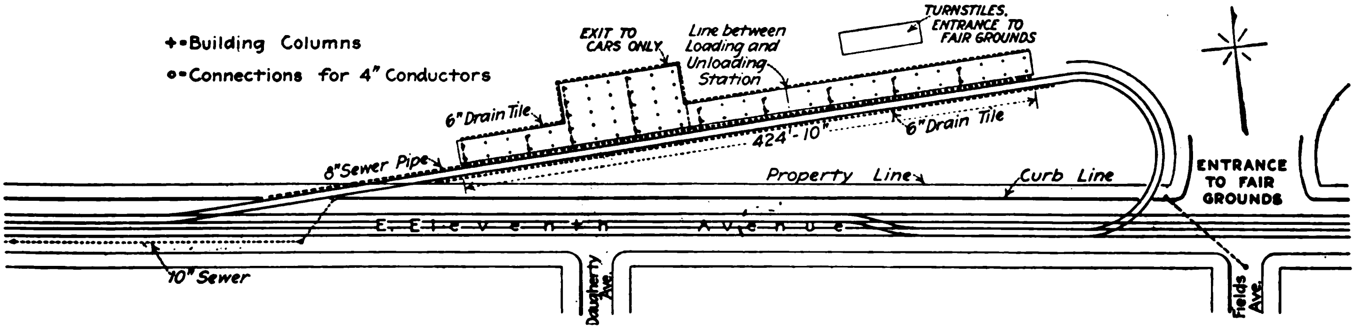
CROWDS AT THE LOOP BOARDING CARS

favorable weather conditions people attended in much smaller numbers than was anticipated.

An idea of the track layout at the loop can be had by referring to one of the accompanying drawings. Previous to building the loop, the company had a spur track laid along East Eleventh Avenue coming from Cleveland Avenue on the east to the main entrance, and also a loop at the southwest corner of the grounds which was used only during the State Fair or other events. From this point the people had to walk several hundred feet and cross the Big Four Railroad tracks, on which trains were not only a source of danger but often caused delays and much inconvenience, especially during bad weather. Upon the separation of the grades at this crossing, which was a part of a general program of grade-crossing elimination throughout the city, the traction company extended its line to join the spur already referred to and built a loop track and loading shelter just west of the fair ground entrance. It now operates on regular schedule over the line made by connecting the two branches.


88'-10"
ONE WAY TURNSTILES
TICKET BOOTHS
48'-10"
80'
75'-7'
Fence
COLLECTION TURNSTILES
Fence
4'-5"
16'
BUILDING COLUMNS
Railing
10'
4'-5"
244'-5"

LAYOUT OF LOOP TRACK AT ENTRANCE TO OHIO STATE FAIR GROUNDS


+ Building Columns
○ Connections for 4" Conductors
EXIT TO CARS ONLY
Line between Loading and Unloading Station
TURNSTILES. ENTRANCE TO FAIR GROUNDS
6" Drain Tile
424'-10"
6" Drain Tile
8" Sewer Pipe
Property Line
Curb Line
ENTRANCE TO FAIR GROUNDS
E. Eleventh Avenue
10" Sewer
Daugherty Ave.
Fields Ave.

DETAIL OF LOADING AREA AT FAIR GROUND LOOP, COLUMBUS RAILWAY, POWER & LIGHT COMPANY

The fair ground loop surrounds a small triangular-shaped park. Cars coming from the west encircle the loop and return, a cross-over being provided by which cars westbound from Cleveland Avenue can also transfer to the south track to enter the loop.

On the fair ground side is provided a shelter about 425 ft. long with a fence between the loading and unloading areas. A dispatcher's booth is built on this line adjacent to the track, from which the movement of cars for loading is directed. Extra cars are laid in at the old loop west of the Big Four Railroad and are drawn upon, as needed, by the dispatcher, who has all necessary telephone connection for speedily handling the cars. The dispatcher releases cars for loading at the loading station as the number of people in the prepayment area warrants.

The loading and unloading stations are properly illuminated to take care of night operation, traffic generally being heavy on the first four nights of the week and light on Friday night.

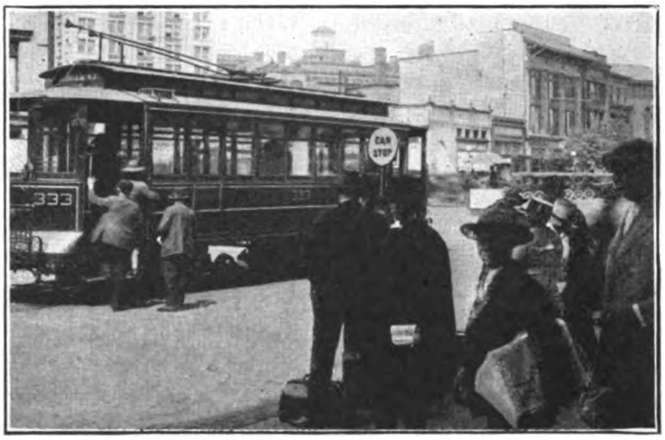
Upon going to the cars the people leave the Fair grounds through one-way turnstiles and buy their tickets or secure change in the loading station at one of three portable ticket booths conveniently located. Then they pass through collection turnstiles into a prepayment area, depositing their fares in fare boxes. Transfers are issued on the cars by conductors as desired.

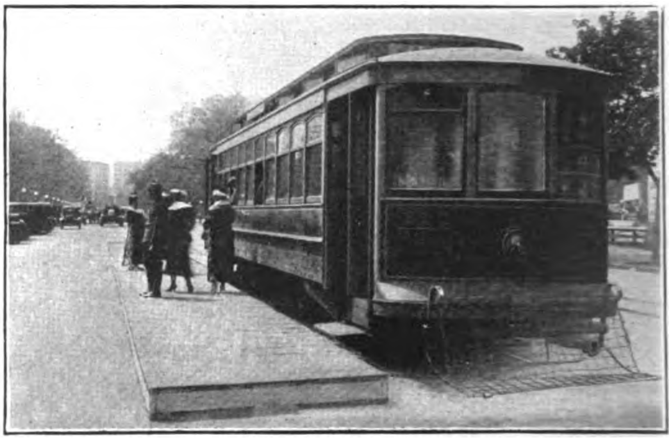
Missouri Utility Commission Report

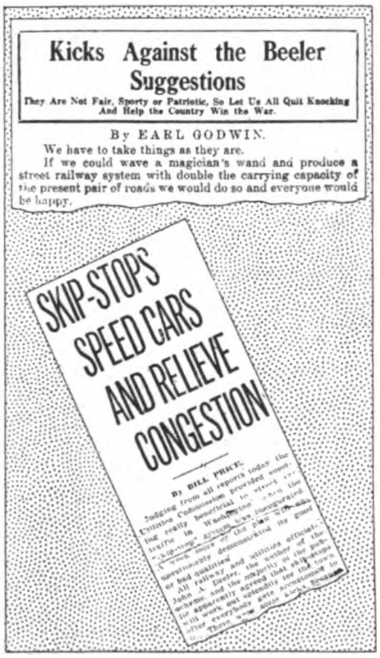
THE fifth annual report of the Missouri Public Service Commission, for the year ended Nov. 30, 1917, contains a general résumé of the activities of the various branches of the commission during the period under review. In connection with the work of the engineering department, it is stated that the matter of steam and electric railway clearances is now under consideration, as well as the matter of equipping street cars with fenders.

The analysis of accidents during the first ten months of 1917 shows a total of 237 killed and 4356 injured, twenty-nine and 2198 of these respectively being for electric railways. The property damage during the same period amounted to $226,370, the amount for electric railways being $2,666.

The report states that the continuation of the European War has materially reduced the demand of the investing public for utility securities. The securities authorized by the commission during the last fiscal year showed a decrease from those in the preceding year. Moreover, practically all of the authorizations were for other than electric railway purposes.







Kicks Against the Beeler Suggestions

They Are Not Fair, Sporty or Patriotic, So Let Us All Quit Knocking And Help the Country Win the War.

By EARL GODWIN.

We have to take things as they are.

If we could wave a magician's wand and produce a street railway system with double the carrying capacity of the present pair of roads we would do so and everyone would be happy.

SKIP-STOPS SPEED CARS AND RELIEVE CONGESTION

By BILL PRICE.

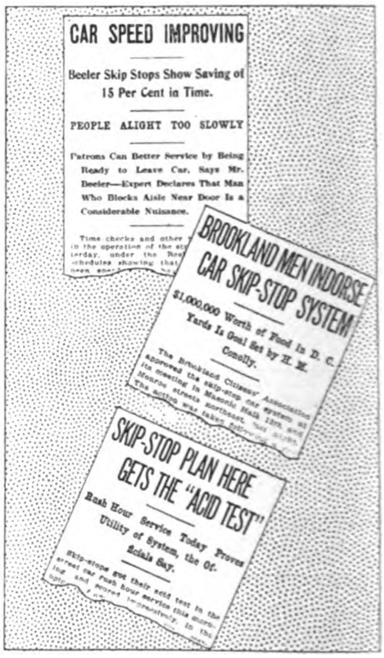
THE CAPITAL TRACTION COMPANY SYSTEM

By order of the PUBLIC UTILITIES COMMISSION the "SKIP STOP" system will be put into operation effective SUNDAY, APRIL 21, 1918.

Points where cars will stop for passengers will be indicated by yellow signs with black lettering "CAR STOP."

WATCH FOR **CAR STOP** **YELLOW SIGN**

STOPS FOR PASSENGERS WILL BE MADE ONLY AT POINTS SO MARKED



CAR SPEED IMPROVING

Beeler Skip Stops Show Saving of 15 Per Cent in Time.

PEOPLE ALIGHT TOO SLOWLY

Patrons Can Better Service by Being Ready to Leave Car, Says Mr. Beeler—Expert Declares That Man Who Blocks Aisle Near Door Is a Considerable Nuisance.

BROOKLAND MEN INDORSE CAR SKIP-STOP SYSTEM

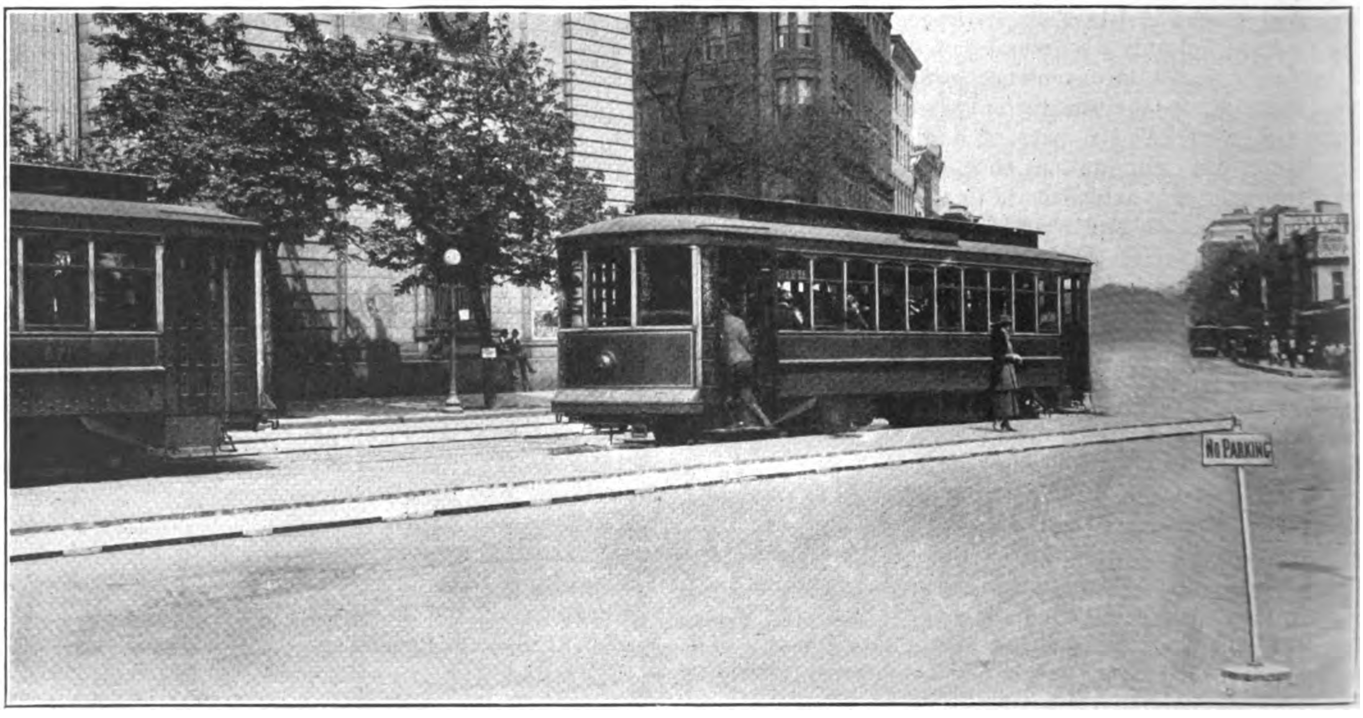
$1,000,000 Worth of Food in D. C. Yards Is Goal Set by H. M. Conolly.

The Brookland Citizens' Association approved the skip-stop car system at its meeting in Masonic Hall 12th and Monroe streets northeast, last night.

SKIP-STOP PLAN HERE GETS THE "ACID TEST"

Rush Hour Service Today Proves Utility of System, the Officials Say.

Skip-stops got their acid test in the street car rush hour service this morning and scored impressively.



Above, at left, a car at "Car Stop" sign. At right, loading platform 10-in. high, eliminating one step for passengers. In the center, newspaper headlines indicate the success of the skip stop. Also window poster which provided advance information as to car stops. At bottom, view of "No Parking" sign which helped the police in preventing congestion at loading patforms.

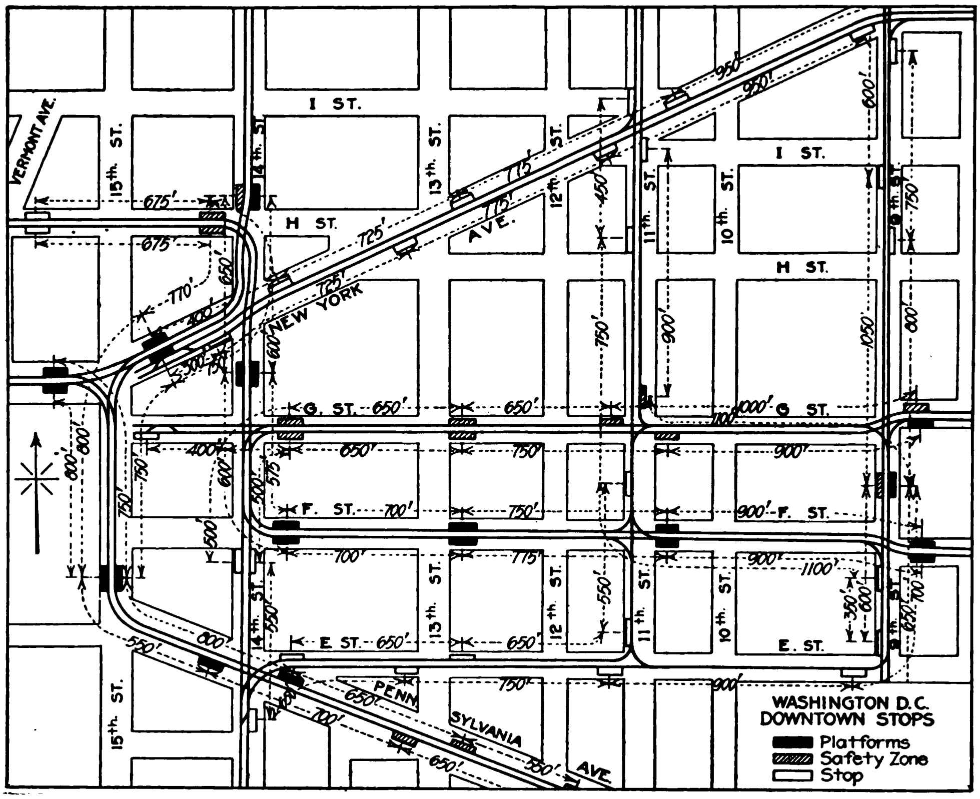
Skid Stop Received with Approval in Washington

Skip Stop at Washington Adds 10 to 15 Per Cent to Service

Co-operation of Public, Commission and Railways Leads to Immediate Success of Skip-Stop Plan—Elimination of More Than One-Third of Stops, Use of Vivid Stop Signs, Erection of Loading Platforms and Front-End Fare Collection Increases Schedule Speeds Materially

ON Feb. 7, 1918, John A. Beeler, consulting engineer, submitted the second of his unit reports to the Public Utility Commission of the District of Columbia. In this he recommended the abolition of more than one-third of the stops, particularly to clear up the congested downtown section. The downtown changes were made on Feb. 17 and April 7, for the respective railways and the skip stop applied to the entire District of Columbia on Sunday, April 21.

The throat of the Capital Traction Company, comprising a length of 2300 ft. on Fourteenth Street between Pennsylvania Avenue and H Street, was relieved on Feb. 17 by removing about one-half the stops and carefully rearranging the remaining ones for distances varying from 500 ft. to 750 ft. On April 7 the throat of the Washington Railway and Electric Company, F and G Streets between Seventh and Fifteenth Streets, received similar treatment, the spacing in one case being 1100 ft. The accompanying plan shows the stopping places of both companies in the downtown area and the distances between them. It will be observed that these stops frequently are located on the far side at congested junctions.



PRESENT LOCATION OF STOPS IN THE DOWNTOWN SECTION OF WASHINGTON, BOTH COMPANIES, AND DISTANCES BETWEEN STOPS

Before the new stops for the downtown section went into effect the newspapers had given wide publicity to the proposals through the medium of the unit reports; second, through the editorial comments which were distinctly favorable; third, notices in the cars, and fourth, through hearings before the Public Service Commission. Coincident with the inauguration of the system, prominent "Car Stop" signs were installed as described hereinafter. Also through the co-operation of Major Pullman, chief of police, the traffic officers gave the street cars the right-of-way over all other traffic. Loading platforms long enough to accommodate two cars at a time were placed at each stop to provide aisles of safety. About a dozen of these platforms are in use, the heaviest with front-end fare collection. Another two dozen platforms are under construction. These perform two useful functions; they accelerate passenger interchange in saving a step and they cause the people to congregate on the platforms instead of spreading out in the street, where they are in danger from automobiles.

The great improvement in the downtown section met with such approbation that the way was well paved for the extension of the skip stop to the entire community.

Sunday, April 21, was selected as the day for making the skip stop universal. According to calculations made by Walter C. Allen, executive secretary of the commission, the built-up sections served by the Capital Traction Company now have 352 instead of 576 stops, or a cut of 39 per cent, and those served by the Washington Railway & Electric Company, 591 stops instead of 944, or a cut of 37½ per cent. On outlying lines the stops total 155, which is only a 10 per cent cut inasmuch as these stops were not closely spaced before the Beeler survey was made. In general the city stops average 750 ft. or seven to eight to the mile. On busy Fourteenth Street, however, the spacing averages 780 ft.

What Those Interviewed Said About Skip-Stop Service

A white-haired
CAPITAL TRACTION MOTORMAN

The people will get used to the skip stop and like it. I remember when they used to get in front of the horses to make me stop in front of their homes; and they sure had fits when we stopped only at crossings!

WALTER ALLEN
Executive Secretary Public Utility Commission

The merest tyro can see that the skip stop will enable the companies to operate more service.

CHAIRMAN BROWNLOW
of the Public Utility Commission

The fact that nobody has protested against the skip-stop principle, and that of the half-dozen protests which were made most had some merit, is indeed satisfactory evidence of the feeling of the public.

W. F. HAM
Vice-President Washington Railway & Electric Company

The difference is that now our schedules are no longer paper schedules, they are carried out!

MAJOR PULLMAN
Chief of Police

This work would have been well worth while if it had resulted in nothing more than clearing up the Capital Traction Company's throat on Fourteenth Street.

J. A. HANNA
Vice-President and General Manager, Capital Traction Company

It is remarkable how the people have taken to it. The loading platform also helped wonderfully in keeping people who are waiting for cars from scattering over the street.

In spite of these important changes, public approval was practically unanimous. Mr. Allen says that but one adverse criticism was made in advance, and the half dozen later protests were readily allayed. To have had so little protest from a community of 400,000 people may well be considered remarkable.

To advise their passengers, both companies issued a window poster as shown, while the Washington *Star* published a complete list of stops in daily installments, a feature which actually was a beat in the eyes of the public. The trainmen received advance booklets giving a complete statement of the stops on every line, whether far, near or some other location. It should be said here that in every instance the stops are located with a view to the local conditions. In some cases they are several car lengths from the street intersections. Some nearside stops were changed to far-side stops, and vice versa.

Motormen are instructed to bring the car to a standstill with the entrance directly opposite the sign so that valuable seconds are saved in boarding. Through the co-operation of the police department, also, a non-parking clearing 96 ft. long, sufficient for double-berthing is being established in front of every stop. A standard alongside the "Car Stop" sign reads: "Please do not leave car between street car safety zone and curb."

Although a few wrinkles in traffic regulation remain to be smoothed out with the aid of the police department, the results to date are remarkably satisfactory. Where cars stood stockstill for minutes at a time or moved at the pace of a glacier, their movement is now so free that Washingtonians can scarcely believe their eyes. As riders they profess to believe that the running time has been cut nearly in half. Of course, this is psychological; but the reality of 10 to 15 per cent increase in the speed attained is satisfying enough to the operators.

As Mr. Ham intimates in the quotation elsewhere, the elimination of delays is quite as important as the increase over the former paper schedules. The Capital Traction Company has not yet prepared new schedules but has put preliminary running times in hand, pending the make-up of such schedules. For example, on Pennsylvania Avenue the thirty-seven and one-half minute westbound run is now thirty-three minute, and the thirty-seven and a half minute eastbound run is now thirty-two and a half minutes. It has become evident that the need was not for new lines, but for a clear track over which more cars and more miles per car could be operated. In fact, it is certain now that the forthcoming seventy cars ordered by the companies will find full use in taking care of increased travel, much of which will come out of present pedestrian ranks.

IMPORTANCE OF SIGNS

In discussing with Mr. Ham the matter of making the skip stop successful he said: "A proper sign is one of the absolute essentials." Those who see the sign adopted will admit that it is vivid enough to fulfill its functions admirably. As Washington has no poles or wires, the signs are in the form of standards 6 ft. 6 in. from the sidewalk to the center of a 12 in. yellow disk on which are printed on wood the words "Car Stop" in black. In some places white disk standards are erected bearing the legend: "Cars Do Not Stop Here." These signs and the presence of loading platforms save even the stranger from falling into error. The stop signs were obtained from the Traffic Sign & Signal Company, Gloucester, Mass.

CONSULTATION, PREPARATION AND CO-OPERATION PRODUCED SUCCESS

In view of the likelihood that the skip stop will be widely tried in the immediate future in response to the request of the Fuel Administrator to save coal, it is not amiss to point out that success in Washington is not the result of arbitrary action. First there was consultation with all the interests affected, second there was preparation in the layout of stops, and third there was co-operation in executing the proposals of the commission's consulting engineer. The skip stop, in brief, was put throught on its merits rather than as a temporary measure to meet an emergency.

The unified government of the District was a distinct aid. The District affairs are administered solely by a board of three men who constitute both the District Commissioners and the Public Utilities Commission. Thus all departments pulled together. Both the large local railway companies, as well as the interurbans, entered heartily into the spirit of the situation, even down to the standardization of such minor details as the stop signs.

As for the newspapers, the headlines and the subcaptions reproduced in the illustration on page 848 tell their own story.

Selling Service for a Fair Price

This Is the Big Job of Electric Railway Operators To-day—It Is Time for Them To Prove That They Are as Good Merchants as They Are Producers —How Salesmanship Paid One Railway

BY FRANK PUTNAM
The North American Company, New York, N. Y.

MANY American electric railway operators have begun to doubt whether service can be sold for a fair price.

They can produce it—given sufficient revenue. Nobody else knows so well how to do it. And they can produce it economically. They have had to, for years past.

They know how to run the service, but apparently they do not know how to sell it for a fair price. With labor and capital costs considered, few if any operators are getting a fair price for even the inadequate service which most of them now supply.

They are strong in the engineering and the administrative factors of the business. They seem to be weak, however, in the vital factor of salesmanship. They are good producers, but poor merchants.

THE PUBLIC MUST BE TOLD

Under commission regulation, electric railways have been trying to prove their need of more revenue to build new lines, buy more cars, pay better wages and assure to investors a fair return. The commissions have not, as a rule, been granting what the companies must get if they are to give the public satisfactory service.

Why? Because the public is the court of last resort—the customer controlling the commissions. The public must first be satisfied that a rate increase is needed in its own interest before commissions will think it safe to grant relief.

Electric railway operators, up against this fact, have "gone down to the tavern and cussed the court" for lacking courage to do what it knows ought to be done, and have let it go at that. They have been so busy blaming the commissions that they have overlooked their own share of responsibility—and it is the larger share.

There have been exceptions. A few companies have gone straight to the public in newspaper advertisements with statements which were *prima facie* proof that they needed more revenue in order to pay good wages, give good service and yield a fair return. Most of these, however, have not made a thorough job of it. They have not sufficiently trusted the public to lay all of their cards face up on the table.

The public is you and I and the other fellow. The public is always fair, even liberal, when it knows all of the facts. It is always suspicious, and properly so, when asked to approve transactions concerning which it lacks facts necessary to the formation of an intelligent opinion.

The utilities should create an informed public opinion to back up the commissions in constructive instead of punitive rate and service regulation. This proposition has been tested. I have had a hand in trying it out. It works.

During the past year I helped one utility to sell $2,000,000 of preferred stock across its counters, at par, to customers. The company got better than 97½ per cent net. It secured more than 3000 pocket-interested local partners, many of them active in promoting the company's business, all of them potential defenders of the company's rights against unjust attack from any quarter. It kept $140,000 a year at home—a 7 per cent dividend to its customer-partners. It held down the cost of service for all its customers, by saving $120,000 on the cost of new capital needed to pay for plant additions and betterments.

That company's position was exceptional. It had a record of excellent service at low rates. It had, a few months earlier, told its public, in a series of newspaper advertisements, all about its affairs and its policies. It told how it had substituted solid plant values for so-called "water"—injected unavoidably during the process of uniting many competing companies into one to serve the whole community at least cost—by declaring small dividends over a series of years and building itself up with earnings which the owners might have taken out with the approval of the State commission. Its clear, square, candid and complete statement of its conditions and policies, and its sale of shares to more than 3000 customers, abruptly ended a strong movement for a competing municipal system.

I expect to see that company finance all of its after-the-war extensions and betterments—and these will aggregate many millions of dollars as the city grows—by selling new issues of its stock, approved by the State commission, to its customers. I expect to see it, within ten years, have 35,000 home partners—a controlling minority of the electorate upon all public issues affecting its service. Its position, conditioned on continued good conduct, will be safeguarded against any wave of political radicalism. If finally taken over by the municipality, in deference to the theory that all public services should be owned by the public, it will not be robbed in the transaction.

MAKING A RAILWAY SITUATION PLAIN

I spent the last half of 1917 and the first five weeks of 1918 in telling the people of a Mid-Western city, through advertisements in its daily and weekly newspapers, all about the affairs, policies and needs of its electric railway system. Like many other railways this one, caught between the devil of the usurers, tax collectors and fixed fares on one hand and the deep sea of doubled operating costs on the other, finds itself unable to give satisfactory service, pay good wages or make any return to its stockholders. Its difficulty being due chiefly to excessive city taxation and the non-compensatory character of the flat 5-cent fare with universal free transfers, and only to a small degree to over-capitalization, the company has very properly "passed the buck" to the city government and the State commission.

The company was asked to pay $2,500,000 of accrued taxes on franchise values confiscated by the State in 1913. It was asked to pay wage increases totaling more than $3,000,000 a year. It was asked to spend from $3,500,000 to $4,000,000 for new car lines urgently and long needed in districts which had no car service. It had a $3,500,000 first mortgage bond issue maturing on June 1, 1918. It had a treasury surplus of $3,000,000. Its net income, steadily diminishing year by year, was a trifle more than $600,000 in 1917. Obviously it could not meet the demands with its existing revenue.

PUBLIC CONVERTED THROUGH PUBLICITY CAMPAIGN

When we began our seven-months advertising campaign, the city government and the daily press declared the company's city taxes must not be reduced more than an average of $85,000 a year for the term of the franchise, this reduction having been informally agreed upon by the city and company in preliminary conferences. Several of the forty-five advertisements used were devoted to proving from the public records that the company was grossly overtaxed and to exposing the injustice and the absurdity of taxing its franchises five years after all its franchise values had been confiscated by the State.

Within four months from the start the strongest newspaper opponent was editorially demanding that all of the company's franchise taxes, amounting to $480,000 a year, be repealed and, if necessary, that its property taxes be greatly reduced, as a possible means of avoiding an increase of fares. When the city government, eight months after the campaign started, passed the franchise ordinance, it repealed all of the $480,000 a year franchise taxes and substituted a gross receipts tax of one-half of 1 per cent, or $65,000 a year, thus cutting the taxes levied against the company $415,000 a year.

The city not only reduced the company's taxes but it conceded in the ordinance the State commission's authority to regulate fares. Now it is making only a formal protest before the commission against a fare increase, which it recognizes must be ordered if the company is to pay good wages, give good service, make necessary extensions and yield a fair return on the legitimate investment.

Without the advertising campaign the public would not have understood the necessity for a tax reduction and a fare increase. The city government would have been afraid to cut the taxes, and doubtless the State commission, not unnaturally, would have been reluctant to grant the additional relief which the whole community now knows is needed, in the public's interest as much as the company's.

The cost of the advertising was only a small part of the first year's saving in taxes. Beyond the direct financial relief which it helped the company to procure, the advertising strengthened the company's position by making the public understand these facts:

1. An electric railway, whether publicly or privately owned, is a branch of the public service.
2. The city and State governments are just as much obligated to assure ample good electric railway service as they are to assure ample good water, school and other public services.
3. As long as any branch of the public service is permitted to be built and operated at the cost and risk of private citizens, city and State governments, in the public interest, must let them earn enough to assure ample good service.
4. Aside from the rank injustice of it, the public's pocket loss is many times greater than that of the private investors when city and State governments prevent electric railways from earning enough to give ample good service, to pay good wages, to make necessary extensions and to yield a fair rental return for the money so employed.

I don't pretend to be either an advertising expert or an electric railway expert. I have been going to school for three years to a group of the most intelligent public utility men in America, and I do know some things about the American public. I know what the public, in any big American city, wants to know about its public utilities, and I dug out those facts and printed them, with all the convincing argument and punch I could put into them.

Some electric railway men told me I was giving the public more figures than it would take time to read or understand, and some advertising experts told me my copy wasn't "scientific"—whatever that is. Granting that these criticisms were probably true, we got what we went after, with the public's consent and approval. Real experts should be able to get equal or better results in less time and at a smaller cost. This case is cited merely to prove to electric railway operators that straight salesmanship applied to the public utility business will pay as well as it does in any other big business.

IT PAYS TO ADVERTISE

Too many electric railways, untrained in modern merchandising methods, have been indignant but dumb in the face of rising costs and increasing burdens of operation. They have been trying hard to make $1 of earnings give $2 of service and have been wondering, I suppose, why that fact did not speak for itself, and why it did not satisfy the demands of an unreasonable public.

The railways are only just now learning to employ the newspaper advertising columns, as all other merchants do, as a means of selling their service to the public for a fair price. They can do it, just as other merchants do it, when they realize that they are merchants and not chartered monopolists.

There is no sanctity in the 5-cent fare. There is no more reason why a street-car ride, each year costing more to produce, should remain forever at the fixed 5-cent rate, than there was for calico to remain forever at 5 cents a yard. The men who make and sell calico have advertised to the public the reasons why its price had to rise. The public, knowing why, pays the higher price without complaint.

There is no mystetry about the cost of electric railway service. The state now dictates the form in which the books shall be kept, to show every penny taken in and the nature of every item for which a penny is expended. It is up to the companies to sell their situation to the public—and thereafter keep it sold.

Here's How the Electric Railways Can Help to Build Ships

Passenger Transportation Service Section of United States Shipping Board Has Begun Co-operating With Electric Railways to Provide Real Transportation Facilities Quickly—Double-Tracking, Train Operation, Prepayment Areas and Staggered Hours Show Progressive Spirit and Foresight—Learn What Has Been Done by This Department and See Where You Can Help With Brains and Equipment

ON APRIL 1, the United States Shipping Board Emergency Fleet Corporation formally organized a Passenger Transportation Service Section with A. Merritt Taylor as manager of passenger transportation. By April 3 it had prepared and mailed a questionnaire for all shipyards, some 150, in the land; also for all shipping board district officers in charge of steel ship construction and all district supervisors in charge of wood, composite and concrete construction. By April 6 the War Board of the American Electric Railway Association had prepared and mailed a questionnaire in co-operation with the Shipping Board calling upon electric railways to state what equipment they could release for the latter's needs.

In the meantime, the staff for this vital part of the shipbuilding program was being built up rapidly, as indicated by the accompanying schedule of personnel in the panel on this page.

The functions of the staff are expanding and specializing so rapidly that it would be useless to make an organization chart. It will be more to the point to explain how the traffic surveys are made by the transportation engineers as this will give a hint to the electric railways affected as to what they are expected to tell the manager of the transportation department if they are to be of maximum aid in forwarding the shipbuilding and other war programs. While the procedure will vary with the circumstances, the following has been prepared as a general outline, and should prove of interest.

Personnel of Passenger Transportation Service Section as of April 26, 1918

Name	Title	Reported for duty	Past Employment
A. Merritt Taylor	Manager	Apr. 1	Pres. Philadelphia & West Chester Traction Co.
A. B. Maine	Executive Aide	Apr. 1	Chief Clerk, Dept. City Transit, Phila.
O. B. Cooke, Jr.	Engineer	Apr. 2	Member of Firm Kelly, Cooke & Co.
J. A. Renshaw	Jr. Asst. Engineer	Apr. 4	Asst. Engineer Dept. City Transit, Phila.
J. W. Welsh	Engineer	Apr. 8	Electric Engineer & Traffic Agt. Pittsburgh Railways.
W. C. Solly	Asst. Engineer	Apr. 8	Engineer, New Chester Water Company
C. G. Enz	Chief Clk. & Acct.	Apr. 8	Asst. Chief Clerk Dept. City Transit, Philadelphia.
M. I. Frantz	Stenographer	Apr. 8	Stenographer, A. M. Taylor, Philadelphia.
G. T. Seely	Asst. Manager	Apr. 11	Assistant General Manager, Chicago Elevated Lines.
M. W. Rew	Asst. Engineer	Apr. 12	Chief Engineer, Pittsburgh Transit Commission.
J. C. Thirlwall	Engineer	Apr. 15	Electrical Engineer, General Electric Company, Schenectady, N. Y.
C. F. Hewitt	Engineer	Apr. 15	Private Engineer and formerly General Manager, United Traction Co., Albany, N. Y.
D. C. Ainey	Progress Engr.	Apr. 15	Assistant Engineer, Public Service Commission, Harrisburg.
Jilson J. Coleman	Engineer	Apr. 22	Agent for Manufacturing Companies.
Wm. W. Handy	Engineer	Apr. 22	Chief, Report-Appraisal Dept. Day & Zimmerman, Philadelphia.
Edward F. Burnett	Special Agent	Apr. 23	General Agent, Western Passenger Association.
Harry C. Kendall	Asst. Engineer	——	Electrical Engineer, Denver Tramways.
Geo. W. Remington	Asst. Engineer	——	Engineer, General Electric Co.

Procedure for Survey

The first duty of a survey engineer is the notification of a district officer, shipyard executive and local transportation companies, by wire, of the impending survey; giving the name of the engineer in charge and assistants, with time of arrival.

The general information to be tabulated and collected by the engineer in charge prior to his start from headquarters follows:

1. Names and addresses of district officer, district supervisor, shipyard executive and local counsel of the Emergency Fleet Corporation.

2. Response to questionnaire sent in by the shipbuilding corporation, including maps and letter requested in questionnaire.

3. Report of district officer, or district supervisor, and any papers or data in file relevant to the passenger transportation situation at the yard in question.

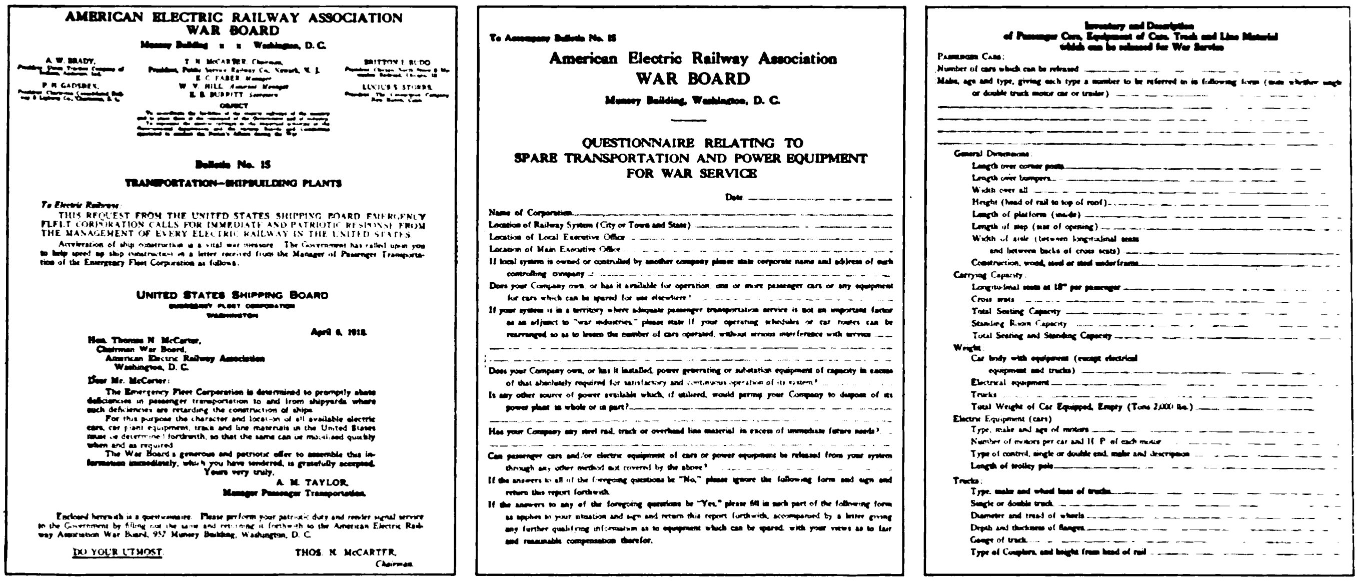
Immediately upon his arrival on the ground the transportation engineer makes arrangements for establishing the local residence and business headquarters for transportation party. Preferably the working headquarters of the staff are in the shipyard or district office.

After the arrival of the survey party, calls are made upon the district officer and district supervisor where reasonably accessible, upon the official in charge of shipyard, and upon the general manager (or other available officer) in charge of each passenger transportation company serving the shipyard in question. The call upon the district officer and the district supervisor is of a general character, to develop possible high points of the general situation. The call upon the shipyard officials is prefaced with a general statement as to the purpose of impending survey, and is intended to develop all facts relative to transportation deficiencies and possible means of relief; examination of any data collected by the shipyard, etc.

The data and information secured up to this point from the questionnaire, from personal conferences with shipyard officials and from independent observations of the survey party is then sifted, and the vital requirements for improvement of the local transportation situation are determined for use as a background for discussing various phases of the situation with the transportation companies.

NEGOTIATIONS WITH LOCAL RAILWAY

The call upon the transportation company's executive officer is prefaced with a statement as to the purpose of the impending survey, followed by discussion of the local situation, as it affects the shipyard, and a development of transportation company's general views in the matter of ways and means for improving the shipyard service. A direct statement is presented as to the results which the Fleet Corporation is determined to get in the matter of adequate transportation facilities, the talk being shaped in such a way as to leave no doubt in the mind of the transportation company that immediate concrete results are what the Fleet Corporation requires and that it is prepared to give the transportation company whatever assistance may be essential—financial, or otherwise—to bring about the results required. Where undue loss will result to the transportation company, the Fleet Corporation is prepared will absorb such loss to secure essential results. The transportation company is also assured that any and all information supplied is confidential and for use solely in connection with the shipyard situation.



AMERICAN ELECTRIC RAILWAY ASSOCIATION
WAR BOARD
Munsey Building : : Washington, D. C.

A. W. BRADY,
P. H. GADSDEN,
T. N. McCARTER, Chairman,
President, Public Service Railway Co., Newark, N. J.
E. C. FABER, Manager
W. V. HILL, Assistant Manager
E. B. BURRITT, Secretary
BRITTON I. BUDD
LUCIUS S. STORRS

OBJECT

Bulletin No. 15

TRANSPORTATION—SHIPBUILDING PLANTS

To Electric Railways:

THIS REQUEST FROM THE UNITED STATES SHIPPING BOARD EMERGENCY FLEET CORPORATION CALLS FOR IMMEDIATE AND PATRIOTIC RESPONSE FROM THE MANAGEMENT OF EVERY ELECTRIC RAILWAY IN THE UNITED STATES.

Acceleration of ship construction is a vital war measure. The Government has called upon you to help speed up ship construction in a letter received from the Manager of Passenger Transportation of the Emergency Fleet Corporation as follows:

UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION
WASHINGTON

April 6, 1918.

Hon. Thomas N. McCarter,
Chairman War Board,
American Electric Railway Association
Washington, D. C.

Dear Mr. McCarter:

The Emergency Fleet Corporation is determined to promptly abate deficiencies in passenger transportation to and from shipyards where such deficiencies are retarding the construction of ships.

For this purpose the character and location of all available electric cars, car plant equipment, track and line materials in the United States must be determined forthwith, so that the same can be mobilized quickly when and as required.

The War Board's generous and patriotic offer to assemble this information immediately, which you have tendered, is gratefully accepted.

Yours very truly,
A. M. TAYLOR,
Manager Passenger Transportation.

Enclosed herewith is a questionnaire. Please perform your patriotic duty and render signal service to the Government by filling out the same and returning it forthwith to the American Electric Railway Association War Board, 957 Munsey Building, Washington, D. C.

DO YOUR UTMOST.

THOS. N. McCARTER,
Chairman.

To Accompany Bulletin No. 15

American Electric Railway Association
WAR BOARD
Munsey Building, Washington, D. C.

QUESTIONNAIRE RELATING TO
SPARE TRANSPORTATION AND POWER EQUIPMENT
FOR WAR SERVICE

Date ____________

Name of Corporation ____________
Location of Railway System (City or Town and State) ____________
Location of Local Executive Office ____________
Location of Main Executive Office ____________
If local system is owned or controlled by another company please state corporate name and address of such controlling company ____________
Does your Company own, or has it available for operation, one or more passenger cars or any equipment for cars which can be spared for use elsewhere? ____________
If your system is in a territory where adequate passenger transportation service is not an important factor as an adjunct to "war industries," please state if your operating schedules or car routes can be rearranged so as to lessen the number of cars operated, without serious interference with service ____________
Does your Company own, or has it installed, power generating or substation equipment of capacity in excess of that absolutely required for satisfactory and continuous operation of its system? ____________
Is any other source of power available which, if utilized, would permit your Company to dispose of its power plant in whole or in part? ____________
Has your Company any steel rail, track or overhead line material in excess of immediate future needs? ____________
Can passenger cars and/or electric equipment of cars or power equipment be released from your system through any other method not covered by the above? ____________
If the answers to all of the foregoing questions be "No," please ignore the following form and sign and return this report forthwith.
If the answers to any of the foregoing questions be "Yes," please fill in such part of the following form as applies to your situation and sign and return this report forthwith, accompanied by a letter giving any further qualifying information as to equipment which can be spared, with your views as to fair and reasonable compensation therefor.

Inventory and Description
of Passenger Cars, Equipment of Cars, Track and Line Material
which can be released for War Service

PASSENGER CARS:
Number of cars which can be released ____________
Make, age and type, giving each type a number to be referred to in following form (state whether single or double truck motor car or trailer) ____________

General Dimensions:
Length over corner posts ____________
Length over bumpers ____________
Width over all ____________
Height (head of rail to top of roof) ____________
Length of platform (inside) ____________
Length of step (size of opening) ____________
Width of aisle (between longitudinal seats and between backs of cross seats) ____________
Construction, wood, steel or steel underframe ____________

Carrying Capacity:
Longitudinal seats at 18" per passenger ____________
Cross seats ____________
Total Seating Capacity ____________
Standing Room Capacity ____________
Total Seating and Standing Capacity ____________

Weight:
Car body with equipment (except electrical equipment and trucks) ____________
Electrical equipment ____________
Trucks ____________
Total Weight of Car Equipped, Empty (Tons 2,000 lbs.) ____________

Electric Equipment (cars):
Type, make and age of motors ____________
Number of motors per car and H. P. of each motor ____________
Type of control, single or double end, make and description ____________
Length of trolley pole ____________

Trucks:
Type, make and wheel base of trucks ____________
Single or double truck ____________
Diameter and tread of wheels ____________
Depth and thickness of flanges ____________
Gauge of track ____________
Type of Couplers, and height from head of rail ____________

FIRST TWO PAGES OF QUESTIONNAIRE WITH LETTER OF TRANSMISSAL SENT OUT BY AMERICAN ELECTRIC RAILWAY ASSOCIATION

The chief of the party may also make a direct request for the whole-hearted patriotic co-operation of the transportation company, with arrangements to secure the undivided time and service, as and when needed, of the officers representing the traffic and transportation, track and roadway and statistical departments of the transportation company, in order to secure the required data and collateral information in the shortest time possible.

After the study and correlation by the survey party of facts and information resulting from a conference with the transportation company in connection with data gathered from shipyard sources, a set of preliminary recommedations is drawn up by the chief of the party on the vital elements of the situation.

The preliminary recommendations are utilized by the chief of the party as a background for a joint conference between the representative of the transportation companies and of the passenger transportation department, at which conference the district officer or district supervisor and local counsel of the Fleet Corporation are present, if practicable. A brief outline of the tentative plan so developed with recommendations is then telegraphed to the manager of transportation by the chief of the party, with his individual views and comments thereon and his recommendations.

In cases free from complications, and involving no large financial commitment—an immediate decision may be telegraphed by the manager of transportation. In no case are final commitments made, involving expenditure of money by the Emergency Fleet Corporation, however, except on the authority of the manager of transportation.

If possible, the local counsel of the Emergency Fleet Corporation draws up a tentative form of contract covering the provision of additional transportation facilities for shipyard service, developed as necessary by the joint conference mentioned.

The formal report governing various phases of the local situation investigated and giving specific recommendations of the engineer in charge is prepared at headquarters and is transmitted to the manager of transportation for his approval, so that the office records may be kept in suitable form.

Where there is considerable opposition to the proposed plan or to required changes or additions on the part of the transportation company, immediate conference is arranged between the manager of passenger transportation and the executive officials of the transportation company to develop an agreement covering construction, equipment, operation and any arrangements as to financial aid to be afforded by the Fleet Corporation.

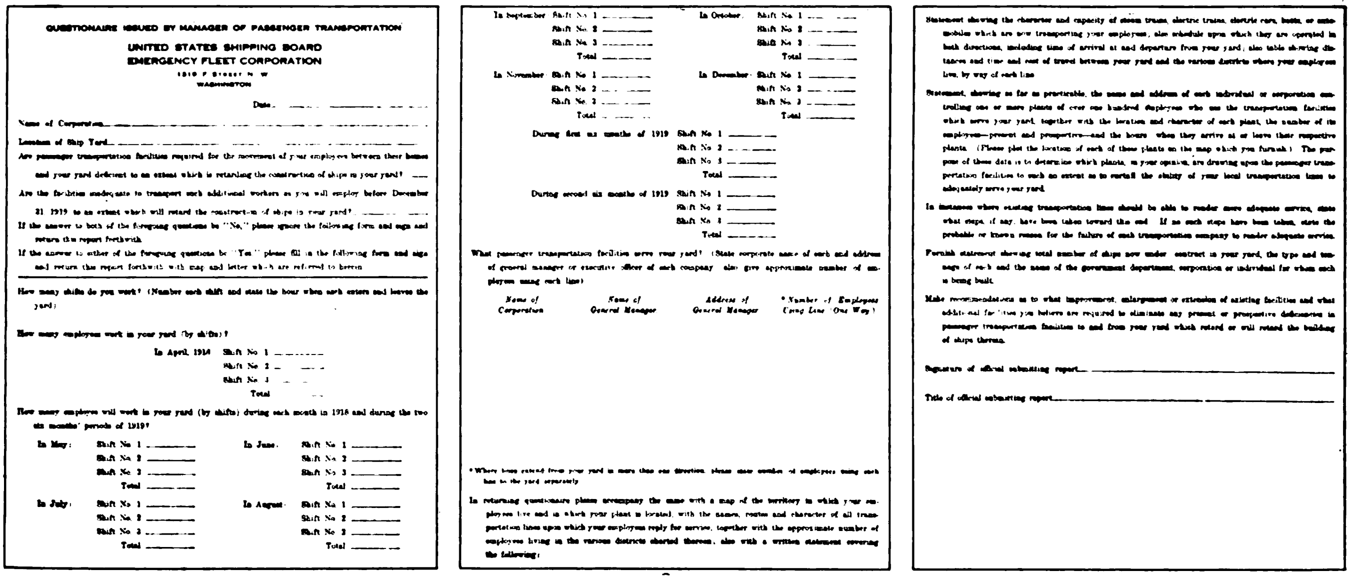
A formal contract is then prepared by general counsel, embodying the terms of the agreement with the transportation companies.

The foregoing general outline may be supplemented by the following details:

THE DETAILED INFORMATION DESIRED

The detailed information compiled by the transportation engineer in charge of the survey naturally groups itself into two divisions, namely, that relating to the needs and that relating to the means available for supplying those needs. The work of collecting the data then proceeds along the following lines after the call on the shipyard officials:

1. General checking over of questionnaire and information sent in by shipyard to develop explanation of points brought out therein and additional points generally resulting from discussion.



QUESTIONAIRE ISSUED BY MANAGER OF PASSENGER TRANSPORTATION
UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION
1319 F Street N W
WASHINGTON

Date ____

Name of Corporation ____

Location of Ship Yard ____

Are passenger transportation facilities required for the movement of your employees between their homes and your yard deficient to an extent which is retarding the construction of ships in your yard? ____

Are the facilities inadequate to transport such additional workers as you will employ before December 31, 1919 to an extent which will retard the construction of ships in your yard? ____

If the answer to both of the foregoing questions be "No," please ignore the following form and sign and return this report forthwith.

If the answer to either of the foregoing questions be "Yes," please fill in the following form and sign and return this report forthwith with map and letter which are referred to herein.

How many shifts do you work? (Number each shift and state the hour when each enters and leaves the yard.)

How many employees work in your yard (by shifts)?

In April, 1918 Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

How many employees will work in your yard (by shifts) during each month in 1918 and during the two six months' periods of 1919?

In May: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In June: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In July: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In August: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In September: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In October: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In November: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

In December: Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

During first six months of 1919 Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

During second six months of 1919 Shift No. 1 ____
Shift No. 2 ____
Shift No. 3 ____
Total ____

What passenger transportation facilities serve your yard? (State corporate name of each and address of general manager or executive officer of each company; also give approximate number of employees using each line.)

Name of Corporation	*Name of General Manager*	*Address of General Manager*	**Number of Employees Using Line (One Way)*

* Where lines extend from your yard in more than one direction, please state number of employees using each line to the yard separately.

In returning questionnaire please accompany the same with a map of the territory in which your employees live and in which your plant is located, with the names, routes and character of all transportation lines upon which your employees rely for service, together with the approximate number of employees living in the various districts charted thereon; also with a written statement covering the following:

Statement showing the character and capacity of steam trains, electric trains, electric cars, boats, or automobiles which are now transporting your employees; also schedule upon which they are operated in both directions, including time of arrival at and departure from your yard; also table showing distances and time and cost of travel between your yard and the various districts where your employees live, by way of each line.

Statement, showing as far as practicable, the name and address of each individual or corporation controlling one or more plants of over one hundred employees who use the transportation facilities which serve your yard, together with the location and character of each plant, the number of its employees—present and prospective—and the hours when they arrive at or leave their respective plants. (Please plot the location of each of these plants on the map which you furnish.) The purpose of these data is to determine which plants, in your opinion, are drawing upon the passenger transportation facilities to such an extent as to curtail the ability of your local transportation lines to adequately serve your yard.

In instances where existing transportation lines should be able to render more adequate service, state what steps, if any, have been taken toward this end. If no such steps have been taken, state the probable or known reason for the failure of such transportation company to render adequate service.

Furnish statement showing total number of ships now under contract in your yard, the type and tonnage of each and the name of the government department, corporation or individual for whom each is being built.

Make recommendations as to what improvement, enlargement or extension of existing facilities and what additional facilities you believe are required to eliminate any present or prospective deficiencies in passenger transportation facilities to and from your yard which retard or will retard the building of ships therein.

Signature of official submitting report ____

Title of official submitting report ____

QUESTIONNAIRE SENT BY EMERGENCY FLEET CORPORATION TO SHIPYARDS ASKING FOR INFORMATION AS REGARDS TRANSPORTATION FACILITIES

2. Secure map, or prepare sketch map of shipyard property, upon which may be indicated information of the following character:

(a) Location of entrance and exit gates to yard.

(b) Important streets in the vicinity of yard, with character of paving and transportation lines thereon.

(c) Availability of nearby sites for sidings or terminal loops, if such are needed, ownership thereof and probable cost; noting also the character of existing structures located thereon, or if any additional structures are proposed.

(d) Character of adjacent territory, the degree of development for residential purposes, areas available for new dwellings, and kind of industries in the neighborhood. General description of dwellings, within, say about 1 mile, and possibilities for utilizing same to a greater extent, in order to relieve the transportation system. Opportunities for new dwelling construction within walking distance of the plant, and capacity of such new accommodations, as well as capacity of existing accommodations. Note whether high or low ground, and other features affecting living conditions, whether good or bad.

3. Take or obtain photographs of all conditions directly bearing upon deficiencies in passenger transportation facilities and illustrating recommended transportation facilities, as, for instance, photographs of proposed sites for terminal loops, different types of cars in shipyard service, typical track construction and condition, and photograph of any seriously overloaded cars during the rush-hour period.

4. Rough check of traffic flow to and from yard and to and from district in which it is located, as to origin, destination and routes. Where shipyard has not supplied data as to destination of employees, secure approximation either from company or passenger count where necessary only.

5. Detailed and specific consideration and study of features of transportation facilities developed by the questionnaire, as needing correction.

6. Development of a general line of recommendations enumerating in some detail additional facilities to be provided, as:

Cars: New equipment.
Rehabilitation of existing equipment.
Possibility of borrowing from nearby lines.
Track: Laying of second track.
Sidings and terminal loops.
Construction of new lines.
Rehabilitation of existing lines.
Possible Re-routing: and reduction in number of cars operating on routes not serving shipyard and transference to shipyard routes.
Tripper Service: or Special Train Service—
Number, type and capacity of cars.
Headway, schedules, etc.

DATA OF TRANSPORTATION FACILITIES

1. Complete map of street railway system or systems, showing:

(a) Routes serving shipyard without change of cars and routes serving shipyard with one transfer differentiated from rest of system.

(b) Industrial and commercial districts served, with notation as to character and extent thereof with respect to transportation facilities required.

(c) Fare and time zones.

(d) Indication of heavy grades, if any, and maximum grade.

(e) Grade crossings with steam railroads and drawbridges, with notations as to delays occasioned thereby, importance of draws.

(f) Ownership and probable cost of land which will, or may be, required for extensions to existing lines, terminal loops, sidings, etc. Have any improvements been projected thereon?

2. Inventory by types and capacities of total cars operated, with proportion of such cars serving the various districts through which the company operates.

3. Number of cars operated on routes serving shipyard:

(a) During morning and evening rush hours and off-peak periods, by types and capacities.

(b) Headway during morning and evening rush hours and off-peak periods.

(c) Number of cars, by types and capacities, used in tripper service for shipyards and adjacent plants.

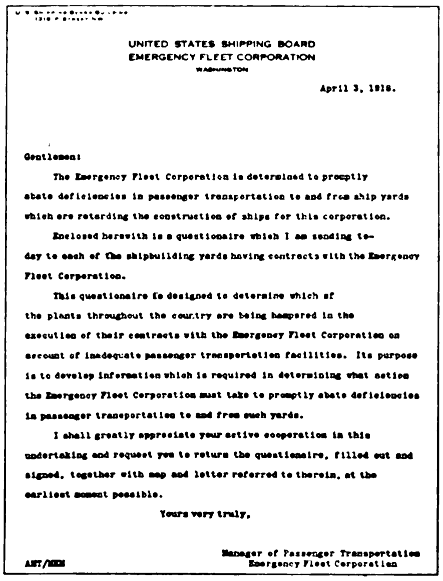
(d) Approximate number of stops per mile.

(e) Essential railway operating statistics by routes, insofar as they are related to shipyard situations.

(f) Platform labor situation—union or non-union; difficulty of securing and retaining platform labor, etc. Extra compensation for rush-hour service. Where platform labor situation warrants, careful consideration should be given to possibility of utilizing shipyard employees to operate trippers in rush-hour service. Attitude of motormen and conductors toward such utilization; regulation of transportation company respecting same as to necessary qualifications of men. In such cases also responsibility of shipyard employee to railway company during the performance of his platform duties should be clearly specified as should also the responsibility of the company for such employee's action during such time as he is working for the transportation company.

4. Lines serving shipyard and adjacent districts, with turn-outs—Full data should be secured as to distance between and length of turn-outs available for car storage, headway, and schedules in both directions, with notations as to extent of delays in turn-outs morning and evening.

5. Report should be obtained from company's chief engineer, or similar technical official, concerning power house, substation and line capacities, and present maximum demands on power house, substations and various lines. These data need be approximate only, their purpose being to furnish some indication of the extent of spare capacity, if any, and degree of overloading, if such conditions exist. Notations should be made as to source of power—hydro-electric or steam—generated by company or purchased. Engineer's report should also give the number of cars in operation during maximum station peak, average kw.-hours consumption per car mile or per ton mile, during winter and summer periods, and information along similar lines. Typical station load curves for different seasons of the year should also be obtained.


UNITED STATES SHIPPING BOARD
EMERGENCY FLEET CORPORATION
WASHINGTON

April 3, 1918.

Gentlemen:

The Emergency Fleet Corporation is determined to promptly abate deficiencies in passenger transportation to and from ship yards which are retarding the construction of ships for this corporation.

Enclosed herewith is a questionaire which I am sending today to each of the shipbuilding yards having contracts with the Emergency Fleet Corporation.

This questionaire is designed to determine which of the plants throughout the country are being hampered in the execution of their contracts with the Emergency Fleet Corporation on account of inadequate passenger transportation facilities. Its purpose is to develop information which is required in determining what action the Emergency Fleet Corporation must take to promptly abate deficiencies in passenger transportation to and from such yards.

I shall greatly appreciate your active cooperation in this undertaking and request you to return the questionaire, filled out and signed, together with map and letter referred to therein, at the earliest moment possible.

Yours very truly,

Manager of Passenger Transportation
Emergency Fleet Corporation

LETTER OF TRANSMISSAL SENT WITH QUESTIONNAIRE BY EMERGENCY FLEET CORPORATION TO SHIPYARDS

6. Availability of additional sources of power supply, and steps necessary to utilize such sources, if needed.

7. Record of car break-downs on a line, or lines, serving districts, if of frequent occurrence, should be obtained; also general report from the master mechanic of the company covering the physical condition of cars, extent and cost of repairs needed to place the cars in good condition, with notations as to car repair ship and carhouse facilities.

8. New or second-hand cars, car equipment, power plant equipment on order, if any; giving capacity and general description, probable delivery date and name and address of manufacturer or vendor.

9. Where conditions would warrant such a step, careful consideration should be given to the possibility of staggering the transportation load as between plants, and within the shipyard plant itself, and by short stopping and starting cars. (Consider rulings on wage and labor conditions by the Shipbuilding Labor Adjustment Board.) In connection with this a note should be made of non-essential industries in the shipyard district which draw upon the transportation facilities to any material extent.

10. Report from engineer of maintenance-of-way, or corresponding official, covering physical condition of track and roadway, bridges and trestles, etc., with extent and cost of repairs needed to place track in good operating condition.

11. General statement from company covering the following:

(a) Its independent recommendations as to what steps should be taken to provide adequate and satisfactory service to the shipyards, and the reason, or reasons, why each step has not been taken, or the obstacles which have, or are, retarding improvement in service, have not been removed.

(b) Estimate of cost in some detail for effecting the desired improvement.

(c) Outline of company's plans for handling additional traffic resulting from shipyard growth, with an estimate of new equipment which would be needed and the probable cost thereof.

(d) Financial position of company, specifying difficulties in the matter of new financing, maturing obligations, etc., and giving its views as to character and extent of financial assistance which was to be rendered by Emergency Fleet Corporation.

(e) Consideration of water transportation facilities in detail.

12. Investigation of feasibility of auto-bus routes. Make notations covering the following points:

(a) *Character of Road:*
- Foundation and surface, and present condition.
- Cross-section of road—crowning, etc.
- Limiting height of overhead obstructions. (This fixes generally the character and type of bus.)
- Width of roadway (maximum)
- By whom maintained (State, town or county; name, title and address of responsible official in charge thereof.)
- Extent of necessary repairs for bus line traffic.
- Determination of most feasible city streets for routes.

(b) *Character of Territory:*
- General.
- Railroad or electric railway crossings.
- Cities, boroughs and towns passed through; name, title and address of head official of each.
- Character and extent of vehicular traffic which now uses road.
- Sites for garages and shops.

(c) *Character of Traffic Which Would Use Busses:*
- General.
- Extent of—total, and shipyard traffic.
- Distribution of traffic as to time.
- Probable stops per mile.
- Possibility of routing busses so as to pick up ex-rush hour traffic.

13. Expediting provision of required additional facilities:

(a) Plans and specifications to be prepared by company immediately upon consummation of plans.

(b) Execution of necessary local ordinances and permits, compliance with regulations of Public Service Commissions, etc. Quick action required as a war measure.

(c) Complete schedules of requirements of material and equipment, as to specifications and quantities to be submitted to Manager of Transportation by company.

(d) Take up with Priority Board and complete arrangements for source of supply.

(e) Close contracts with manufacturers.

(f) Follow up shop construction and deliveries.

(g) Coincident with (a) to (f) above, follow up and see that agreed upon operating improvements are being worked out and put into effect.

(h) Field observations from time to time to determine the extent to which additional facilities and changes in operation have abated deficiencies in transportation.

ENCOURAGING PROGRESS ALREADY MADE

In accordance with the procedure outlined engineers of the Passenger Transportation Service Section have already surveyed the needs at the larger Eastern yards such as Chester, Newark Bay and Baltimore. Up to April 26, all the shipyards at Beaumont, Savannah, Houston, Brunswick, Jacksonville, Everett and Bellingham had reported satisfactory transportation conditions as had also at least part of the builders at Mobile, Wass Point, Madisonville, Orange and Pascagoula.

In general the conditions on the Pacific Coast are satisfactory except that more electric service could be used at Seattle.

The Newport News & Hampton Electric Railway is building a 3 to 4 mile extension north of Newport News to a new housing development. The Shipping Board has advanced the money for the line and for the purchase of ten cars.

At Oakland, the Key Route is to be extended ½ mile to the Moore shipbuilding plant. At this location also service has been improved by closing the drawbridge between Alameda and Oakland.

As noted in the case of Camden, the section is prepared to use either steam or electric transportation. While it has no commandeering powers over inter-state steam lines, it works in close harmony with the Director-General of Railroads. Thus in a recent case, the latter extended a morning and evening service of twenty-six passenger coaches as soon as the needs were put before him.

Ships may be used, as at New London, where a ferry has been installed for service to the Bath Iron Works. To date, however, it has not been found necessary to use motor trucks or buses.

CO-OPERATION WITH PUBLIC SERVICE

In the Southern division of the Public Service Railway arrangements have been made with the railway for thirty-three new cars in addition to those assigned from regular service, for the purpose of serving the Gloucester and Camden shipyards. Suitable power plant, transmission and substation equipment will be added by the electric company to provide power for these cars. Additional shop and car storage facilities will also be provided. The Fleet Corporation will finance these improvements at a cost of $1,200,000, the Public Service Corporation paying 5 per cent interest annually on the total cost. The contract runs until after the war. At the time of the discontinuance of service the company will buy certain portions of the equipment as agreed upon at an appraisal value to be fixed by a board of arbitrators. Of the total expenditure about one-half is for increasing the power facilities. The cost would have been more but for the provision for operation in such a way as to flatten the load peaks.

In the vicinity of Newark the Fleet Corporation has an arrangement with the railway for 2-mile double-track extension across the meadows crossing the Jersey Central tracks, at the Oak Island freight yard, on a long viaduct to be built by the steam railroad and the city of Newark. The Fleet Corporation will pay the bills for this work and also will cross-connect the extension with the neighboring city lines by means of a connecting track on Gotthart Street and Avenue R. Involved in this improvement also is the purchase of eighteen cars, and the service will be sufficient to care for one-half the employees of the Submarine Boat Corporation. The cost will be about $800,000.

In the Southern Division Mr. Taylor has arranged for an equitable division of traffic among the steam and electric lines, for the staggering of the opening and closing hours in the shipyards and for assistance from the shipbuilders for operating cars during rush hours. The shipyards will furnish one-half the number of men required to run trippers, the railway to pay standard platform wages. Similar arrangements will probably be made also elsewhere on the Public Service property.

It is expected that within ninety days the transportation facilities will have been increased to meet the anticipated demands upon them and that it will be easily possible to expand them as required.

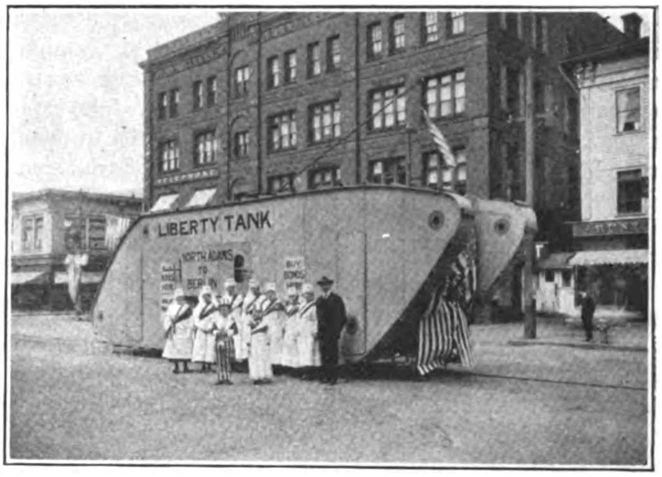
In all of these improvements the railway will have the hearty co-operation of the department in introducing the most efficient methods of operation. For instance, prepayment areas have already been introduced at the Camden and Gloucester shipyards by means of fenced loops. The plans contemplate the provision of such prepayment stations at other congested loading points.

SHIPPING BOARD'S TRANSPORTATION SERVICE CAPABLE OF HANDLING ALL ELECTRIC RAILWAY MATTERS

The scope of the Passenger Transportation Service Section is really much broader than to supply service to the shipyards themselves. Its job is to speed up shipbuilding just as much in the production of what goes in the hull as in the building of the hull itself. Thus, it is almost impossible to foresee the inland ramifications that may develop. For example there is the Westinghouse plant at Essington near Philadelphia where 5000 men will be making steam turbines for the Emergency Fleet Corporation's ships. Arrangements must be made to transport these men expeditiously although they are not actually in shipyard service.

With the constantly growing degree of co-ordination between the different Government departments it is to be hoped that the efforts in local transportation and housing will be concentrated to avoid duplication of effort and mutual interference. As the department organized by the Shipping Board is the only one composed specifically of electric railway specialists, it is the logical body for this important purpose. The knowledge and vigor it has already displayed gives good promise that the electric railway will play a deservedly big part in the winning of the war.

Making an Electric Railway "Tank"



THE accompanying illustration shows how the Berkshire Street Railway, Pittsfield, Mass., has camouflaged a single-truck car as a "tank." This car has been doing great work in the Liberty Loan campaign at North Adams and other towns in Northern Berkshire. The tank was designed by W. W. Richmond, treasurer Hoosac Savings Bank, North Adams.

The North Staffordshire (England) Railway has constructed for local use a 17-ton storage-battery locomotive. It is driven by two series motors rated at 41 hp. at 250 volts. The battery weighs about 6½ tons and has a one-hour discharge rate of 150 amp. The locomotive is capable of hauling a 90-ton load at 10 m.p.h. on the level, or 72 tons at 11 m.p.h.

New Flash Suppressor Applied on the St. Paul

Addition of Collector Rings to Direct-Current Generator Permits Making of Alternating-Current Short-Circuit, Limiting Internal Disturbances to Armature Windings

By N. W. STORER and F. T. HAGUE
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

A DEVICE for preventing flashing, known as the "flash suppressor," which differs radically in its theory of operation from all circuit opening or reactance inserting devices, has recently been successfully developed. It functions to protect the machine from injuring itself when its current output exceeds a predetermined value. The device is being installed by the Westinghouse Electric & Manufacturing Company in the 3000-volt substations of the Chicago, Milwaukee & St. Paul Railway.

The flash suppressor consists of a set of small contactors, arranged to short-circuit the armature windings of the direct-current generator through three collector rings, connected in three-phase relation. This device is actuated and tripped in a manner similar to that of the circuit breaker, but with this difference—the contacts, which carry current only momentarily when the device operates, are very small and light, and have normally but a short distance to travel. It differs also, in that this device closes a circuit while a circuit breaker opens one and must, therefore, quench the arc before it can completely rupture the circuit.

To secure operation equally as rapid as that of a high-speed circuit breaker, only a relatively simple mechanism is required, and it is not difficult to secure a much higher speed without complication. The contactor can easily be made to close in from 0.006 to 0.008 second, which is amply fast to prevent a flash from spreading on any but the higher frequency machines.

THE FLASH SUPPRESSOR APPLIES A RADICAL REMEDY

The flash suppressor performs a double function—first, closing a short-circuit on the collector rings, which simultaneously reduces the voltage between commutator bars practically to zero. If the voltage per coil were the same throughout the winding, this short-circuit would reduce the voltage between all bars to zero; but owing to the locations of the various coils with respect to the poles, their voltages differ and there will be small voltages remaining between some commutator bars; not enough, however, to support an arc. Consequently, if flashing has not started when the contactor closes, it will not start; and, if it has started, it is instantly suppressed.

The second function of the flash suppressor consists in cutting down the field flux. A short-circuit through the collector rings causes a large wattless current to flow through the armature windings whose magnetizing force opposes that of the field and cuts down the voltage at the maximum safe rate, without opening either field or armature circuit.

It will thus be seen that the stored energy, not only of the line but of the machine itself, is harmlessly short-circuited through the machine and dissipated in the armature and field windings. The direct-current circuit breaker at the switchboard will be opened automatically, but only after the flash suppressor has done its work and then, of course, the voltage is reduced practically to zero. The use of the flash suppressor, therefore, not only eliminates the danger to the machine from flashing, but also obviates the necessity for opening the extremely heavy short-circuit currents with the circuit breaker, and the attendant surges in the line. In other words, the fire-works are eliminated from the substation.

WHAT THE OSCILLOGRAMS SHOWED

During the development of this method of suppressing flashing, a large number of tests were made on machines of different types and characteristics. The following tests are representative and apply to the type of generator generally used in high voltage direct-current railway service. Oscillograph records have been taken which portray the characteristics of direct-current generators on extreme overloads and the changes in these characteristics which are brought about by the application of the flash suppressor. The direct-current generator used in these tests was a 1000-kw., 650-volt, 750-r.p.m. machine. It embodies no unusual design features not standard with railway generators that would tend to give it unusual momentary overload capacity.

On the limiting overload which the machine would stand without flashing the armature current rose to a constant value of 13,000 amp., or about eight times full load current. The total circuit resistance measured 0.0287 ohm, and the actual current obtained was 57 per cent of the theoretical current that would be obtained by dividing the terminal voltage by the circuit resistaance. The initial rate of current increase was about 2500 amp. per 0.001 second, and the current rose to 95 per cent of its final value in the first 0.010 second.

The shunt field current underwent a sudden increase in value, which is characteristic, even of compensated generators, when a suddenly applied overload or a partial flash occurs. The increase of field current to 2.5 times normal value was due to flux distortions, the demagnetizing action of local currents in the commutated armature coils, and possibly to some of the commutator bars being short-circuited by the partial flashover.

In the next test the flash suppressor was adjusted for short-circuiting the alternating-current side 0.0006 second after the direct-current side. Both short-circuits were made at 650 volts without resistance or reactance of any kind in the circuit. The premises outlined in the foregoing theory were completely borne out, as the flash at the commutator at the time of direct-current short-circuit was confined to a small explosive puff of extremely short duration which did not damage either brushholders or commutator surface. Many duplicate oscillograph records of combined short-circuits were made which established that the suppression of flashing is entirely independent of the point of the alternating voltage wave at which the short-circuit occurs, and that all armature positions give essentially the same effect. By means of the oscillograph record the delay of the alternating-short-circuit behind the direct-current short-circut can be very accurately measured.

Since the use of the flash suppressor involves short-circuiting the alternating-current side of a generator a few thousandths of a second after a direct-current overload is applied, it is of interest to know the magnitude of the alternating current flowing when the collector rings are short-circuited upon themselves. The current flowing when the alternating-current side of the machine is short-circuited is very materially less than the current flowing when the direct-current side is short-circuited, since the winding resistance is the principal limiting factor at time of direct-current short-circuit, while the winding reactance imposes greater limitation on the alternating-current short-circuit. Moreover, the polyphase reactance of the armature winding is nearly twice as great as the reactance of an alternator of equal rating, because of the large number of turns required for a given voltage in order to avoid an excessive average voltage between commutator bars.

SHORT-CIRCUITING THE COLLECTOR RINGS "KILLS" THE DIRECT CURRENT

Oscillograms of the alternating currents indicate that the resultant current rises uniformly in magnitude until it reaches its maximum value in approximately 0.0014 second (one-half cycle) after the instant of application of the alternating-current short-circuit. It is an inherent condition of any polyphase short-circuit that the resultant armature currents attain their maximum magnitude after one alternation from the instant of short-circuit. The armature current and field have very unusual characteristics under combined alternating and direct-current short-circuit conditions. The oscillograms referred to earlier show that the direct-current begins to increase at the uniform rate of about 2500 amp. per 0.001 second, and in 0.006 second reaches a value of 14,000 amp. The application of the collector ring short-circuit immediately arrests any further increase of direct current, and in the next 0.014 second (one-half cycle) the direct current is steadily decreased until it drops to practically zero. The large decrease of the direct-current in the 0.014 second following the application of the alternating short-circuit, i. e., the time required for the alternating short-circuit to attain its maximum value, is due to the well-known fact that an armature winding can deliver only a definite current on short-circuit. This current is limited by the electrical constants of the armature winding and is not affected by the number of points at which a short-circuit is applied to the winding. This simply means that the transient short-circuit current output from the collector side is subtracted directly from the direct-current output and the decrease of direct current corresponds exactly to the building up of the alternating short-circuit current. On each successive machine alternation, the direct current pulsates to a maximum and minimum value of steadily decreasing magnitude. The direct current finally settles to a constant value of about 7000 amp. (4.5 times full load) in about 0.075 second.

In case of a direct-current short-circuit through a relatively low resistance the direct current rose only to 57 per cent of the theoretical value obtained by dividing the terminal voltage by the total circuit resistance. In another test where the direct current reached an almost constant value before the flash suppressor was actuated, the current only reached 30 per cent of its theoretical short-circuit value. Extensive tests have shown that high-speed compensated generators will deliver twelve to fifteen times full-load current on direct short-circuit (including the current in the flash-over). This short-circuit is about 25 to 30 per cent of the theoretical short-circuit current based upon the circuit resistance, including brush contact.

The characteristic curves of the various currents are not materially changed, as the time of the alternating short-circuit is further delayed after the direct-current short-circuit is applied. One oscillogram taken in these tests shows the alternating-current short-circuit delayed 0.011 second after the direct-current and this condition was mainly evidenced in operation by a slight increase in the explosive puff of the arc blowing itself out, before it had time to do any damage. The direct current in this case rose to about 19,000 amp., or twelve times full load, while the field current did not rise as high as when the delay of the alternating-current short-circuit was less.

These tests were made on the machine as a separately excited shunt generator, as this is the most favorable condition for operation of railway generators which are required to function on regenerated load. In order to establish the operating characteristics of a compound-wound machine, the series field was connected in circuit. In one test on a compound machine the alternating-current short-circuit was delayed 0.010 second. The maximum value of the direct current was not changed by the addition of the series field, nor was its characteristic oscillation reduced. The shunt field current was affected very considerably, due to the series field magnetization discharging through the shunt field circuit in the period before the alternating-current short-circuit is applied. The operation of the machine was not materially different as regards the volume of flash from a short-circuit, under the same conditions, as a shunt generator.

The characteristics of the direct-current wave show clearly wherein the merits of the flash suppressor lie. The application of the alternating-current short-circuit not only arrests the increase of current feeding into the direct-current short-circuit, but it actually suppresses this current to practically zero for an instant. This characteristic, in conjunction with the reduction of the voltage between commutator bars, effectually snuffs out any are that has been started by the direct current before the alternating-current short-circuit is applied. The direct current rises to a sufficient value to flash, but it is removed by the alternating-current short-circuit long before a bar can pass from one brush arm to the next, and the flash which actually gets started is summarily suppressed.

The value to which the shunt field current rises is an accurate measure of the rate at which the main field flux is reduced, and also of the voltage induced in the shunt field coils during the period of short-circuit. An inspection of the field current curve showed that the maximum current is only seven times the normal full load, so that the voltage induced in the shunt field coils is six times the excitation voltage. High-voltage railway generators are invariably separately excited at some low voltage, such as 125 volts, (of which one-half is normally consumed in field rheostat) so that an induced field voltage of six times normal is a negligible increase on field coils which are normally designed to withstand a much higher voltage.

The tests which have been described are only typical of a large number that were made during the development of the flash suppressor. All of these tests, on machines of widely different characteristics, point to the fact that in the flash suppressor has been found a real and positive preventive of flashing of direct current railway generators.

It has been designed directly to attack the cause of flashing and suppress it rather than to minimize the liability of flashing or to mitigate its effect more or less completely.

Illinois Governor Uses I. T. S. Private Car

The private car of H. E. Chubbuck, vice-president executive of the Illinois Traction System, was used to convey Governor Frank O. Lowden and a party of state officials from Springfield, Ill., to Peoria, Ill., to attend the funeral of William H. Stead, formerly attorney-general of Illinois and a member of Governor Lowden's cabinet at the time of his death. The run was made in exactly two hours.

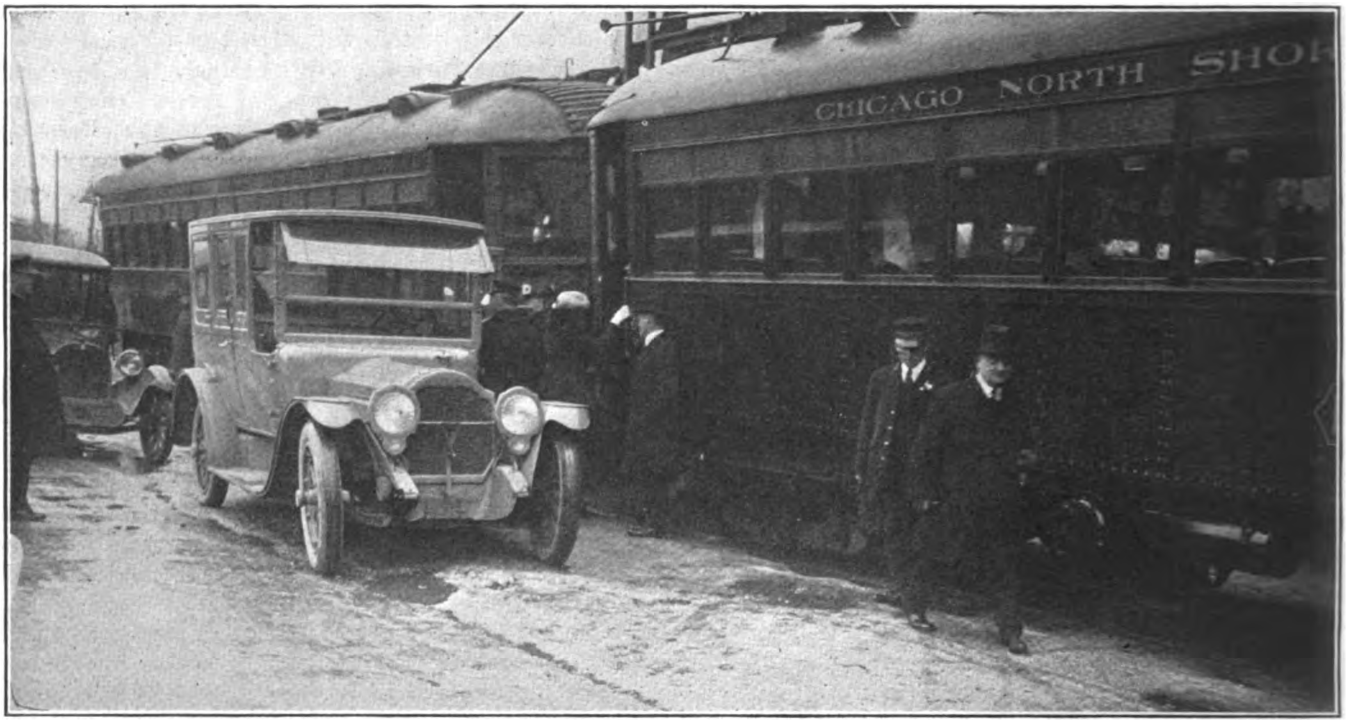
The private car had the right-of-way, the trip being planned to meet cars bound in the opposite direction with a minimum of delay.

McAdoo Travels via Electric

North Shore Line Carries Secretary of Treasury and His Party on Successful Excursion to Great Lakes Naval Training Station

ONE of the important features of the Liberty Loan visit of William J. McAdoo, Secretary of the Treasury, to Chicago on April 28 and 29 was a trip to the Naval Training Station at Great Lakes, Ill., *via* the Chicago, North Shore & Milwaukee Railroad. This is a high-speed electric line, under the management of Britton I. Budd, president Chicago Elevated Railroad.

The party consisted of Secretary and Mrs. McAdoo, F. B. McDougal, Director of the Federal Reserve Bank; General Barry, commanding Central District, U. S. A.; Colonel McChesney, U. S. A.; H. C. Merrick, president National Security League; Charles W. Folds, H. L. Stuart and E. K. Boisot of the Liberty Loan Committee; Captain W. A. Moffett, U. S. N., Commandant Great Lakes Station; Commander James Wilson, U. S. N., and Lieutenant-Commander Isbesten, U. S. N.



MR. AND MRS. McADOO BOARDING THE McADOO SPECIAL AT GREAT LAKES

The trip was personally supervised by Mr. Budd. The train included one combination dining and parlor car and one coach. The train left the Congress Street Station on the elevated lines at 8.30 a. m. and went over the elevated tracks to Evanston, thence over the North Shore Line to Great Lakes. A delicious breakfast was served to twenty-eight persons en route.

At Great Lakes the visitors were driven in automobiles through the big training station, and Secretary McAdoo addressed and reviewed five battalions of Jackies. The special train left at 11.30 and made the return trip of 35 miles in one hour to Chicago. Without the electric line the trip might have been impossible, owing to the limited amount of time at the Secretary's disposal. The trip was similar to that made by Secretary of the Navy Daniels over the same line on April 10, as noted in the ELECTRIC RAILWAY JOURNAL of April 20.

Insulated Negative Return Feeder System Satisfactory at Lynchburg, Va.

American Railways Designs Simple System for Local Situation and Brings Return Drop Within Easy Control—The Author Explains How the Data for Selecting Feeder Sizes Were Obtained

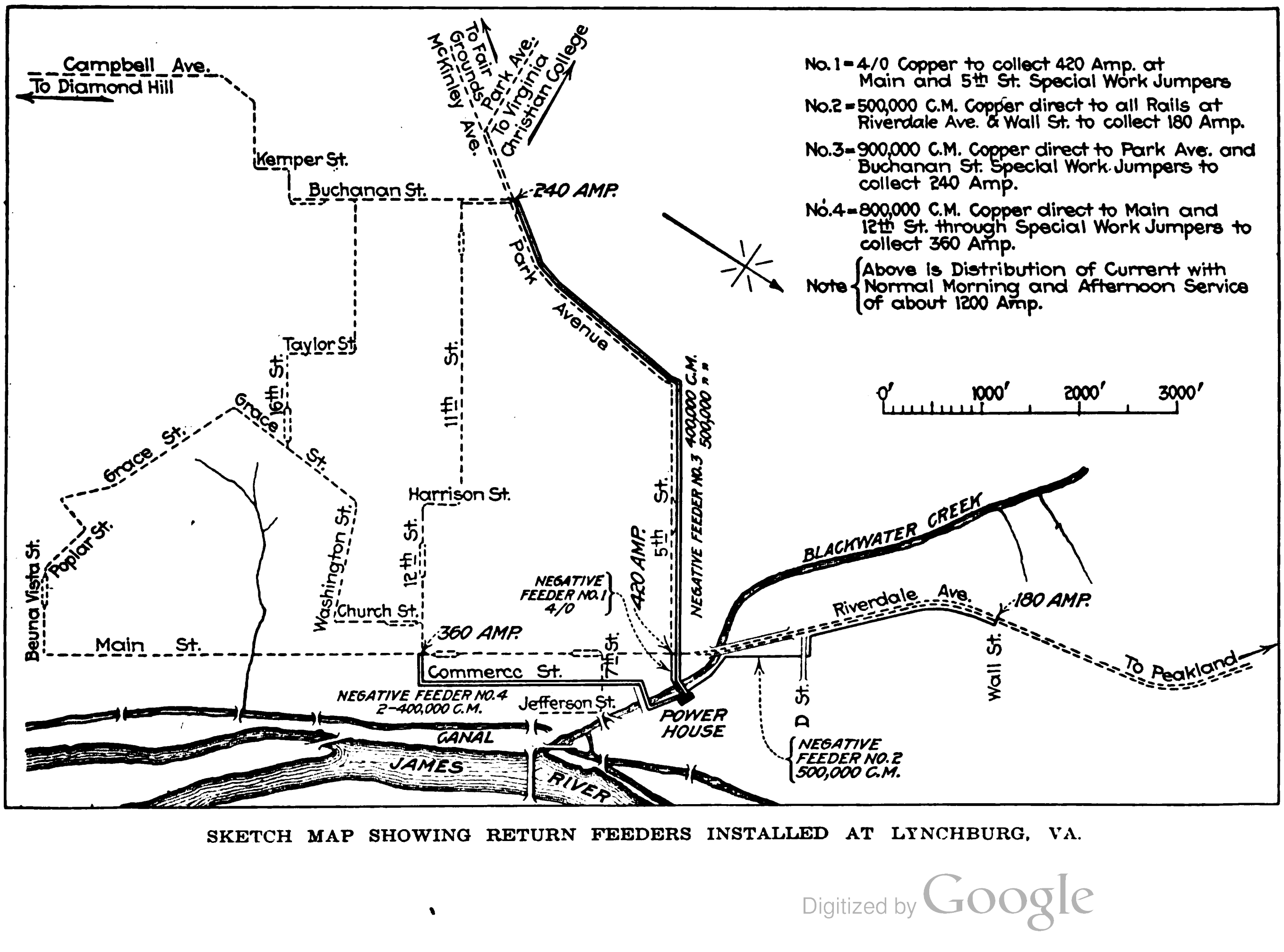
By A. P. WAY
Electrical Engineer, American Railways Company,
Philadelphia, Pa.

FOR two years to date there has been in continuous operation at Lynchburg, Va., an insulated negative feeder system which has satisfactorily met all expectations. It was installed to prevent electrolysis from stray currents, and the management decided to apply this remedy to the cause rather than the effect of the difficulty; in other words, to prevent current from leaving the tracks rather than to endeavor to prevent damage to underground structures after current had been forced or induced to flow in them. The insulated negative feeder system which reduces the over-all potential drops in tracks appeared to be the best method for Lynchburg, but it must be understood that a successful remedy for one railway system is by no means a solution for all.

Previously there had been no negative feeders supplementing the rails. The entire return current was collected from the tracks through a total of 1,500,000 circ. mil of cables at the corner of Fifth and Main Streets, the point nearest to the power house, about 800 ft. distant. Electrolysis effects were actually concentrated at this point, except at a point directly in front of the power house there was some trouble where the cables were connected to old rails in the earth. This latter condition was remedied by insulating the feeders from the earth at the power house end.

The entire track bonding was in particularly good condition except at some points where jumpers around special work were not good, but these were soon repaired. In view of the fact that the over-all voltage drop over tracks between given points provides the potential which forces current through parallel circuits in earth, etc., it was decided to reduce these over-all voltages by removing some of the current from the rails by overhead feeders at a number of points in different directions beyond Fifth and Main Streets.

To determine the distribution of the load two maps were made showing the location of all cars at a particular moment during normal operation early in the afternoon and at 5.30 p. m. during the peak-load period.


Campbell Ave.
To Diamond Hill
Kemper St.
Buchanan St.
To Fair Grounds
McKinley Ave.
Park Ave.
To Virginia Christian College
240 AMP.
Park Avenue
Taylor St.
16th St.
11th St.
Grace St.
Grace St.
Poplar St.
Beuna Vista St.
Washington St.
Harrison St.
12th St.
Church St.
360 AMP.
Main St.
Commerce St.
7th St.
5th St.
420 AMP.
NEGATIVE FEEDER NO. 1 4/0
NEGATIVE FEEDER NO. 3 400,000 C.M. 500,000 " "
NEGATIVE FEEDER NO. 4 2-400,000 C.M.
Jefferson St.
CANAL
JAMES RIVER
POWER HOUSE
BLACKWATER CREEK
Riverdale Ave.
180 AMP.
Wall St.
D St.
To Peakland
NEGATIVE FEEDER NO. 2 500,000 C.M.
No. 1 = 4/0 Copper to collect 420 Amp. at Main and 5th St. Special Work Jumpers
No. 2 = 500,000 C.M. Copper direct to all Rails at Riverdale Ave. & Wall St. to collect 180 Amp.
No. 3 = 900,000 C.M. Copper direct to Park Ave. and Buchanan St. Special Work Jumpers to collect 240 Amp.
No. 4 = 800,000 C.M. Copper direct to Main and 12th St. through Special Work Jumpers to collect 360 Amp.
Note {Above is Distribution of Current with Normal Morning and Afternoon Service of about 1200 Amp.
0' 1000' 2000' 3000'

SKETCH MAP SHOWING RETURN FEEDERS INSTALLED AT LYNCHBURG, VA.

The watt-hour meters at the power house were read every fifteen minutes, and the average load was thus determined for periods of fifteen or thirty minutes, one, eighteen or twenty-four hours. From these it was found that the average current per car was as follows:

One hour normal period, 55 amp.; one hour peak period, 51 amp.; fifteen minute peak period, 68 amp.

The layout was designed to make an over-all voltage drop of 0.5 volt per 1000 ft. of track during the normal period, with a one hour average station load of 1150 amp. This made about 0.85 volt during maximum fifteen-minute peak. This further made an average maximum one-hour drop of 0.64 volt and average twenty-four-hour drop of only 0.38 volt per 1000 ft. of track. To be sure, there are larger momentary voltage drops that would be shown by an indicating voltmeter, but momentary maximum voltage swings are no more productive of electrolytic corrosion than would a momentary maximum charging current be effective in charging a battery.

By referring to the accompanying map it will be seen the most economical points from which to collect current were at track intersections allowing small current density in diverging tracks beyond. Feeders were run to Fifth and Main, Twelfth and Main, Buchanan and Park, and Rivermont near Wall. Just enough current was allowed to flow in the tracks between these points and Fifth and Main to keep the drop within 0.5 volt per 1000 ft. of track during normal service, and the feeders were designed of such cross-section as to carry back to the plant the excess current delivered to tracks beyond these points.

For example, 480 amp. originated beyond Twelfth and Main, while the track between this point and Fifth and Main should have carried only 120 amp. to produce the allowable drop. Consequently 350 amp. had to be carried by a feeder. Similarly 360 amp. originated beyond Buchanan and Park, while the track would carry about 120 amp., leaving 240 amp. for a feeder, and the conditions were similar for the other feeder. This left about 420 amp. to be collected from the tracks at Fifth and Main, including the local load.

FEEDER SIZES WERE DETERMINED BY RESISTANCE NEEDED TO PRODUCE DESIRED VOLTAGE DROP

The cross-sections of cables were determined as follows: A No. 0000 cable was provided to carry the 420 amp. from Fifth and Main Streets with a drop of about 15 volts. Adding to this the drop in the track on Main from Fifth to Twelfth Streets, due to the local current and the 120 amp. originating beyond Twelfth Street and not carried by feeder, we have approximately 18 volts from Twelfth and Main to the power house. This will be the drop in the feeder from Twelfth and Main. Knowing the length, drop and current carried in the cable its cross-section was determined to be approximately 800,000 circ.mil. Similarly the cable to Buchanan and Park Streets had to be 900,000 circ.mil. and the cable to Rivermont and Wall 500,000 circ.mil. In this way no resistance was needed other than that in the feeders. When the cables were installed the current distributed itself very closely in accordance with the calculated values.

No elaborate tests were made after the installation as experience with a similar installation elsewhere had shown that the voltages between underground structures and rails were reduced to satisfactory values. In that the earth resistance was the same, the reduction of stray current would be directly proportional to the reduction of these voltages. The results of the following two years the installation give the conclusive proof of its success.

How Electric Lines Can Help

Secretary McAdoo Disclaims Present Intention to Take Over Electric Railways, but Asks for Co-operation in Freight Hauling

ON HIS recent trip to the Great Lakes Naval Training Station, as noted in another column, Secretary of the Treasury McAdoo expressed to a representative of this journal his views in regard to the status of electric railways.

Secretary McAdoo said that there is no present intention of taking over these properties, for local conditions are such that government operation would be extremely difficult and in most cases not feasible.

The government desires, however, to co-ordinate the electric lines so as to promote the highest degree of coöperation with the steam roads. Mr. McAdoo believes that the electric lines are an important factor in the transportation field, and that it is highly desirable to develop electric railway freight-handling facilities in territories which are not reached by steam roads, where the steam carriers need relief or where a better and more economical service can be rendered by the electric lines.

Speaking of the Liberty Loan, Mr. McAdoo said the spirit of the people throughout the country is inspiring, and that a greater enthusiasm for the Third Loan is being shown than for either of the foregoing issues. The statement that the West does not realize the seriousness of this war is without foundation. On Mr. McAdoo's Western trip the people turned out at any and all hours to hear him speak.

Publishers Criticise Zone Law

AT A MEETING of the Periodical Publishers' Association, held in New York on April 26 to consider the postal "zone" law, a resolution was adopted unanimously condemning this law and urging Congress to postpone it until after the war. As Allan H. Richardson, president of the Periodical Publishers' Association, pointed out, the publishing industry is today laboring under all the difficulties which were described at the publishers' hearings last fall, and in addition the difficulty of increased costs, far beyond anything which was foreseen at the time of those hearings. Moreover, the industry is rendering incalculable service to the government, and it is more essential, than ever before, that it should be kept wholly intact and should be spared any unnecessary burdens. The resolution follows:

> *Whereas*, the increased second-class postage rates, as provided in Section 3 of the Act of Congress, approved Oct. 3, 1917, which becomes effective July 1, 1918, will be most unfair and oppressive to the periodicals of the country and the reading public,
>
> Now, therefore, be it resolved, by the Periodical Publishers' Association of America, that Congress be urgently requested to suspend the provisions of said law, insofar as they apply to increased second-class postage rates, until one year after the close of the present war.

How Various Types of Special Work Layouts Have Been Developed in Brooklyn

BY M. BERNARD
Assistant Engineer Way and Structure Department, Brooklyn (N. Y.) Rapid Transit System

IN THE issue of the ELECTRIC RAILWAY JOURNAL of March 16, 1918, W. L. Whitlock, office engineer Denver Tramway, describes a type of special work which is designated as the "outside" switch. This refers to the location of the tongue and switch on the outer rail instead of its normal position on the inner rail.

Since the function of special work and any other track structure is to guide rolling stock to its destination in the most economical manner, it follows that the use of proper types is of great importance. A description of the types in use on the Brooklyn Rapid Transit System and the various stages of development leading up to their adoption may be of interest.

Originally all special work of girder construction was of the standard hard-center type as illustrated in Figs. 1A and 1B. The tongue switch was located on the inside in all layouts, the mate on the outside, and all frogs were constructed with flangeways in both runs. About 1902, as a result of a variation of traffic conditions, these types were modified as illustrated in Figs. 2A and 2B for use at locations where the traffic over one run was negligible as compared to that of another. At such points the tongue switch was placed on the outside rail, the mate on the inside rail, and the frogs were made of the "jump" type, that is, the flangeway for the light traffic rails was omitted, necessitating the wheels jumping over the unbroken main line. The hard center feature was, however, retained. The reasons in favor of this type are well set forth in Mr. Whitlock's article and are therefore omitted here. About the same time, also, to facilitate ease of riding, the practice was introduced of installing a tongue mate with a tongue switch in the trailing ends of all standard type layouts. This is illustrated in Fig. 3.

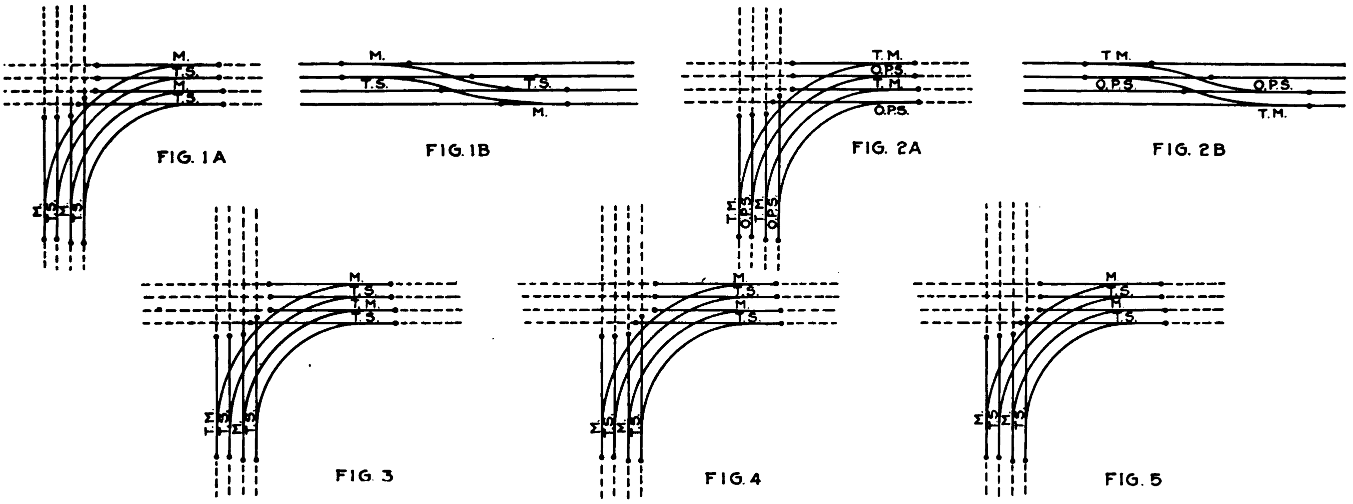


Fig. 1A—Double connecting curves with "hard center" frogs and flangeway in both runs. Tongue switch on inside.

Fig. 1B—Cross-over with "hard center" frogs and flangeway in both runs. Tongue switch on inside

Fig. 2A—Double connecting curves with "hard center jump type" frogs and flangeway for main line only. Tongue switch on outside

Fig. 2B—Cross-over with "hard center jump type" frogs and flangeway for main line only. Tongue switch on outside

Fig. 3—Double connecting curves with "hard center" frogs, flangeway in both runs and tongue mate with tongue switch in trailing ends.

Fig. 4—Doub'e connecting curves with "built up jump type" frogs, flangeway in main line only and inside tongue switch

Fig. 5—Double connecting curves with "hard center" frogs and flangeway in both runs in inner rail while outer rail has "built up jump type" frogs and flangeway in main line only. Inside tongue switch.

SPECIAL WORK DEVELOPMENT STAGES ON THE BROOKLYN RAPID TRANSIT SYSTEM

About 1909 the use of the outside tongue switch type was discontinued and the use of the tongue switch on the inside was adopted for various reasons, partly enumerated below. About the same time the use of bolted construction instead of hard-center construction in the jump type was inaugurated. This is illustrated in Fig. 4. Some of the objections to the use of the tongue switch on the outside and a plain mate on the inside are as follows:

With the mate on the inside there is quite a portion of the inner curve unguarded, the length depending on the radius, wheel flange, etc. This condition is liable to produce derailments of cars and is aggravated by the requirement of flange-bearing in most mate designs, so that in time the plane of the wheel treads of cars going around the curve is higher on the inner rail than on the outer. The flanges of the wheels of cars going over the main line, also, cut into the floor of the mate forming a ridge. Unless this is ground regularly it may become large enough to cause trouble just at the time when least expected or, rather, least desired. This condition also develops in a lesser degree with tongue, switches and mates in their normal position, but it is minimized by the guard action of the tongue. The design of a tongue mate requiring a "break" in the straight gage line where there is more or less pounding also affects the corresponding part of the mate opposite and consequently there is not as much difference in the cost of maintenance of the two types as might at first be inferred. The use of two different types requires a more elaborate system of records and a larger number of stock pieces to take care of the necessary renewals.

The practice of installing a pair of tongue switches in the trailing position in regular layouts was discontinued in 1911 and the original type was readopted as the results obtained did not seem to justify the additional expense, which amounted to about 40 per cent. The maintenance cost of a tongue mate also exceeded that of a plain mate in the same position.

The bolted construction in frogs of the "jump" type was adopted because of the cupping that developed in the rail abutting the hard center. This has been prevented by the use of an unbroken length of rail in the main line.

Subsequent to the adoption of this design in emergency layouts reports were frequently received that cars would not take the curve because the frogs in the inner rail in many layouts happened to come very nearly opposite those in the outer rail so that both wheels had to jump gaps at the same time, resulting in derailments. This led to the adoption of the present type for such layouts as is illustrated in Fig. 5. It will be noted that this type differs from that shown in Fig. 1A only in the design of the frogs in the outer rail, which are of the jump type.

The types illustrated in Figs. 1A and 1B are at present used on our system for regular operation and those in Figs. 3 and 4 for emergency operation.

Home-Made High-Potential Test Set

A SIMPLE but effective high-potential testing set used by a New Hampshire electric railway in the armature winding room is shown diagrammatically herewith. The apparatus consists of a 10-watt General Electric potential transformer whose high-tension winding is terminated in plug-handle contacts and whose low-tension side is connected through any one of three incandescent lamps to an ordinary 110-volt a.c. lamp socket.

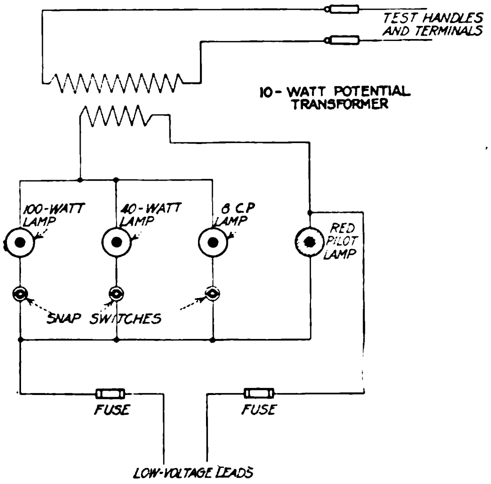
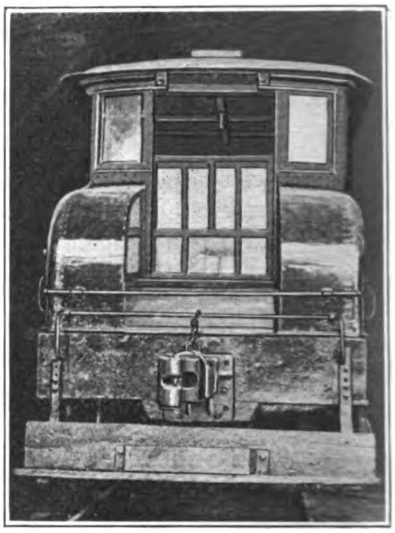


DIAGRAM FOR HIGH POTENTIAL TEST SET

Depending upon whether the 100-watt, the 40-watt or the 8-cp. lamp is thrown into the low-tension circuit, the potential at the high-voltage plugs is 1760, 1200 or 800 volts. When the terminals of the high-voltage side are short-circuited, as when a ground is found between a commutator bar and the motor shaft or core, the lamp burns at full candle power. The red pilot lamp shown at the right in the diagram burns continuously when the transforming low-voltage coil leads are plugged into circuit.

Efficiency and Safety of Electric Industrial Locomotives

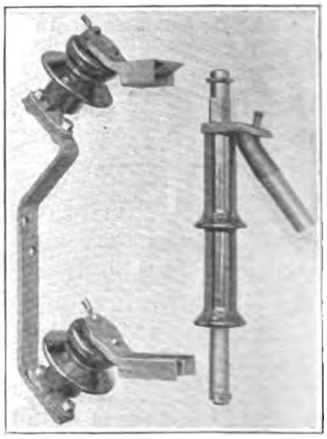
AN ELECTRIC locomotive used by a Massachusetts industrial plant was recently greatly improved by cutting down the cab housing as shown in the accompanying photograph. As originally designed, the housing extended across the full width of the cab, with the result that the operator could not see the track and coupler at the front of the locomotive, and at times there was delay in controlling the movement of the equipment. The cab housing was accordingly cut down for about 50 per cent of the width, and additional window space was provided in the center of the cab. The operator now has a clear view of everything in front of the machine as well as a better lighted working space in the cab itself. Increased production has resulted, owing to the faster and safer handling of the equipment made possible by the change.



ELECTRIC LOCOMOTIVE WITH REDUCED CAB HOUSING

Combined Disconnecting Switch and Fuse for Outdoor Use

THE combined fuse and disconnecting switch shown in the accompanying illustrations is used for the protection of transformer banks where no primary switches are used. The construction consists of two supporting petticoat type insulators on which are mounted the holders. The ends of the fuse are provided with brass contacts which can be pressed into the stationary clips on the supporting insulator. This type was designed by the General Electric Company primarily for operation in small outdoor substations. The contacts are protected against the effects of ice, sleet and snow by the method of mounting and by means of a punched hood attached to the top of each supporting insulator. This combined fuse and disconnecting switch is made in single-pole units for vertical mounting on flat surfaces. It is available for use at 15,000, 22,000, 35,000 and 45,000 volts. The maximum current rating is 50 amp. and no special arrangements are needed for mounting.



15,000-VOLT COMBINED FUSE AND DISCONNECTING SWITCH

American Association News

Company Sections Producing Unusually Instructive and Stimulating Programs.

Inspirational and Patriotic Talks Are a Feature at Practically Every Meeting.

N. W. Bolen at the Jersey City Meeting of Public Service "Hit the Nail on the Head" When he Spoke on "Our Job."

Filipinos Are Also Doing Fine Work in Preparing Papers for the Manila Section

Rousing Public Service Meeting at Paterson

THREE hundred members attended the April meeting of the Public Service Railway company section, which was held at the Market Street carhouse in Paterson on April 25. The plan of holding the meetings in different division centers is proving to be a great success, as was attested by the Jersey City meeting last month.

The Paterson meeting was a combined smoker and entertainment, J. L. O'Toole, assistant to the president, being the principal speaker. L. J. Tynan, attorney, and H. D. Briggs, assistant general claim agent, also spoke briefly. After the speaking the meeting was turned over to H. E. Feakes, supervisor Paterson carhouse, in charge of entertainment. There was a piano solo by a motorman and a sleight-of-hand performance by a conductor, while the "Boys' Band," consisting of sons of Passaic division trainmen, rendered several selections during the evening.

Mr. O'Toole's line of thought was that electric railway workers can and must stand behind the men at the front. Electric railway transportation furnishes an indispensible cog in the machinery of war preparation. He said not only is it necessary that this fact be realized, but electric railway workers should be leaders in showing patriotism by subscribing to the present and future Liberty Loans. He paid tribute to the results already achieved by the boys at the front and predicted, on the basis of past performance, that "they will continue to prove to the world that America can and will make good her vows."

N. W. Bolen on "Our Job"

AT THE March meeting of the Public Service company section N. W. Bolen, general superintendent, spoke on the subject "Our Job." As the title indicates, the talk was intended to impress upon Public Service men the importance of contributing their bit by faithful transportation work. After outlining some of the things which he had seen in his thirty-six years of railway service, and the difficulty involved in street railway work now, he raised the question "Why should any man remain in such a business?" His answer was that there is no industry so appealing to those who are really fitted to the arduous demands of this business. No other is so close to humanity, with its faults and virtues; no other is so closely linked with the industrial growth and prosperity of the community, and no other is more vital to the welfare of the country in the mighty struggle now going on.

To make his line of thought perfectly definite Mr. Bolen gave a list of the most important extra burdens which have been imposed upon Public Service by the war. At the extreme northern end of the line is Camp Merritt where as many as 30,000 soldiers are congregated at one time. At Edgewater is the plant of the American Can Company, which will ultimately employ 3000 men; while near by are the plants of the Aluminum Company of America, the General Chemical Company and the Remington Arms Company. At Bayonne is the Electric Launch Company and across the ferry is the Staten Island Shipbuilding Company, each with employees running into the thousands. On the Hackensack side is the Federal Shipbuilding Company, which will ultimately employ 7000 men; the Foundation Company with 3500 men, the United States Engineers' Depot with 600 men, and the Butterworth-Judson Company, acid manufacturers, with 3600 men. Further down are the plant of the Submarine Boat Corporation which later expects to employ 15,000 men, and also the Quartermasters' Depot employing 3000 men.

On Bloomfield Avenue, Newark, is the International Fuse Company. When an addition is completed for the manufacture of shells the total number of employees will approach 10,000. The Ford destroyer plant shortly to be started will, it is reported, require 12,000 men. Further south are the Weston Electrical Instrument Company and the Dusenberg Motor Company, each with 1000 employees, and the new plant of the Standard Aëroplane Corporation which will have 5000 men when running full. The Moore shipbuilding plant in Elizabeth employs about 1800 men, and at Bonhamtown the government is building a great ordnance depot facing on the Raritan River which will employ 6000 men. On the South Amboy line of the Public Service the Union Powder Company is rapidly approaching a total of 3500 employees and the Parlin Plant of the DuPont Company will employ 6500 men in the manufacture of powder. The Wright-Martin aircraft plant at New Brunswick is employing around 3500 men. At New Brunswick also the Johnson & Johnson Company employs more than 1000 people in the manufacture of bandages and surgical supplies.

In the southern division there is the New York Shipbuilding Company with 11,500 employees and the New Jersey & Pennsylvania Shipbuilding Company with 7000 employees. At Gloucester also the War Department will employ about 5000 men when running full. In round numbers, some 90,000 employees in the plants mentioned will be engaged in the manufacture of war materials, and Public Service is being called upon to transport a large proportion of them. Mr. Bolen said "Our job is cut out for us, and it is a big one; but I have faith in the ability of Public Service men to carry to successful conclusion any task to which they set themselves and faith that they will not fail in this national crisis."

"Patriotic Talks" at New Haven

THE regular meeting of the Connecticut Company Section was held on April 30, at the Hotel Garde, New Haven, preceded by the usual dinner. V. S. Curtis, secretary and general traffic agent, spoke on the "Express Department," and George E. Wood, mechanical engineer, read a paper on "Power Station Accomplishments." A number of "Patriotic Talks" on subjects of current interest were given by unannounced speakers.

Complicated Piece of Track Special Work

AT THE MEETING of the Capital Traction Company Section held at Washington, D. C., on April 11, the principal speaker was H. P. Huntting, engineer of way. He gave a talk on the installation, last year, of a complicated piece of special track layout at the junction of New York and Pennsylvania Avenues, and Fifteenth Street. This work was done without interrupting traffic, notwithstanding the fact that the intersection is located at one of the busiest points in Washington. An abstract of Mr. Huntting's paper will be given in a later issue of the JOURNAL.

At this meeting also a representative of the local Liberty Loan committee made a strong appeal for the purchase of Third Liberty Loan Bonds. As a result a campaign was instituted in the company's organization, similar to that carried on in the drive for the second loan. At the conclusion of the meeting refreshments were served.

Portland Section Hears Talk on Army Life

AT THE MEETING of the Cumberland County Power & Light Company section held on April 23 the principal speaker was Lieut.-Col. Frank B. Cummings, lately returned from France. He related his experiences from the time he left the United States until he reached the training camp in France. A lively discussion followed. The entertainment of the evening comprised a chalk talk by a member from the commercial department, a piano solo and a vaudeville act by local entertainers.

The Abuse of the Transfer

AT THE March 5 meeting of the Manila section, I. G. Obligacion, chief clerk transportation department M. E. R. & L. Co., read a paper on "The Menace of the Transfer." From this it appears that the transfer privilege is abused in Manila as elsewhere.

After outlining the advantages accruing to the railway and the public from the use of transfers Mr. Obligacion told of some of the local transfer abuses. The principal points made were these: A passenger asks for a transfer to a certain line and then presents it on a different line; when the conductor refuses to accept it the passenger complains to the management. A passenger on leaving a car meets some friends and forgets about the passage of time until several cars have gone by; he is then indignant because the conductor of the car boarded refuses to accept his transfer, and indulges in abuse of the system. Some passengers are indignant because the conductors will not assist them in getting a round trip for a single fare. Some passengers ask for transfers at certain transfer points and insist on riding to a more distant transfer point; when not permitted to do this they insult the conductor, give the transfers to their friends, use "late dates," "picked up," "plugged ones," etc.

In Mr. Obligacion's opinion the virtues of the transfers outweigh their defects but they should be checked and accounted for as accurately as fares. They are really parts of fares, and only through proper checking can abuses be prevented. The local company uses special rules for the administration of the transfer system, selects transfer points carefully, prohibits the acceptance of transfers outside of such points, punches the month and day on the transfer before it is sent out from the office, issues an individual punch to each conductor and changes the color of transfer pads on every line every fiscal year.

Filipinos Read Papers at Manila Meeting

AT THE MEETING of the Manila Section held on Feb. 12, T. Castillo, carhouse starter, outlined the duties of a man in his position. After stating that the first duty of a starter is perfect familiarity with the schedules, he listed the following as inspectors' duties: To keep extra lists properly in order to avoid inequitable distribution of work. To keep an accurate record of absences and their causes, and also a record of the capabilities of the men as to their familiarity with certain kinds of equipment. To study the trouble sheet so as to handle contingencies wisely. To have on hand enough cars and crews to take care of extra traffic, anticipating the needs of the public. To inspect platform men before allowing them to go on duty, to be sure that they are presentable in appearance and have all of the necessary equipment. To call to the attention of crews defects in track, line, streets, etc., which they should know about in order properly to perform their duties. To see that cars go out on time and in perfect condition. To perform their work in such a way as to keep the men contented. To report promptly to their superiors details of accidents and defects in any part of the system. To furnish the public with exact information regarding the operation of the system. To check and correct trainmen's reports so as to insure accurate data regarding car movements. To report daily to the superintendent of transportation as to all unusual occurrences, violation of rules, etc.

At the same meeting M. Fariñas, traffic inspector, spoke on "Trainmen as Witnesses." Mr. Fariñas pointed out that while the most valuable witness which the company can secure in the case of an accident is one who is not employed by the company in any capacity, an employee can be a valuable witness if he is careful to make statements that can be substantiated. An employee giving evidence for the company is placed at a disadvantage due to the fact that the judge is more likely to be impressed by declarations of witnesses for the plaintiff.

In addition to being prepared to substantiate his own statements, the trainman can be of great assistance in securing witnesses of an accident who will be able to give clear descriptions of it. The names of possible witnesses should be secured even though the passenger states at the time that his injury amounts to nothing.

LETTERS TO THE EDITORS

R. W. Blackwell and the Electric Railway Industry

LONDON, ENGLAND, April 15, 1918.

To the Editors:

By the sudden death of Robert W. Blackwell, after a very short illness at his residence, "Elmbank," Hampstead, on March 29, the electrical profession loses one of the few remaining and best-known pioneers of electric traction, and one whose name has been intimately connected with the most important branch of electrical engineering, both in the United States and in this country, for the last thirty-five years.

Born in 1858, Mr. Blackwell graduated as M. A. and B. LL. at Princeton University, where he was a contemporary of President Wilson. After graduation for a short time he engaged in the practice of law. Attracted however by the great demand for mechanically operated street cars, the need for which was so urgently felt in the United States, he jointly, with Edward W. Bentley and Walter H. Knight, founded in 1883 the Bentley Knight Electric Railway Company of New York, which installed and equipped an electrically operated tramway system in Cleveland, Ohio. This line opened for traffic in 1884 and was the first line to be operated electrically as a commercial undertaking.

Mr. Blackwell, as a contemporary of Sprague, Van Depoele and Edison, was intimately associated with the great pioneer work carried out in the United States between 1883 and 1889. Speaking at the sixth annual meeting in Philadelphia, of the American Street Railway Association, on Oct. 19, 1887, Mr. Blackwell said: "We entered the electric city tramway field long in advance of all others, and we believe that electric street railways for city service can be used effectively only where the power to drive the car is transmitted to it from a generating station." How true this pre-vision was has been amply demonstrated, although at the time many thought the future lay with the storage battery.

He was actively engaged in the management of his company until 1889, when he transferred the Bentley Knight Company's interests to the Thomson-Houston Company of Lynn, Mass. Mr. Blackwell was shortly afterward summoned to England to give evidence before Parliament on behalf of the first bill promoted by the Central London Railway Co. and it was the experience he gained during this stay which showed him the great prospects of electric traction in the United Kingdom and eventually, in 1890, induced him to take up his residence in this country. In 1890 he became associated with Messrs. Greenwood & Batley of Leeds, in conjunction with whom he opened an office in London for the purpose of introducing electric traction on the tramway systems of the United Kingdom. Speaking about the United States before the Institution of Electrical Engineers in 1892, Mr. Blackwell said: "The public has thoroughly supported those tramways which have introduced electricity, and has rewarded their enterprise by greatly increased patronage. That electric traction will receive the same acceptance here that it has already gained across the water, I do not doubt." Time more than justified Mr. Blackwell's anticipations, although several years of arduous pioneering work were necessary to overcome the opposition of inertia and vested interests before electric traction was definitely established in this country.

In 1894, Mr. Blackwell founded the firm of Robert W. Blackwell & Company which, in 1895 secured the contract from the British Thomson-Houston Company for the construction and electrical equipment of a new tramway in Bristol, and the work there carried out was so satisfactory that it at once secured for the firm the premier position as contractors in the electric traction field. The very great financial success secured by this first electrification on a commercial scale served as an incentive to many others to follow in its footsteps, and Bristol was visited and inspected by delegates from all parts of Great Britain and the Continent as a model electric tramway installation.

As engineers and contractors, R. W. Blackwell & Co. were henceforth connected with a very large majority of all the electric traction systems installed in the United Kingdom, amongst which may be mentioned: Bradford, Bolton, Cork, Central London Railway, Coventry, Cardiff, Chatham, Dublin, Doncaster, Giants' Causeway, Glasgow, Gateshead, Isle of Man, London United, London County Council, Leicester, Liverpool, Norwich, Nottingham, Plymouth, The Potteries, Reading, Southampton, St. Helens and many other British undertakings. Blackwell & Company supplied materials and engineering advice, also, to a large number of Continental firms. They were the expert advisers on traction matters to such firms as the Oerlikon Company, Shuckert & Company and Ganz & Company and their designs and specialties are to be found in a very large number of electric tramway installations throughout Europe, Africa, Asia and South America. It was they who designed the originally successful trolley standards for top seat tram cars and first standardized the pole and bracket arm construction for overhead lines. Wherever anything new was to be seen or experience was to be gained, there Mr. Blackwell went or sent his engineers or representatives to investigate and test, with the result that purchasers always came to him for information and advice. He showed in 1897, at the Brussels Exhibition, an

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(*Concluded from page 866*)

Mr. Fariñas also outlined the ideal accident report. The spirit of his talk is shown by this quotation: "Trainmen should make every effort to avoid discussions or arguments with passengers, should always be polite and courteous, and should seize every opportunity to make their passengers their friends. They must remember that at any moment they may be obliged to call upon these passengers to act as witnesses of an accident."

In discussing Mr. Fariñas' paper F. P. Santiago said among other things that "employees are good witnesses of any accident if they will just give a fair and unbiased description of what they saw. They should never make the mistake of exaggerating the facts of a case just because they want to favor the company. By misrepresenting the facts they may cause the company to refuse a just claim which may afterwards have to be contested in court. All that the company wants is the truth."

exhibit which was one of the most interesting in the whole British section. He was a member of the International jury there.

It is interesting to note that although American born and a very prominent member of the American Society in London, all Mr. Blackwell's associates and staff were British and the prescience shown by him in selecting men and the kindly assistance and advice and loyal support he always gave his staff has resulted in the launching of a great many engineers into the prominent positions they now hold in many parts of the world. His motto has always been—"You cannot afford to do bad work, the best only is good enough." His firm carried out many important works for English railway companies including the Great Western, the Great Central, and the London, Brighton & South Coast Railway Companies. The work carried out for this latter company included some of the most difficult bits of construction ever put up and erected under the most unfavorable conditions.

As the founder and chairman of Robert W. Blackwell & Co. Ltd., Mr. Blackwell's name has become a household word with all those interested in, or connected with, electric traction throughout the world. Not only as an engineer and contractor, but in many other directions Mr. Blackwell showed great initiative, as by building up a most successful manufacturing business in roofing and in other materials many of which previously had to be imported from abroad.

He was for many years also chairman of Messrs. Johnson & Phillips, electrical engineers and cable manufacturers, and did very much to bring them to the high pitch of prosperity they have reached to-day. He was as much loved and respected by his co-directors and the employees of this firm as he was by those of Messrs. Blackwell & Company.

Mr. Blackwell had many outside interests which cannot be referred to here. Sufficient be it to say that he was in charge of most of the arrangements for looking after the American Military Mission during their visit to this country, and that he was a great supporter of the American Red Cross and kindred societies.

He was a member of the Royal Automobile Club and of the City Liberal Club and always retained his membership in the Manhattan and University Clubs of New York. He was a prominent Mason, was Past Master of the Lodge of the Nine Muses and the founder of the American Columbia Lodge, and was awarded London rank for his Masonic services.

His memory will be kept green in the hearts of all these who had the privilege of his friendship, and nothing is more characteristic of him than the opinion expressed by one of his oldest friends, "Blackwell was as straight as a die."

PHILIP DAWSON.

Proposed Uniform Standard Track Spirals

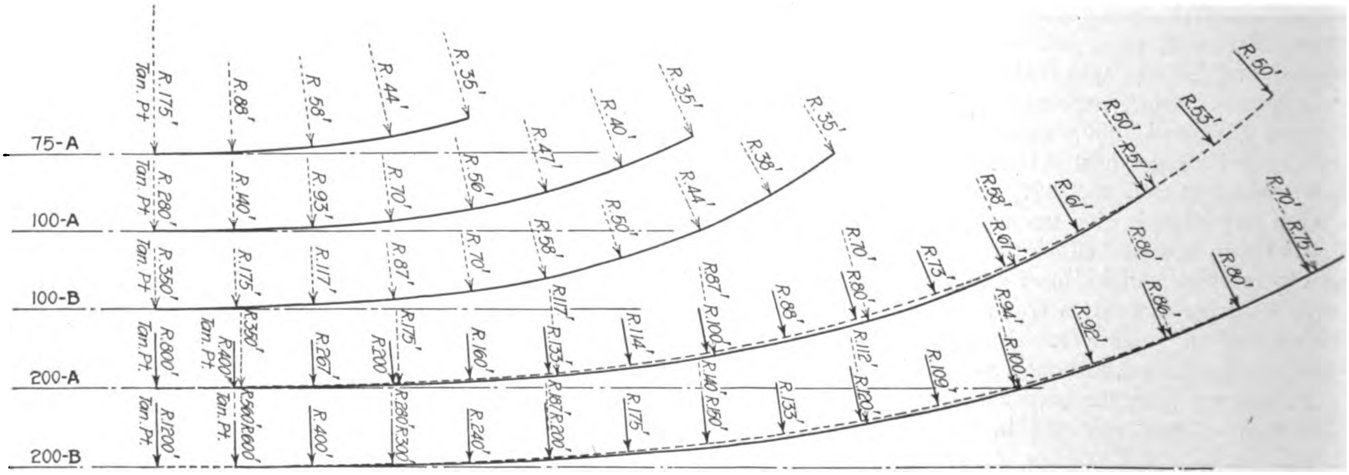
WILLIAM WHARTON, JR., & COMPANY

EASTON, PA., April 23, 1918.

To the Editors:

It is to be hoped that E. M. T. Ryder's article on track spirals, appearing in the issue of April 6, 1918, will arouse the interest of the electric railway engineers and the manufacturers of special track work in the subject, and that it will lead eventually to some uniform practice.

The manufacturers would welcome almost any system of track spirals that might be devised, providing it would satisfy the electric railway engineers and would find more general adoption by them. Without such general adoption in actual practice it would simply constitute another addition to the systems in use, increasing the troubles and vexations due to the lack of standard practice with which the special track work business is already burdened, and which show up in the cost of special work.



MR. ANGERER SUGGESTS USING FEWER AND LONGER CHORDS IN PROPOSED STANDARD TRACK SPIRALS

The trouble with most attempts at standardization is that the product produced is either no better, or is more costly than what has been in use, or both. A track spiral, to stand the chance of more general adoption must, first, be based upon a sound, recognized principle, which many of the present existing spirals in street railway practice are not. And, second, it must be simple and at least as easy of application as any of the existing systems. Most of the proposed standards aim at unnecessary refinement.

Mr. Ryder's proposed spiral, the writer believes, covers the first point; it may not cover the second point as fully as may be desired. Nearly all spiral systems now in use, with the probable exception of that of the Connecticut Company, employ too many changes of radius of curvature between the tangent and the circular or center curve. As far as alignment is concerned, if half the number of different radii, and in some cases even a less proportion, were used it would still give the same practical effect upon the running of the cars. In curving rails on a bending machine for spirals of the same length and same final off-set, one with twice the number of radii as another requires from 25 to 50 per cent more time to curve than the other.

It must be realized, of course, that, in order to make a design flexible and applicable to center curves of a range of radii, one must not go to the other extreme and have too few changes of curvature in the spiral. Conceding further that, in order to follow out a system or principle, the increments constituting or forming the spiral must be confined within certain limits, it would seem that Mr. Ryder had arrived at quite a satisfactory solution in the basic spiral, marked 100-*A* on the diagram. This spiral would be found most generally satisfactory and applicable. It may be that a somewhat longer spiral, as the one marked 100-*B*, would be preferred in some cases, particularly with center radii somewhat longer than 35 ft., in which case part of the spiral would be dropped off. Spiral 100-*C* could well be left out altogether, as it would rarely find application to curves with a short central radius. For spirals longer than 100-*B* and for use with longer central radii it does seem that longer chords and fewer radii could be applied to considerable advantage. Chords of 10 ft. in the 200 spirals would reduce the number of radii to fewer than one-half, to reach the same central radius. Spiral 200-*A* could thus be developed from spiral 100-*B* by using the same radii but with 10-ft. chords, making only six changes between 0 and 50-ft. radius. Spiral 200-B might be formed by doubling both chords and radii of spiral 100-*A*.

We would thus have four spirals. 100-*A*, 100-*B*, 200-*A* and 200-*B*, to which might be added the spirals shown on the top of the diagram of proposed uniform standards, which Mr. Ryder calls 200-*C*, but which probably had better be called 75-*A*. These five spirals would, in the writer's belief, cover all requirements. The two spirals at the bottom of Mr. Ryder's diagram, also called 200-*C*, are really combinations and any combination might be used, or might be necessary, to cover contingencies such as car clearances or avoiding of obstructions. It would seem that they should not be defined or included in a set of standard spirals.

The past attempts of the manufacturers and of the committee on way matters of the American Electric Railway Engineering Association have shown that the problem is not a simple one. Mr. Ryder has, undoubtedly, given the subject a great deal of thought and study, and the principle worked out and outlined in his article is extremely valuable. Any further development or modifications, and attempts at simplification might well follow the same lines. The comments and suggestions made herein are not a criticism, they are only made with the idea of helping along, in the hope of arriving at "something" that may finally prove satisfactory to all concerned and give us a real standard of spirals—one that will be used.

V. ANGERER, Vice-President.

THE AMERICAN RAILWAYS COMPANY
PHILADELPHIA, PA., April 27, 1918.

To the Editors:

Referring to Mr. Ryder's article on track spirals, printed in the issue of the ELECTRIC RAILWAY JOURNAL for April 6, 1918, page 649, and to Mr. Harvey's letter printed in the issue for April 20, page 775, it seems to me that there are many points in Mr. Harvey's letter which are worthy of careful consideration and which generally meet with my views. In this connection, I beg to quote from my letter of March 15, 1917, to Mr. Ryder as chairman of the committee on way matters as follows:

"As I understand the question it is not spirals which we are standardizing but a method of figuring spirals. In other words, all of the spirals at present in use are generally satisfactory from an operating point of view and this committee should develop if possible a simplified method of figuring the distance from the termination of the center radius to the point of the spiral curve, and this curve should be designed to permit the installation of a standard switch in the plain end without distorting the curve.

"If easy riding qualities can be obtained by a two or three-part compound curve, as suggested by Mr. Falconer of the New York State Railways, it would seem that we are getting into entirely too much figuring for the average draftsman on a small property if we divide our curve up into a greater number of parts.

In our practice we have used Wharton spirals exclusively. These appear to the writer to be well within the grasp of the average draftsman when used with the very complete data issued by the Wharton company. We have seldom found it necessary to use other than the plain-end No. 1 in connection with switch-end *A* and plain end No. 2½ with switch-end *B*.

In view of the fact that all of the larger operating companies have developed spiral standards of their own, sometimes with much elaboration, it might be pertinent to inquire how far the larger companies would follow a standard not of their own design. In the smaller companies I understand it is the practice to use whatever spiral is used by the special work manufacturer without question."

C. G. KEEN,
Engineer of Way and Structure.

War Affects Shop Planning System But Slightly

The planning system worked out for the Portland Railway, Light & Power Company, and described in the 1916 and 1917 Maintenence Issues of the ELECTRIC RAILWAY JOURNAL, has been found to be entirely successful and "works fine," Master Mechanic F. P. Maize reports. The system is in operation as described, except that under present war and labor conditions the advances cannot be made as originally contemplated. The only other change in the system is that girls have been substituted for men clerks in compiling the records.

Recent Happenings in Great Britain

Traffic Keeps Up Despite Fare Increases—Committee on Production Adjusts Tramway Wages—Miscellany

(From Our Regular Correspondent)

In the House of Commons Sir Albert Stanley, president of the Board of Trade, said that the addition of 50 per cent to railway fares at the opening of last year had not the desired effect in curtailing traveling. In all probability, a considerable number of passenger trains would be canceled at once. Should these restrictions prove ineffective, others will be put in force. "Curfew" regulations announced by Sir Albert provide that all places of amusement shall close at 10:30 o'clock at night. Other restrictions foreshadowed included a considerable reduction in tramway and electric railway services, including the underground services of London, and the rationing of London in coal next winter on a much lower scale than in the past. It is also proposed to extend rationing to the greater part of England. Munition works, hospitals and nursing homes are to be exempted. The reason for these restrictions is the remoteness of this particular part of the country from the coalfields and the difficulties of transport.

THE RECENT WAGE AWARD

Threatened strikes of tramway workers in various cities of Great Britain have been averted by the award of the committee on production. It states that men aged eighteen years and over, and the grades of women aged eighteen years and over whose terms of employment include an understanding that they shall be paid the same rates as the grades of men whose places they have filled, shall receive such an advance as would give £1 a week over the pre-war rates of the grades concerned, payment to be made on the basis of a week of six days or shifts. Women aged eighteen years and over who are not covered by this decision are to receive an advance of 4s. a week, subject to a maximum of 20s. a week, over the pre-war rates of the grades concerned. Girls, boys, and youths under eighteen are to receive such an increase as will give them half the additional advances provided by the committee's award to the men or women, as the case may be, in the same undertaking. The advances went into operation on the pay day in the week beginning March 4, 1918. The award does not include women to whom apply the provisions of the orders made by the minister of munitions under the munitions of war (amendment) act of 1916. Officials of the Transport Workers' Federation state that the award is satisfactory.

EDINBURGH LEASE EXPIRES IN JUNE

The lease between the Edinburgh Corporation and the Edinburgh & District Tramways expires in June of next year, and steps are being taken to consider the future policy of the corporation with regard to the undertaking. The sub-committee of the Corporation tramway committee has decided to recommend to the full committee that the time has arrived when a tramway manager should be appointed.

The town clerk at Edinburgh has been notified that the corporation proposes to apply in the present session of Parliament for powers to construct tramways between Edinburgh and Queensferry.

SUNDAY SERVICE AGITATION

The Southport tramways committee has decided to recommend to the Council that it run the trams on Sundays. Hitherto there has been no service of Sunday cars on the corporation system, but only on that of the Southport & Birkdale Company, recently acquired by the town for £35,000. The ratepayers have twice voted on the question of Sunday trams on the corporation lines, and have each time recorded a substantial majority against the plan.

The Liverpool tramways committee, having decided to create the office of deputy manager, has appointed to that position J. S. D. Moffet, general manager of the Belfast Corporation Tramways. From 1896 to 1898 Mr. Moffet was assistant borough engineer of Sunderland, from 1898 to 1904 assistant in charge of the tramways and improvements department under the engineer at Rochdale, from 1904 to 1913 general manager and engineer of the Rochdale Corporation Tramways, and from 1913 to 1916 general manager and engineer of the West Ham Corporation Tramways. He went from West Ham to Belfast.

LONDON TRAFFIC INCREASES

At the annual meeting of the Underground Electric Railways, London, Ltd., the chairman said that during the past year there had been a remarkable growth in the business done by the various companies included in the underground system, but that this growth had been accompanied by increases of expenditure, due to the increased war bonuses to the staff, both on the railways and on the omnibuses, that offset the gain in gross business. The increases of wages during 1917 would affect the 1918 accounts to a still further degree, even if there were no further advances. Increases in fares during 1917 accounted for a certain portion of the larger receipts. The Underground now controls most of the passenger service in London. It carried approximately 900,000,000 passengers a year. The majority of the fares of these passengers was 2d. or under. The satisfactory result of the through running of the London electric trains to Watford was encouraging as an indication of what the company hoped to achieve when the program of improvements up for consideration in 1914 could be carried through to completion. The chairman also said that London was grateful to the companies, for without the organization the people would have been stranded and immobile in the present crisis.

Though women drive trams in many provincial towns in Great Britain, they have so far been forbidden to do so in London. It now appears that the ban on women drivers is to be removed. According to a report of a conference of the tramways committee of the Board of Trade James Devonshire stated that it was probable that women would be licensed as tramcar drivers shortly in the metropolitan area, but that the police would take no responsibility with regard to trade union difficulties.

NEW FARES FOR NOTTINGHAM

The new scale of fares on the Nottingham Corporation tramcars has been put into effect, notwithstanding protests from various quarters. The raising of prices has been forced on the committee by the increase in wages. Briefly it may be said that all the odd halfpenny charges are raised to the level penny, that the journeys are reduced to something like what they were in the early days after the system was electrified, and that overlapping stages have been abolished. The transfer tickets were done away with some time ago, but this is the first general advance in prices that has been made.

FINANCIAL READJUSTMENT PROPOSED

The committee appointed in July, 1917, by the holders of the debentures of the London United Tramways states in an interim report that it has made considerable progress with the representatives of the shareholders in agreeing on a scheme for the readjustment of the capital. The arrangements proposed are, however, dependent upon the passing into law of a bill now before Parliament, and until this is assured it is not possible to submit any definite proposals for the consideration of debenture holders. The bill in question provides, among other things, for an extension of the periods of the various franchises under which the tramways are operated, and also permits of some increase in the fares. The tramway system urgently requires a large expenditure on renewals and repairs.

Subject to the provision of the bill, the committee has agreed to recommend that nearly £250,000, and other funds accumulated in the receivership should be applied to the habilitation of the physical system. It has also agreed to the conversion of part of the existing debenture stock into preference shares so that, if necessary, part of the earnings otherwise applicable to debenture interest may for a period be diverted to maintenance. A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Boston Relief Prospects

Terms of New Measure Still Being Considered, But No Wide Differences Have Developed

Prospects appear good for the passage at this session of the Massachusetts Legislature of an act to provide increased revenue for the Boston Elevated Railway. The exact terms of the measure to be presented soon for discussion on the floor of the House are still under consideration in the committee on ways and means, which recently concluded public hearings upon the bill (House 1442) reported by the committees on metropolitan affairs and street railways, sitting jointly.

COMPANY FAVORS PUBLIC CONTROL

M. C. Brush, president of the company, recently informed the ways and means committee that under present conditions public control along the general lines of the bill appeared likely to lead to favorable results. He said that the most important point to realize was that the public needed high-class transportation service, developed according to its growing requirements. In general, the company supported the idea of public control, with guaranteed dividends and fares rising or falling as required to meet the full cost of the service. The management felt that the company had been too liberal in accepting the burden of subways developed and carried during the last twenty years.

On May 1 Governor McCall sent a letter to the committee stating various objections held by him to the bill as it stood at that time. The Governor's principal objection was that the contractual relations between the company and the State should not be made permanent. He also urged that the State should not give away, as a contract right, any part of its power to regulate the company, should it revert to private management, and that the State should not abandon its power to take the property by right of eminent domain. The Governor also favored the control of the company by unpaid trustees, believing that a higher grade of ability can be secured for this service in such case.

HOW THE COMMISSION FEELS

At the final hearings Chairman Macleod of the Massachusetts Public Service Commission offered several criticisms of the bill. He pointed out that the State had overreached itself in driving too hard a bargain with the company and said that it was out of the question to maintain a 5-cent fare and relieve the taxpayer from any contributions whatever to meet the cost of transportation facilities. The chairman objected to that part of the bill requiring the State to turn back the property in better condition than when it was received in the event of private control being restored at the end of the ten-year period.

SUBWAY PURCHASE FAVORED

The Public Service Commission was still of the opinion that the purchase of the Cambridge subway by the State would be advantageous to both the company and the public. It also believed that there was no sound justification in the bill for requiring dividends of 6 per cent to be paid on the common stock at the end of four years, contending that if, as the result of present conditions, common stock could be issued at par on a 5½ per cent basis, it was better that temporary needs should be financed by the issue of preferred stock at a somewhat higher rate than that the car riders should be compelled to pay an excessive rate indefinitely on all the stock now outstanding.

Contempt Case Dismissed

At the conclusion of arguments recently in the Superior Court in Seattle, Wash., Judge John S. Jurey dismissed the contempt proceedings instituted against the Puget Sound Traction, Light & Power Company by Hugh M. Caldwell, corporation counsel of the city. The citation ordered the company to show cause why it should not be adjudged in contempt as a result of an advertisement published in a morning paper of April 15 bearing on the city's suit to collect $60,917, as the company's proportion of the construction cost of the Fremont Avenue bridge, and $666 monthly for maintenance.

Mr. Caldwell argued that the appearance of the advertisement on the morning the case was set for trial tended to prejudice the city's case with the court or jury. In dismissing the action, Judge Jurey ruled that although the advertisement referred to the case in question, it was self-serving on the face of it, and could not seriously be taken as tending to influence the court.

Attorney Howe, for the company, declared the advertisement was not intended to prejudice a jury.

The company obtained a continuance of the trial until May 6, pending a decision of the Supreme Court in an alleged similar case from Tacoma. Mr. Caldwell obtained a writ of mandate from the Supreme Court ordering Judge Jurey to show cause on April 26 why the case should not immediately go to trial.

Arbitration for Cleveland

Cleveland Men Accept Arbitration—Company Waives Demand for Open Shop and Women Employees

The Cleveland (Ohio) Railway and its employees on May 3 agreed to submit their wage controversy to the National Labor Board to be adjusted by arbitration. The wage scale, length of runs and conditions for Sunday, night and holiday operation are the ones that will be settled by arbitration. The company agreed to drop its demand for open shop and the employment of women, concessions on other points having been made by the men.

The old contract provided that all differences may be submitted to arbitration. The men argued that "may" in the contract could not be construed as "must" and on that ground they refused to arbitrate the company's demand for an open shop and the employment of women as conductors. J. J. Stanley, president of the company, made these demands in order to render better service. The men say that motormen and conductors who have left the service will return if the wages are made sufficiently attractive.

Mayor Harry L. Davis issued a statement asking that the company and its employees get together. He advanced patriotic reasons for avoiding a strike at this time.

DEVELOPMENTS ON MAY 2

William B. Fitzgerald, vice-president of the Amalgamated Association, conferred with President Stanley on May 2 and a number of conditions of the proposed contract were discussed. Neither the matter of wages nor the company's demands noted previously had been reached late in the afternoon.

Mr. Faulkner, representing the federal labor department, offered his services. They were accepted by the union. President Stanley, however, preferred that the matters in dispute should go to arbitration. It was understood that he then insisted on the open shop and the employment of women. As has been stated before, Mr. Stanley held that all matters in controversy were subject to arbitration under the old contract, while the men contended that Mr. Stanley's demands were not intended for arbitration under the terms of the wage agreement.

On April 29 the trainmen voted to strike unless their demand for increased wages and improved conditions, as heretofore outlined in the ELECTRIC RAILWAY JOURNAL, was granted. No time was set for this action. The contract under which the men have been working expired on May 1.

New Chicago Proposal Advanced

Counsel for the Aldermanic Committee Suggests Plan Which Embodies Trusteeship Idea for Surface and Elevated Lines

Chicago Aldermen, who have been considering a new franchise for the local traction companies, had a chance to consider "immediate municipal ownership" in a new form at a meeting of their sub-committee on April 29. This latest development in the ordinance negotiations was brought about by the submission of a "trustee plan of public ownership" by Walter L. Fisher, special counsel for the committee.

TRUSTEESHIP PLAN PROPOSED

Mr. Fisher stated that his plan was based on the same general principles as the Boston trusteeship plan and the general railroad policy recently put forward by Theodore P. Shonts, president of the Interborough Rapid Transit Company. He contended, however, that both these plans, by having the taxpayer carry part of the burden of transportation, involve a principle "of more than doubtful expediency."

The new plan requires that all the surface and elevated properties be turned over on agreed terms to a new corporation, to be operated solely for the public benefit without profit and subject only to payment of the actual cost of financing. The new corporation would consist of a board of trustees to be composed of public-spirited Chicago men, having perhaps some official of the city and a representative of the employees as directors ex officio. There would be provision also for an executive committee to give full attention to the properties and to be paid appropriate salaries.

Mr. Fisher would have his new corporation take over the properties subject to the outstanding bonds and other securities to an amount not exceeding the agreed purchase price. Any money needed for extensions and improvements would be raised by the sale of bonds at low interest rates. Present security holders would receive some new form of security and a rate of return to be agreed upon.

The rate of fare would start with 5 cents and possibly a 1-cent charge for transfers between surface and rapid transit lines. There would be provision for increasing or decreasing the fares and transfer charges, so that service might be furnished at cost. Mr. Fisher also expressed the opinion that it would seem to be sound policy not to increase rates when this could be avoided by eliminating the cost of street paving and cleaning.

The Fisher plan is admittedly based on the essentials of the contract plan of municipal ownership advocated by Mayor Dunne in 1905, but its author says it avoids all the objections urged against municipal ownership.

The Aldermen did not take kindly to the idea. They could not see how the present security holders might be persuaded to turn over $220,000,000 worth of property to a board of disinterested citizens with no guaranty of a return other than that which might be found in the revenues from operation. They were afraid the proposed board of trustees might develop into a political coterie. The proposal will be discussed at further sessions.

WHAT THE COMPANIES PROPOSE

Speaking for the Chicago Surface Lines and the Chicago Elevated Railways, President Busby of the former company on April 25 outlined the terms upon which they will go into the plan for unification of all traction lines and the construction of subways. This statement was presented at a meeting of the sub-committee of the City Council which has been considering the essentials of a new ordinance.

The companies propose a thirty-year franchise, the city to have the right at any time to take over the properties on payment of the established purchase price, or to take them at the end of the franchise subject to the outstanding indebtedness. If the city does not exercise this option at the expiration of thirty years, it is proposed that the company shall have the right to continue operations under the ordinance.

Mr. Busby also suggested the establishment of a "traction fund" into which the company should pay annually a specified amount for amortizing discounts and expenses in connection with the issuance of bonds; also a sum equal to 5 per cent on the cost of city owned subways and equipment; also all "surplus receipts." These "surplus receipts" are to consist of the amount remaining after the following deductions: operating expenses, including payments for amortization and for the "traction fund"; actual interest on bonds within city purchase value; 5 per cent on the excess, if any, of purchase value over the par amount of such bonds; actual sinking fund payments; subway rentals; and an amount equal to 1.75 per cent of the average purchase value for the year, as a minimum allowance to the company in addition to the interest mentioned above, and a per centage to be determined from time to time by the local commission to make up a fair and just return to the company.

FIVE-CENT FARE WITH TWO-CENT TRANSFER

The proposal is made that the rate of fare be 5 cents, with a charge of 2 cents for each transfer between a surface and a rapid transit line, and without charge for any other kind of transfers. As a safeguard against having the receipts go below the point where the above payments can be made, it is suggested that the city agree to join with the company in applying to the local commission for an increase in fares when this is necessary.

For the purpose of carrying out the plan at a minimum cost to the traveling public, it is suggested that the service be relieved of all non-transportation charges such as paving, maintaining paving, and the sprinkling and cleaning of streets. The city is also asked to provide for the carriage of express and light freight under conditions which will not interfere with passenger transportation.

Counsel for the committee announced that he did not agree with some of the proposals of the companies, his principal objection being against an interest return in excess of the actual cost of financing. Mr. Busby explained that the companies' proposal on this point was different in form but not in substance from that of the Traction & Subway Commission, which recommended a varying rate of return. The sub-committee will hold other sessions to discuss these differences.

Seattle Wage Offer Rejected

Trainmen Vote Down Raise of Five Cents an Hour, Accepted by Committee as Satisfactory.

The offer of the Puget Sound Traction, Light & Power Company, Seattle, Wash., to raise the pay of its trainmen, and to enter into a new agreement, has been voted down by the union of trainmen, by a vote of 756 against 148.

The proposed agreement provided for an increase of pay for trainmen of 5 cents an hour, and for $15 a month extra for other crafts paid monthly, the agreement to take effect on April 15, 1918, and to remain in force until Aug. 1, 1919, or until sixty days after the conclusion of peace with Germany, if the war ends before that time. The present agreement between the company and the men expires on July 31.

One of the main reasons for the men's refusal to accept the new agreement was that recognition was not given to their demand for an eight-hour day, with time and a half pay for overtime work.

A. W. Leonard, president of the company, stated that the new wage scale had been previously agreed upon by representatives of the employees, and the agreement had been posted in the carhouses and other company buildings in Seattle and in Tacoma. He said that both the company and the committee representing the employees felt that the increase offered was substantial and that it would have the effect of retaining the employees in the service. During the full period of the proposed agreement the men would have drawn $295,000 additional. The present wage scale is from 33 cents to 40 cents an hour. The proposed new scale ranged from 38 cents to 45 cents an hour. Under the new scale the average monthly wage of trainmen would have been increased from $103 to $118, and the new average for men drawing the highest hourly pay would have been increased from $115 to $130 per month. Since the declaration of the war 3319 men have been employed in the various departments of this company, and 3513 have left the service.

Montreal Commission Named

Body Provided for in New Tramway Franchise Will First Take Up Fare Question

Judge Saint-Cyr of the Court of Sessions, Prof. L. A. Herdt of McGill University, engineer, and John S. Archibald, architect, have been appointed by the Lieutenant-Governor-in-Council to be the three members of the permanent tramways commission provided for in the new franchise accorded to the Montreal Tramways and ratified at the last session of the Quebec Legislature.

The first duty of the new tramways commission, will be to fix the rate of fares. This must be done within sixty days from the date of appointment. Various clauses of the new franchise will be the real deciding factor in determining the fares, but expectation has been general that there will be an increase on the present tariffs. For example, there is a fund provided for lowering the fares. When the amount of this fund goes down, the fares will go up, and vice versa. It will be the tramways commission which will decide.

The three members of the commission are appointed for ten-year terms, but can be removed by the Lieutenant-Governor-in-Council for cause, and either the company or city of Montreal, by means of quo warranto proceedings, can demand the removal of any commissioner for fraud, corruption and refusal to fulfill in good faith his duty. The commission or its employees are authorized to look over the books of the tramways company, but to examine, verify or audit the affairs of the company must employ a chartered accountant. Each year the commission must make a report to the city on the state of the railway system.

A brief review of the provisions of the contract for the thirty-five year franchise under which the commission was appointed was published in the ELECTRIC RAILWAY JOURNAL for Feb. 9 page 288.

Arbitration for Salt Lake City

After arbitration had been decided upon as a means of settling the differences between the employees and the Utah Light & Traction Company, Salt Lake City, Utah, questions arose as to what to arbitrate and what not to arbitrate. Officials of the company contended that it was their understanding that the entire question of wages and one-man operation was to be submitted. The employees announced that they would not arbitrate the one-man operation question. Then officials of the company announced that they would eliminate the one-man car question from the matters to go before the arbitration board. A statement made public by H F. Dicke, general manager of the company, was concluded as follows:

"If the men do not want to arbitrate one-man operation the company will not insist upon it. We will proceed with the arbitration of wages and such other minor matters as have been discussed, and if the settlement involves any increase in wages the company may find it necessary to ask the Public Utilities Commission for permission to inaugurate this method."

Council May Take Up Wages

At a conference with representatives of the trainmen of the Toledo Railways & Light Company and Federal Mediator A. L. Faulkner on April 24, Mayor Cornell Schreiber of Toledo, Ohio, agreed that the question of an increase in the rate of fare to meet an advance in wages of motormen and conductors may be submitted to the Council for consideration. This plan was approved by officers of the company.

The Mayor still expressed his objection to any increase. He said the average wage received by men who had been with the company a year or more was higher than he had expected. City accountants figured this from the books of the company to be $90.30 per month. The Mayor expressed the belief that the men were not entitled to an increase of 10 cents an hour at this time.

John Quinlivan, business agent of the Central Labor Union, declared that the wage estimate of $90.30 took in overtime and that the men should not be expected to work from thirteen to eighteen hours in order to make a fair average wage.

Confer on Franchise Relief

Officials of the Rhode Island Company on April 30 met with members of the city government of Providence, R. I., to discuss measures for financial relief, which were recommended in the report of the special investigation commission but which were not made compulsory by the General Assembly.

The report recommended that the company be relieved from the payment of the present heavy franchise tax in Providence. It also recommended that the company be not required to pay for the paving between its rails unless the use of the streets by the company was the actual cause of the damage. Another recommendation was that the city relinquish control over the company in favor of the Public Utilities Commission. These matters all came before the General Assembly, but it was so late in the session before the decision was reached to adopt the zone system that these subjects were left to die in committee.

It is understood that city officials do not favor Providence making concessions if the other municipalities through which the company operates collect their franchise taxes and exact paving obligations. It is also said that the representatives of the city are not in favor of the complete elimination of the franchise tax, although they are inclined to consider favorably a substantial reduction in the tax. There is positive opposition among city officials to granting the request that the city relinquish control over the company within the city limits. It is expected that it will take several weeks before a conclusion is reached.

For Army Technicians

Government Providing Courses—7500 National Army Men Now in Schools —90,000 to Be Trained This Year

Under plans drafted by the committee on education and special training, appointed by Secretary Baker last February, twenty-five schools are now under contract to give the intensive training needed for various technical and skilled work by the army, such as motor truck drivers, airplane mechanics, carpenters and blacksmiths. There are now 7500 National Army men under such instruction, and the number of schools will be increased until 30,000 men can be handled at one time. The courses are of eight weeks' duration so that it is expected that 90,000 men will be trained this year. The final lot of 30,000 men will go to the schools on Sept. 1.

While the men at the schools are National Army men and come through the draft boards they volunteer for this special training and go to the schools directly from their homes. They are not drawn from the cantonments. To insure proper assignment, a plan is now being worked out whereby all men will be sent first to a number of reservoir schools and then sent to study the work for which they are best qualified.

News Notes

Increase in Wages in Everett.—The Puget Sound International Railway & Power Company, Everett, Wash., has announced an increase of 3 cents an hour, or 25 cents a day, in the wages of its trainmen.

Wage Increase of Two Cents an Hour.—The New Jersey & Pennsylvania Traction Corporation, Trenton, N. J., has granted an increase of 2 cents an hour to the motormen and conductors on all the divisions.

Military Service Folder.—A folder has been printed giving the names and assignments, as of Jan. 1, 1918, of the executives and employees of the H. M. Byllesby & Company organization in military and naval service.

Strike on Kansas Line.—Conductors and motormen of the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., went on strike at 4.30 o'clock on April 21. The men demand recognition of their union, but are said to be satisfied with wage conditions.

Motorman Buys a $5,000 Bond.—Charles Owings, a motorman in the employ of the United Railways & Electric Company, Baltimore, Md., has bought a $5,000 Liberty Bond. Owings has been connected with the railways in Baltimore for more than twenty-five years.

Tightening of Control Urged.—A charter amendment providing stricter control of public utilities in Portland, Ore., has been submitted to the City Council by a committee from eight civic clubs which asks that the amendment be put on the ballot at the coming primary election. C. L. Rauch is chairman of the committee, which has investigated the 6-cent fare decision.

Increase in Wages in Los Angeles.—The wages of the trainmen on the entire Pacific Electric Railway system, Los Angeles, Cal., were increased on April 16. Those who work on the interurban lines received an advance of 3 cents an hour and those on the local lines 2 cents. Trainmen on the freight and work trains received a proportionate increase. The advance was made voluntarily by the company.

Trained Men for Washington.—Practically all of the departments in Washington need technically trained men. One of those from whom this paper has received an application this week is the Bureau of Mines Experiment Station, which has special need of bacteriologists, chemical engineers, electrical engineers, machinists, and steam fitters. Blanks will be sent to anyone who wishes to file an application.

Trenton Indictments Quashed.—The Supreme Court of New Jersey has quashed the indictments found against officers and directors of the Trenton & Mercer County Traction Corporation. The city sought to indict the officials for erecting poles and stringing wires on certain streets without proper authority from the municipality. It was a phase of the fight of the city against the company, based upon alleged inadequate service.

Women May Be Used in Camden.—The Public Service Railway, Newark, N. J., is seeking applications from women for possible employment on the cars of its Camden lines. Male employees on the division have been asked to recommend women whose husbands or brothers have joined the colors. These will be given preference in filling the places. Up to May no women had been used in the train service even experimentally.

Mayor Signs Subway Relief Bill.—The Lockwood bill, authorizing the Public Service Commission and the Board of Estimate of New York City to relieve the contractors building the new subways from the burdens placed upon them by the high costs of labor and materials, and to do whatever is best to complete the work as speedily as possible, was approved on April 30 by Mayor Hylan. It is expected the Governor will sign the bill.

Philadelphia Hearing Continued.—The hearing being held in regard to the final ratification of the lease agreement for the operation of the city high-speed lines by the Philadelphia (Pa.) Rapid Transit Company, was resumed before the Public Service Commission on April 25. Director of City Transit Twining said that the city in the 1907 contract with the company confirmed all the rights and franchises of the company and that the 1907 contract must be recognized in the present negotiations.

Wage Advance in Philadelphia.—The co-operative committee of employees of the Philadelphia (Pa.) Rapid Transit Company at a meeting held on April 27 determined in company with the management to advance the rate of pay of all motormen and conductors 2 cents an hour so that effective from May 1 the new scale will be as follows: New men, 33 cents; after one year's service, 34 cents; after two years' service, 35 cents; after three years' service, 36 cents; after four years' service, 37 cents; after five years' service, 38 cents.

Arbitrators Recommend Increase of Wages.—The board of arbitration which heard the claims of the employees of the Hamilton (Ont.) Street Railway for an increase in wages has forwarded its report to the Minister of Labor. The men asked for an increase from 24, 26 and 30 cents an hour for first, second and third-year men respectively to 36, 38 and 42 cents an hour—or an increase of 12 cents all around above the present wage scale. The arbitrators have recommended a basis of 30, 34 and 37 cents. The finding of the board was unanimous. The company has also allowed by agreement concessions in the way of overtime pay.

Gross Earnings Tax Argued.—Arguments on the demurrer entered by the Puget Sound Traction, Light and Power Company, Seattle, Wash., in the city's suit to collect $72,443, or 2 per cent of the gross earnings of the company for 1917, were recently heard before Judge King Dykeman in the Superior Court, and the case taken under advisement. Judge Dykeman announced that he would decide the present issue along with the city's application for a writ of mandate compelling the company to do its proportion of paving on West McGraw Street from Queen Anne Avenue to Queen Anne Boulevard, which the court has had under advisement for six months.

Praise for British Columbia Electric Railway.—The *Daily Province* of Vancouver, B. C., for March 26 contained a full-page illustrated historical review of the British Columbia Electric Railway properties. In appreciation of the work of the company the paper said: "The history of any great undertaking such as the British Columbia Electric Railway is always tinged with romance. It required great faith in British Columbia for these 10,000 shareholders and directors to send their $50,000,000 6000 miles away into public utility properties. In a sense this was real empire building, for British Columbia electric development has made Vancouver and Victoria."

Only One Way Out.—Following a conference of electric railway employees of Rochester, Syracuse and Utica in his office recently to discuss a demand for an increase of 9 cents an hour in wages, James F. Hamilton, vice-president of the New York State Railways, gave out a statement in which he said the men had put forth the demand for the increase on the ground that the cost of living made higher wages imperative, and that the company recognized the justice of the men's demands, but that it could not grant any increase until the revenues of the company were increased. Mr. Hamilton promised that efforts would be made to convince city administrations that the only source of relief for the company and the men was in increased fares.

Joint-User Rights Determined.—Justice Cropsey in the Supreme Court in Brooklyn, N. Y., has decided that the Brooklyn & North River Railroad cannot string its own power-carrying wires on the poles and fixtures of the Manhattan Bridge Three-Cent Line on the Flatbush Avenue extension. Some time after the Three-Cent line began to operate on the Manhattan Bridge the Brooklyn & North River Company obtained franchises to operate on the Manhattan Bridge. The new occupant of the bridge had to buy its power from the Three-Cent line. The rate was considered too high and as a result an arbitration board fixed a rate which was still somewhat higher than other rates. The Brooklyn & North River Company protested to the court against this rate, but Justice Cropsey held that even though it cost the North River company more to buy power from the Three-Cent line than from other concerns, it was not entitled to string its own wires or power-carrying equipment over the Flatbush Avenue extension in Brooklyn.

Programs of Meetings

New York Electric Railway Association

The annual meeting of the New York Electric Railway Association will be held at Lake Champlain on June 22. The day will be devoted to a business meeting. In the evening there will be an informal dinner, at which two or three prominent men will speak. A detailed program of the meeting will be published later.

Iowa Electric Railway Association

The annual convention of the Iowa Electric Railway Association will be held in Des Moines, Ia., on May 23. Because of the additional burdens which have been placed on the members of the association, due to the war, the directors have decided that it will be best not to carry out the usual program this spring. Among the subjects which will be discussed at the meeting are questions of financing and legislative matters. A convention of the Iowa section of the National Electric Light Association will be held in Des Moines on May 22 and 23. This will permit members of the railway association who are interested in lighting to attend both conventions.

Financial and Corporate

War Finance Boards Named

President Selects Men to Supervise Financing—Names New Capital Issues Committee

The first step in the organization of the $500,000,000 War Finance Corporation has been taken. On April 30 President Wilson sent to the Senate the names of the four directors who, with Secretary McAdoo as ex-officio chairman, will conduct the work of aiding the financing of essential enterprises. The nominees for two-year terms are William P. G. Harding, of Alabama, and Allen B. Forbes, of New York; and for four-year terms, Eugene Meyer, Jr., of New York, and Angus W. McLean, of North Carolina.

Mr. Forbes, who is senior member of the utility investment banking house of Harris, Forbes & Company, New York and Chicago, has declined the nomination, owing to his interest in past flotations by a large number of utilities which may make application for future loans. No successor has been appointed.

Mr. Harding is at the present time a governor of the Federal Reserve Board. Mr. Meyer, a New York banker, is a member of the national war savings committee and is connected with the War Industries Board. His business activities cover a wide range in connection with the marketing of railroad, mining and industrial securities. Mr. McLean has had a successful career as lawyer, banker, manufacturer and farmer.

The new capital issues committee, as nominated by the President, will consist of the following seven members: Charles S. Hamlin, of Massachusetts; John Skelton Williams, of Virginia; Frederic A. Delano, of Illinois; James B. Brown, of Kentucky; John S. Drum, of California; Henry C. Flower, of Missouri, and Frederick H. Goff, of Ohio. This committee, created under the war finance corporation act, will replace the present voluntary capital issues committee of the Federal Reserve Board.

Mr. Williams is Comptroller of the Currency, a member of the Federal Reserve Board and a member of its present capital issues committee. Mr. Hamlin and Mr. Delano are also members of the Federal Reserve Board and the above-mentioned committee. Paul M. Warburg, now a member of this committee, was not appointed to the successor body, in order that he as vice-governor might be free to manage the affairs of the Federal Reserve Board during Governor Harding's work as a director of the finance corporation.

Mr. Brown is a prominent banker and business man of Louisville; he is a director of the Louisville Gas & Electric Company and has helped to organize many industrial and utility companies. Mr. Drum is a prominent banker of San Francisco and a director of the San Francisco-Oakland Terminal Railways, the Pacific Gas & Electric Company and other utilities. Mr. Goff, a Cleveland banker, has had extensive experience in banking and manufacturing. Mr. Flower is a leading banker of Kansas City. He was for many years a director of the Metropolitan Street Railway and the Kansas City Railway & Light Company. Both Mr. Goff and Mr. Flower have been members of the advisory committee of the present capital issues committee.

The existing committee, since its organization three and one-half months ago, has developed an extensive system of examining the merits of proposed security issues, through the co-operation of sub-committees in each Federal Reserve District, composed of bankers and business men acting as volunteers. This machinery probably will be used by the new organization. The committee in the last three and one-half months has approved new issues aggregating $103,000,000. It has refunded obligations amounting to $238,000,000, and it has disapproved $44,000,000 of proposed issues.

Decrease on Boston & Maine Properties

The annual report of the Boston & Maine Railroad for the year ended Dec. 31, 1917, covers the operations of the two owned electric railway branches, the Portsmouth (N. H.) Electric Railway and the Concord & Manchester Electric Branch, Manchester, N. H., and the one leased line, the Conway (Mass.) Electric Street Railway.

The combined operating revenues of the first two lines for the last calendar year were $264,343, an increase of $6,462 over the returns of the preceding year. This gain was more than offset, however, by the increase of $40,002 in operating expenses, which totaled $217,313. The main rise in operating expenses occurred in connection with repair of motor equipment of cars, maintenance of way, motormen and conductors, production of train power and legal expenses. The net revenue for 1917 was $47,030, a heavy reduction from $80,570 for the year before. The number of passengers carried increased from 5,073,785 to 5,210,793, and the number of revenue car-miles run decreased from 1,058,086 to 1,043,149.

The Conway Electric Street Railway made a poorer showing in 1917 than in the year before. The operating revenue decreased from $10,882 to $9,258, and the expenses increased from $8,886 to $8,924. Tax accruals more than doubled, and the deficit for the year amounted to $7,253 as compared to $5,186 in 1916.

Spokane Merger Progresses

New Company Will Probably Be Formed to Take Over Railway Property of Two Washington Lines

Progress in the plan for the merger of the railway lines of the Washington Water Power Company and the Spokane Traction Company was reported on April 26 by Attorney Frank T. Post, general counsel for the Water Power Company, at the joint meeting of the Washington and the Idaho Public Service Commissions. The merger has been under consideration for two years. Mr. Post said it was nearer a successful conclusion now than at any previous time, and informed Mayor C. M. Fassett that he could secure confidential information on the progress of the negotiations if he so desired. Mr. Post said:

"The plan is to form a new company to take over both properties. We will need the help of the city in this matter, as many changes are to be made. For this reason I would suggest that the Public Service Commissions of Washington and Idaho value the power and railway systems of the Washington Water Power Company separately, leaving the railway system until later. The changes in the street railway will materially effect its valuation."

Chairman Blaine of the Public Service Commission of Washington was not sure as to what could be done toward delaying the railway valuations. He said that a great many communities were interested in the light and power valuations and that it would be necessary to complete this at as early a date as possible.

The discussion as to the railway property of the Washington Water Power Company arose over the request of J. M. Geraghty, corporation counsel, for leave to introduce the franchises of the company in evidence. He said he was prepared to show that some of the company's chief franchises had expired and that others would expire in a year. He urged that the absence of a grant from the city seriously impaired the value of the property and that this situation should be borne in mind by the Public Service Commissions in fixing the value of the railway.

Title Taken to Chicago Line

The Chicago & West Towns Railway, Chicago, Ill., took title to the property of the Suburban Railroad, by Emil G. Schmidt, receiver, under date of Feb. 26, 1918, for $85,970 and $1. The company subsequently made a mortgage in favor of the Harris Trust & Savings Bank as trustee on its property in the western suburbs of Chicago to secure a bond issue of $1,000,000 as of March 1, 1918, and payable Sept. 1, 1920. Of the total amount $750,000 has been issued for the purpose of retiring indebtedness, while the remaining $250,000 is to be used for purchases and extensions.

Partial Abandonment

Interurban Would Discontinue in Four Towns and Abandon Part of Local Service in Another

A petition was filed with the Public Service Commission of the Second District of New York on April 19 by George Bullock, as receiver of the Buffalo & Lake Erie Traction Company, for leave to abandon that portion of the company's railroad from the junction of Main and Temple Streets, Fredonia, to the Pennsylvania State Line. Commissioner Barhite held a hearing on the petition in Buffalo on April 29.

The portion of the road proposed to be abandoned is about 28 miles long and runs through the towns of Pomfret, Portland, Westfield and Ripley. The road operates through Brockton, Westfield, Forsyth and several other villages.

The petition alleges that the earnings from the line proposed to be abandoned are not sufficient to meet operating expenses and that the earnings from that part of the road still proposed to be operated are not sufficient to yield a fair return and take care of the deficit in operating revenues on the non-paying portion. It is also alleged that demands have been made upon the petitioner to pay for paving streets and highways along the line proposed to be abandoned, the expense of which will equal, if not exceed, the total gross operating revenues of the line.

Commissioner Barhite on April 29 postponed hearing the petition for approval of the proposed abandonment of portions of the Dunkirk Street Railway, operated under lease by the Buffalo & Lake Erie Traction Company. The last hearing on the original petition for abandonment in Dunkirk was held on Nov. 26.

New Mortgage Proposed for B. R. T.

A special meeting of the stockholders of the Brooklyn (N. Y.) Rapid Transit Company will be held on May 23 to discuss the advisability of executing a new mortgage to replace the company's first refunding gold mortgage of July 1, 1902, which authorized an issue of bonds to the amount of $150,000,000.

The call for the meeting explains that the present mortgage served a useful purpose as long as interest rates were low, but because the maximum rate allowed on the bonds was fixed at 4 per cent, it had been impossible to sell any of them except at a considerable discount. No bonds have been sold since February, 1909.

The notice to the stockholders refers to the necessity of providing for the $57,735,000 of secured 5 per cent gold notes which mature on July 1. Whether it is desirable to have available additional bonds for collateral or whether the notes should be renewed is also to be discussed.

The directors hope to present a plan for taking care of the gold notes before maturity. These notes were issued for subway extensions, etc., under contracts with the city. Of the bonds authorized to be issued under the new mortgage, $87,040,000 will be reserved to take up the bonds heretofore issued. This new mortgage will be dated June 1, 1918, and will mature June 1, 1968. Since the last sale of bonds in 1909 the company has acquired additional properties so that the collateral security on deposit is stocks, bonds, and certificates of indebtedness amounting to more than $84,400,000. There are also pledged, subject to the lien of the company's $7,000,000 mortgage of Oct. 1, 1895, securities and stocks of a par value of $11,605,000, making a total of about $96,000,000 of collateral. Against this is, the company says, only a charge of $3,459,000 of the refunding 4 per cent bonds outstanding.

Accident Cuts West India Net

The total receipts of the West India Electric Company, Ltd., Kingston, Jamaica, for the calendar year 1917 were $287,210, as compared to $286,321 for 1916, an increase of $889. The railway receipts totaled $196,409, a gain of 80 per cent. The total operating expenses, however, increased from $144,064 to $159,189, with resulting net profits of $128,020 in 1917 as compared to $142,257 in 1916. The large increase in operating expenses, which was responsible for the reduction of net profits, was entirely due to accident claims arising from a serious collision.

After the payment of fixed charges of $49,909, there remained a net income of $78,111 or 9.76 per cent on the capital stock. In each preceding year since 1910 the percentage of net income to capital had been more than 10 per cent, with the exception of 1912, when it was 9.37 per cent. Four quarterly dividends amounting to $40,000 were paid in 1917.

The property and plant account in 1917 showed an increase of $7,142. The number of passengers carried in 1917 was 4,825,737, an increase of 12,983 or 2.7 per cent. The operating ratio was 55.42 per cent in 1917 as compared to 50.31 per cent in 1916.

Remarkable Progress in Shanghai

The street car service in the International Settlement of Shanghai was inaugurated ten years ago under British management. The remarkable increase in receipts—despite the fact that the tracks have not been extended, and despite the sweeping reduction in receipts per passenger from $0.0193 gold in 1909 to $0.0086 gold in 1917—is shown by the following summary for 1909 and 1917:

	1909	1917
Number of cars	65	167
Number of pasengers	11,750,000	73,500,000
Receipts	$226,970	$631,953
Receipts per passenger	$0.0193	$0.0086
Royalty to Municipal Council	$11,048	$31,471

The fares in Mexican currency are $0.03 for first class and $0.015 for third class for each section, the sections averaging about seven-tenths of a mile in length.

Effort to Reclaim Road

Section of Taunton & Pawtucket Street Railway, Sold for Junk, May Be Saved

Plans are under consideration at Attleboro, Mass., for the purchase by the city of the section of the Taunton & Pawtucket Street Railway from Briggs Corner to Attleboro, and for its operation for the benefit of residents of the district served by this line.

The property as a whole was sold at auction in November, 1917, to the Swift-McNutt Company, Boston, and the road is now being dismantled with the exception of the section above mentioned. It consists of about 17.5 miles of single track, and the average gross revenue has been about $50,000 a year.

The original property was the Bristol County Street Railway, organized about eighteen years ago. This went into the hands of a receiver in 1905, and friendly interests reorganized it soon after as the Taunton & Pawtucket Street Railway. Bond interest was paid up to 1909, but since then the property has been struggling to keep out of the hands of a receiver, being run under the consent of the bondholders.

Following the sale last fall to the Swift-McNutt Company, an application was made to the Federal Court to approve the taking over of the road by Swift-McNutt. This was issued a few weeks ago. Operation of the road ceased in March. The proposed purchase of the branch line by the city of Attleboro involves a plan for the assessment of 5 per cent annually on abutters until half the purchase price is paid. The wrecking firm now owning the property will await the settlement of this matter before dismantling the Briggs Corner-Attleboro section.

Financial News Notes

Immediate Payment Not Required.—Judge Dodge of the United States District Court at Boston has denied the application of the State Treasurer requiring the immediate payment of the 1917 franchise tax of the Bay State Street Railway, Boston, Mass., amounting to $81,467 with 12 per cent interest.

Dissolution Proceedings Ended.—Justice Irving G. Hubbs in the Fifth Judicial District of the New York State Supreme Court has signed an order winding up the dissolution proceedings of the Empire United Railways, Inc., Syracuse, N. Y., the property of which was sold under foreclosure some months ago.

Usual Philadelphia Company Divided.—The Philadelphia Company, Pittsburgh, Pa., which controls the Pittsburgh Railways and other utility properties, on April 29 declared the usual quarterly dividend of 1½ per cent on the common stock, payable on May 15 to stockholders of record of May 2. The directors acted at a postponed meeting, as the usual time for voting on the dividend was a fortnight ago.

Chicago & West Towns Earnings.—The gross revenues of the Chicago & West Towns Railway, Chicago, Ill., for the calendar year ended Dec. 31, 1917, amounted to $587,292. The operating expenses and taxes totaled $413,597, leaving net revenues of $173,694. Interest on bonds amounted to $33,360, and interest on bills payable and rentals to $6,438, with the result that the net income totaled $133,896.

Another Road on the Scrap Heap.—Announcement has been made that the rails, poles, wires and cars of the Denton (Tex.) Traction Company, operating 4.5 miles of road, have been sold to a junk company and the task of demolishing the system is expected to begin shortly. The Denton Traction Company began the operation of cars in the fall of 1907, but last January the management decided to discontinue the service.

Indianapolis Net Falls.—The gross earnings of the Indianapolis Traction & Terminal Company, Indianapolis, Ind., for the calendar year 1917 totaled $3,654,683, an increase of $15,725. The operating expenses, at $2,212,012, showed an increase of $146,883. The net earnings from operation, therefore, amounted to $1,442,620, a decrease of $131,159. There was expended for maintenance of track and roadway and equipment in 1917 the sum of $611,273, as compared to $605,737 in the preceding year.

Will Abandon Part of Its Line.—The Connecticut Valley Street Railway, Greenfield, Mass., has announced its intention to abandon its line between Turners Falls, Millers Falls and Montague on July 1. The company feels that it cannot be expected to maintain service on the line which shows inability to meet operating expenses alone, to say nothing of any return on the investment.

Even in Enemy Territory.—The Munich correspondent of a Zurich, Switzerland, paper, in referring recently to local conditions in Munich, said: "Not only is the inefficient housing, especially for the middle class, a calamity, but the street car fares are so high. There are increases up to 40 per cent, and a 10 pfennig trip is a thing of the past. They figure on increased receipts of at least 2,500,000 (pfennig). The new fare is in effect on April 1."

Subscriptions to New Cleveland Stock.—The Cleveland (Ohio) Railway is reported to have received subscriptions for stock to an amount sufficient to pay its debt of $1,230,000 and pay for all the extensions and other additions to the property that the company will need this year. While the stock has not all been taken by the stockholders, it is said that it is not likely that the company will offer any of the stock to the public until after the close of 1918.

Successor to Cincinnati, Dayton & Toledo Incorporated.—The Cincinnati & Dayton Traction Company, Cincinnati, Ohio, has been incorporated with capital stock of $1.250,000, by J. M. Hutton, Leo Van Lahr and others. This is to be the successor to the Cincinnati, Dayton & Toledo Traction Company, the property of which was sold under foreclosure recently to the representatives of the bondholders. An outline of the terms of the reorganization was published in the ELECTRIC RAILWAY JOURNAL for April 13, page 723.

Interest Payment Deferred.—F. D. Carpenter, president of the Western Ohio Railway, Lima, Ohio, which operates 112 miles of road, notified holders of the company's first mortgage 5 per cent bonds that it would be unable to pay the interest on these bonds due on May 1 and that it would defer payment until Sept. 1. Holders are requested to forward coupons for collection at that time. It is explained that the severe operating conditions of the past winter with the resultant interruptions to service and the increase in the cost of operation made it impossible for the company to accumulate its usual monthly reserve for the payment of interest.

Temporary Extension of Commonwealth Bonds.—The Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., had $8,081,000 of 6 per cent convertible bonds falling due on May 1. No arrangements had been made for the paying off of the bonds on the above date other than application to the War Finance Corporation for an advance to meet the retirement of the bonds. Anton G. Hodenpyl, president of the company, in a letter addressed to the holders of the bonds, asked that they withhold presentation of the bonds on the date of maturity, as it was not expected that the War Finance Corporation could take action on the matter in such a short time. Coupons were paid on May 1, and bonds will continue to draw interest up to the time they are redeemed.

Western Pacific to Operate Tidewater Southern.—The operation of the Tidewater Southern Railway, Stockton, Cal., has been taken over by the Western Pacific Railroad, which heretofore controlled the company through stock ownership. Under the new plan of operation, Byron Bearce, president; J. C. Linaberry, superintendent, and J. C. Lindsey, chief engineer, are no longer connected with the properties. The system is being operated as before, the personnel changes being chiefly in the executive department. C. M. Levey, president of the Western Pacific Railroad, is acting as head of the newly-acquired electric system, and for the present the remainder of the staff consists of C. B. Hotchkiss, auditor and treasurer, and E. L. Gamble, general manager. Mr. Gamble continues in his former position with the Northern Electric Railway.

Electric Railway Monthly Earnings

** ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$8,261	*$11,696	†$3,435	$422	†$3,857
1m., Feb., '17	22,040	21,381	659	667	†8
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO					
1m., Feb., '18	$35,396	*$26,499	$8,897	$11,319	†$2,422
1m., Feb., '17	32,361	*21,591	10,771	11,435	†664
2m., Feb., '18	76,169	*54,473	21,696	22,640	†944
2m., Feb., '17	68,798	*43,724	25,074	22,873	2,201
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.					
1m., Feb., '18	$36,294	*$28,999	$7,295	$6,534	$761
1m., Feb., '17	32,010	*19,445	12,565	6,552	6,013
12m., Feb., '18	471,213	*317,849	153,364	78,618	74,746
12m., Feb., '17	401,499	*236,151	165,348	78,451	86,897
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Feb., '18	$96,461	*$38,811	$57,650	$32,255	$25,395
1m., Feb., '17	80,987	*30,744	50,243	28,414	21,829
12m., Feb., '18	1,130,911	*436,953	693,958	366,316	327,642
12m., Feb., '17	915,378	*356,985	558,393	343,142	215,251
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., Feb., '18	$1,619,202	*$1,154,493	$464,709	$478,854	†$14,145
1m., Feb., '17	1,530,735	*925,409	605,326	430,917	174,409
12m., Feb., '18	19,894,954	*12,893,881	7,001,073	5,382,618	1,618,455
12m., Feb., '17	17,340,513	*9,696,593	7,643,920	5,076,403	2,567,517

GRAND RAPIDS (MICH.) RAILWAY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$102,091	*$76,699	$25,392	$19,270	$6,122
1m., Feb., '17	103,932	*73,700	30,232	17,392	12,840
12m., Feb., '18	1,296,559	*917,866	378,693	222,487	156,206
12m., Feb., '17	1,305,380	*847,091	458,289	193,341	264,948
HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.					
1m., Feb., '18	$26,644	*$19,126	$7,518	$5,075	$2,443
1m., Feb., '17	25,249	*17,635	7,614	5,183	2,431
12m., Feb., '18	345,198	*219,814	125,384	61,042	64,342
12m., Feb., '17	331,399	*189,658	141,741	63,279	78,462
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Feb., '18	$24,721	*$18,195	$6,526	$7,901	†$1,375
1m., Feb., '17	25,550	*18,830	6,720	7,180	†460
12m., Feb., '18	302,759	*233,497	69,262	91,766	†22,504
12m., Feb., '17	312,229	*222,382	89,847	86,314	3,533
SAVANNAH (GA.) ELECTRIC COMPANY					
1m., Feb., '18	$85,198	*$56,906	$28,292	$24,382	$3,910
1m., Feb., '17	69,295	*42,645	26,650	23,565	3,085
12m., Feb., '18	1,002,397	*672,128	330,269	292,499	37,770
12m., Feb., '17	843,910	*559,154	284,756	284,061	695

** On May 1, 1917, the Atlantic Shore Railway was divided east and west of York Beach, Me., the western end passing to the operating control of the Portsmouth, Dover & York Street Railway. Figures for the first four months of 1917 are for the entire system. Beginning with May 1, figures for the Atlantic Shore as at present constituted are given. *a* Includes $140,707 for depreciation, in addition to $40,000 charged in the monthly statements. No depreciation included in 1916 operating expenses. † Deficit. * Includes taxes.

Traffic and Transportation

Toronto Fare Increase Lost

Investigators See the Need for More Revenue, but Politicians Apparently Unwilling to Assume Responsibility

The battle of the fares is in progress in Toronto, Ont., on the Civic Railway. One side proposes, but the other fails to dispose. Meanwhile the deficit keeps piling up. Ever since the Civic Railway was placed in operation in 1912, the fares have been notoriously low.

TWO-CENT CASH FARE

The road consists of only 20 miles of line, but a cash fare of 2 cents or six tickets for 10 cents prevails. This was urged as too low from the beginning by the Commissioner of Works, but the City Council refused to act. In 1913 the Commissioner again recommended an increase in fares. This time he suggested that the municipal lines charge the same rate of fare as the Toronto Railway. But no action followed. The process has been repeated from time to time since, but the proposal to secure more revenue has always gone down to defeat.

The latest refusal of relief occurred only a few weeks ago. It followed the presentation of a report recommending fare increases and other changes which was presented by T. Bradshaw, commissioner of finance, and R. C. Harris, commissioner of work, who also has charge of the construction and operation of the Civic Railway. The board of control sent the report of Messrs. Bradshaw and Harris on to the City Council, advising that the recommendations did not meet with its approval and the City Council acquiesced, so the fares remain as they were before. In this report the Commissioner of Finance and the Commissioner of Works said in part:

RATEPAYERS TAXED TO MAKE UP LOSSES

"Since the institution of the various civic car lines, the ratepayers at large, up to Dec. 31, 1917, were called upon to pay $590,688 for special service accorded those in the districts contiguous to the civic lines. As before reported, it cannot be urged that this practice is sound, wise or business-like. Every public utility should be made self-supporting. It is unfair that the citizens at large should be compelled to make good annually, through the tax rate, the deficit created by reason of preferential treatment accorded a section of the community. Furthermore, it provides one of the most potent and damaging arguments against public ownership. We should persistently hold in mind the necessity of conserving every financial resource, against the acquisition of the Toronto Railway, forty-three months hence. We are neither conserving nor prudent in furnishing service below cost. In our opinion such policy is unwise and dangerous, inasmuch as it may have some serious collateral bearing upon the 1921 situation.

"We recommend that the fares on the civic car lines be 3 cents cash, or ten tickets for 30 cents; children's fare to be 1 cent cash, as at present; the foregoing rates to apply from 5.30 a.m. to 12 o'clock midnight; night fares from 12 midnight to 5.30 a.m. to be 5 cents cash, as at present. We estimate that the recommended scale of fares will be sufficient to cover the operating, maintenance and capital charges, but not physical depreciation, or municipal taxes, which, in our opinion, should be collected from every public utility, operated municipally or otherwise. If this scale be adopted, the following statement, based upon the number of passengers carried in 1917, and the service provided for in the estimates of 1918, would approximate the situation at the end of this year, viz.:

Operating and maintenance charges	$325,624
Capital charges	171,064
Total	$496,688
Revenue passengers..16,478,391 at 3 cents a passenger	494,351
Deficit	$2,337

"We cannot too strongly urge upon the administration to give effect to this recommendation. In our opinion it embraces good finance, sound business and efficient administration."

Consolidation Suggested in Trans-Bay Rate Case

A consolidation of the San Francisco-Oakland Terminal Railways, the Key Route, and the electric system of the Southern Pacific Company on the east side of San Francisco Bay was recommended by the engineering department of the Railroad Commission of California in the continuation of the transbay rate case recently heard in San Francisco. The consolidation of the two systems, eliminating parallel lines, it was asserted, would affect an annual saving of $600,000 to $700,000 if consent of the cities involved could be secured for the required changes. If the lines had been consolidated in 1916, engineers for the commission contend that there would be a profit of $595,700 instead of a deficit of $41,368 as claimed by the companies.

The report of the commission engineers also contained the suggestion that if a consolidation is not effected, savings can still be made by eliminating duplicate service. Discussion of whether the Railroad Commission has authority to fix rates on roads under government control did not result in a decision on this point up to the time of adjournment.

Comment on Springfield Cars

Brief Review of Ideas Expressed by Massachusetts Commission in Its Recent Zone-Fare Decision

In the article published in the ELECTRIC RAILWAY JOURNAL of April 6, page 663, reviewing the decision of the Public Service Commission of Massachusetts with respect to zone fares in Springfield, Mass., brief reference was made to the matter of car equipment. In general, the commission favored the improved practices recommended by Prof. A. S. Richey, Worcester, Mass., whose report was abstracted in this paper for Jan. 2, 1917.

ONE-MAN EXPERIMENT SUGGESTED

While the commission did not approve the suggestion of John P. Fox, expert for the city of Springfield, that the existing cars be quite generally operated by one man, by closing up the rear door and making other changes, it did say that with cars properly designed for the purpose, the principle of trailer operation was sound. The commission was not convinced, upon present evidence, that the use of these old cars in the manner suggested was either safe or otherwise desirable. It suggested in this instance that it would do no harm, however, to prepare one car for such use in order that careful tests might be made.

On the general subject of rolling stock the commission said that the company needed more cars and it should also provide for the gradual replacement of rolling stock of obsolete types with more modern and economical equipment. On certain lines, either trailers or two-car trains with multiple-unit control could be operated with economy and to general public advantage.

In the course of the proceedings there was much discussion of the one-man car. Mr. Fox's suggestion that existing cars be quite generally operated with one man, by closing up the rear door and making other minor changes, was not indorsed by the commission on account of the heavy traffic and the present accident record of the company, but it is said that, clearly, one-man car operation deserved very serious consideration on the part of the company.

ONE-MAN CARS MIGHT DO HERE

The commission said there were lines in the Palmer division on which the service was now very infrequent and inferior, where one-man cars would probably give better accommodation at lower expense, and this was true of the Westfield division and doubtless of certain lines in the Springfield division. It was also possible that the company might have cars which could be reconstructed satisfactorily for this purpose at relatively small expense, without investing in wholly new equipment. The commission strongly advised that this question receive immediately and careful attention.

Seattle's Traffic Problem

Unprecedented Industrial Activity and Man Shortage Complicate City Railway Transportation

Following a public assertion by Mayor Ole Hanson, Seattle, that railway service in Seattle has "broken down," A. W. Leonard, president of the Puget Sound Traction, Light & Power Company, declares that Seattle is getting a larger measure of service than ever before and that what has taken place in the city is in reality a fundamental and entirely unexpected change in the direction of service, together with a shift in industrial population.

According to statistics of the company, the railway system is carrying more passengers now, furnishing more passenger car miles of service, and paying a larger volume of wages than ever before in its history. In March, 1916, 7,450,686 passengers were carried; in March, 1917, 8,139,633 passengers, and in March of this year 9,573,725 passengers.

Mr. Leonard said in part:

"While it is true that there is rush-hour congestion and probably always will be, it is not true that our service has broken down. We carry more persons in a shorter time in the morning than formerly, and do it as well as the circumstances will permit. It must be remembered that a large part of our equipment, representing an investment of millions of dollars, can be used only for rush-hour service and that it is in use one-eighth of each working day and idle seven-eighths of the time.

"What we are doing in the aggregate is to furnish 20 per cent more service and carry 30 per cent more load than two years ago, and the service increase would be as great or greater than the load increase if it were possible to get more men to take out more cars.

"In February last, for instance, eighty-seven men entered our train department service, and 106 men left it. Electric railways here or elsewhere cannot pay shipyard wages. The government carries the shipyard load. We carry our own, and have to get the revenue to do it from the car riders."

Jitney Regulation Up to City

The Legislative Assembly of British Columbia on April 22 gave the city of Vancouver power to prohibit the operation of jitneys within the city either on city routes or on the interurban route to New Westminster. This is the first step towards the carrying out of the recommendations of Dr. Adam Shortt, who reported last November on the electric railway situation and with whose decision the city of Vancouver and the British Columbia Electric Railway agreed to abide, following a strike of the railway men last June.

The British Columbia Electric Railway took no part in the proceedings before the Legislature. The city arrayed itself against the jitney interests. Formerly the city had refused to take any action against the jitneys, but on the ground that it would be a breach of faith not to carry out the agreement, the City Council carried its own case to the Legislature. Attempts were made to bar competition only on streets where there are car lines and to exclude from the proposed charter powers the elimination of interurban jitneys. These amendments were voted down.

It now remains for the City Council of Vancouver to pass a by-law prohibiting the operation of jitneys. This it is expected will be done within a few weeks. It will mark the end of a long fight, first, for regulation, which failed to fructify, and, then, for the elimination of jitneys as an economic factor. The fight for elimination started when jitney competition and increasing prices led to the suspension of service last June at the time the electric railway employees struck for higher wages.

Virginia Lines Seek Relief

Make General Statement to State Corporation Commission Reciting Their War-Time Burdens

A committee representing eighteen electric railways, fifteen gas companies, thirty-two water companies and sixty-four electric light and power companies serving 1,750,000 people in Virginia appeared before the Corporation Commission of that State during the week ended April 27 with the request that the commission consider the burdens which have been placed upon such corporations.

The members of the special committee representing the public utilities included Thomas S. Wheelwright, president of the Virginia Railway & Power Company; Herbert W. Jackson, president of the Virginia Trust Company; B. B. Ferguson, president of the Portsmouth Gas Company, and John W. Hancock, general manager of the Roanoke Railway & Electric Company and the Lynchburg Traction & Light Company.

The committee explained that because of the unprecedented increase in operating expenses and maintenance costs, many of the utilities have been forced to reduce or abandon entirely the payment of dividends; that others face this necessity in the near future, and that still others may become bankrupt. In continuing the committee said:

"At the present time it is impossible for the utilities to get money with which to maintain their properties, or to refund maturing debts, except at ruinous interest rates. These conditions are halting the development of the utilities and make it necessary for the companies to appeal to the State and municipal authorities for increases in rates sufficient to maintain their credit and efficiency.

"If relief is not granted the utilities will be unable to meet the requirements of the government or the needs of the local communities which they serve, the security holders will lose heavily and the employees will suffer."

St. Louis Fare Brief In

Case Regarded by the Company as Imperative, but No Specific Rate Asked

Attorneys for the United Railways, St. Louis, Mo., on April 22 filed a brief with the Public Service Commission of Missouri in the company's application for increased revenue. The brief states that the application is for an "order authorizing the applicant to make such additional charges for the transportation of passengers as will enable it to meet its necessary expenses for 1918 and pay a fair return on the investment in the property."

It is pointed out that no particular form of relief was requested in the formal application, "but the evidence for the applicant suggests that relief may be given, either by increasing the 5-cent fare or by charging for transfers, or by a combination of these methods."

The brief points out that the movement for increased revenue for electric railways in the United States is almost universal, and that applications for such increase have been made by 119 such companies since last fall.

The brief outlines the company's theory for the request as follows:

"Applicant's theory is that its receipts will be curtailed by $371,453 and its expenses increased by $2,674,188 as compared with 1917, resulting in a deficit of $2,452,794 in the payment of interest on bonded indebtedness and a deficit of $3,529,564 in the payment of a 6 per cent return on the agreed valuation of $60,000,000; or, to put it another way, after paying operating expenses (including increased costs) there will be only $70,435 available for return on investment."

The brief repeats the statement made when the commission held its hearing to the effect that unless relief is granted, the Union Depot line bonds, maturing June 1, cannot be taken up, and these lines will revert to the original owners, and become in all probability a separate and distinct system.

Fair Warning Demanded

The Board of Public Utility Commissioners of New Jersey has instructed public utility corporations that they must notify the commission of all rate increases fully twenty days before they are to go into effect, together with all data relative to the same. The announcement of the commission follows:

"Before any public utility owning, operating, managing, or controlling any street, gas, electric light, power, sewer, water, or telephone plant or equipment for public use with the State of New Jersey, shall increase any existing rate or schedule, or change or alter any existing classification, the said public utility shall, at least twenty-days prior to the date when it is proposed that the said increase change or alteration shall become effective, give written notice to the Board of Public Utility Commissioners."

New York Transfer Cases Adjourned

Companies Urge Possibility of Transfer Relief, but Commission Is Still Considering Jurisdiction

The Public Service Commission for the First District of New York has either dismissed or adjourned indefinitely the various fare cases that have been pending before it for nearly a year. After the decision in the Rochester fare case, the commission dismissed the higher unit-fare applications of the Staten Island Midland Railway and the Richmond Light & Railroad Company, and it asked the companies concerned in the 2-cent transfer cases whether in their opinion it could proceed further on their applications. After hearing argument on this point, the commission has now adjourned the transfer cases subject to call upon its decision as to jurisdiction.

TRANSFERS CAN BE REGULATED

In asking for the opinion of the railways as to available means of relief, counsel for the commission expressed the opinion that the transfer cases could not be continued on a rate basis, in connection with system valuations. Alfred A. Cook, attorney for the Third Avenue Railway, averred that the Rochester decision does not prevent the commission from establishing charges for transfers at certain points on the Third Avenue lines between different operating companies. The reason is that the franchises of these companies do not contain any restrictions regarding transfers, and the commission, under its power to establish joint rates, can abolish the transfers or establish a charge for them.

James L. Quackenbush, general attorney New York Railways, explained to the commission that no legal obligations exist for the continuance of many of the transfer points in New York City. In connection with litigation regarding penalty actions, the city companies established many transfer points as a matter of expediency. In general, in Mr. Quackenbush's opinion, the commission has plenary power over statutory transfer obligations. Henry J. Smith mentioned various parts of the New York Railways System where transfers can be abolished or charged for. He suggested that the commission give as much transfer relief as is in its power but then leave the question open for a short time, in order that the city may waive some existing franchise restrictions and thus secure a uniform transfer structure.

FEW B. R. T. RESTRICTIONS

A. M. Williams, counsel for the Brooklyn Rapid Transit Company, said that there are only a few places on his system where the franchises prescribe transfers. Most of the transfers exist under an order of the commission in 1914. The commission can abrogate this order or modify it so as not to require the issuance of transfers at certain points except upon the payment of 2 cents. The Brooklyn system has 751 intersections of lines of the same operating companies and 1082 intersections of lines of different operating companies. According to Mr. Williams, the commission can charge for transfers at all of the latter points and at most of the former.

Ernest Baldwin, special counsel for New York City, said that the law provides for the payment of one fare for a continuous ride, and that no one short of the Legislature can change the statutory provision to this effect. Moreover, he pointed out that the commission would not be permitted to discriminate by imposing transfer charges at some points and not at others.

Pending a formal statement by the commission in an electric railway case, the best indication of its feeling in regard to the Rochester decision is given in its Bronx Gas & Electric Company opinion approved on April 18. In discussing the Rochester decision in this case, the commission said in part:

HOW COMMISSION INTERPRETS ROCHESTER DECISION

"A rate fixed by a special statute, passed before or after the public service commission law, remains subject to commission revision, downwards or upwards, unless the Legislature has, by the public service commission law, specifically and clearly withheld the power to increase the rates of a particular class of utility above the maximum fixed by such a statute."

According to the commission, five members of the Court of Appeals preferred to join in deciding what the Legislature has done rather than undertaking to decide in advance what it might do, namely, whether a specific delegation of power to prescribe rates notwithstanding the limiting provisions of franchises would be construed by the court to confer validly and effectually any power on the commission to deal with rates fixed by franchises granted under the *aegis* of the Constitution. Continuing, the commission said:

"The question of the possible limits of legislative power with respect to the rates fixed in such contracts the learned court expressly declines to decide unnecessarily, but at least until such time as the Legislature may undertake to confer broadly upon the commission the power to prescribe what rates are reasonable, even in excess of those fixed by franchise agreements, the commission, in the absence of a modification of the contract or the city's consent, has no power to take action looking to an advance in any rate above the franchise figure.

"The ordinary regulative power of the commission may at any time be availed of, on a proper showing of facts, to reduce any public utility rate, even if that involves the fixation of a rate for such utility service below the rate fixed or authorized by the company's franchise; but if the public utility has obtained the valuable right to use public streets by agreeing to maintain, at the city's option, a stipulated fare, the regulative power cannot raise that fare above the contract figure without the city's consent."

A meeting of the New York Electric Railway Association was held in New York on April 29 to receive the report of the committee appointed a year ago to consider ways and means of securing increased revenues in New York State. The report was accepted, and the committee was instructed to proceed with its work along such lines.

Step in Auto Regulation

California Railroad Commission Makes Another Advance Toward Putting Autos on Regulation Basis

The Railroad Commission of California has ordered that within four months from April 1 all public automobile stages shall either own their equipment or lease it for a specified amount on a trip or term basis, the leasing of equipment not to include the services of a driver or operator. All employment of drivers or operators of leased cars is to be on the basis of a contract by which the driver or operator shall bear the relation of employee to the transportation company engaging them. The practice of leasing equipment or employing drivers or operators on a percentage basis is prohibited.

The order of the commission is the result of its investigation. A number of automobile stage line owners or managers were brought before the commission at public hearings in Los Angeles and San Francisco. The commission says that the practice of leasing cars on a percentage basis is not desirable from a standpoint of public necessity, and does not tend to put the industry on a suitable basis. Where the entire upkeep of the car falls on the lessor, the public does not receive proper service, nor does the car owner receive just returns. Stage companies or lessees have in many cases been practically relieved from all responsibility for maintenance or operation and have acted merely as ticket agencies or brokers. These companies or associations have claimed the ownership to operate routes exclusively, and their conduct has sometimes been the cause of poor service to the public and poor compensation to the actual owners and operators of automobiles for them.

Appeal in Transfer Order Case

L. Edward Herrmann, counsel of the Board of Public Utility Commissioners of New Jersey, has filed in the Court of Errors and Appeals a supplemental brief in the appeal of the borough of Bradley Beach from the decision of the New Jersey Supreme Court in the case of the Atlantic Coast Electric Railway against the Utility Commission and the borough of Bradley Beach.

In this rate case the Supreme Court

decided that the Utility Commission had not the power to compel the railway to issue transfers from one line to another on its system and upon this reasoning set aside an order of the commission. The borough of Bradley Beach had an ordinance under which it sought to enforce the transfer arrangement with the railway, and the commission held that the terms of the ordinance were to be carried out.

Justice Trenchard, who wrote the opinion of the Supreme Court, declared that "this ordinance, with its acceptance and action thereunder by the railway, being to constitute a contract between the company and the municipality, it is incompetent for the Board of Public Utility Commissioners, just as it is incompetent for the municipality itself, to violate that contract by imposing upon the company an additional burden, the effect of which is to require it to carry passengers for the same fare, not to, buy beyond," a certain point.

Increase for Resort Road

Railway at Ocean City, N. J., Operated Only Four Months a Year, Will Charge Seven-Cent Fare

The Board of Public Utility Commissioners of New Jersey has granted, subject to challenge, the request of the Ocean City Electric Railroad to increase its fares from 5 cents to 7 cents. The request was made by William G. Moore, president of the railway. The company operates a 10-mile road in Cape May County during June, July, August and September. It is one of the few roads which cease operation during the winter. A peculiar fact is that the franchise of the company does not contain any provision as to the rate of fare to be charged.

In the application to the regulatory commission, President Moore of the company said:

"During the seasons of 1914, 1915 and 1916 the income was scarcely sufficient to provide for the operating expenses, taxes and depreciation, and it left no return whatsoever upon the invested capital of the company. The company would have found it impossible to operate the road had not one of the stockholders of the corporation, from time to time, advanced his own money to pay the interest upon the bonds and to meet deficits accruing from operation. We cannot borrow any more money from the same source to meet the future expenses. The funded debt consists of $75,000 of 5 per cent bonds. On Dec. 3, 1916, the company owed $196,693 for money advanced. It has outstanding $100,000, par value, of capital stock, on which no dividend has ever been paid. The company cannot operate the road during the present season unless it is allowed to charge a higher rate of fare."

The road can now charge 7 instead of 5 cents until the municipality of Ocean City challenges its right. In that event a hearing would have to be given.

More Zone Fares for Massachusetts

Commission in That State Approves This Plan of Fares for Forty-two Mile System With Athol as Its Center

An order approving the establishment of a zone system of fares for the Northern Massachusetts Street Railway was issued on April 30 by the Public Service Commission of Massachusetts. The road operates about 42 miles of track and serves the Athol-Gardner district, with a line to the outskirts of Fitchburg. There is a branch about 11 miles long running from East Templeton through Baldwinville to Winchendon. The company is controlled by a voluntary association known as the Massachusetts Consolidated Railways, which also controls the Connecticut Valley and Concord, Maynard & Hudson street railways.

At present the system is divided into twelve fare zones with a 5-cent fare unit. The company's new schedule, now approved, proposes to divide the line into zones of about 1 mile each, to charge a fare of 5 cents for the first three zones or less, and 2 cents for each additional zone. It is also proposed to issue ticket books with 150 coupons for $2.80, each coupon good for travel within one zone, except that at least three coupons will be detached for each ride.

ENTITLED TO 6 PER CENT RETURN

The financial investigation of the commission leads the board to conclude that the investment which may properly be used as the rate base is about $1,150,000. In accordance with the principles which the commission has laid down in previous cases, taking into consideration the risk of the enterprise, the company is entitled, states the decision, to a return of at least 6 per cent upon the foregoing amount, without any deduction for depreciation, unless failure to make provision for it is due to the payment of unwarranted dividends, or is otherwise attributed to mismanagement. The average annual dividend paid during the entire period prior to the consolidation was about 3⅔ per cent, and since consolidation (1912-1917) the average rate is slightly more than 2 per cent. A large deficit has been accumulated, and unearned dividends have been paid. Maintenance, renewals and depreciation have been neglected.

The commission holds that at least $50,000 a year, which is 20 per cent of the railway's gross earnings, is necessary to provide for current maintenance and depreciation. The operating expenses and taxes for 1917, exclusive of maintenance and depreciation charges were $162,215. A charge of at least $50,000 as stated, is necessary for maintenance and depreciation and an additional charge of $69,000 is required to pay a 6 per cent return upon the investment value above set. Upon this basis the company appears to be entitled to a total revenue of $270,215. Owing to the trend of prices for fuel, labor and supplies, the board says this figure should be increased for 1918 to at least $275,000. As the total income of the company for 1917 was $247,407, the road is fairly entitled to an increase of about $27,500 in its gross revenue through a readjustment of fares.

The only opposition offered at the hearings was directed to three subsidiary matters. One of these affected the loop line in Gardner. The patrons there asked the option of traveling to Gardner Center by alternative routes upon the payment of a 5-cent fare. The commission found no good reason for such a privilege, which involves using a more circuitous route and a transfer, with no greater frequency of service than by the direct route. Certain residents of Westminster objected to a fare limit established by the company, but the number was so small that the commission did not feel warranted in extending the zone length to 1.4 miles in this case, pointing out that there was little justification for overlaps when the increase of fares in successive zones is only 2 cents instead of 5 cents.

The other feature of the proposed tariff to which objection was raised, was the abolition of the workingmen's tickets, which were available during certain hours of the day between Orange and Athol. These tickets were sold in books of forty for $1.25, or at the rate of 3⅛ cents each. As there were two fare zones between Orange and Athol, the ticket fare between these points was 6¼ cents as compared with a cash fare of 10 cents. In the form in which the tickets were now issued they could also be used by passengers riding in one fare zone only, thus reducing the minimum fare from 5 cents to 3⅛ cents. The commission said that this particular objection could be easily obviated by having the books made up of twenty tickets with two coupons each, but the company in its schedule withdrew the tickets entirely.

These tickets were put in operation many years ago by the Athol & Orange company when it was operated as a separate company, but were retained by the present management. No similar tickets are available between other points of the Northern Massachusetts system. The commission was of the opinion that this ticket rate under present conditions was too low to afford a reasonable compensation to the company and that it might also be regarded as constituting a discrimination against other communities served by the company.

As the proposed fare schedule is on a radically different basis from the one previously employed, it was difficult to make an accurate estimate in advance of the increased revenue which would be likely to result from its adoption. Certain fares under the new schedule will be upon a lower basis than at present and some decrease in riding is to be anticipated between certain points where the fares have been increased. In view of these facts and in the light of the revenue results from the recent adoption of a similar system of fares by other companies, the commision was satisfied that the actual increase in revenue under the schedule filed would be well within the limit of the amount to which the company appeared to be entitled.

Rhode Island Zoned on May 5

The Public Utilities Commission of Rhode Island on April 29, at the request of the Rhode Island Company, extends to May 5 the time for the beginning of operation of the zone system.

The new system was to have gone into effect on May 1, but the time to get the details into working order was found insufficient and the extension of five days was asked for and granted. The company also filed with the commission the definite locations of the ends of the intermediate zones, which were only approximately fixed in the act passed by the General Assembly.

The company has adopted a "coin" system for use in the collection of the 2-cent increment in fares. The coins will be considerably larger than a cent, with a hole in the center. They will have a face value of 2 cents. After collecting a 5-cent fare the conductor will sell these disks, which can be collected in the Rooke register now in use. On one side the coin will read: "Two-cent zone ticket—the R. I. Co." On the other it will read: "Good only on continuous ride after 5-cent fare has been paid."

Staggered Stops for Whole City

The United Railways & Electric Company, Baltimore, Md., is gradually installing the staggered skip stop on its entire system. On April 7 it became effective on the Harford Avenue, York and Frederick Road lines; on April 14 on the Edmondson Avenue line; on April 18 on the Madison Avenue, Emory Grove, North Avenue, Garrison Boulevard, Linden Avenue, Woodlawn and West Arlington lines; on April 21 on the St. Paul Street, Boulevard, Carey Street and Gilmor Street-Guilford Avenue lines; on April 25, Wilkins Avenue, Preston Street, Federal Street and Ellicott City line and on April 28, Gay Street.

At present the stops are indicated by cardboard signs marked, East, West, North or South stop. These will be replaced as soon as possible by the same legends painted on the trolley poles. The change in stops was introduced by a description in *Trolley News* of the staggered skip stop and its relation to fuel conservation as set forth in correspondence between the United States Fuel Administration, the Maryland Fuel Administrator and the Public Service Commission. For the present, the cars will be run without changing the schedules. This will save fuel by permitting a large increase in coasting.

Zone Rates for Springfield

The Public Service Commission of Massachusetts has approved the detailed plans of the Springfield Street Railway for a zone system of fares worked out in harmony with the recent decision of the board sanctioning a rate increase.

With the exception of the Indian Orchard district substantially all of the city of Springfield will be located within the 5-cent fare zone. This zone will terminate at Pine Point on the Indian Orchard line, the 6 2/3-cent zone ending at Harvey Street and the 8 1/3-cent zone at the end of the line. On the Westfield line the 5-cent zone going out of Springfield extends to Silver Street; a second 5-cent zone thence extends to the Westfield line, and in Westfield a 6-cent fare becomes effective. On the interurban line from Westfield to Holyoke the copper zone schedule of 2 cents per mile becomes effective at St. Mary's Cemetery, and on the Westfield-Huntington line it begins at the Huntington town boundary.

H. M. Flanders, general manager of the Springfield company, stated in a recent press interview that the new rates would go into effect on May 1.

The decision of the commission in this case was reviewed in the ELECTRIC RAILWAY JOURNAL of April 6, page 663.

Transportation News Notes

Toronto Company Fined.—The Ontario Railway & Municipal Board imposed on the Toronto Railway a fine of $1,000 a day for twenty-four days, making a total of $24,000, for failure to place 100 new cars on its lines as ordered by the board more than a year ago.

Los Angeles Has a Woman Conductor.—The Los Angeles (Cal.) Railway is experimenting with a woman conductor recruited from among the company's office help. This is believed to be the first instance on the Pacific Coast in which a woman has been employed in this capacity.

Dallas Experimenting with Skip-Stops.—The City Commission of Dallas, Tex., has enacted an ordinance providing for experimental skip-stop operation on several lines of the Dallas Railway. The ordinance as enacted applies only to the downtown section and to the Ervay and South Belt lines.

Another Massachusetts Fare Request.—The Northampton (Mass.) Street Railway has petitioned the Public Service Commission for permission to increase its fares. The company has also asked for an extension of its charter privileges which will allow it to carry baggage, express matter and newspapers.

Cleveland's One-Cent Line Succumbs.—What is known as the pier loop line, connecting the Public Square and the East Ninth Street pier, Cleveland, operated by the Cleveland Railway at a fare of 1 cent, will hereafter charge the same rate as the other lines in the city. Increased operating costs have made this necessary.

Rebates Ordered in Fare Case.—The Public Service Commission of Pennsylvania has ordered the Shamokin & Mount Carmel Transit Company, Mount Carmel, Pa., to comply with a recent ruling of the commission and issue certificates of excess fare to patrons, pending a decision on the litigation against the 6-cent fare.

Fare Charges Suspended.—The Public Service Commission of Massachusetts has further suspended operation of schedule 75, the original interurban "copper-zone" schedule, on the Bay State Street Railway until June 1, 1918, also workmen's commutation and excursion tickets until the same date. Decision of the commission regarding these tickets has been pending since Aug. 10, 1917.

Manchester Would Charge Six Cents.—In order to maintain the road in reasonable condition, and enable it to earn such a dividend as it has paid in the past, application has been made to the Public Service Commission of New Hampshire by the Manchester Street Railway for its approval of an increase in fares from 5 cents to 6 cents as being the best and fairest arrangement for all concerned.

Pay-As-You-Enter Service in Minneapolis.—The Twin City Rapid Transit Company, Minneapolis, Minn., has the pay-as-you-enter plan on trial on the Fourth Avenue N and Sixth Avenue S line. This was the first line on which an electric car was operated in Minneapolis. The change in power was made on Dec. 24, 1889. The present trial provides for entrance and exit at the conductor's end.

New Jersey Hearing Postponed.—The Board of Public Utility Commissioners of New Jersey has postponed until May 8 the hearing on the application of the Public Service Railway for increased rates. The adjournment was granted on request of Marshall Van Winkle of counsel for the municipalities which are opposing the proposed increases. He desired additional time for himself and his associates in which to prepare his side of the case.

Staggered Hours at Camden.—In an effort to relieve rush-hour congestion on the lines of the Public Service Railway at Camden, N. J., and New York Shipbuilding, New Jersey Shipbuilding and Pennsylvania Shipbuilding companies have put into effect new schedules of working hours, so that the thousands of workers will not conflict with each other in going and coming to the various plants.

Atlanta Fare Case Set for May 26.—The petition of the Georgia Railway & Power Company, Atlanta, for permission to increase fares to 6 cents and to charge 2 cents for a tranfer will be heard before the Railroad Commission of Georgia on May 21. The increase in fares would apply to all lines in Atlanta, except the Atlanta-Stone Mountain route, and also to the company's system in Gainesville.

City Acts Against Company.— R. S. Houch, city solicitor of Scranton, Pa., has filed a bill in equity asking the court to rescind, cancel and annul all contracts now existing between the city and the Scranton Railway. The bill attacks the company's right to continue to operate on the ground of general violations of franchise agreements. The suit is the outcome of the company proceeding with its plan to put 6-cent fares into effect despite protests from the city.

Hearing on New Albany Application.—The hearing on the application of the Louisville & Southern Indiana Traction Company to the Public Service Commission of Indiana for permission to increase its fares in New Albany and Jeffersonville and on the interurban line between New Albany and Jeffersonville was held in New Albany on April 16. The commission took the case under advisement after hearing testimony on both sides in regard to the value of the property.

Lynchburg Fare Petition Heard.—The petition of the Lynchburg Traction & Light Company, Lynchburg, Va., to be allowed to discontinue the sale of six tickets for 25 cents was heard before the State Corporation Commission recently. Representatives of both the city and the company admitted that the commission had jurisdiction in the matter in spite of the fact that the company was operating under a city franchise. Further evidence is to be submitted later.

Appeal from Two-Man Crew Law.—Stockholders of the Fort Smith Light & Traction Company, Fort Smith, Ark., have brought suit in the United States District Court for an injunction against prosecutor Earl U. Hardin and Attorney John D. Arbuckle restraining them from prosecuting the company for failure to observe an act passed in 1915 by the Legislature providing for two-men crews on all electric cars in Sebastian County. The court is asked to declare the act unconstitutional.

No Return to Railway-Jitney Competition.—The City Commissioners of Atlantic City, N. J., have killed a bill, providing for the return of jitneys to Atlantic Avenue, where the Atlantic City & Shore Railroad has enjoyed a transportation monopoly since the jitneys were driven from that thoroughfare a year ago. Those who urged the return of the jitneys to Atlantic Avenue contended that the railway had not complied with promises made in its behalf when the measure was adopted ruling the autos off that thoroughfare.

Straight Fare Proposed.—The Chicago, Ottawa & Peoria Railway, a subsidiary of the Illinois Traction System, has applied to the Public Utilities Commission of Illinois for permission to abolish zone fares and to establish a straight 2-cent fare. The company also desires to collect 3 cents a mile from all passengers who board cars without tickets and to eliminate the sale of round-trip tickets. The commission early in the year approved similar tariff changes for other Illinois Traction System interurban properties. They were noted in the ELECTRIC RAILWAY JOURNAL for Feb. 9, page 297.

Taken Without a Chaser.—Kirk Miller said recently in the Washington *Post:* "Look at this skip-stop system, which we never thought we could take without a chaser. At first everybody made a sour face when they swallowed a dose of skip-stop and it was unanimously voted that we should declare war on Turkey, Bulgaria and Skipstopia and issue passports to Dr. Beeler and his entire retinue. Now we're ready to elect him first lord mayor of the Skipstopovian islands, and donate him a complete set of flat wheels as medals for his intricate surgical operations in the vicinity of our bad tempers."

Would Abandon Flat for Zone Fares.—The Milford, Attleboro & Woonsocket Street Railway, Milford Mass., operating 28 miles of electric railway, has asked the Public Service Commission for permission to change to a zone fare basis. This would eliminate the present fare section of 5 cents and substitute a minimum fare of 5 cents for two of the proposed zones and 3 cents cash for each additional zone traveled, or 2½ cents for the extra zone when tickets are purchased. The company planned to put the new system into effect on April 15, but the commission suspended the tariff until June 1.

Commission Opposed to Turnstiles.—The Public Service Commission for the First District of New York, approving an opinion by Commissioner Charles Bulkley Hubbell, has put itself on record as against the general adoption of turnstiles, or passimeters as they are sometimes called, in connection with ticket booths, especially in Manhattan, and the commission has denied an application of the New York Municipal Railway Corporation (Brooklyn Rapid Transit System) for the installation of turnstiles in the Rector Street, Cortlandt Street and City Hall stations on the Broadway subway.

Segregating the Wets.—To meet a problem which arises every Saturday night in handling traffic between Pawtucket, wet, and Attleboro, dry, the Interstate Consolidated Street Railway is trying to work out a system of segregating its passengers. On the last trip on Saturday nights two cars leave Pawtucket together. The scheme adopted by the management of the railway is to have the conductors usher into one car, as far as practicable, those who are under the influence of liquor, so that they may keep to themselves and leave the other car for persons who are sober and well-mannered.

Court Sustains Cleveland Fare Change.—On April 23 the Supreme Court of Ohio, announced its refusal to review the decision of the Court of Appeals of Cuyahoga County in the case of the city of Cleveland against the Cleveland Railway wherein was questioned the right of the company to increase its rate of fare under the Tayler franchise from schedule C to schedule B. The Common Pleas Court recently granted an injunction, preventing the company from taking this step, but the restraining order was promptly dismissed by the Court of Appeals. Since the case was filed the rate has been advanced to Schedule A.

Railway to Operate Buses.—The New Jersey Transportation Company, a subsidiary of the Public Service Corporation of New Jersey, Newark, N. J., has made application to the director of improvements for the necessary permits to operate eighteen motor buses from Hamburg Place and Gotthart Street to the shipbuilding plants at Port Newark Terminal. It is planned to have the buses connect with cars of the Public Service Railway on the South Orange line terminating at Hamburg Place, the fare to be 5 cents on the electric railway and 5 cents on the bus. The buses will be operated from 6 a. m. to midnight.

Lincoln Fare Hearing Closed.—On April 23 the State Railway Commission of Nebraska overruled the motion of the city of Lincoln to take an inventory of the property of the Lincoln Traction Company in connection with the pending fare case and also overruled a motion of the city for a continuance of sixty days, which time was asked for by the city for the purpose of introducing testimony. The case was then submitted to the commission on the record. The company has two applications for leave to issue stock and bonds before the commission, and also an application alleging the present rates of fares are inadequate and requesting the commission to fix reasonable rates. An emergency petition of the company for fare relief was denied by the commission as noted in the ELECTRIC RAILWAY JOURNAL for March 2, page 435.

New Minneapolis Jitney Regulation.—Effective on May 6 Minneapolis will have a new jitney ordinance, some of the provisions of which are as follows: All such vehicles must be licensed. Drivers must be at least twenty-one years old and have a State chauffeur license. The owner must have a $10,000 surety bond or an insurance policy or a reciprocal or inter-insurance contract. The license fee is fixed at $25 for a vehicle with capacity of not more than seven, and $2 additional for each additional seat. Fares must be collected only when the vehicle is at a stop. Signs must indicate the route of each car. Between 5 a. m. and midnight the fare must not exceed 5 cents for each person for the full route, and at other times not more than 10 cents. Special trips may be made without regular route signs at special compensation.

Personal Mention

R. Home Smith, Toronto, Ont., has been elected president and director of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., to succeed William O. Morgan, New York, resigned.

George D. Powell has been promoted to the position of office engineer in the maintenance of way department of the Union Traction Company of Indiana, Indianapolis, Ind. He was formerly draftsman in that department.

C. S. MacCalla has resigned as vice-president and general manager of the Washington Water Power Company, Spokane, Wash., and left on April 25 for New York City, although he had intended to remain in Spokane until May. A farewell dinner to him at the Spokane Club was attended by officers and employees of the company. Mr. MacCalla was graduated from the electrical engineering school at Lehigh University in 1896. He had been with the Washington Water Power Company for sixteen years. Previous to that he was with an Australian railway for the General Electric Company and later with the Brooklyn (N. Y.) Edison Company. He went to Spokane as assistant to the general manager. At that time that official was D. L. Huntington, now president of the company. Mr. MacCalla was later promoted to general manager and then to vice-president and general manager. He had the executive direction of the installation of four large auxiliary power plants now operated by the company. The first of these was at Post Falls, Idaho, on the Spokane River, erected in 1904 and 1905; the steam plant at Ross Park, in Spokane, in 1907 and 1908; the 27,000-hp. plant at Little Falls, Spokane River, in 1908 to 1910, and the Long Lake plant, Spokane River, which was under construction from 1911 to 1913. The last-mentioned plant has a capacity of 67,000-hp. and provides for an ultimate capacity of 90,000-hp.

C. S. MACCALLA

G. O. House has been appointed superintendent of the St. Paul lines of the Twin City Rapid Transit Company, succeeding A. L. Cunningham, who has been appointed captain in the National Army, Quartermaster Corps. Mr. House has been superintendent of the St. Paul Water Works.

John H. Roemer, of the legal firm of Cummins, Roemer, Flynn, Milkewitch & McKenna, counsel for H. M. Byllesby & Company, Chicago, has been obliged to decline a commission as lieutenant-colonel in the National Army, to act on a board of appraisers on account of his present engagement for the government as a civilian in connection with various boards of appraisers engaged in similar work concerned with terminal and dockage property under consideration for use by the Government in its war activities.

William T. Price has been appointed traffic manager and property agent of the Denver (Col.) Tramway and the Denver & Intermountain Railroad. Mr. Price entered railroading in 1902 as a clerk in the Omaha offices of the Chicago, St. Paul, Minneapolis & Omaha Railroad. In 1904 he went to the Union Pacific as clerk in the freight claim department at Omaha, advancing to the position of traveling freight claim agent and adjuster. In 1911 he was transferred to Denver, where he held the position of contracting freight agent until 1912, when he was appointed traveling freight agent for Colorado territory. On Aug. 1, 1915, he was made commercial agent of the Union Pacific System in charge of southern Colorado, which he handled from Pueblo. He resigned from the Union Pacific System on April 1 to become connected with the Denver Tramway.

Townsend H. Soren has been elected a vice-president of the Hartford (Conn.) Electric Light Company in charge of construction. Immediately after graduation from Harvard he was employed by the General Electric Company at Schenectady and remained with that company until July, 1916. Mr. Soren's duties with the General Electric Company were largely confined to the general supervision of the work of that company in connection with large electric railway developments in New York City. This work started with the equipment of the Ninety-sixth Street power station and substations of the Metropolitan Street Railway in 1897 and was followed by the equipment of the Manhattan Elevated Railway, the Interborough Rapid Transit Company and the Hudson & Manhattan Railroad and the electrification of the main line of the New York Central & Hudson River Railway, including the construction and electric equipment of the locomotives for that company.

J. W. Brown has resigned as assistant general superintendent of the Public Service Railway, Newark, N. J., to become general manager of the Wheeling (W. Va.) Traction Company, taking over with that company, among other duties, those previously performed by W. B. Atwood, general superintendent, who resigned to accept a position elsewhere. Mr. Brown has been connected with the Public Service Railway since April, 1911. He has been assistant general superintendent since 1913. Previous to 1911 he was with the Aurora, Elgin & Chicago Railroad, and prior to that time was superintendent of transportation of the West Penn Railways, Connellsville, Pa. He entered the service of the McKeesport, Wilmerding & Duquesne Railway, McKeesport, Pa., about fifteen years ago as night car dispatcher. He also served as electrician and later as power station engineer of this company. When the Pittsburgh, McKeesport & Connellsville Railway was formed Mr. Brown was made master mechanic of the McKeesport Division of that road and later was promoted to division superintendent. When the transportation department of the company was organized in 1903 he was appointed superintendent of transportation of the company. He resigned from the West Penn Railways in August, 1910, to become connected with the Aurora, Elgin & Chicago Railroad. Mr. Brown has built up for himself an enviable reputation in the handling of men and in solving problems in connection with the new science of employment. He has been editor of the employees' publication of the Public Service Railway, the *Trolley Weal*, since its establishment in 1917. Mr. Brown has been very active in the work of the American Electric Railway Transportation & Traffic Association, particularly as vice-chairman of the joint committee on block signals for electric railways. His associates in the Public Service Railway tendered a banquet to him on April 10. Among those who attended were R. E. Danforth, J. L. O'Toole, H. V. Drown, M. R. Boylan, A. Jackson, H. C. Donecker, N. W. Bolen, M. Schreiber, W. B. Graham and H. A. Benedict.

J. W. BROWN

Construction News

Recent Incorporations

***Chillicothe & Camp Sherman Electric Railway, Chillicothe, Ohio.**—Incorporated with a capital stock of $50,000. Incorporators: George A. Vaughters, president of the Chillicothe Electric Railroad, Light & Power Company, John A. Poland, J. A. Phillips, Alex Renick, J C. Martin and Ralph Madison.

Franchises

San Francisco, Cal.—The United Railroads of San Francisco has received a franchise to construct an extension of its Army Street line to the Union Iron Works.

Chicago, Ill.—Following its custom of not permitting building operations which are not necessary to the success of the war, the Illinois Public Utilities Commission has denied a certificate of convenience and necessity to the Chicago, Fox Lake & Northern Traction Company, which proposed to build an interurban line from Palatine, Ill., north into Wisconsin. The new company also proposed to purchase the property of the Waukegan, Rockford & Elgin Traction Company, which the commission would not allow. [May 26, '17.]

Philadelphia, Pa.—The West Philadelphia Passenger Railway, a subsidiary of the Philadelphia Rapid Transit Company, has received a franchise from the City Council to construct a new double-track extension on Island Road and Eastwick Avenue to the county line.

Track and Roadway

Los Angeles (Cal.) Railway.—In view of the emergency now existing and the impossibility of procuring grooved girder rails from the mills, the Los Angeles Railway Corporation and the Pacific Electric Railway have petitioned the City Council of Los Angeles to amend the ordinance of the city prescribing the type of railroad construction and railroad rails in streets so as to permit railroad construction of a type other than with grooved girder rail and concrete base outside of the business district of the city.

Jacksonville, (Fla.) Traction Company.—Operation has been begun by the Jacksonville Traction Company on its line to Camp Johnston.

Des Moines (Ia.) City Railway.—The Des Moines City Railway has begun its season's construction work in Des Moines. The first work is at Seventh and Walnut Streets, in the heart of the business district, where special construction is being placed. As soon as this is done the Fort Des Moines and Sevastapol lines will be routed through the loop. Heretofore these lines have terminated at Seventh and Grand Avenues and it has been necessary to switch the cars.

Manhattan City & Interurban Railway, Manhattan, Kan.—Announcement has been made by the Manhattan City & Interurban Railway that it will rehabilitate its track and overhaul all its equipment.

Shreveport (La.) Railways.—It is reported that plans are being considered by the Shreveport Railways for the construction of an extension of its East End line from Fourteenth Street to the eastern city limits.

Mattawamkeag & Northern Railway, Bangor, Me.—The Public Utilities Commission of Maine has granted an extension of the charter of the Mattawamkeag & Northern Railway, which proposes to construct a line from Mattawamkeag to Millinocket and East Millinocket, 23 miles. George W. Stearns, Millinocket, is interested. [April 13, '18.]

Butte (Mont.) Electric Railway: It has been announced the Butte Electric Railway will expend $70,000 in street and track improvements within the next few weeks. This sum will be distributed in the following projects: Broadway, from Montana to Arizona Street; West Granite, from Montana to Main Street; East Park, from Main to Covert Street and several blocks on Main Street. In addition, new switches and new material will be installed. Main Street will be double-tracked for several blocks.

International Railway, Buffalo, N. Y.—It is reported that the fast line of the International Railway from Buffalo to Niagara Falls will be opened on May 30.

Harrisburg (Pa.) Railways.—This company is reconstructing its double track in Second Street from Walnut to State Street and is constructing new track connecting the Cameron and Market Street lines.

Pittsburgh (Pa.) Railways.—The Public Service Commission of Pennsylvania has ordered the Pittsburgh Railways to construct a double or single track with turnouts in Wheatland Street, Pittsburgh. The order came as a result of a complaint by the city of Pittsburgh that the company had not constructed a line as required.

Dallas (Tex.) Southwestern Traction Company.—Work is being delayed on the construction of the proposed line of the Dallas Southwestern Traction Company from Dallas to Irving owing to trouble in getting the right-of-way. About four-fifths of the route has been graded. E. P. Turner, president. [March 9, '18.]

Dallas (Tex.) Railway.—No street car line will be built by the Dallas Railway from Dallas to Love Aviation Field, according to an announcement by Richard Meriwether, superintendent of the company. Mr. Meriwether said material is too high and too scarce and the labor supply is too uncertain to justify the undertaking.

Salt Lake, Garfield & Western Railway, Salt Lake City, Utah.—It is reported that electrification of the Salt Lake, Garfield & Western Railway to Saltair is practically completed and that electric cars will be operated on the line by May 30.

Texas Electric Railways, Dallas, Tex.—The tracks on Tarlton Avenue, Rose Hill, will be lowered to a level with the street by the Texas Electric Railway.

Shops and Buildings

Philadelphia (Pa.) Railways.—A contract has been awarded by the Philadelphia Railways to William Steele & Sons for the construction of a new carhouse and repair shop at Penrose Ferry and Fort Mifflin Roads, to cost about $28,000.

Power Houses and Substations

Trenton & Mercer Traction Corporation, Trenton, N. J.—Major Edmund J. Barry, who is in charge of the government munitions plant at Tullytown, Pa., has ordered additional electric power furnished to the Trenton, Bristol & Philadelphia Street Railway from the power house of the Trenton & Mercer County Traction Corporation at Trenton, N. J. Wires will be strung through the streets of Trenton across the Delaware River to connect with the former line at Morrisville, Pa. The work of construction will begin in a short time. Major Barry was prompted to take this action because of the insufficient transportation accommodations placed at the disposal of the workmen from Trenton who are employed at the Merchant's Shipbuilding plant at Bristol, Pa., and the Foundation Munitions plant at Tullytown, Pa. The Trenton, Bristol & Philadelphia Street Railway Company informed the government authorities that it did not have sufficient power at its disposal to warrant the increased service desired.

Virginia Railway & Power Company, Richmond, Va.—A contract has been awarded by the Virginia Railway & Power Company to Nicholas & Linderman, Norfolk, for alterations and improvements in its one-story substation, to cost $11,700.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Review of the Coal Situation

National Association Predicts Shortage Unless Action Is Taken To Supply Necessary Transportation

According to a statement issued by the National Coal Association on April 28, another coal shortage, more serious than that of last winter, and almost certain interference with the war program, is inevitable throughout the East unless there is soon a readjustment of traffic over Eastern railroads. The enormous demands of other war industries are crowding coal off the rails, and the resultant continued shortage of cars at the mines has cut production to the danger point. This is the season of the year when the mines should be working at top speed to produce stocks for storage against the needs of next fall and winter. The mines, however, are not working at top speed, nor at a rate even approaching top speed. In the face of the heaviest demand for coal in the country's history, the mines have been so hindered by insufficient car supply that they have made little, if any, headway over last year's record—a record which fell 50,000,000 tons short of meeting the nation's demands.

Opinions of operators in the great producing area east of the Mississippi, which furnishes more than 90 per cent of the country's bituminous coal, requested by the National Coal Association, are almost unanimously to the effect that the coal shortage next winter will be worse than that of last winter unless the mines are furnished sufficient cars to enable them to increase materially their present rate of production.

It is understood that the railroads are hauling far more traffic as a whole than they ever hauled before. It is evident therefore that freight of other classes than coal is responsible for all or practically all of this increase. It would seem that the time has come for the War Industries Board, or whoever is running the war, to decide upon a readjustment of traffic over the Eastern railroads so that coal may be handled in sufficient tonnage to take care of the industrial and domestic requirement of the Eastern States.

The latest official summary of the United States Geological Survey shows that with a full-time output of 15,500,000 tons, bituminous mines produced during the week ending April 13 but 70.1 per cent of output or 10,864,000 tons. Production lost because of car shortage was approximately 2,800,000 tons during the week or 467,000 tons a day. Pennsylvania fields capable of producing 4,385,000 tons during the week lost 762,000 tons, or 17 per cent because of car shortage. The following table, covering fifteen producing sections with a full-time output of 11,810,000 tons during the week, shows the extent to which production was curtailed by inadequate transportation facilities in each field:

Producing Field	Full-Time Output, Tons	Production Lost Because of Car Shortage—Tons
Western Pennsylvania	2,000,000	460,000
Central Pennsylvania	2,000,000	150,000
Somerset County, Pa	185,000	105,000
Irwin Gas Fields, Pa	200,000	47,000
Illinois	2,450,000	352,000
Indiana	945,000	192,000
Southern Ohio fields	480,000	130,000
Northern and Central Ohio fields	760,000	240,000
New River and Winding Gulf Fields, West Virginia	430,000	93,000
Fairmont Fields, West Virginia	260,000	145,000
Cumberland and Piedmont fields, West Virginia and Maryland	200,000	55,000
High volatile fields of southwest Virginia	835,000	255,000
Northeastern Kentucky fields	230,000	55,000
Western Kentucky fields	355,000	73,000
Southern Appalachian fields	480,000	40,000
Total	11,810,000	2,392,000

Rotary Market Dull

War Situation Is Determining Practically the Entire Demand—Delivery Conditions Unimproved

As with other railway equipment rotary converter demand is very light. Such business as is heard of pertains directly or indirectly to government requirements. Where extensions have been made by the traction roads it is of the same character; that is, to meet the transportation demands at cantonments and camps or other military and naval needs. Prices have remained about stationary for some time, and no changes are anticipated. It is more difficult to obtain material—iron, steel, copper, etc. This is particularly true of steel for the shaft.

Another angle to the situation is that often when commercial orders are made up a government representative comes along and finds the rotary will satisfy the requirements of some government installation, whereupon it is commandeered without ceremony. Of rotaries on order at the present time about 88 per cent are for the government on priority. Even with a certificate of priority a rotary of 2000-kva. rating is not deliverable under six months. On a commercial requirement it is eight months, with from seven to eight months on 500-kva. units.

Filling Steel Orders on Private Account Held Up

Facilities of Mills and Blast Furnaces Devoted Solely to Government Requirements for Thirty Days.

At a meeting of fifty iron and steel manufacturers held in New York City April 26, after a conference with government officials, it was decided to hold in abeyance practically all orders for commercial steel. By this action the heads of the industry engaged to put their entire plants at the disposal of the United States and the allied governments for the production of material for the munition factories and shipyards, thereby sidetracking indefinitely contracts entered into with private buyers. Therefore manufacturers of rolling stock, railway equipment, electrical apparatus, machinery, supplies, accessories and a long line of specialties and staples for which steel is essential, unless requirements have been anticipated and sufficient stocks are on hand to meet the demand, will be obliged to curtail or defer production and postpone promised deliveries.

Exceptions from this program, it is understood, will be only those buyers of commercial steel who secure government authorization for the early completion of their orders. The initial steps in this schedule for concentration were taken several weeks ago, when a number of companies decided to shelve for a period of thirty days all commercial orders.

Furthermore, a fresh survey of steel consumption throughout the country made by the government requires that each seller of steel be informed by his customer or the buyer the precise use to which steel already ordered is to be put. All tonnage either on government or civilian orders is to be so itemized. The various rulings that have been made as to priorities in manufacture and shipment are to be elaborated, so that in substance there will be a definite sequence all along the line, the less essential commodities to be placed nearer the bottom of the list.

Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C., in a recent report describes the strained tariff relations that existed between Russia and Germany much of the time between 1890 and the outbreak of the war. Copies can be obtained at the price of 5 cents from the superintendent of documents, Government Printing Office, Washington, D. C.

Open-Car Equipment Receiving Slight Attention

Railways Not Buying Material or Supplies as in Former Years—Standard Closed Type Preferred

Contrary to the practice of former years a number of the Eastern electric railway companies are not making their usual preparations for the refurnishing and rehabilitation of their open rolling stock. Manufacturers and agencies which specialize in this equipment frankly say the buying for this purpose, which customarily is in evidence long before this, has not materialized. A majority of the traction roads purchase their essential supplies and requisites in the winter. One of the largest Eastern corporations, when questioned, stated it had not made up any summer budget this year and that this matter was always arranged in the winter.

In explanation of this attitude the vice-president and general manager said he had discussed this matter with the officials of other railways and the consensus of opinion was that no extensive repairs, replacements or refurnishing of open cars, other than was absolutely necessary, would be made.

One reason was that the income of many traction roads was insufficient to met the expense. A second was that even if the funds were available it would be undesirable, on patriotic grounds, so to spend them. All the money that could be spared, the official continued, should be invested in Liberty Bonds to help win the war, and non-essential betterments could wait.

For seatings it was learned that no orders were given, the informant, who has wide experience, remarking that the electric railways were getting away from the regulation open cars. The closed type, with facilities for removing or dropping the windows and depending on the heavy curtains for storm protection, was preferred and being placed in service. Of curtains of duck—striped, plain or colored—very little had been bought for summer equipment. At one time this was an item of importance, but this year, to quote a manufacturer who furnishes curtains for a large portion of the new rolling stock, only one road, a system operating at a seaside resort, had purchased a yard, and the order was for only five cars.

Duck, he said, was scarce—in fact none was to be had, as the government had commandeered the entire available supply. The price had been going up steadily, 75 per cent representing a year's increase. As previously noted in the ELECTRIC RAILWAY JOURNAL curtain fixtures, which are about all patented articles, have advanced 10 per cent in six months on the light-weight kind. So far as could be ascertained, companies which do no overhauling until the cars are actually brought out of the carhouses for summer service were also dilatory in providing equipment of this description.

Gear Manufacturers Hold Convention and Elect Officers

The second annual meeting of the American Gear Manufacturers' Association was held at White Sulphur Springs, W. Va., April 18 to 20, 1918.

At the opening session F. N. Sheppard, of the United States Chamber of Commerce, spoke on "How We Can Get Behind the Government and Help Win the War," and B. F. Waterman presented a paper on "Gear Standardization."

At the morning session on Friday an executive committee and officers for the ensuing year were elected as follows:

Executive committee: F. W. Sinram, Frank D. Hamlin, H. E. Eberhardt, Frank Burgess, George L. Markland, Jr., Milton Rupert, William Ganschow, E. J. Frost and H. W. Chopin.

The officers elected were president, F. W. Sinram; vice-president, H. E. Eberhardt; secretary and treasurer, Frank D. Hamlin.

At the Saturday session the papers presented were: "Uniform Cost Accounting," by J. H. Dunn, and "Hobbs and Hobbing Machines," by F. G. Hoffman and John Edgar.

Railroad Administration Orders 30,000 Cars

An Additional Lot of 70,000 Also Being Under Negotiation—Completion To Be Rushed

Orders for 30,000 box and coal hopper cars, involving between $80,000,000 and $90,000,000, has been placed by the Railroad Administration with the American Car & Foundry Company. This is the first order of its kind entered into on so large a scale since the government asumed control of the railroads. It is expected the cars will be completed in time for the fall and winter business of the roads. Reports also say negotiations are pending for the construction of 70,000 additional freight cars.

The cars will have steel underframes and a sufficient quantity of the materials has been assured by the War Industries Board. The contract was awarded on the basis of an approximate profit of 5 per cent on the manufacturer's cost. The impression in metal circles is that the plans will involve the use of a minimum amount of wood in the box cars and probably some wood in the superstructure of the hopper cars.

Rolling Stock

Washington Railway & Electric Company, Washington, D. C., which recently ordered twenty-five new cars, as noted in the ELECTRIC RAILWAY JOURNAL of Apr. 3. from the G. C. Kuhlman Car Co., this week added another twenty-five, making fifty in all. The specifications duplicate those published in this department on April 20, page 794. Delivery of the new lot will be in October.

Public Service Railway, Newark, N. J., to equip the shipyards branch of its system in Camden and Gloucester, N. J., last week ordered thirty-three new cars, standard type, of the Cincinnati Car Company, referred to in recent numbers of the ELECTRIC RAILWAY JOURNAL. The rolling stock and other necessary improvements on order of the United States Shipping Board, Emergency Fleet Corporation, will cost about $1,250,000, and go through on priority preference. Delivery of the cars is to be made in ninety days.

Brooklyn (N. Y.) Rapid Transit Company now states that it is probable no order for the fifty new centre-entrance trail cars, for which specifications are in hand, will be placed within a month. The matter is now in the personal charge of T. S. Williams, president of the company.

Hudson & Manhattan Railroad, New York, N. Y., which submitted estimates and specifications to the United States Shipping Board Emergency Fleet Corporation for an extension to the shipyards at Port Newark Terminal, N. J., and for the purchase of 100 all-steel cars as mentioned in the ELECTRIC RAILWAY JOURNAL, March 23, page 597, and subsequently, has its proposition still under consideration. Reports say Engineer Drum recommended the improvement, but Admiral Bowles is opposed to the plan on account of the cost, which is placed at $3,000,000.

Interborough Rapid Transit Company, New York, N. Y., which has been in the market for 10,000 tons of heavy steel rails for its 1919 requirements, has not yet succeeded in placing the order. The steel mills decline to accept its terms, both on price and delivery.

Philadelphia (Pa.) Rapid Transit Company, following the order for 100 new cars, on account of the United States Shipping Board, Emergency Fleet Corporation, for the Hog Island shipyard extension referred to and of which specifications were published in the ELECTRIC RAILWAY JOURNAL, March 16, page 552, is reported as about to purchase fifty additional cars of the same type, to be operated in the same service.

Manila Railroad & Light Corporation, Manila, P. I., controlled by the J. G. White Management Corporation, New York, N. Y., which has been contemplating the purchase of fifteen new cars, as mentioned in the ELECTRIC RAILWAY JOURNAL of Jan. 26 and Feb. 23, is now preparing the specifications in which bids will be asked. The order will be placed shortly, as it will take nearly a year and a half after the car builders have them on delivery before they will reach Manila. The rolling stock is to be two-man single and double truck, and it is reported the St. Louis Car Co., which built the last cars for the Manila corporation, will receive the order.

Trade Notes

Sprague Electric Works of the General Electric Works, New York, N. Y., announces the removal of its office in Boston from 201 Devonshire Street to 84 State Street, room 906; also the removal of its quarters in St. Louis, from the Chemical Building to the Pierce Building, room 1352.

Drew Electric & Manufacturing Company, Indianapolis, Ind., manufacturer of electric railway, light, power and gas materials, has appointed William M. Lawyer its sales representative for the northern part of the State of New York. Mr. Lawyer has headquarters at 383 West Fayette Street, Syracuse, N. Y.

National Bank of Commerce, New York, N. Y., has printed the Export Trade Associations act (Webb act), as approved April 11, with annotations in convenient pamphlet form. The enactment of the law is a decisive step, in the direction of an expansion of foreign trade. Copies may be had by applying to the foreign department of the bank.

Fred W. Godfrey has severed his connection with the Republic Electric Company to become associated with the American Carbon & Battery Works of the National Carbon Company, Inc., of East St. Louis, Ill. Mr. Godfrey will cover all of Minnesota, North and South Dakota, Nebraska, Colorado, Montana, Wyoming, Utah, Idaho and New Mexico. He has traveled the Central West for many years.

Jeffery-DeWitt Company, manufacturer of high-tension disk insulators, will after June 1 move its factory from Detroit, Mich., to Kenopa, W. Va.

Charles C. Shneider, manufacturers' agent, has moved from 329 to 327 Broadway, Market Building, Detroit, Mich., where larger quarters have been secured. Mr. Schneider, who represents the Pittsburgh Lamp, Brass & Glass Company, has recently added to his line the transformers made by the Cumberland Electric Company of Memphis, Tenn.

Asprómet Company, Pittsburgh, Pa., will, after May 1, be the new name of the Asbestos Protected Metal Company. When this company was established in 1905, its sole product was asbestos protected metal. It has now a line of building material specialties, many of which contain neither asbestos nor metal in their make-up. The former name became restrictive to the point of being misleading; hence the change.

General Electric Company, Schenectady, N. Y., had one of the most novel exhibits at the annual meeting of the Natinal Railway Appliance Association in Chicago, Ill., in March, in the form of its large service flag. Due to war conditions, making shipments for exhibits all but impossible, the General Electric Company was unable to install its usual representative exhibit for this occasion. The best answer to this question of why the company's railway appliances were not on exhibit was the service flag, showing 3650 employees in the army and navy service, flying from a flagstaff in the space reserved.

New Advertising Literature

Economy Electric Devices Company, Chicago, Ill.: Bulletin 50, illustrated, entitled "The Economy Meter: An Electric Railway Efficiency Device," has interesting chapters on efficiency in electric railway operation, advantages of energy checking and other subjects of equal import.

Wilson Welder & Metals Company, Inc., New York, N. Y.: Illustrated catalog "Electric Welding Manual," furnishing instructions for the installation, care, operation and maintenance equipment of the Wilson system. It may be interesting to note that the damaged engines of the German interned ships, seized by the United States government, were repaired in part by the Wilson welding system, the details of which are given.

Westinghouse Traction Brake Company, Pittsburgh, Pa.: Illustrated catalog, publication No. 9035, entitled "Motor Driven Compressors: Westinghouse and National Types." Primarily these air compressors were designed for use in connection with air-brake equipment on electric cars, a service requiring an unusual degree of efficiency, reliability, compactness, ease of access and quiet operation. These characteristics also make them particularly suitable for general commercial purposes; and they are finding a wide field of application wherever electric motive power is available. The various types are described in detail.

NEW YORK METAL MARKET PRICES

	April 24	May 1
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26¾	26¼ to 26¾
Lead, cents per lb	6.90	7.00
Nickel, cents per lb	50	50
Spelter, cents per lb	6.87½	7¼
Tin, Straits, cents per lb	92	96
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

* No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	April 24	May 1
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6
Zinc, cents per lb	5¼	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	*$34.00	*$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	April 24	May 1
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	30.40 to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.25
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	....	$65.00
T-rails, high (Shanghai), cents per lb	4¼	4¼
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	79%	79%
Car window glass (double strength, all sizes AA quality), New York, discount, F. O. B. factory	80%	80%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	12½ to 13	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl.	$2.65	$2.65
Cement (carload lots), Chicago, per bbl.	$2.71	$2.71
Cement (carload lots), Seattle, per bbl.	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.60	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	43½	43½

* Government price.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, May 11, 1918 *Number 19*

Be Sure You're Right—Then Go Ahead on Skip or Stagger Stops

THE skip-stop and stagger-stop plans are at last in a fair way to get a trial on a nation-wide scale. The Fuel Administration stands behind their use, and a period of nine months of non-zero weather opens up before them. This conjunction of circumstances simply puts it up to the electric railways to lay out the stops in the way that will prove of greatest benefit to the greatest number.

It will not do to cut out stops at random without regard to the conditions at each stop. A school, a church, a factory, an important store are often justifiable exceptions; not so the cantankerous individual who sees his own interests through high-powered magnifying lenses. Therefore, let every railway in introducing the change make a careful survey of where the traffic comes from and where it goes to, make allowance for torn-up streets and poor paving, give ample publicity to the reasons for the change and its benefits, and, finally, put up conspicuous stop signs to eliminate confusion and cussing.

When the stop-reduction plan is handled in this way, the railway will not go through the harrowing experiences of those roads which went at the subject hammer-and-tongs and then had to admit that many of the stops could have been located to better advantage elsewhere. In all cases it is better to have all the data in advance. Then if a protest does come, the railway will be able to prove, as in a recent instance, that exactly seven people got off every day in front of the People's Pants Emporium before the heartless railway ordered its cars to stop 250 ft. further along.

Finally, before the plan is begun, prove that the skip stop is as much for the public's benefit as for that of the railway. This will help its popularity, although under present conditions the public is inclined to grant favors to utilities even where the gain is entirely to the company, provided the latter shows that it really needs the help.

Prepare to Haul Freight

One of the ways in which the electric railways of the country can help the nation at the present time is to assist in hauling freight. The steam railroads are congested and are not able to carry all the freight which is offered to them. The electric railways can take much of this overload to better advantage than can motor trucks or any other means of transportation.

Electric railway companies should not only prepare their properties to handle this business, but, if local restrictions stand in the way, efforts should be made to have them removed. Then shippers should be urged to use the electric lines. At present many companies are devoting themselves entirely to passenger transportation, while most others are engaged principally in this kind of service. On electric railways taken as a whole the possibilities of freight haulage have hardly been touched. The effort to increase our freight business is now a national duty.

P. H. GADSDEN,
Resident Member at Washington, D. C.
Electric Railway War Board

Electric Freight Handling Is a Necessity

NO ONE has ever discovered for what mysterious reason a right-of-way railroad operated by electricity should rely mainly upon passenger business when exactly the same structure without trolley wire or third-rail would be pre-eminently a freight handler. If there is any reason at all, it is that electricity was first applied to the street railway and therefore is still largely associated with passenger rather than freight operation.

Of course, there is nothing new in the argument that electric railways can and should—and some of them do—handle freight in a big way. What we think is new, however, is the way in which A. B. Cole has considered this more-than-timely subject in his article in this issue. Instead of rethreshing time-worn suggestions, he made a first-hand investigation covering specifically almost every situation which he describes, and where his own notes were lacking or incomplete he was able to reinforce them by the magnificent researches of the War Board of the American Electric Railway Association. We believe that Mr. Cole's article and the War Board's digest constitute the best statement ever put together on what is now even more important to our government than to the electric railways, namely, the quickest possible handling of freight in the largest possible quantities with the smallest possible number of men. Clearly this means that there is little more than short-haul emergency use for the motor truck if the electric, like the steam, railroads are properly exploited.

As we summarize the situation, only four obstacles are now in the way of such exploitation. The first of these, the removal of local franchise restrictions, would not cost a cent. The second, interchange privileges with steam railroads, would bring many railroads into the big freight-handling class also at little or no expense. The third, new equipment and larger terminals, would cost some money but would be by far the least expensive as well as the quickest way of securing the commodity sought—namely—more transportation. The fourth, the closing of existing gaps in interurban networks, would take some more money, but the amount required would be only a fraction of the hundreds of millions of dollars in roadway building and maintenance demanded for motor trucks, which are so short in life, costly in upkeep, wasteful in fuel and prodigal in men.

Advertise Clean-Up Week and Practice Its Precept

AT THIS TIME of the year there arises in many communities an appeal to clean up yards and vacant lots. This is known in certain localities as the annual "clean-up week," being sponsored by civic organizations and city authorities mainly on sanitary grounds. Electric railways in many cities and towns have joined in the campaign with enthusiasm, and for the little effort and money expended there is often a return in the form of good-will which is worth going after.

There are two ways in which traction companies can do their bit in clean-up work. One is to turn the broom and hose on their own property and equipment. Too frequently there is basis for unfavorable comment on the unsightly appearance of cars which may need only a scrub brush to make them more presentable. The vacant space around car stations also is often covered with rubbish. If the electric railway manager feels that he has nothing to look after in either of the particulars cited above, he may find it to his advantage to display posters in his cars calling attention to the clean-up campaign.

Use Specialized Research to Supplement Association Committees

THE Southwestern Electrical & Gas Association is not the largest but it is one of the livest of our public utility organizations. This has been proved again in the resolution of the April convention to establish at the University of Texas scholarships in connection with fuel and lubricants.

It may be presumptuous to say so, but we believe that the associations in our industry have failed to solve many a problem because of too much dependence upon committee work and too little dependence upon university or other outside investigators. To-day, while fighting the German menace, we should not forget that the efficiency which made that menace possible is very largely the result of specialized, scientific research. When a German association was faced by a knotty problem, its committee did not hesitate to employ an outside expert. The German Street & Interurban Railway Association, for example, engaged a metallurgist to assist in studies of rail corrugation.

The defect of committee work fundamentally is that the members are on it *con amore;* and often love of the job is not great enough to prevent all the duties from being foisted upon the chairman. If the chairman is able and sacrificing, we get a report of action; if he isn't, we get a report of "progress." In the rarer cases where nearly everybody works, we run the danger of a worthless collection of "ifs" and "whereases" because the algebraic sum of opposing views tends to approach zero.

Surely a great improvement would follow if the committee confined itself first to setting forth the problem to a specialist engaged to solve it and then to subjecting his studies and conclusions to analysis from an operating standpoint. Instead of sending out a data sheet, the specialist would visit enough properties to determine for himself the limitations of local conditions, or, if it were a question for laboratory analysis, he would have all the means at hand to do the work in a scientific way.

Take so simple a matter as that of testing the life, chipping and breaking of motor brushes, for example. Can the railway manager be sure that whenever a shopman substitutes new brushes for worn ones he properly records the number, type and name of those so replaced? A look at the average shopmen will give the answer!

Indeed, there are many problems that the industry could solve quickly by specialized research—problems of energy saving in the plant and on the car; of varnishes, paints and insulations; of some features in track and line construction; maybe even systems of fare collection! As most of our associations operate to-day, too much is left to slipshod generalizations from offhand opinions and too little to data gathered in the field or the laboratory by a recognized specialist.

Publicity Work at Home Must Now Be Done by the Railway Companies

THE decision of the Court of Appeals in New York State that the public service commissions have no power under the State constitution to raise fares upon electric railways, operating under franchises which stipulate the maximum rate of fare, simply intensifies the necessity for comprehensive and convincing local publicity work by the companies concerned. Permission to increase fares above the franchise rate must now come from the local councils or, in New York City, the Board of Estimate and Apportionment.

Public service commissioners are men who have become educated in the intricacies of the electric railway business. In placing before them the details of the situation, both financial and operating, electric railway managers address men who know the field and understand its language. More important, the men addressed have already learned that the interests of the public service corporations and the interests of the public are not opposed to each other. They understand perfectly the essential equities—that just as labor is entitled to a good wage, just as superintendence is entitled to good pay, so is the invested capital which makes the public service possible entitled to its fair return.

While commissioners, like all of us, are human, the courage of public service commissions throughout the country to make just decisions in the face of possible political opposition has been amply demonstrated. The difficulties of making the average common council, which can give but little time to electric railway matters, understand the situation in all its complicated bearings and then act justly regardless of the probable political effect, is, in the very nature of things, a much more difficult task. Common councils are hostile to rate advances from the start. Only overwhelmingly convincing evidence can be expected to change their minds. A certain few must be expected to vote, regardless of proofs, according to the dictates of immediate political expediency as they see it.

The task before the electric railway companies, in short, is a task of complete community education, each company for itself, according to the exigencies of its local problem.

But in all cities the leading thought to be driven home is the same—the value of service. And it must be brought home, not in terms of abstract justice but in terms of dollars and cents. Bad service costs everyone far more than increased fares. No man can sell his house and lot, his farm or factory, for as much if the trolley line running by it gives poor service, as he can if the service is good. The wage worker who owns no property loses in time far more by bad service than the extra car fare would cost. That cost at the most, on two rides a day, for 314 working days, would be $6.28 a year.

To choke a trolley company until it is black in the face does the city and the car rider no good. It lessens the company's power to give good service.

It often happens that a local newspaper has so committed itself against fare increases that it cannot be expected to reverse itself. But the prosperity of newspapers, as of politicians, depends upon the public goodwill. It cannot persist in a policy opposed to the wellbeing of a town and of its readers, without suffering harm. So in the last analysis, the company must convince the community. That's the only answer.

On the whole, there will be a compensation for this necessary extra effort. The public's good-will will be gained—nay, it must be gained, since to win before the public service commission a verdict for higher fares that would be unpopular at home, would, after all, be a Pyrrhic victory.

Railways Should Help Employees to Start Vegetable Gardens Again

A YEAR ago many electric railways assisted their employees to start vegetable gardens. The purpose was partly to assist the individual employees to reduce their cost of living by raising a part of their food supplies and partly to increase the food supply of the country.

These reasons apply just as strongly now as twelve months ago so that the same efforts should be continued, and increased, this year. They should certainly not be relaxed. The National War Garden Commission has issued some "Garden Primers" to encourage just this sort of home cultivation and can be depended upon to help. Owing to the late spring there is still ample time to put in seed and plants but not a day should be lost from now on.

The Pennsylvania Railroad reports that its employees east of Pittsburgh last year planted approximately 1200 gardens on company lands and raised crops of an estimated value of $250,000. This railroad has offered to rent ground belonging to the company to its employees at a charge not exceeding $1 per acre for the season and for tracts of more than an acre a charge not exceeding 50 cents per acre for the season will be made. One argument urged for the inauguration of the daylight saving plan was that it would help in the establishment of these war gardens. Now that daylight saving is here, people should take advantage of it.

A Useful Application of Electric Generator Armature Reaction

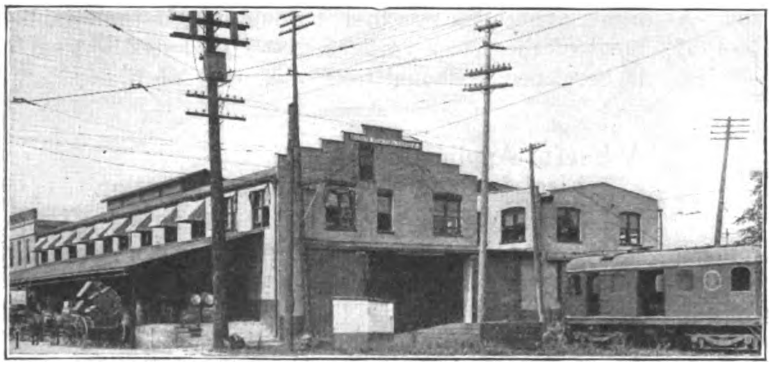
IN LAST WEEK'S issue of the ELECTRIC RAILWAY JOURNAL there was described a device for short-circuiting the armature windings of a direct-current generator in order to prevent "flashing," or the jumping of an arc from brush holder to brush holder. This device short-circuits for an instant first the direct-current brushes and a few thousandths of a second later it short-circuits three collector rings tapped into the armature windings like the rings of a rotary converter. In case of excessive overload on the machine, such as might cause flashing, the generator is protected in the manner indicated while the main circuit breaker is coming into action.

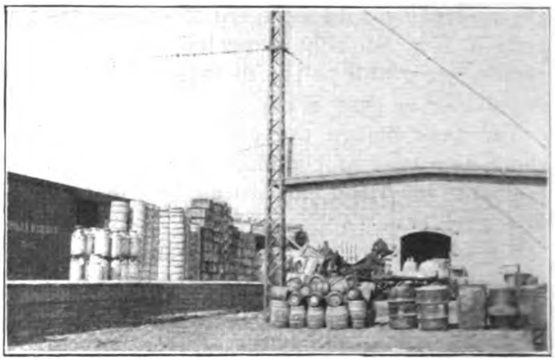
This interesting device involves a number of fundamental principles, one of which in particular deserves special mention. When the alternating-current short-circuit occurs, large alternating currents flow through the collector rings and windings. These currents are of low power factor because the reactance of the local circuit is high compared with the resistance. They therefore produce a magnetizing force opposed to the main field, greatly decreasing or practically neutralizing the latter and so reducing the direct current voltage produced by the machine.

The above phenomenon illustrates the intimate magnetic relation of the armature and the field of an electric generator and brings to mind a somewhat analogous ease which had an important bearing upon the early success of the electric railway generator. Pioneers in the electric railway business will remember the terrific sparking which characterized the early multipolar railway generators. This was largely due to the impracticability of making the several paths in the armature winding produce exactly the same voltage. Then when all the brushes of the same polarity were connected together there were fireworks, sometimes startling, at the commutator. Flash-overs also were frequent.

When the rotary converter was invented it was noted that this machine did not spark like the ordinary direct current machine and it was found that the improvement was due to the collector rings which were each connected to the winding at a number of equipotential points. Analysis showed that alternating currents circulated locally in the windings, of low power factor on account of the relatively high reactance. These currents reacted on the poles, weakening the strong ones and strengthening the weak ones, thus equalizing the voltage in the several armature paths. The application of equipotential or bonding rings to the multipolar generator followed as a matter of course. It had the desired effect and destructive sparking largely became a thing of the past.

This early experience is mentioned here partly because suggested by the new "flash suppressor" and partly because it is well now and then to remember how much of present comfort we owe to the inventors of the past.





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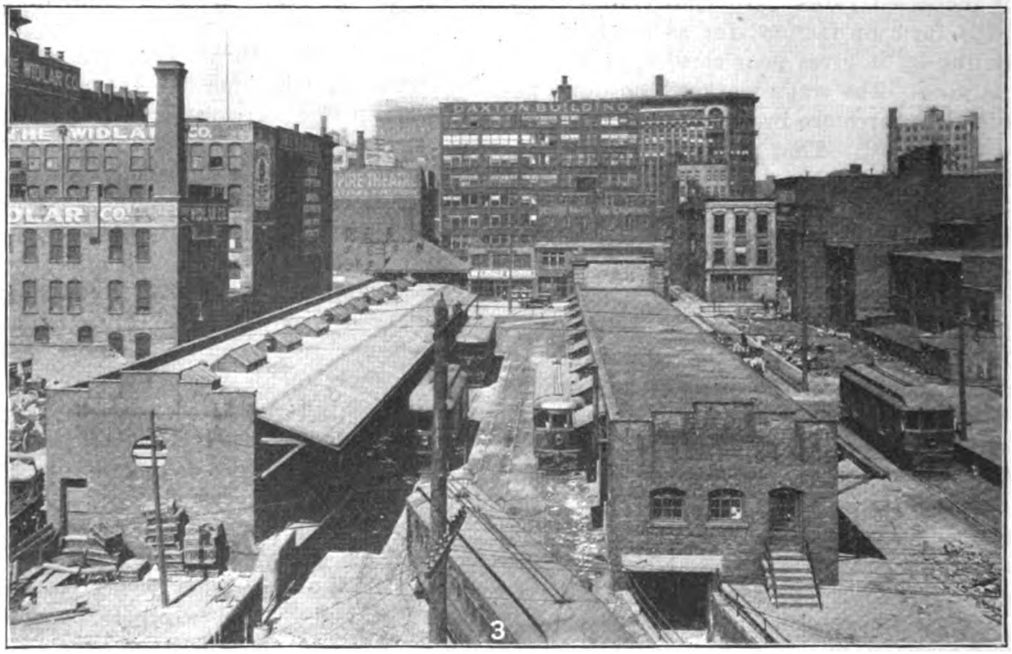

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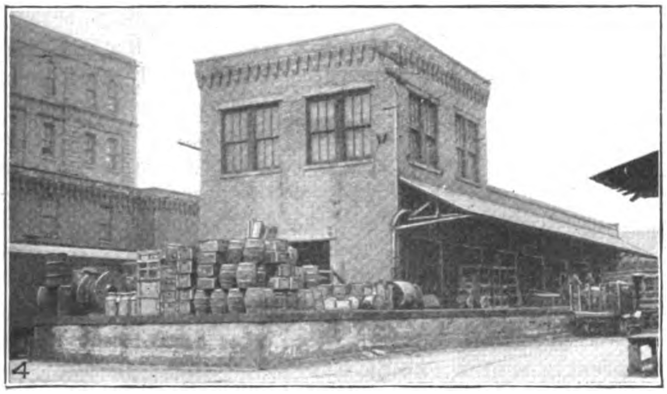

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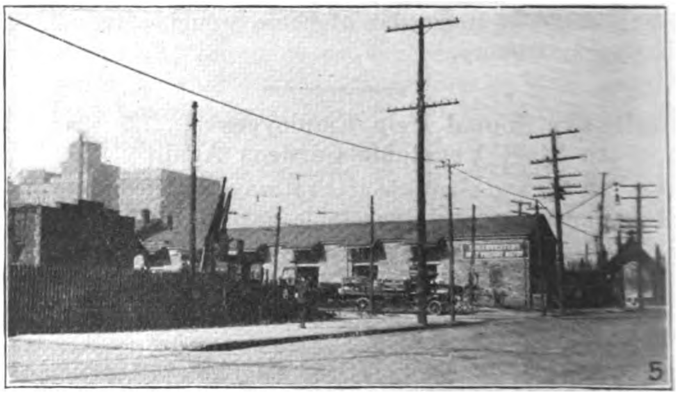

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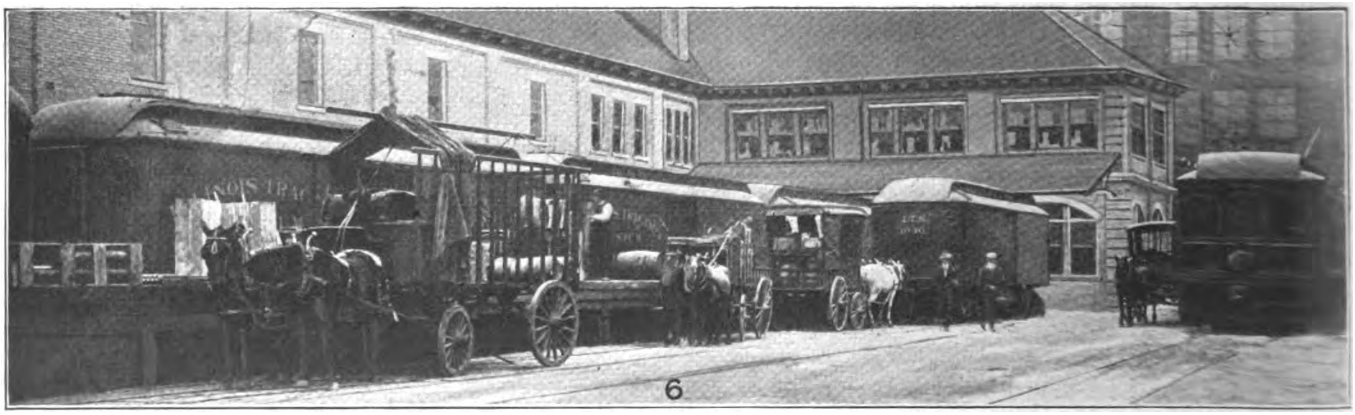

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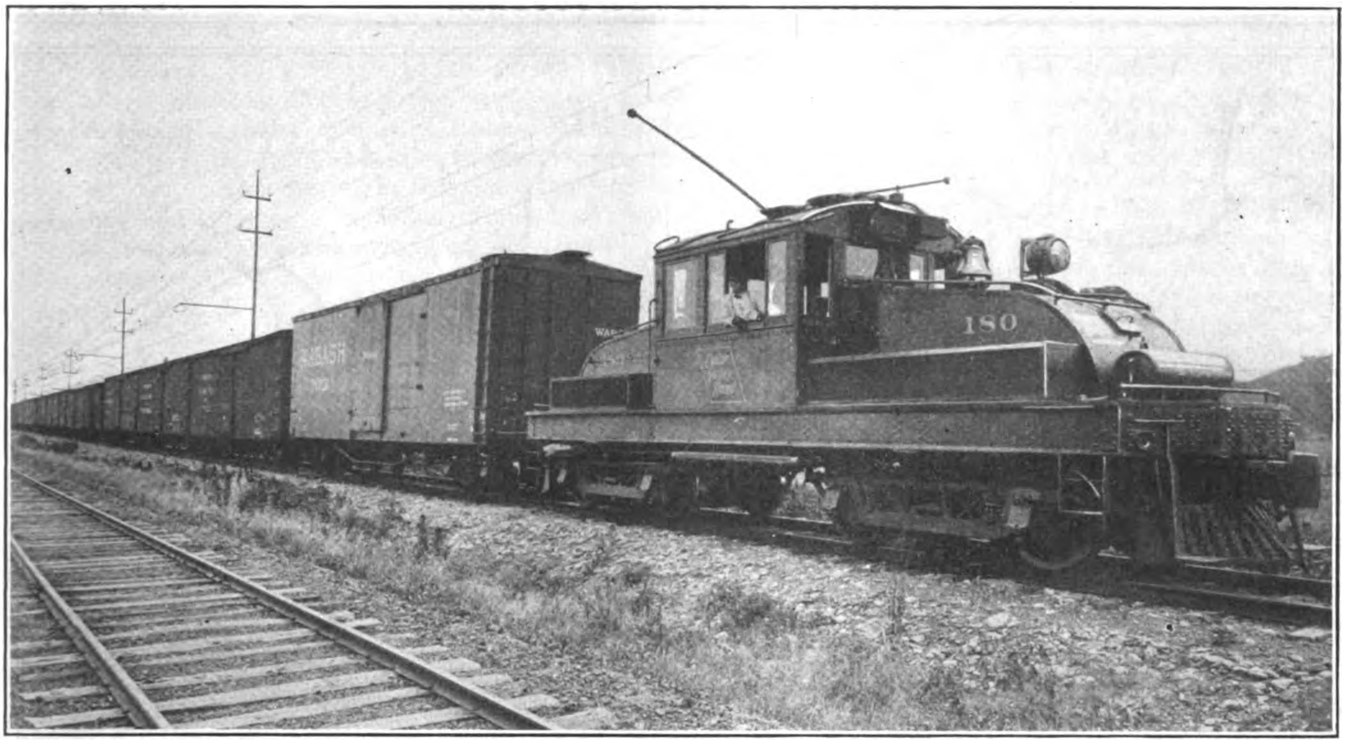
A FEW ELECTRIC RAILWAY FREIGHT STATIONS

Fig. 1—Illinois Traction System—Springfield, Ill.
Fig. 2—Michigan Railway—Grand Rapids, Mich.
Fig. 3—Electric Package Agency—Cleveland, Ohio
Fig. 4.—Ft. Wayne & Northern Ind. Traction Co.—Ft .Wayne, Ind.
Fig. 5.—Cleveland, Southwestern & Columbus Ry.—Cleveland, Ohio.
Fig. 6—Illinois Traction System—St. Louis, Mo.



A 60-TON ELECTRIC LOCOMOTIVE AND TRAIN, WATERLOO, CEDAR FALLS & NORTHERN RAILWAY

Electric Railways Are in a Position to Haul More Freight

By A. B. Cole

In Co-ordination with the War Board of the American Electric Railway Association

The author has recently made an extended personal study of the freight carrying facilities of electric railways. From the data thus secured and from those compiled by the War Board, he is able to point out how electric railways, in general and specifically, can relieve a large proportion of the present traffic congestion, particularly when helped by the removal of local franchise restrictions, the extension of steam railroad interchange arrangements, and federal aid in financing the purchase of new rolling stock, the carrying out of track alignment and the improvement of terminal facilities

IN THE MINDS of our public and government, the electric railway is associated only with the transportation of passengers.. This is deplorable, since it means that thousands of miles of track are being used only a very small portion of the time and for only a fraction of their capacity instead of fully sharing the burden of carrying the greatest freight movement in the history of American railroading. It is true that the steam railroads are best fitted for long through hauls, but an investigation of our electric railways will disclose some surprisingly long hauls, as well as indicate what the addition of a few miles of track here or there, the removal of local franchise restrictions, the increase of motive power and car equipment, terminal facilities, etc., could do to relieve the steam railroads of burdensome local passenger and freight service, particularly the latter.

Many of the interurban electric railways, especially those constructed during the early development of this class of transportation, gave little attention to the movement of freight. Those built in more recent years have been devoting more attention to the development of this service. Fortunately enough instances exist to prove not only that electric railways can do great things to relieve freight congestion, but also that they can do it in the fullest co-operation with their older steam brother. Where there is a duplication of facilities, as between a steam railroad and an electric line, the facilities of the electric line should be used to their maximum capacity to relieve the steam line of the short-haul traffic. The general equipment, the motive power and cars of the steam railroad which are used in this short-haul service could then be released for long-haul through freight and passenger service. Thus the present unprecedented congested condition of the steam railroads could be very materially relieved.

The unused and undeveloped facilities of the electric railroads of the country are of such magnitude and can be made available in the present crisis at such a comparatively small cost that it would seem extravagant and wasteful, both in man power and in money, were the government to countenance the much discussed motor-truck transportation plan before the freight carrying power of the electric roads has been fully developed.

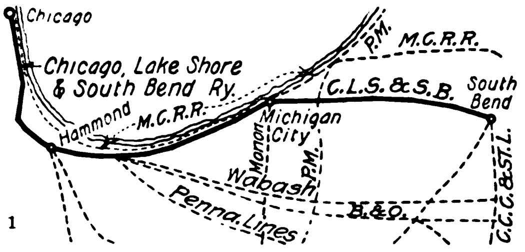

Chicago
Chicago, Lake Shore & South Bend Ry.
P.M.
M.C.R.R.
C.L.S.& S.B.
South Bend
Hammond
M.C.R.R.
Michigan City
Monon
P.M.
Wabash
B.& O.
Penna. Lines
C.C.C.& St.L.

FIG. 1

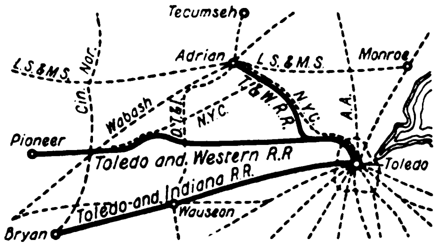

Tecumseh
L.S.& M.S.
Cin. Nor.
Adrian
L.S.& M.S.
Monroe
Wabash
D.T.& I.
N.Y.C.
T.& W.R.R.
N.Y.C.
A.A.
Pioneer
Toledo and Western R.R.
Toledo
Toledo and Indiana R.R.
Wauseon
Bryan

FIG. 2

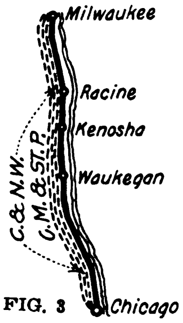

Milwaukee
Racine
Kenosha
Waukegan
C.& N.W.
C.M.& St.P.
Chicago

FIG. 3

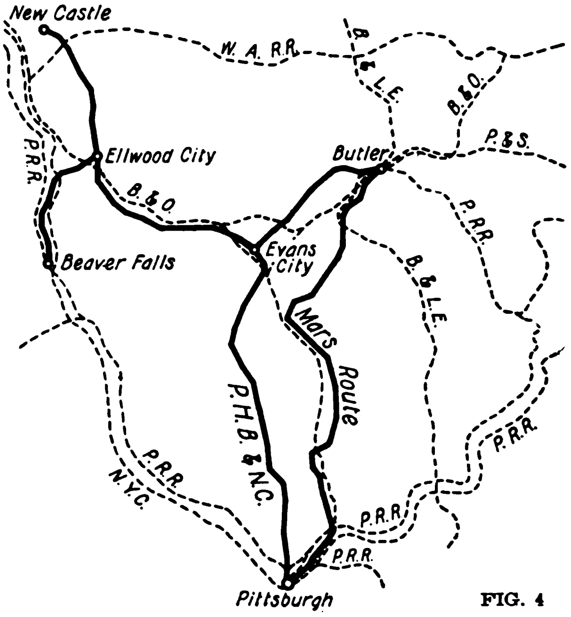

New Castle
W. A. R.R.
B.& L.E.
B.& O.
P.& S.
P.R.R.
Ellwood City
Butler
B.& O.
P.R.R.
Beaver Falls
Evans City
B.& L.E.
Mars Route
P.H.B.& N.C.
P.R.R.
N.Y.C.
P.R.R.
P.R.R.
P.R.R.
Pittsburgh

FIG. 4

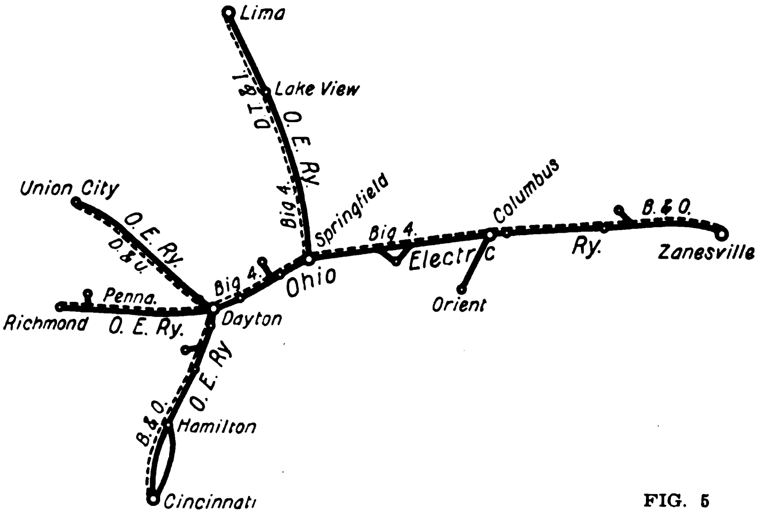

Lima
Lake View
T.& O.C.
O. E. Ry.
Big 4.
Springfield
Columbus
Big 4.
B.& O.
Union City
O. E. Ry.
D.& U.
Big 4.
Ohio
Electric
Ry.
Zanesville
Penna.
Orient
Richmond
O. E. Ry.
Dayton
O. E. Ry.
B.& O.
Hamilton
Cincinnati

FIG. 5

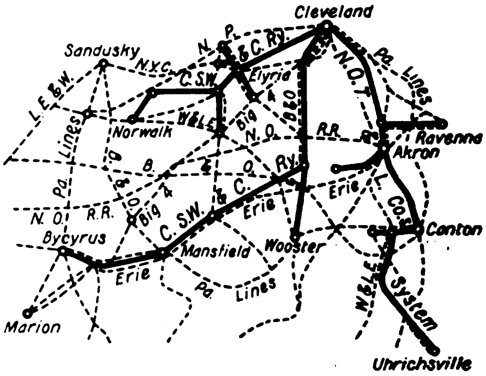

Cleveland
Sandusky
N.P.
C.R.R.
N.Y.C.
C.SW.
Elyria
N.O.T.
Pa. Lines
L.E.& W.
Norwalk
W.& L.E.
Big 4
B.& O.
N.O.
R.R.
Ravenna
Akron
Pa. Lines
B.
O.
Ry.
B.& O.
Big 4
C.SW.& C.
Erie
Erie
N.O. R.R.
Bucyrus
Mansfield
Wooster
Canton
Erie
Pa. Lines
W.& L.E.
System
Marion
Uhrichsville

FIG. 6

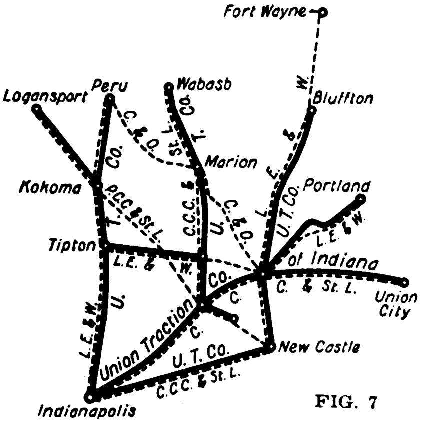

Fort Wayne
Wabash
Logansport
Peru
L.E.& W.
Bluffton
C.& O.
T. Co.
St. L.
Marion
U.T.Co.
Kokoma
P.C.C.& St.L.
C.C.C.& St.L.
C.& O.
L.E.& W.
Portland
Tipton
L.E.& W.
U.
Co.
C.
of Indiana
L.E.& W.
C.& St.L.
Union City
Union Traction
C.
U. T. Co.
New Castle
C.C.C.& St.L.
Indianapolis

FIG. 7

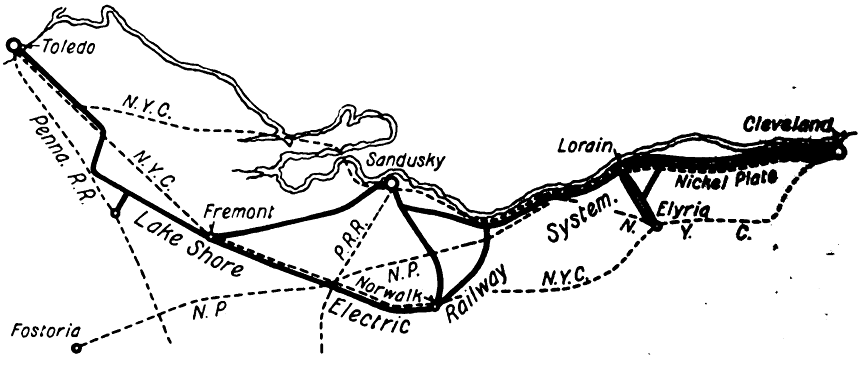

Toledo
N.Y.C.
Penna. R.R.
N.Y.C.
Sandusky
Lorain
Cleveland
Nickel Plate
Fremont
Lake Shore
P.R.R.
System.
Elyria
N.
Y.
C.
N.P.
Norwalk
Electric
Railway
N.Y.C.
N.P
Fostoria

FIG. 8

Fig. 1—Chicago, Lake Shore & South Bend Railway
Fig. 2—Toledo & Western and Toledo & Indiana Railroads
Fig. 3—Chicago, North Shore & Milwaukee Electric Railroad
Fig. 4—Pittsburgh, Harmony, Butler & N. C. and Pittsburgh Mars & Butler Railways
Fig. 5—Ohio Electric Railway
Fig. 6—Cleveland, Southwestern & Columbus Railway, Northern Ohio Traction & Light Company
Fig. 7—Union Traction Company of Indiana
Fig. 8—Lake Shore Electric Railway

DUPLICATION OF SERVICE—SOME SPECIFIC INSTANCES WHERE ELECTRIC RAILWAYS CAN HELP THE STEAM RAILROADS. ELECTRIC LINES SHOWN IN SOLID LINES

The amount of relief which the electric railways can afford the steam lines is not to be measured merely by the tonnage handled, but by the increase in the physical capacity of the steam railroads, through the elimination of long waiting at freight terminals, thus conserving fuel and labor by a reduction of standing time.

The capacity of the steam railroads for through passenger and freight service would be materially increased were the local short-haul traffic handled by the electric lines, and the steam road relieved of odd movements due to local passenger trains, way-freights, and switching, which tend to slow up the through service and impede terminal operation.

An immediate step of most importance in the relief of traffic congestion is the elimination of needless duplication of service by steam and electric lines. A study of seventeen typical cases taken from data secured from the War Board of the American Electric Railway Association and shown in the accompanying maps will indicate the prevalence of this condition.

Immediate Relief by Universal Interchange Far Greater than Through Motor-Truck Haulage

Admittedly there is at present a great shortage of freight cars, and the addition of 100,000 cars recently ordered by the Railroad Administration will only tend to ameliorate, not correct, this trouble. Other steps must be taken, and an important one is to increase the use of the existing cars. This the electric railway would be particularly able to accomplish, if universal interchange between steam and electric lines were established, because of the shorter time spent by freight cars in electric railway terminals.

There are enough electric railways having steam railroad clearances to be of material help; and in the meantime, through federal aid, others could be placed in physical shape for this service at not one-tenth the amount of money which would be required for the construction of highways for the use of motor trucks.

A Few Specific Instances Where Electrics Can Help

Maps illustrating these conditions are shown on the opposite page and elsewhere in this article

An immediate step of most importance in the relief of traffic congestion would be to eliminate the needless duplication of service by steam and electric lines in the same territory. A study of the following typical cases taken from data collected by the War Board of the American Electric Railway Association will indicate the prevalence of this condition:

Northern Ohio Traction & Light Company (1) could readily relieve:

Pennsylvania Railroad at Cleveland, Akron, Ravenna, Barberton, Canton, Massillon, Canal Dover and Uhrichsville.

Baltimore & Ohio Railroad at Cleveland, Kent, Akron, Massillon, Canal Dover, New Philadelphia.

Wheeling & Lake Erie Railroad at Cleveland, Kent, Canton, Massillon.

Erie Railroad at Akron, Kent, Barberton.

This line can handle all steam road traffic between its stations.

Cleveland, Southwestern & Columbus Railway (2) can practically take care of all local freight business between terminals (Cleveland, Wooster and Bucyrus), relieving the New York Central, Baltimore & Ohio, Erie and Pennsylvania Railroads.

Lake Shore Electric Railway (3) is an important link in through interurban service between Cleveland, Sandusky and Toledo, forming an important connection for freight in and out of Detroit. This railway could handle all local business now carried by the New York Central, Nickel Plate and Pennsylvania Railroads between Cleveland and Sandusky and other points.

Chicago, North Shore & Milwaukee Electric Railroad (4) could handle carload and l.c.l. freight as well as Chicago packing house freight to Fort Sheridan and Great Lakes Naval Training Station. Movement of through freight in the Chicago district could be facilitated if carload shipments for points between Highland Park and Milwaukee could be delivered to the electric line, thus eliminating the delay in handling it through Chicago. This in turn would help to reduce congestion at Chicago terminals. The steam railroads favorably affected would be the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul Railways.

Chicago, Lake Shore & South Bend Railway (5) could handle practically all local freight between its terminals, West Pullman, Ill., and South Bend, Ind., relieving the Baltimore & Ohio, Chesapeake & Ohio, Grand Trunk, Michigan Central, New York Central, Pennsylvania and the Wabash.

Michigan Railway (6) can handle both carload and l.c.l. freight. It has considerable equipment, including warehouse and team track delivery facilities at all stations. It could relieve the Pere Marquette, Grand Rapids & Indiana, Michigan Central, Grand Trunk and the New York Central Lines.

Grand Rapids, Grand Haven & Muskegon Railway (7) can care for all l.c.l. shipments originating at its terminals. In this particular case the electric line forms quite an important route between Chicago, Grand Haven, Muskegon and Grand Rapids via the lake boats of the Goodrich Transit Company. This line also forms an important link in through electric railway haulage from Grand Haven and Muskegon to points in Southern Michigan, Ohio and Indiana. Such changes would relieve the Grand Rapids & Indiana, the Pere Marquette, and the Grand Trunk Railways. The last-named serves the same towns as the electric for 28 miles.

Pittsburgh, Harmony, Butler & New Castle Railway (8) can relieve the following steam roads of practically all local freight business, in one of the most important war industry districts in territory served:

Baltimore & Ohio at Pittsburgh, Butler, Evans City, Zelienople, Ellwood City and New Castle—
Pittsburgh & Lake Erie at Ellwood City and New Castle—
Buffalo, Rochester & Pittsburgh at Pittsburgh and Butler—
Bessemer & Lake Erie at Pittsburgh and Butler—
Pennsylvania Railroad at Pittsburgh, Butler and New Castle.

Detroit United Railway (9) can handle both carload and l.c.l. freight over its entire system, thereby relieving the Michigan Central, New York Central, Grand Trunk, Detroit & Toledo, Canadian Pacific, Detroit, Toledo & Ironton, Detroit Terminal, Wabash, Pere Marquette, Ann Arbor, Baltimore & Ohio, Hocking Valley, Pennsylvania, Wheeling & Lake Erie, Toledo & Ohio Central, Toledo Terminal, Detroit, Bay City & Western and Cincinnati Northern.

Toledo & Indiana Railway (10) can handle all local freight traffic between Toledo and Bryan, Ohio, by the steam railroads making more effective use of the Toledo Terminal Railway. This is a belt line connecting with the electric line. If the Detroit, Toledo & Ironton Railway (steam) would interchange with the electric line at Wauseon, Ohio, it would be possible to minimize congestion in this territory without the assistance of parallel steam roads. In general, the steam roads affected would be the Detroit, Toledo & Ironton, Toledo Terminal, New York Central, Cincinnati Northern and Wabash. The last three railroads are parallel to the electric railway.

Rock Island Southern Railway (11) could handle all carload and l.c.l. freight in territory served. It already handles much coal traffic. The steam roads that would be relieved are the Chicago, Rock Island & Pacific, Chicago, Burlington & Quincy, Chicago, Milwaukee & St. Paul, Minneapolis & St. Louis and Santa Fé.

Interurban Railway & Terminal Company, Cincinnati (12) could handle all local passenger and freight business between Cincinnati and Lebanon, Ohio, now carried by the Cincinnati, Lebanon & Northern Railroad. The electric line now has so little business that it is in the hands of a receiver. On the other hand, the grades on the steam line are so severe as to call for an unconomical, prodigal use of locomotives, two being needed for a three-car passenger train out of Cincinnati and two for a seven-car freight train over the same grade.

Aurora, Elgin & Chicago Railroad (13) can handle carload and l.c.l. freight business. The possibilities for extending the l.c.l. business is very great if proper terminal facilities were provided at Chicago. Carload business is now being handled quite extensively and team track freight facilities are provided to all points on the line and to industries adjacent to other lines. The steam roads relieved would be the Chicago & Northwestern, Chicago, Burlington & Quincy, Chicago, Milwaukee & St. Paul, and Chicago Great Western. With the extension of freight interchange privileges, the steam railroads would be still further relieved throughout the Chicago district.

Union Traction Company of Indiana (14) could handle more l.c.l. freight, relieving the steam roads in this district. Here is a noteworthy example in that every one of the 400 miles of this system is paralleled by steam railroads. The roads directly affected are Lake Erie & Western, Big Four, Pennsylvania, Clover Leaf, Wabash, Chesapeake & Ohio, Central Indiana and Monon.

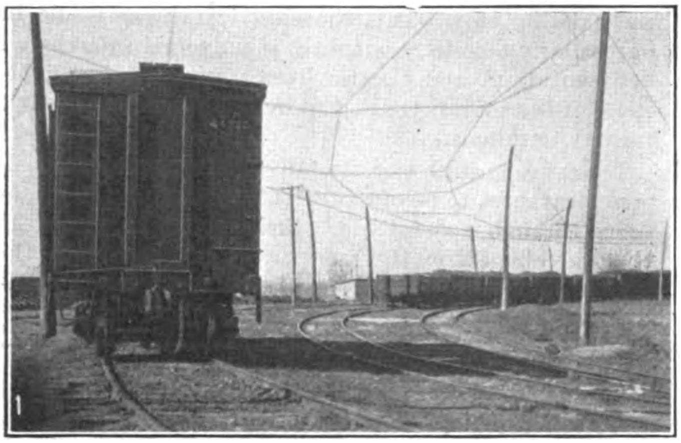
Terre Haute, Indianapolis & Eastern (15) is similar to the case of the Union Traction Company in being paralleled by steam lines. Hence it could afford much relief in l.c.l. business in the territory served by the Peoria & Eastern Railroad, Chicago & Eastern Illinois Railroad, Big Four Railroad, Pennsylvania Company.

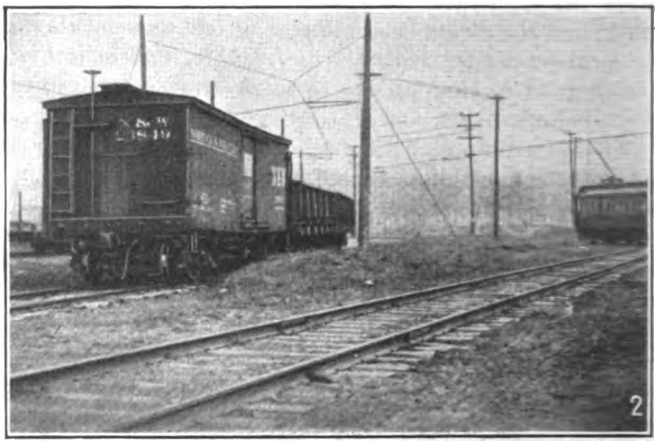
Toledo & Western Railroad (16) can handle both carload and l.c.l. freight and reach any steam railroad entering Toledo through the Toledo Terminal Railway. The steam lines affected would be the New York Central, at Adrian, Palmyra, Blissfield, Riga, Sylvania, Morenci and Fayette; the Detroit, Toledo & Ironton, at Dennison, Ohio and Adrian, Mich.; the Cincinnati Northern, at Alverdton, Ohio, and the Wabash, at Adrian, Mich., and Alverdton, Ohio.

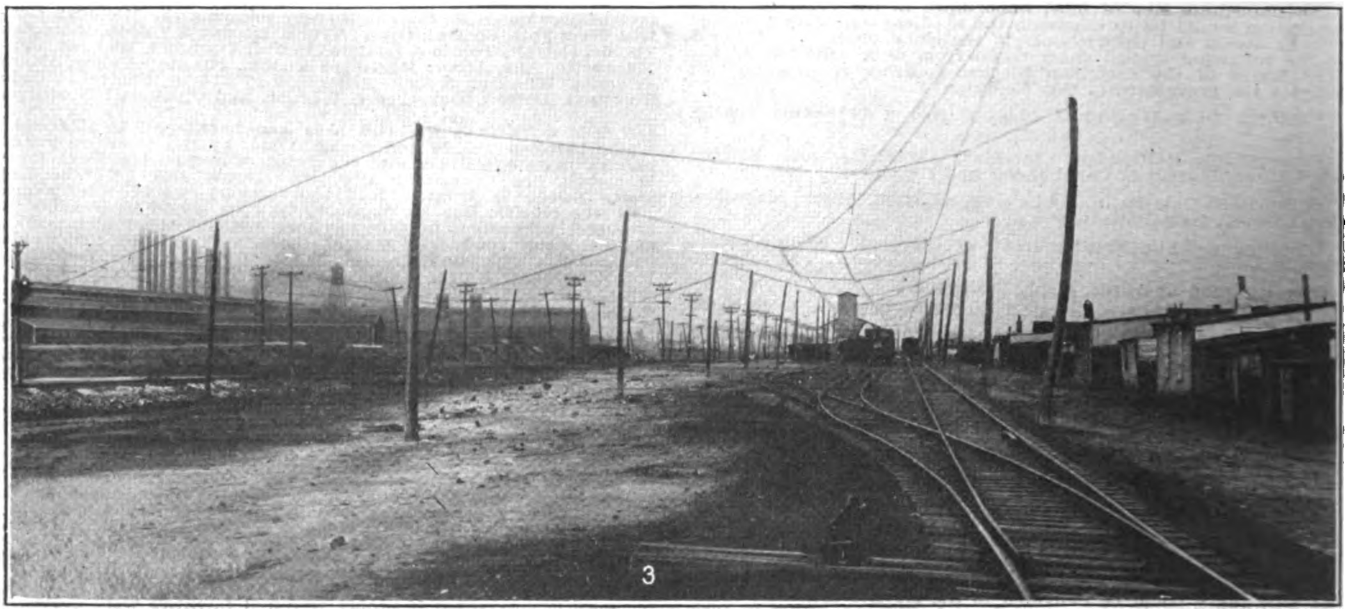
Salt Lake & Utah Railroad (17) can take care of carload and l.c.l. material in territory which it serves, increasing the present amount of freight handled by 300 per cent. This railway has a 50-ton electric locomotive in reserve. It has steam line connections and could greatly relieve the following railroads: Denver & Rio Grande, Los Angeles & Salt Lake, Utah Coal, Union Pacific and Western Pacific.

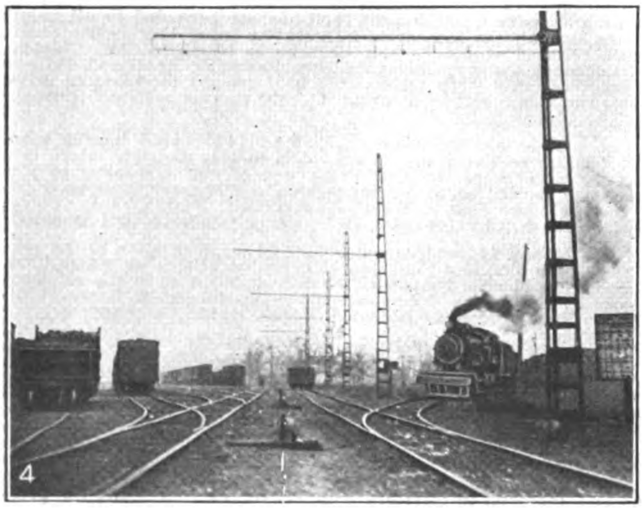
Among the electric railways handling steam road interchange traffic are the Fort Dodge, Des Moines & Southern Railway, the Niagara Junction Railway, the Toledo & Western Railroad, the Michigan Railway, the Inter Urban Railway of Des Moines, the Detroit United Railway, the Aurora, Elgin & Chicago Railway, the Chicago, Lake Shore & South Bend Railway, and the Waterloo, Cedar Falls & Northern Railway. Such interchange is especially desirable at this time. The results obtained by most of the lines in this group warrant due consideration of this traffic by electric lines wherever practicable.

The Waterloo, Cedar Falls & Northern Railway was the pioneer electric line to arrange with the steam railroads for the interchange of freight. As a result more than 70 per cent of the switching from









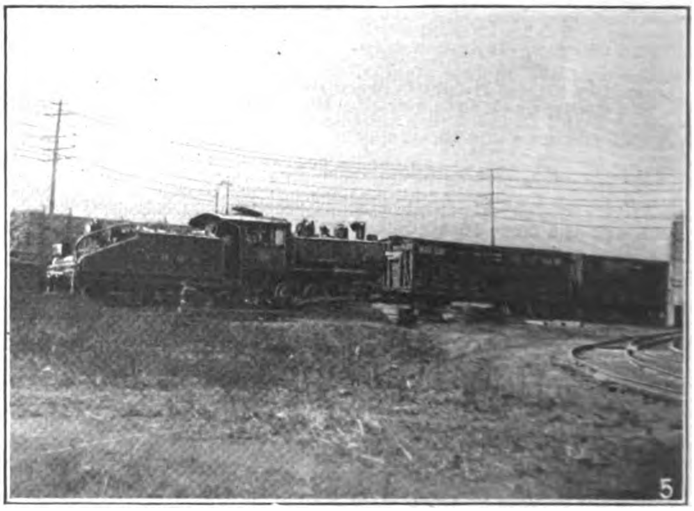
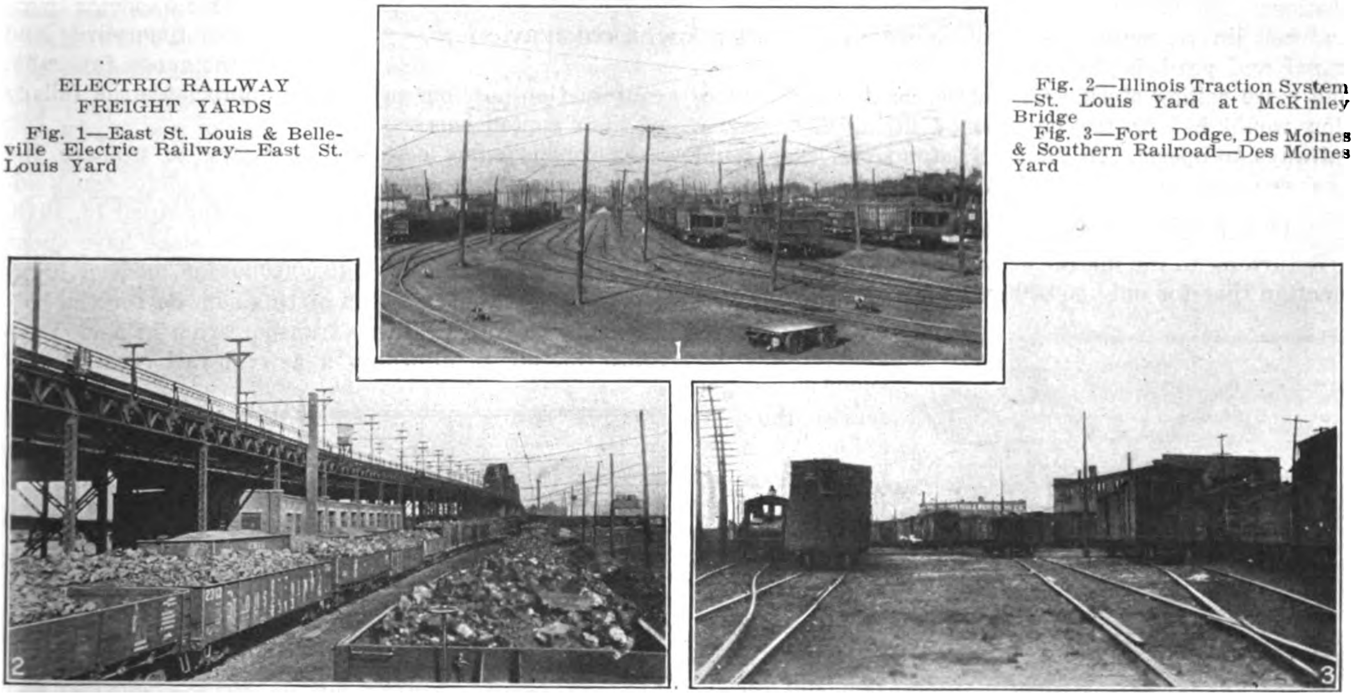


Fig. 1—Toledo & Western R.R. with Toledo Terminal Railway
Fig. 2—Chicago, Lake Shore & South Bend Railway with Lake Erie & Western Railroad
Fig. 3—Illinois Traction System
Fig. 4—Fort Dodge, Des Moines & Southern Railroad with Des Moines Union Railway
Fig. 5—Illinois Traction System—Terminal Railroad Association, St. Louis, Mo.

ELECTRIC RAILWAY STEAM RAILROAD INTERCHANGES steam roads entering Waterloo with its 1[illegible]5 factories is performed by this line. Similarly the several steam roads entering Cedar Rapids enjoy business from Northern territory due to the construction of the Cedar Valley Road. In other words, a 60-mile branch of the latter between Cedar Rapids and Waterloo forms a connecting link and feeder between the steam roads entering Cedar Rapids. At Waterloo, interchange connections are made with the Illinois Central. The accompanying table gives a better idea of the operations of this heavy freight carrier.

At Waterloo and other points interchange connections are made with the Illinois Central, the Chicago, Rock Island & Pacific and the Chicago Great Western Railroads. Just north of La Porte City, a comprehensive interchange track layout is located between the main lines of the Waterloo, Cedar Falls & Northern Railway and the Chicago, Rock Island & Pacific Railway on the adjoining right-of-way. This was built to relieve the interchange of track facilities between these roads in West Waterloo, and to serve for reception and delivery of freight from the South.

This interchange layout includes two parallel storage tracks each long enough to clear fifteen cars, one of which serves as a delivery track and one as a receiving track. Leads from both steam and electric roads approach these two storage tracks at both ends.



ELECTRIC RAILWAY FREIGHT YARDS

Fig. 1—East St. Louis & Belleville Electric Railway—East St. Louis Yard

Fig. 2—Illinois Traction System—St. Louis Yard at McKinley Bridge

Fig. 3—Fort Dodge, Des Moines & Southern Railroad—Des Moines Yard

FREIGHT CARS AND TONNAGE MOVED ON WATERLOO, CEDAR FALLS & NORTHERN RAILWAY DURING A TYPICAL MONTH

Date	System Loads	System Empties	Total Tons	Date	System Loads	System Empties	Total Tons
1	53	13	2,915	16	63	14	3,170
2	57	10	3,385	17	59	18	2,857
3	72	27	3,730	18	29	18	1,558
4	56	23	3,675	*19	60	13	2,823
* 5	47	9	2,193	20	60	21	3,194
6	65	20	3,476	21	66	18	3,447
7	49	30	3,009	22	59	28	3,109
8	56	16	3,047	23	62	33	3,184
9	49	19	2,648	24	57	17	3,004
10	60	22	3,052	25	26	21	1,459
11	33	14	1,826	*26	53	27	2,675
*12	54	5	2,345	27	53	5	2,636
13	45	22	2,371	28	53	16	3,057
14	51	6	2,319	29	67	9	3,209
15	46	34	2,635	†30	24	8	1,226
					1,584	536	83,234

Switching service:—Waterloo Belt-Line Yard Engine handled 1717 loads and 1504 empties. *Sundays. †Thanksgiving Day.

How Quick Electric Freight Aids Food Conservation

The feature which should be borne in mind in any consideration of electric railway freight service is its promptness. The following instance shows how rapid transportation has a direct bearing on the conservation of our food supply.

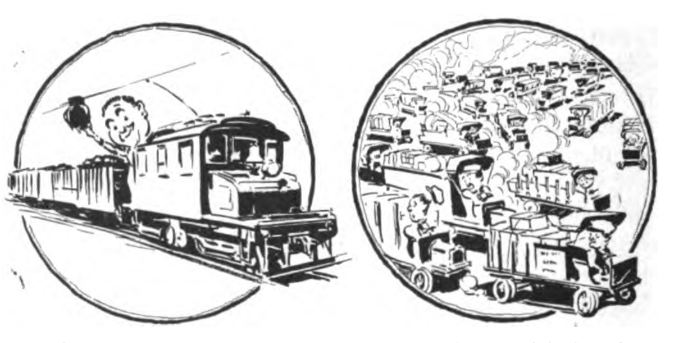
When the steam railroads around Indianapolis were crippled last winter by unusually severe weather, the electric railways not only met the fuel shortage in isolated communities by supplying them with coal, but also answered the appeal of the Food Administrator to save cattle and hogs that were smothering to death owing to lack of steam road car for this traffic. As a result, the electric railways transported about 1000 carloads of livestock.

The electric railways also give faster service than steam under normal conditions. If a farmer has cattle for the Indianapolis market, he notifies the interurban a day or two in advance. Within two or three hours after loading the stock is at its destination. The poundage lost by cattle is so much less on the fast electric interurbans than it is on the through steam lines that the farmer actually saves the cost of transportation.

Such examples as this could be multiplied indefinitely as proof that transportation by electric lines can save vast quantities of perishable freight, whether in the form of livestock, vegetables or fruit.

What Physical Betterments Do Electric Railways Need?

A large number of electric railways are prevented from handling more freight by franchise restrictions which prevent an extensive development along this line. With such restrictions removed, many electric railways would require only a little financial aid to be in a position materially to relieve the freight situation. These restrictions date back to the time of small horse drawn vehicles and appear grotesque to-day in view of the noise and damage produced by motor trucks in the very communities that will not permit a freight car to travel over its own rails.


With a 500-ton electric train a maximum of three or four men is required

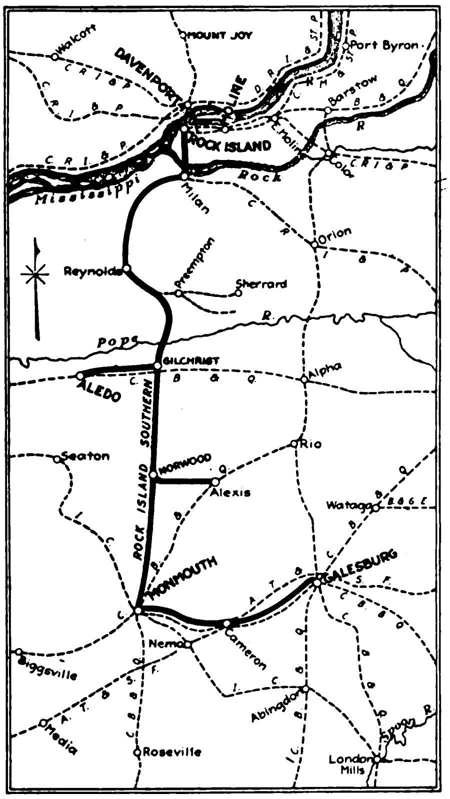
With 500 tons of freight handled by 5-ton motor-truck units, 100 men would be required

A STUDY OF MAN-POWER CONSERVATION

Aside from franchise restrictions, however, the electrics need changes in physical alignment (such as easing of curves, construction of long double-ended sidings at way stations, freight cut-offs and belt lines), more terminal and yard facilities and more rolling stock. Of course, as this reconstruction would be for the purpose of fitting the electric railways to operate on M. C. B. standards, they could haul standard steam railroad cars in unlimited numbers.

Motor-Truck Development Costlier

Returning to the matter of finances, it is pertinent to mention that for only $50,000 a 75-mile interurban was rebuilt to M.C.B. standards for locomotive freight service thus enabling it to move hundreds of thousands of tons at insignificant cost. How long would an expenditure of $50,000, made and paid for by the public, last in buildings and maintaining motor trucks and highways?


Walcott
MOUNT JOY
Port Byron
DAVENPORT
MOLINE
C. R. I. & P.
D. R. I. & St. P.
C. M. & St. P.
Barstow
B. & Q.
R
ROCK ISLAND
E. Moline
Cola
Rock
Mississippi
Milan
C.
R
Orion
I. & B.
Reynolds
Preempton
Sherrard
R.
Pope
GILCHRIST
ALEDO
C. B. & Q.
Alpha
ROCK ISLAND SOUTHERN
Seaton
Rio
NORWOOD
Q.
Alexis
Wataga
B. & G. E.
MONMOUTH
GALESBURG
A. T. & S. F.
C. B. & Q.
Nemo
Cameron
Biggsville
I. C.
Abingdon
Media
Roseville
London Mills
Spoon R.

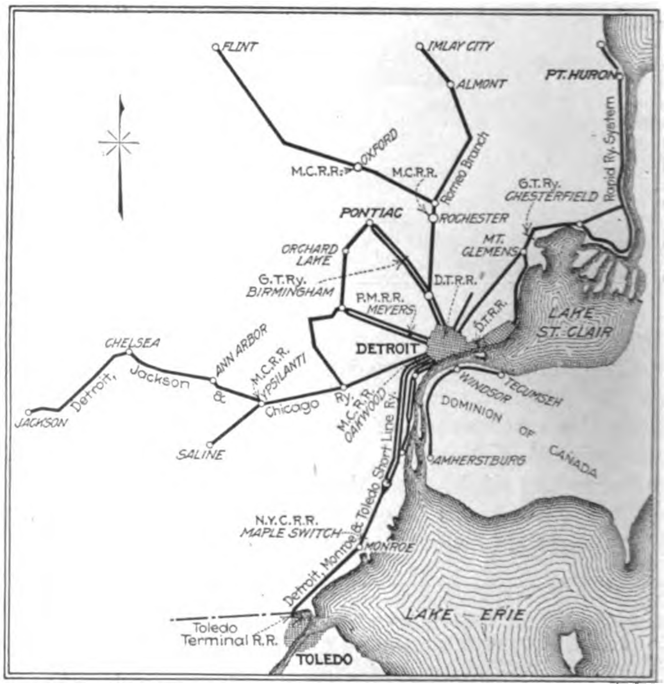
DUPLICATION OF SERVICE—ROCK ISLAND SOUTHERN RAILWAY
(For details see page 895)

It is obvious that $50,000 would not go far in this direction.

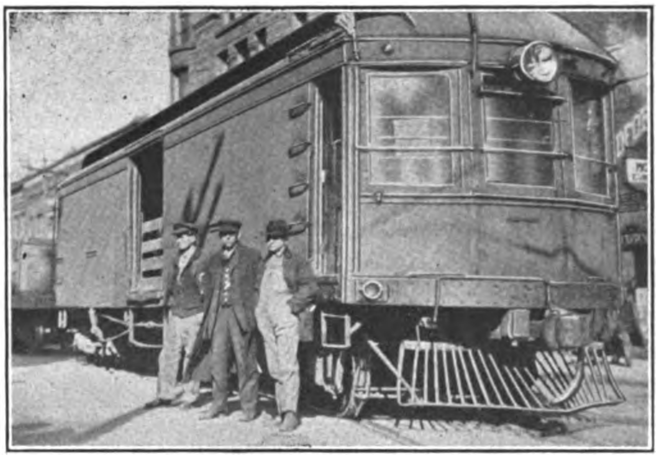
The motor truck has well demonstrated its worth in recent years, particularly behind the firing lines in France. There, where the railroad facilities are generally inadequate and where results must be obtained, regardless of cost, the motor truck has been wonderfully effective in affording a quick, though costly, means of transportation over rough roads for comparatively short distances. There have been instances in this country, too, where material had to be moved without delay and *regardless of cost* and the regular means of transportation have failed for one reason or another, where the motor truck has performed so effectively as to lead many to believe that it has miraculous powers and will in time supersede steam and electric railways as freight carriers.

Motor truck haulage is a costly way of handling freight in quantity—costly from the standpoints of highway maintenance, first cost and depreciation of equipment, waste of fuel and lubricants, and, worst of all, waste of man-power. We need take only the figures of motor truck advocates themselves and place the most favorable construction possible on them to appreciatee the fallacy of their contentions.

Enormous sums also are necessary to prepare the roads for motor trucks. For example, a motor-truck advocate writes in the New York *Times* for April 14, 1918, that New York State and its counties alone have spent the staggering sum of $140,000,000 for modern highways. What would a tenth of this sum do for the betterment of electric railway transportation in New York State, merely in affording a new all-rail route across the State from Niagara Falls to Albany? Again, in the *Saturday Evening Post* for April 6, there is an almost casual reference to spending $850,000,000 to make the national highways suitable for motor trucks; and, quite as casually, the suggestion is made that the motor truck because of its usefulness be subsidized by the government!


FLINT
IMLAY CITY
ALMONT
PT. HURON
Rapid Ry. System
M.C.R.R.
OXFORD
M.C.R.R.
Romeo Branch
G.T.Ry.
CHESTERFIELD
PONTIAC
ROCHESTER
ORCHARD LAKE
MT. CLEMENS
G.T.Ry.
BIRMINGHAM
D.T.R.R.
P.M.R.R.
MEYERS
D.T.R.R.
LAKE ST. CLAIR
DETROIT
CHELSEA
ANN ARBOR
M.C.R.R.
YPSILANTI
Detroit, Jackson & Chicago Ry.
JACKSON
SALINE
M.C.R.R.
OAKWOOD
WINDSOR
TECUMSEH
DOMINION OF CANADA
AMHERSTBURG
Detroit, Monroe & Toledo Short Line Ry.
N.Y.C.R.R.
MAPLE SWITCH
MONROE
LAKE ERIE
Toledo Terminal R.R.
TOLEDO

DUPLICATION OF SERVICE—DETROIT UNITED RAILWAY SYSTEM SHOWING STEAM RAILROAD INTERCHANGES
(For details see page 895)


FOOD CONSERVATION—INTERURBAN STOCK TRAIN

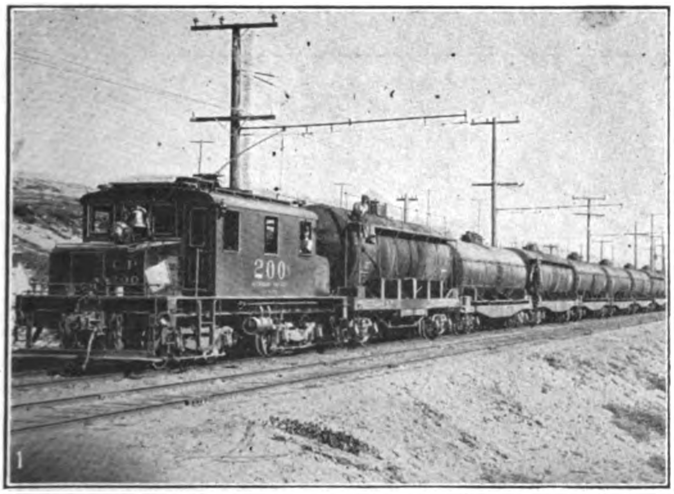
What the motor truck actually does to a modern brick highway is shown in an accompanying illustration of the Akron-Cleveland highway, over which there pass an average of seventy-five trucks every twenty-four hours. This road was newly paved only three years ago under special specifications prepared by County Engineer Stinchcomb, who said, on its completion, that it represented the highest type of country highway—the perfect road. While it is true that the public pays the bill for improved roads (in most cases) it cannot be expected that the wholesale destruction of recently improved highways will be allowed to continue without objection on the part of the public.

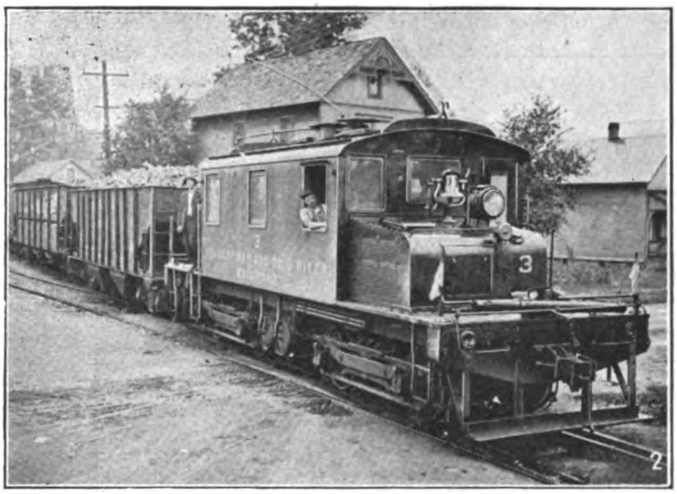
There is now pending before Congress a bill to provide that the United States shall aid the States in the maintenance, repair and reconstruction of public roads subjected to extraordinary traffic by reason of the use of such roads by the Government of the United States. This calls for an appropriation of $10,000,000.

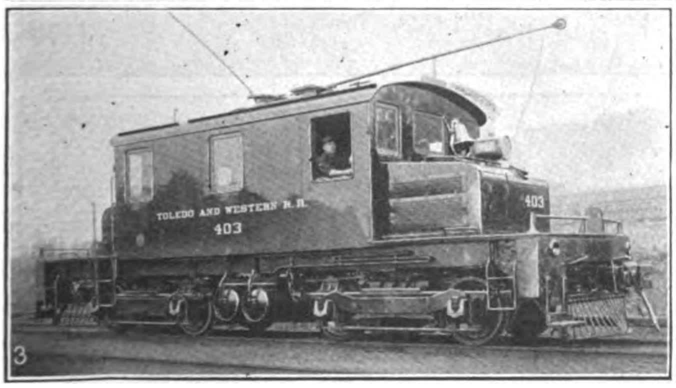
The term "road" or "public road" in this bill includes bridges and culverts. If this bill is passed the money will be appropriated from the Treasury of the United States. If the regular avenues of transportation, viz: the railroads, both steam and electric, were used, this unnecessary expense account of repairs to roads due to the movement of these heavy trucks over the same could be saved. In this connection, in an article in the New York *Times* of May 5, 1918, Richard O. Smith, in charge of the Touring Bureau of the Automobile Club of America, states regarding road conditions in one part of the country as follows:

"The travel on the New York to Washington road has been so large both by motor trucks and passenger vehicles that the main highway is badly worn in many places, and it is no easy matter to suggest favorable detours to insure comfortable travel. Several miles of the Lincoln Highway route through New Jersey and Pennsylvania are in very bad condition."

It is obvious that it would be much cheaper and very much better for the communities in cases of this kind to permit the electric railway to handle freight on its own rails and on streets which it maintains instead of spending vast sums for the benefit of an industry which does







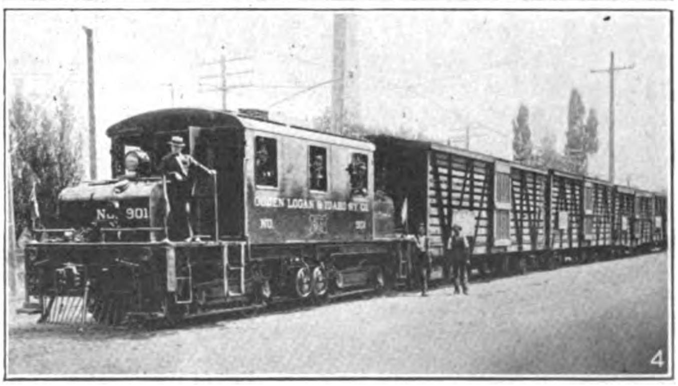
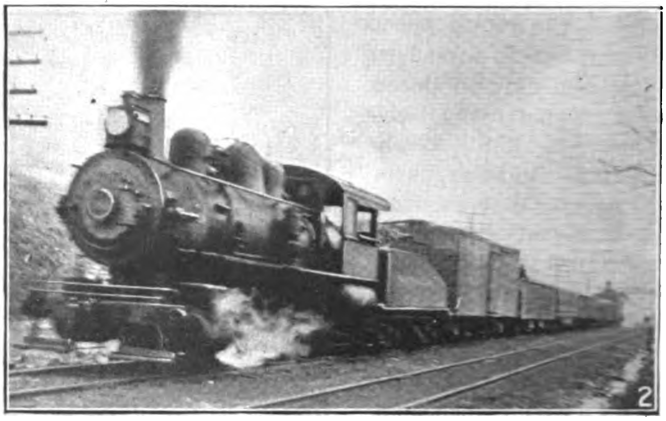
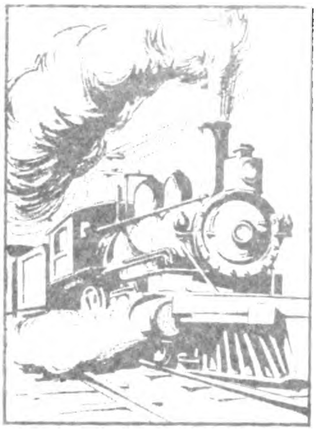
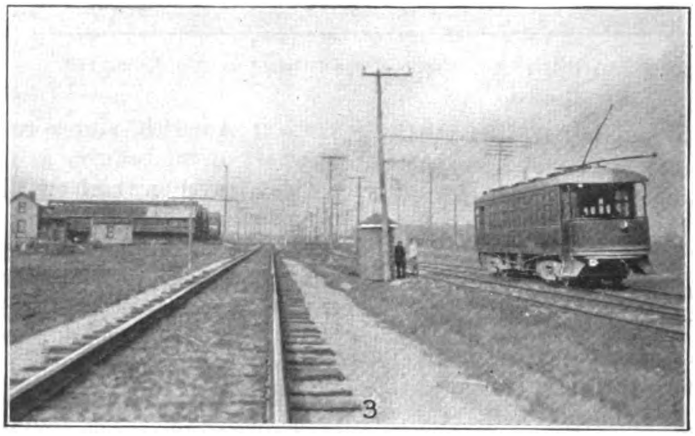


Fig. 1—Pacific Electric Railway
Fig. 2—Youngstown & Ohio River Railroad
Fig. 3—Toledo & Western Railroad
Fig. 4—Utah—Idaho Central Railroad
ELECTRIC LOCOMOTIVES IN STEAM ROAD INTERCHANGE SERVICE







Figs. 1 and 2—Prodigal Use of Locomotives Where Electric Line Could Effect Saving in Fuel, Man-Power and Equipment

Fig. 3—Parallel Electric Line (Interurban Railway & Terminal Company, Cincinnati, Ohio) Could Handle Local Freight and Passengers

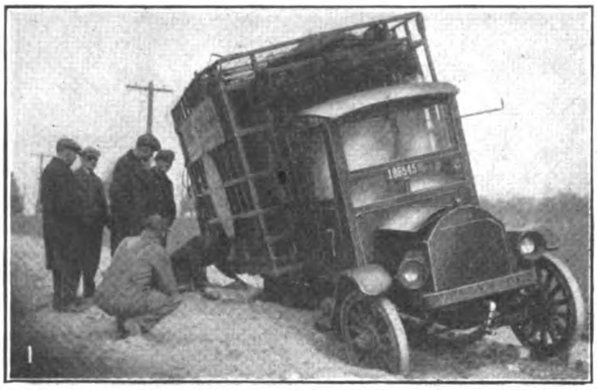
Where the Electric Railways Can Help

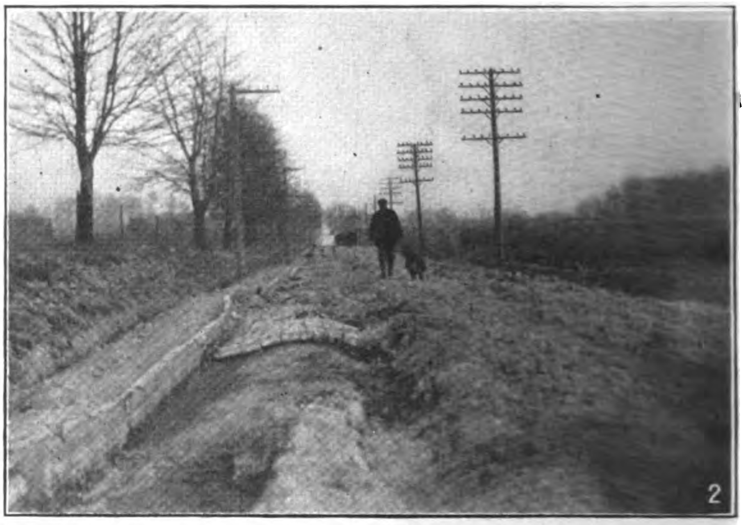
Fig. 1—Truck-Operating Difficulties, Akron-Cleveland Highway

Fig. 2—Effect of a Few Months Last Winter on the Perfect Road

Fig. 3—Seventy-five Trucks Operate Daily on This Highway

Fig. 4—Electric Railway Menace—Motor Truck and Trailer





not pay its keep in taxes. Nor can there be any argument as to the relative safety of motor truck operation over the public highways and train operation over a right-of-way.

The vaunted speed of the motor truck looks foolish alongside of normal electric railway service. For example, the projectors of a motor-truck service between Detroit and Toledo propose to run 5-ton trucks with two 5-ton trailers each, totaling 15 tons, at a schedule speed of 10 m.p.h., or six hours for the 60-mile run. Electric railway freight trains carrying 50 to 150 tons make the same run in three hours! Longer runs than this would put the motor trucks at a still greater disadvantage since they cannot make reasonable speed at night with any degree of safety to themselves or others. On the other hand, a car on rails runs as fast at night as it does in the day.

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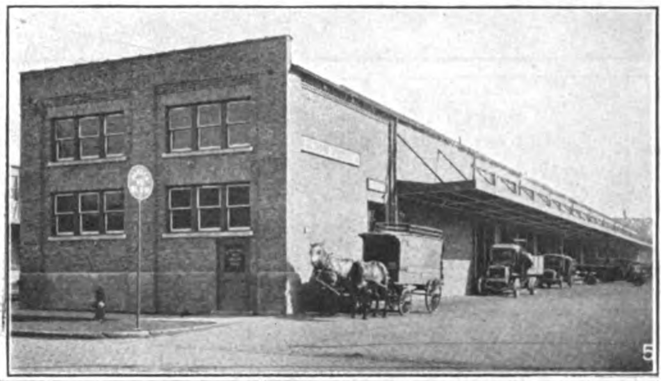
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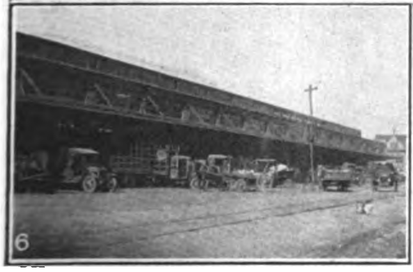
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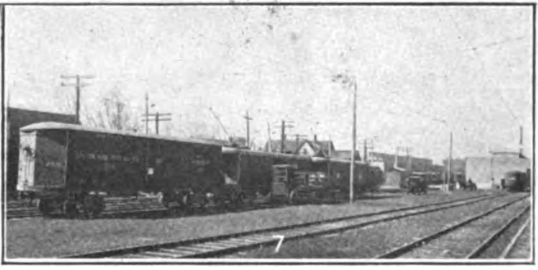
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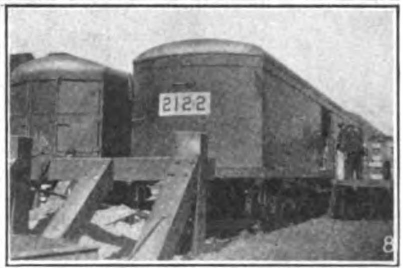
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Fig. 1—Front end of out and inbound freight houses
Fig. 2—House tracks—five of these between warehouses
Fig. 3—House tracks—average of 100 cars per day loaded from these
Fig. 4—Inbound freight house
Fig. 5—Outbound freight house
Fig. 6—Team side outbound freight house
Fig. 7—Team and storage yard
Fig. 8—Loading carload freight

DETROIT UNITED RAILWAY—EAST SIDE FREIGHT TERMINAL

Electric Railway Accomplishment On a 12-Mile Haul

The economic fallacy of the motor truck even for so short a haul as 12 miles can be realized from the wonderful achievement of the Inter-Urban Railway, Des Moines, in completely furnishing Camp Dodge by hauling some 10,000 standard steam road cars, totaling 500,000 tons of freight, in 1000 to 1500-ton trains of twenty to thirty cars each, and requiring not more than four men, so that the haul per man was 250 to 375 tons per trip. The average speed ranged from 15 to 18 m.p.h.

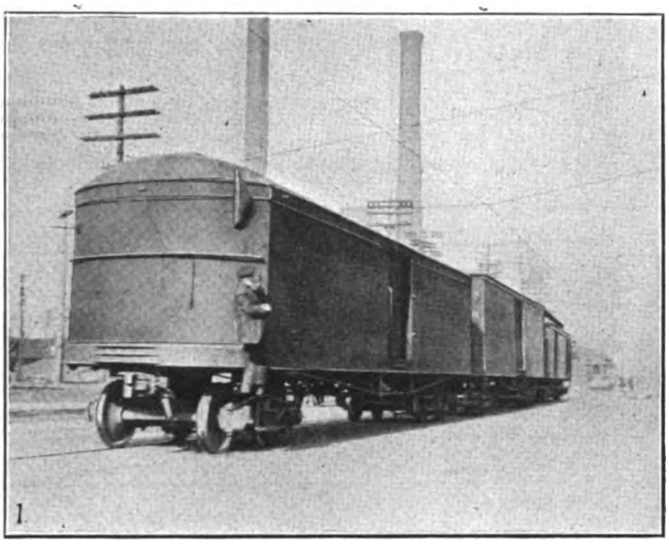
Now, had this job been assigned to motor trucks, each driver would not have averaged better than 10 tons per trip, assuming that he could take such an unusually big load. Therefore, to haul 500,000 tons fully 50,000 men-trips would have been necessary compared with 1666 men-trips (assuming 300 tons per man) on the electric railway. In other words, if the motor trucks could have equalled the speed of the electric railway, they would still have required thirty times the man-power!

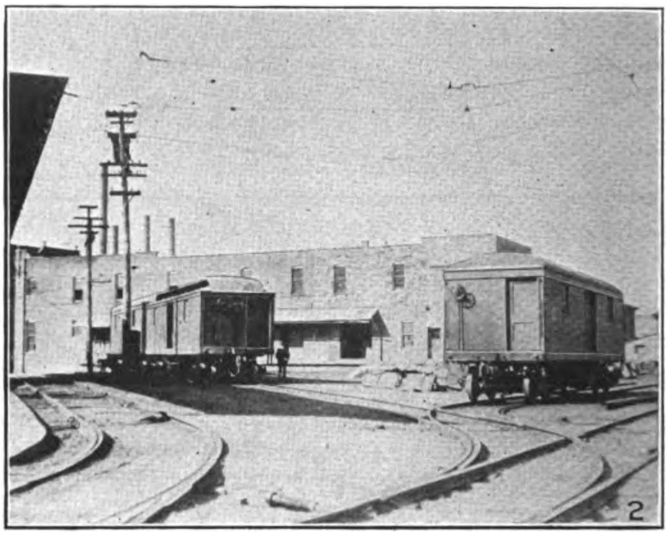
It follows that there could be no greater waste of man-power than the unrestricted use of the motor truck, not alone in the number of men required for the trucks but in the additional men required for road upkeep, maintenance of a heat engine and increased manufacture of gasoline, which is needed far more abroad than here.

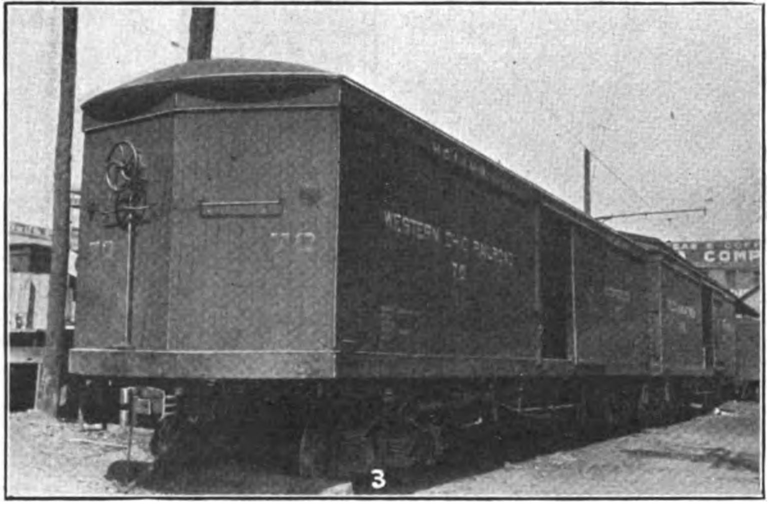
Instances that prove the economic inferiority of the motor truck could be multiplied indefinitely, but it does not follow that the more efficient rail transportation will be utilized as a matter of course. The establishment of regular schedules and routes, and of return load bureaus to enable trucks to return loaded, indicates that the motor truck is backed by men who are making the most of the extraordinary conditions created by the war congestion of the steam railroads. The danger actually exists that both the railways and the public may be injured immeasurably by an uneconomical form of transportation because that form of transportation is backed by interests worth hundreds of millions of dollars. In short, the public sees the motor truck through the veil of romance.

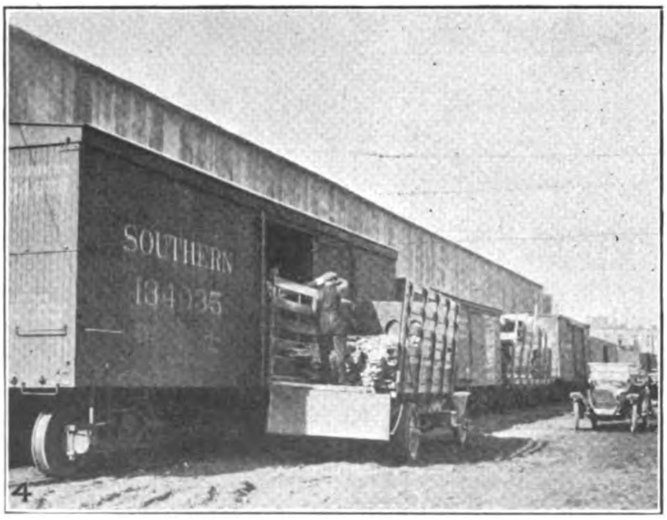
How the Terminal Facilities Help in Handling Freight

The Detroit United Railways has been able to triple its freight-handling capacity by erecting a new terminal on the east side of Detroit and about 1 mile from the Detroit City Hall. The company has nearly completed an extensive new freight structure on the west side,









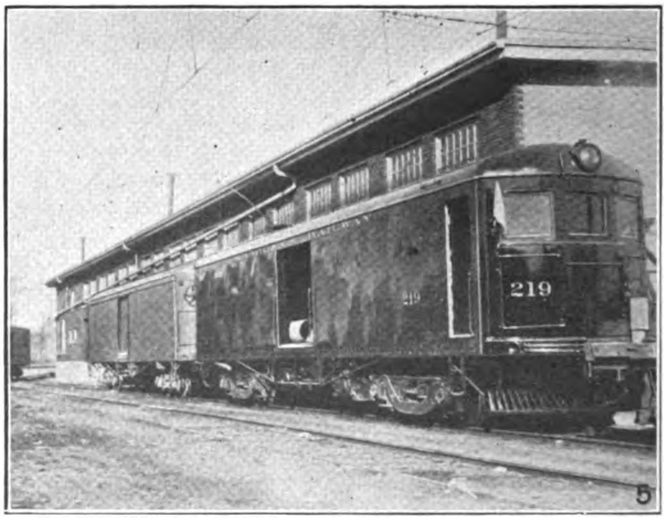
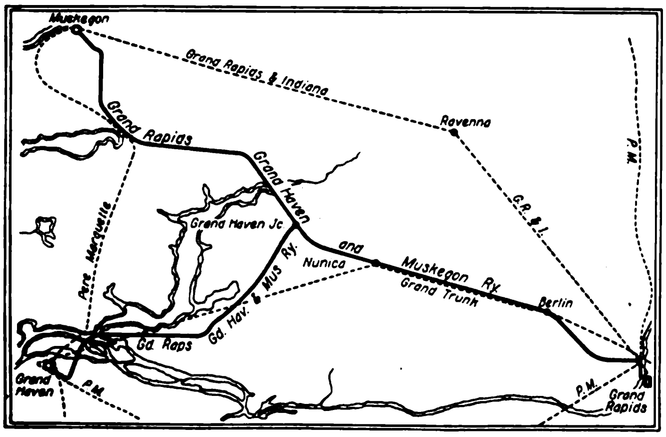


Fig. 1—Typical Interurban Freight Train in the Middle West
Fig. 2—Ohio Electric Railway Freight Terminal—Springfield, Ohio
Fig. 3—Western Ohio Railroad Freight Trailers
Fig. 4—Michigan Railway Freight Yard—Grand Rapids, Mich.
Fig. 5—Michigan Railway—Motor-Freight Car and Trailer

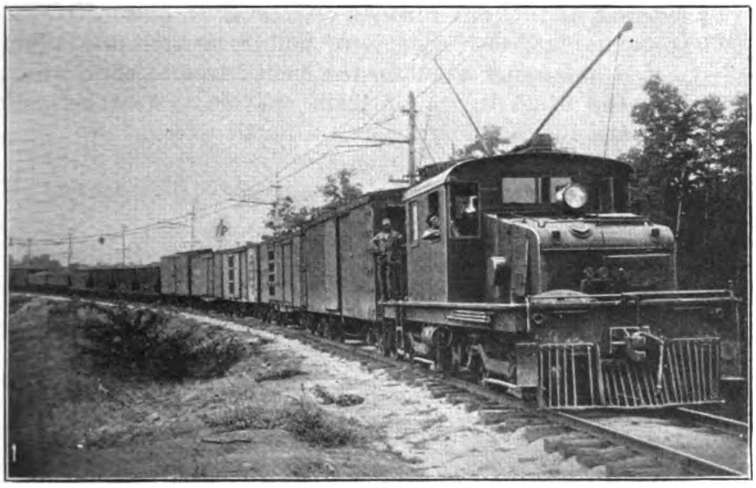
ELECTRIC RAILWAY FREIGHT SCENES



DUPLICATION OF SERVICE—GRAND RAPIDS, GRAND HAVEN & MUSKEGON RAILWAY—(See Page 895)

which represents only one-half of the contemplated development when completed, but has been unable to construct the other half of the terminal because of lack of funds. In the meantime the building has been leased to an automobile concern as a drive-away garage.

The east side terminal occupies an entire city block. The inbound freight house is 60 ft. by 405 ft. and the outbound 45 ft. by 405 ft. Between these two buildings is a yard, consisting of five loading or house tracks. The streets along either side of the freight house serve as a team and truck way to the station. In the block beyond that occupied by the building and house tracks are tracks for loading and unloading carload shipments. These include four team and storage tracks 600 ft. long, connecting between the two buildings and also the main line. All the facilities in this freight house are of the modern type. See ELECTRIC RAILWAY JOURNAL, April 21 and Aug. 11, 1917.



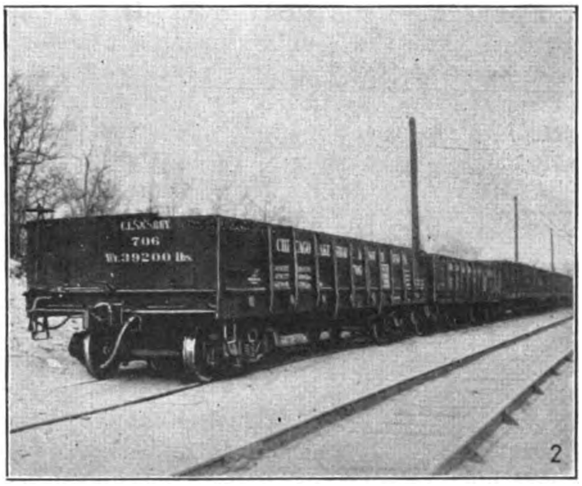


Fig. 1—Piedmont & Northern Lines—Heavy Freight Train. Fig. 2—Chicago, Lake Shore & South Bend Railway, Standard Steam Railroad Equipment

ELECTRIC RAILWAY FREIGHT ROLLING STOCK

An average of ninety-seven to 100 cars a day are loaded out of the east side terminal of the Detroit United Railway, approximately 2200 to 2400 cars per month, which compares favorably with many a steam road terminal. Practically each one of these cars is equivalent in service to from three to five steam road cars, because many of them are motor cars, and make a large average daily mileage.

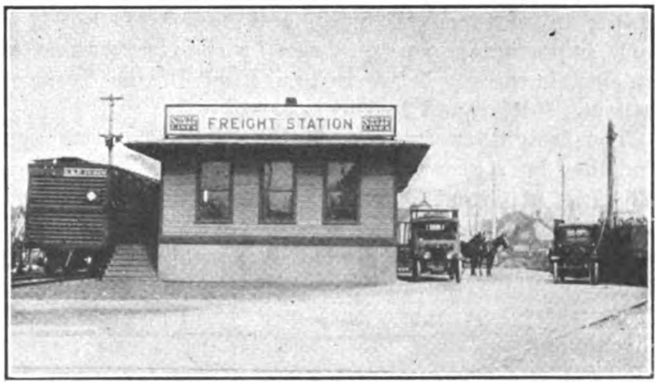
How Detroit United Can Speed Up Air-craft Program

The Detroit United Railway system is so located that the industrial center which it serves could, through close attention to the proper routing of shipments, benefit to even a greater degree than at present from the fast service performed by this line. In the Detroit territory companies manufacturing air-plane motors have often been obliged to make shipments by express because of not being able to get them over the steam roads fast enough. This is very expensive compared with the practically express type of electric freight service of the Detroit United. Although the steam roads have sidings into the air-craft plants, there is no reason why the electric cars of the lines could not be "set out" at these plants for such shipments.

Detroit as a Center of Through Routes

All of the D. U. R. freight routes begin at Detroit. What may be considered the round-trip routes follow:

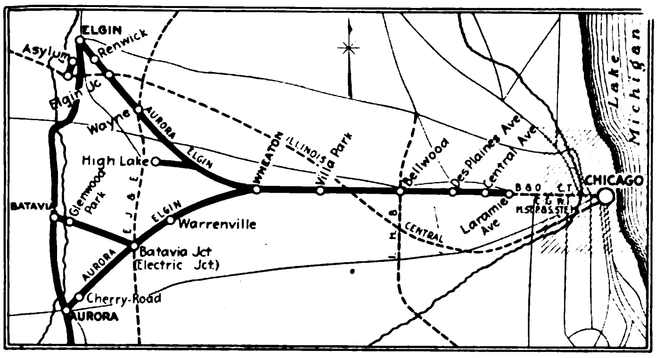
Detroit to Pontiac—Four runs daily (except Sunday).
Detroit to Flint—Three runs daily (except Sunday).
Detroit to Imlay City—Two runs daily (except Sunday).
Detroit to Jackson—Five runs daily (except Sunday).
Detroit to Ann Arbor—Two runs daily (except Sunday).
Detroit to Northville—One run daily (except Sunday).
Detroit to Port Huron—Two runs daily (except Sunday).
Detroit to Mount Clemons—Three runs daily (except Sunday). Wyandotte and Orchard Lake—Two runs daily (except Sunday).



TYPICAL FREIGHT STATION, CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY

There is a regular daily merchandise car service from Detroit to Saginaw and Bay City, via Flint; from Detroit to Battle Creek, Kalamazoo, Grand Rapids and other points in western Michigan, via Jackson over the Michigan Railways, and from Detroit to Lima, via Toledo, over the Toledo, Bowling Green & Southern, Western Ohio, Dayton & Troy Railway.

During last year a great many shipments were made over electric lines between all the points just mentioned.



DUPLICATION OF SERVICE—AURORA, ELGIN & CHICAGO RAILWAY, WHITE CIRCLES INDICATE TEAM LOADING FACILITIES FOR CARLOAD FREIGHT (See page 895)

At a time when the steam roads were greatly congested all over the country, manufacturers and consumers east of Michigan were greatly assisted by the electric railway lines in getting their materials transported. A movement of about seven cars of automobile parts a day takes place between Dayton, Ohio, and Flint, Mich. The ability of the Detroit United to increase this traffic is limited only by the supply of cars.

Michigan Railway Operates Heavy Trains

The Michigan Railway handles a considerable amount of steam road equipment between Grand Rapids, Kalamazoo and Battle Creek by powerful motor cars, each capable of hauling on a level as high as twenty-six freight cars. The average electric freight train out of Grand Rapids and Kalamazoo is from eight to ten cars in length. An extensive interchange business is carried on between the Michigan Railway and the Detroit United Railway.

The freight handled on this system is practically the same as that on any steam road, as it includes both less than carload and carload. A large amount of the latter goes daily out of Grand Rapids for all points connecting with this road, which includes southern Michigan, northern Ohio and Indiana. Much more relief could be given from Grand Rapids via the Michigan Railway to points in southern Michigan and northern Ohio if a very important gap were closed by the construction of an electric railway between Adrian and Battle Creek, or between Adrian and Jackson.

The freight operations of this road are extensive and they have grown so rapidly that the freight terminal built at Grand Rapids only three years ago is entirely inadequate for the service demanded. It has a yard capacity of twenty-eight cars, while the present traffic would require a forty-car yard. In summer from thirty to forty cars are handled daily, and throughout the year there are handled about twenty cars per day outbound and about fifteen cars inbound.

Steam railroad interchange is carried on by this road at the following points in Michigan:

Allegan—Pére Marquette and Lake Shore Railroads.
Montieth—Grand Rapids and Indiana (Richland Junction).
Chicago, Kalamazoo and Saginaw—Richland Junction.
Battle Creek—Michigan Central.
Holland—Pére Marquette.
Lansing—Pére Marquette.
Bridgeport—Pére Marquette.
Battle Creek—Reaching the Grand Trunk through the Michigan Central.

Michigan Railway Interline Service to Detroit and Points South

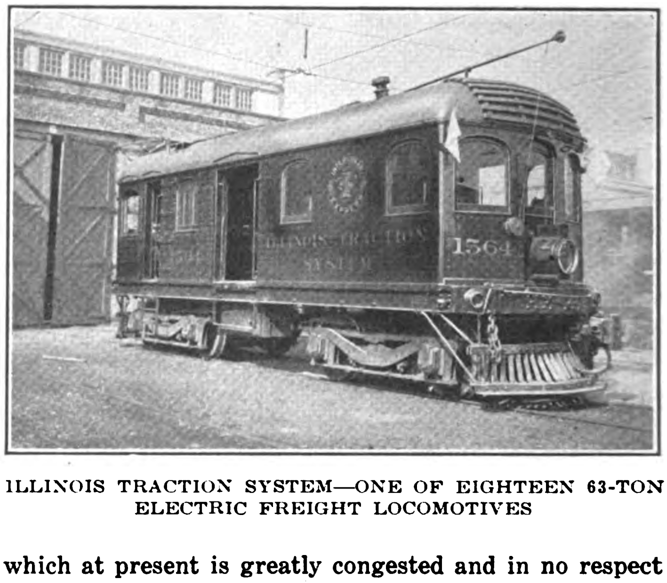
One of the outstanding features of the operation of the Michigan Railway is its flexibility in handling mixed freight equipment, both steam cars and electric trailers.

On the southeastern division, Kalamazoo to Jackson, there are four round trips per day. One of these is an Adams Express run, although this train also handles solid cars to and from terminals. Each train consists of from one to five interurban trailers. Two runs are in the day time and the other two at night.

On the northeastern division, Jackson to Lansing, two round trips are made daily, one during the day and one at night, both doing local work. There is also one round trip each day between Lansing and Owosso, and between Lansing and St. Johns. The freight motive power of this line consists of four steel, 55-ton freight motor cars, each capable of pulling a 500-ton trailing load and easily handling ten loaded freight cars, which is the usual length of train on this system between Grand Rapids, Kalamazoo and Battle Creek.

Electric Freight Terminal Required at Toledo

Toledo, Ohio, is a very important interurban electric freight center. Many cars from Michigan routed to points in Ohio and Indiana, go through this terminal, which at present is greatly congested and in no respect commensurate with the importance of the traffic handled.



ILLINOIS TRACTION SYSTEM—ONE OF EIGHTEEN 63-TON ELECTRIC FREIGHT LOCOMOTIVES

At the same time there exists in Toledo a large steam freight terminal station belonging to the Toledo Terminal Railroad Company which is unused for the purposes for which it was built. Its location is such that it could adequately serve all electric lines entering the city. A part of the station could be used for passenger service. If this structure were released for the use of the electric lines, conditions at Toledo would be very much improved. There are possibly similar cases elsewhere of steam railroad property that could be released to the electric lines.

Heavy Carload Carrier—Toledo & Western Railroad

The Toledo & Western Railroad, running due west from Toledo to Pioneer, Ohio, and with a branch running from Allen Junction to Adrian, does one of the most extensive interchange businesses of any electric line in the country. More than 75 per cent of the revenue is obtained from freight operation.

The organization of this line is similar to that of a steam railroad and, in fact, is considered as such by a number of steam roads which have interchange agreements with the electric line. Such an important factor has this railroad been in the development in territory served that the real estate values have increased 100 per cent in the last fifteen years.

Interchanges are located at the following points:

Toledo, Ohio—Toledo Terminal Railroad and connecting lines.

Franklin, Ohio, and Adrian, Mich.—Wabash Railroad.

Denson, Ohio—Detroit, Toledo & Ironton Railroad.

Freight traffic has been increased to the point where an electric locomotive of 60-tons weight is required to handle some trains during the sugar beet season.

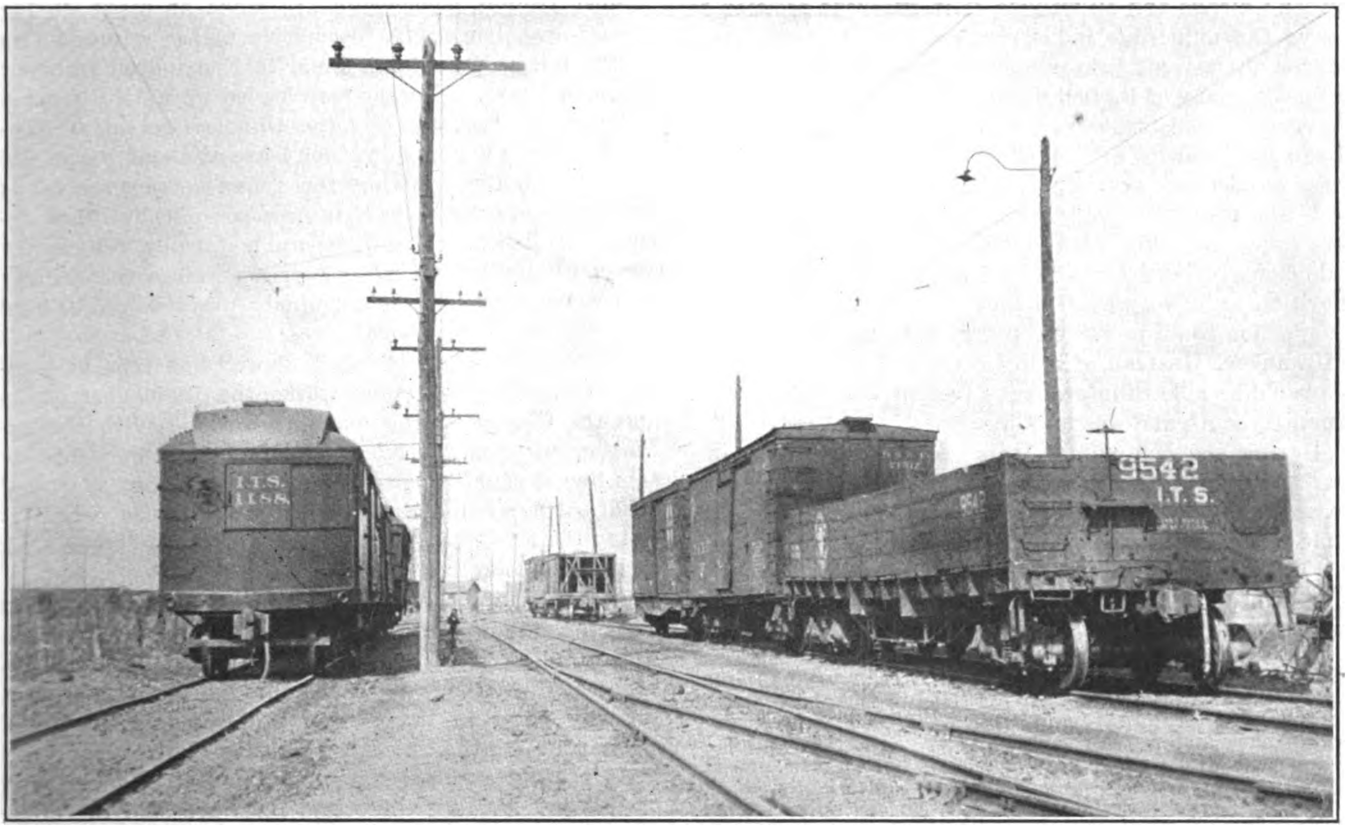
Chicago Franchises Restricting Electric Freight Haulage

Chicago city regulations considerably limit the service which the six electric interurban railways, radiating from the city into a very rich agricultural and manufacturing district, could supply. During the off-peak hours enormous quantities of merchandise could be handled over the elevated and surface lines to and from the heart of the city by these interurban systems without any inconvenience or annoyance to the public.

The present elevated lines are used for passenger traffic only, and their economic value could be increased very considerably by their use for express and freight service.

The radiating interurban lines are not being operated at their full capacity and could very advantageously move any freight matter delivered to them from the elevated system. By this means the public would be much better and more profitably served than at present. The interurban lines maintain an express and freight service but are handicapped by reason of the location of their terminals, which are from 6 to 8 miles from the heart of the city. It is unreasonable to expect shippers to haul freight this distance when the facilities provided by the steam railroads for receiving such freight are convenient for downtown distribution.

There is now pending before the City Council in Chicago an ordinance which, if favorably acted upon, will enable the electric railways entering Chicago to carry freight and express matter over the elevated lines. This will open new important traffic arteries over the Aurora, Elgin & Chicago Railway, the Chicago, Lake Shore & South Bend Railway, and the Chicago, North Shore & Milwaukee Electric Railroad. These lines connect with the elevated structure and have cars that are designed to fulfill the clearance requirements at station platforms and on curves. Unfortunately, the franchise for the elevated lines specifies that no freight other "than mail and such baggage as is carried by hand may be moved



ILLINOIS TRACTION SYSTEM—FREIGHT ROLLING STOCK ALONG A TYPICAL BELT LINE over the elevated lines." This limitation placed on the elevated lines prevents Chicago from enjoying an economic development of inestimable value.

Electric freight haulage in Chicago would greatly relieve steam railroad congestion by taking a considerable amount of short-haul traffic. Aside from providing facilities for carrying freight over the electric lines, including the Chicago Surface Lines, interchange with the steam belt lines operating in this vicinity would make the whole transportation system in Chicago and vicinity far more flexible and useful.

The "North Shore" Line Aids the Great Lakes Naval Station

The Chicago, North Shore & Milwaukee Electric Railroad, skirting the western shores of Lake Michigan between Chicago and Milwaukee, is in excellent position to serve the numerous industries located along its lines. Although it went into extensive freight operation but recently, many of its freight houses are not large enough to care for the traffic, and it has been compelled to enlarge its facilities and erect new stations large enough to give adequate service.

If the plan of moving freight over the elevated lines is carried out, this road will have to make still further additions to its freight facilities. It will then be in a position to be very helpful toward relieving the freight congestion to all points on its line between Chicago and Milwaukee. Instead of being restricted to local freight it would be able to interchange freight with other lines, running south and west of Chicago.

During the last winter, this railway played an important part in handling commodities, judging by these extracts from the Chicago *Evening News* of Jan. 19, 1918:

> Not only did the electric line take care of passengers, but when the steam roads were tied up, it hauled meat, milk and coal to a number of North Shore towns, which otherwise might have experienced a real famine.
>
> The day before the first storm broke in all its fury, the electric line delivered ninety cars of coal to the Great Lakes Naval Station. But for the timely assistance brought to the great training camp with its 20,000 jackies, they would have suffered for lack of fuel. From the Borden's Condensed Milk Company at Evanston, the electric line received two carloads of milk, which were distributed to the towns along the line, thus avoiding a serious milk famine.
>
> Mrs. Scott Dureen, owner of the famous Crabtree Dairy, found the electric railway a savior in the time of distress. The steam railroads could not help her, but the electric line took care of all her shipments in such a satisfactory manner that she will continue to use it hereafter.
>
> When the Naval Section was threatened with a bread famine the electric railway pulled a carload of bread from Libertyville to the Great Lakes.
>
> The same train crew took care of the usual steam road traffic from Rondot.
>
> So successful was the electric road in getting meat cars through and avoiding a meat shortage, that Armour & Company have taken advantage of the facilities and shipped several carloads of meat from the Eaton branch to supply all the North Shore towns along the electric line.

At present the North Shore line has no terminal within the corporate limits of Chicago but stops at its southern terminal, Evanston. However, there is a track connection between this line and the Chicago Elevated lines. Should the Chicago Council finally pass the freight ordinance now pending, it would be possible to work out plans to handle freight at night over both the elevated and surface lines of Chicago. Also intend to greatly develop the territory served by the electric railways.

The "South Shore" Could Run Forty-Car Freight Trains

The Chicago, Lake Shore & South Bend Railway, operating 77 miles between Pullman, Ill., and South Bend, Ind., could also handle all the freight traffic that might be routed over it. Freight is carried as far west as Kensington, Ill., where it is interchanged with the Illinois Central or Pullman Railroads. This road is single track from South Bend to Gary, 59 miles, and double track for the remaining 17 miles. It is protected throughout by automatic block signals.

All freight is hauled by 72-ton electric locomotives rugged enough to draw thirty to forty-car trains instead of the ten-car trains which meet the requirements at present.

Most freight movements are made at night during the off-peak hours. A locomotive makes a round trip of 154 miles from South Bend to Kensington in about fourteen hours. Freight cars loaded up until 6 p.m. in Chicago are "set out" by the Illinois Central at Kensington, from which point they leave at about 1 a.m. and reach South Bend in time for 8 a.m. delivery. This is far better service than that now possible by other existing facilities. This line can materially relieve the steam road situation in its territory, since the railway can carry between its terminals practically all local freight offered for transit.

At South Bend the "South Shore" line taps such industries as the Oliver plow works, the Studebaker plants and the Singer sewing machine works. With the extension of steam road interchange arrangements to this line it could at once become a very great source of relief. Interchange arrangements would also permit it to tap the Haskell & Barker car works at Michigan City and the Rumley implement plants at La Porte, Ind.

Through an interchange agreement already in effect with the Illinois Central Railroad at Gary and with the Elgin, Joliet & Eastern Railway (Chicago Outer Belt Line) at Gary (Golf Junction) this line receives freight for any point in the United States. Interchange is also made with the Chicago & Calumet Railroad.

At present no interchange is made on the east end of this line because the steam lines are said to refuse to deal with an "electric" line. With this barrier removed, the "South Shore" line could interchange with the following steam roads at different points: Lake Erie & Western, Erie, New York Central (Lake Shore), Monon, Michigan Central, Pennsylvania and Baltimore & Ohio.

Wells, Fargo & Company operate their express service on the regular passenger cars, and the last night train each way has an express trailer. Express matter to points east of Hammond, Ind., on the "South Shore" line is brought out from Chicago by the Erie Railroad and turned over to the electric line at Hammond.

In addition to the express business, dispatch or package freight is handled on the regular passenger trains.

Aurora, Elgin & Chicago Railroad Could Handle More Freight

High-speed passenger service is operated by this line as well as a package express and freight service, both carload and less than carload. Like other electric lines entering Chicago, it is seriously handicapped in not being able to operate its cars carrying express and freight into Chicago over the elevated lines, its express and freight terminal being located at a point 6 miles out from the center of the city. This line has freight motors capable of hauling from ten to thirty standard steam road cars.

While the general character of traffic handled by this line is l.c.l. merchandise and package express, it has steam road interchange regulations with the Illinois Central, Chicago, Burlington & Quincy, Indiana Harbor Belt-Line and Elgin, Joliet & Eastern Railroads. Through the last two named belt lines, this electric line can reach any steam road point in the United States. In an endeavor better to serve its territory, the management has prepared a map, reproduced on page 904 to show the points where team tracks are available for loading and unloading.

Illinois Traction System

The Illinois Traction System, traverses a territory of diversified agricultural and mining character, providing freight traffic of a steady nature. There are eleven coal mines on the system, and some of these have no other outlet than the electric road, while on adjacent steam roads there are more than 100 such mines, which are also served by the electric system. The three coal mining districts on the system are from Danville to Champaign, from Springfield to Peoria and from Staunton to Springfield. It is the aim of the traffic department of the company so to arrange shipments that each group of mines will supply all the coal needed in its own region, thus keeping the car mileage down to a minimum. This local distribution is undertaken in large part by the railway which delivers coal along the right-of-way to dealers, who unload on their own special sidings directly to their own wagons for house and factory distribution. Although a considerable part of the line is single track and a heavy passenger business is done, the company has been successful in developing also an extensive freight and express traffic, by inaugurating a generous policy of providing long sidings and general improvement of electric railway facilities, including block signals.

The Illinois Traction System serves more than 100 towns and cities located in fourteen counties in the

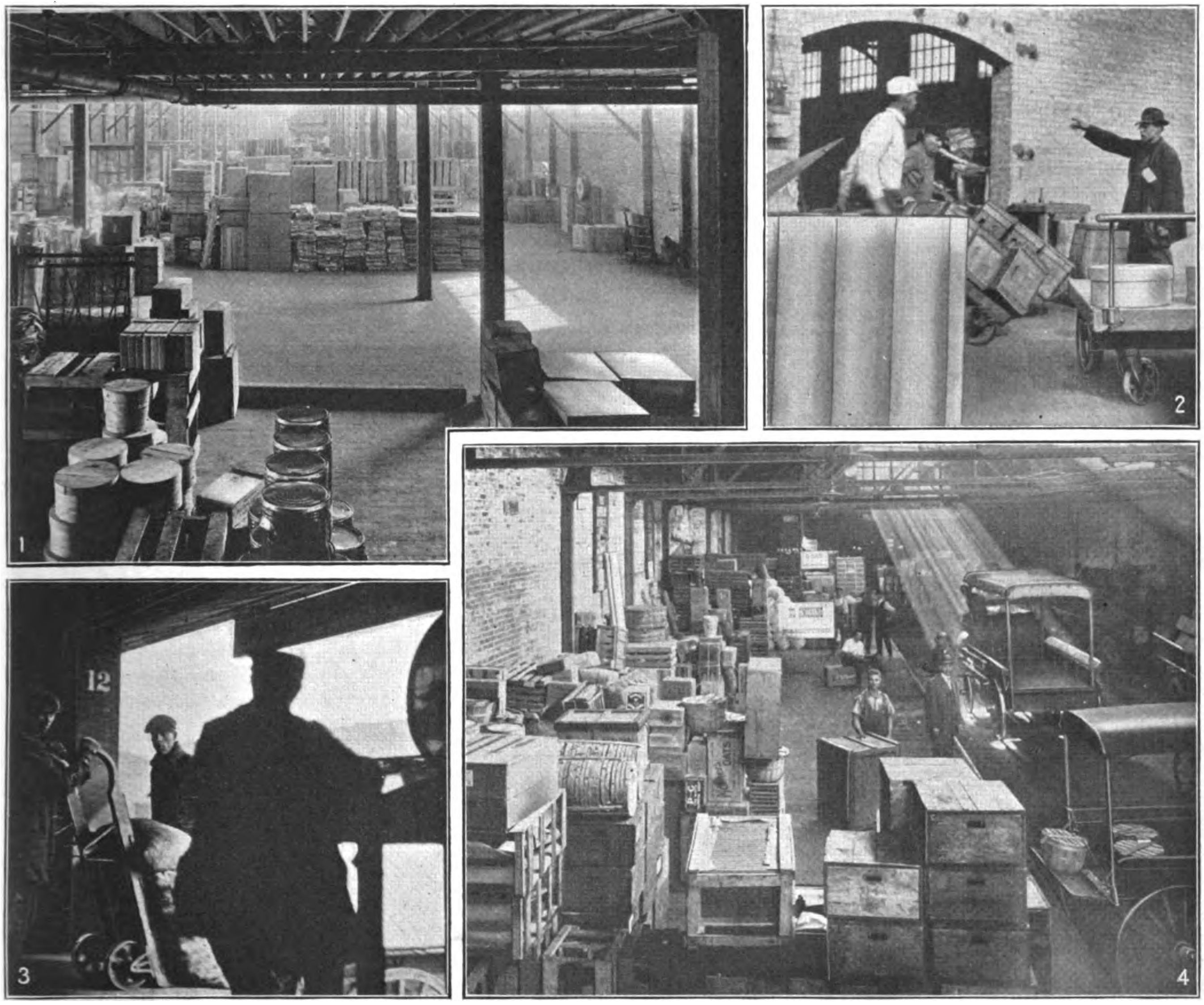
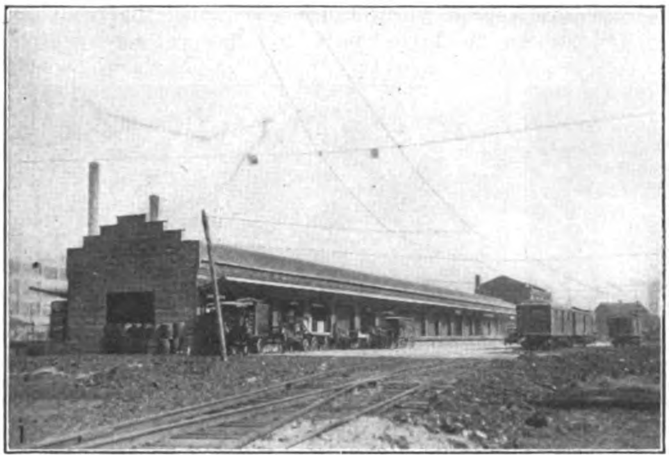


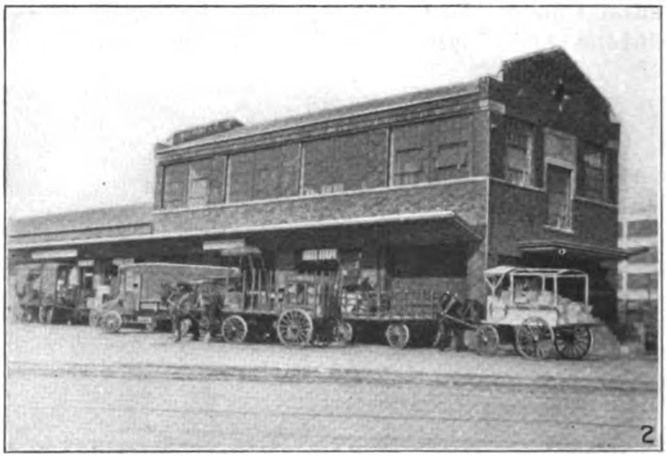
Fig. 1—Detroit United Railways
Fig. 2—Michigan Railway
Fig. 3—Indianapolis Terminal, Checking Freight from Trucks
Fig. 4—Interurban Railway & Terminal Company, Cincinnati, Ohio

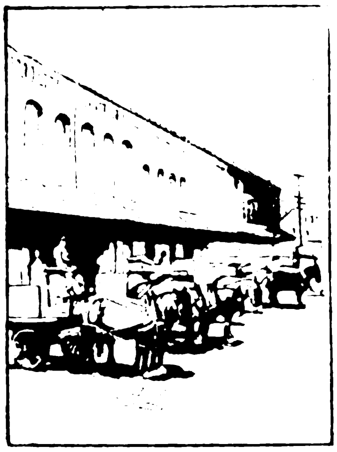
FREIGHT HANDLING ON A NUMBER OF INTERURBAN ELECTRIC RAILWAYS

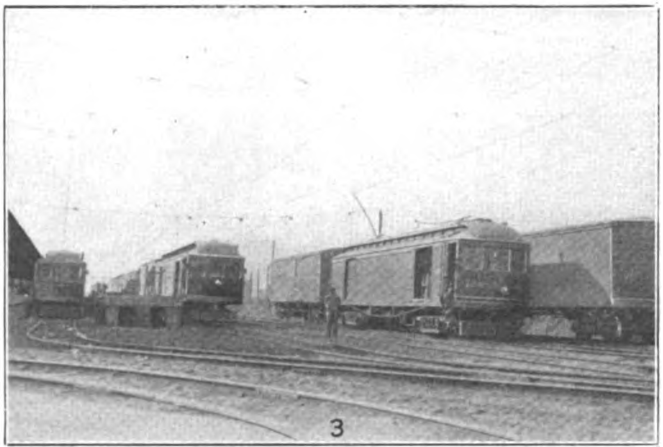
State of Illinois. Its freight and express traffic is handled by motor express cars drawing trailers, and by large 63-ton electric locomotives, with a drawbar pull of 35,000 lb. Each of these locomotives has an equipment of four 200-hp. motors, which gives it a tractive power equal to the average steam freight locomotives.

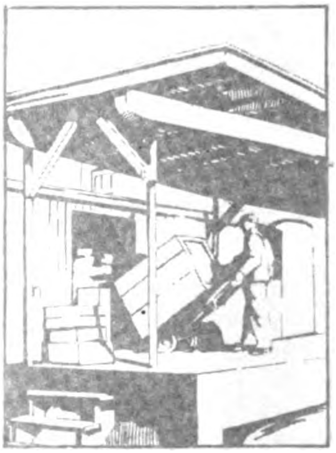
Supplementary to the daily operation of freight and express trains over this system, a through service for package or dispatch freight to and from Chicago is maintained by means of a physical connection with the Chicago & Eastern Illinois Railroad. Connection between this steam road and the electric line is at Glover, near Champaign, where a complete installation of connecting interchange tracks has been made to facilitate this class of traffic. By means of fast through express trains, freight received at any terminal point by 5 p.m. reaches its destination on the traction system by early the next morning.

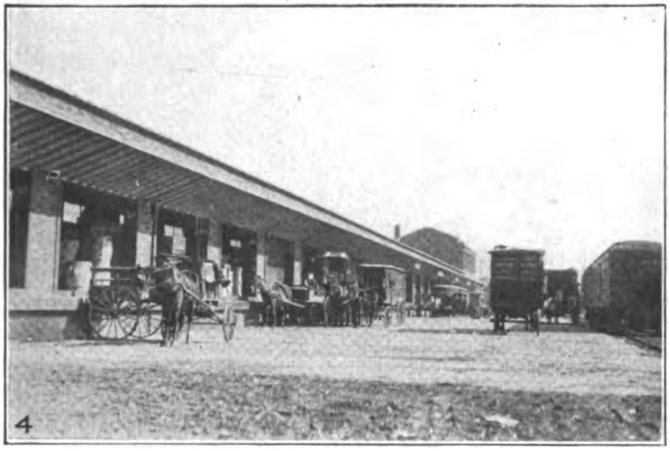












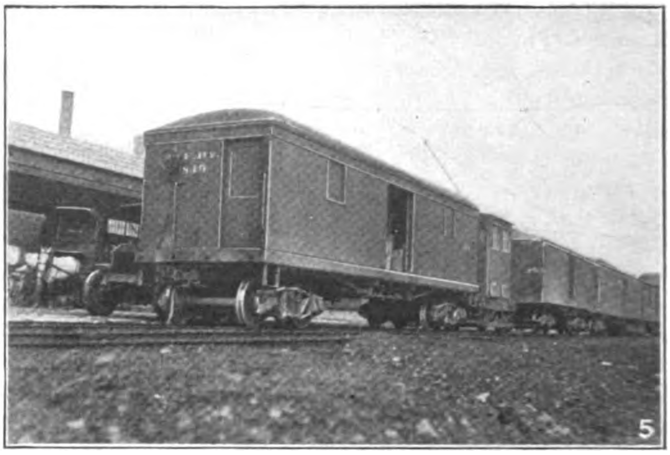


Fig. 1—One of the Terminal Buildings
Fig. 2—Freight Office End of Terminal
Fig. 3—Terminal Yard for Loading and Unloading, Less-than-Carload Merchandising Freight
Fig. 4—Team Driveway
Fig. 5—Interline Interurban Freight Trailers. A Switching Motor Is Used in Moving Trailers About the Terminal Yard, thus Relieving Motor Cars

THE SERVICE AT THE INDIANAPOLIS FREIGHT TERMINAL AVERAGES 2100 FREIGHT CARS PER MONTH

Twenty-four grain elevators have been constructed along the interurban line, and are now in operation and at the service of the shippers of the Illinois Traction territory. Much of the grain going over this system is shipped to Chicago, but since the Illinois Traction System has no physical connection with an electric line into Chicago, it was necessary to build a large transfer grain elevator at Glover, Ill., where connection is made with the Chicago & Eastern Illinois Railroad. Grain on the traction system is delivered to this elevator and is transferred into steam road cars.

Another noteworthy factor in connection with the Illinois Traction System is that it has its own entrance into St. Louis via the McKinley Bridge. By means of its own terminals at St. Louis, and interchange arrangements with all steam railways entering St. Louis, it assures a great saving of time in handling shipments through that gateway.

Freight Haulage by Iowa's Interurbans

One of the outstanding characteristics of the important electric lines of Iowa is that practically all of them have been built and operated on a steam railroad basis. They are of steam railroad construction but are provided with trolley wires.

On the Fort Dodge, Des Moines & Southern as high as twenty cars to the mile are found, while over the Waterloo, Cedar Falls & Northern anything that a steam railroad handles can be transported. On the Inter-Urban Railway of Des Moines we find a wonderfully extensive movement of materials to construct, equip and supply one of the great military camps of the country.

These points are brought out as a comparison with many of the roads in the Central States which could develop similar freight operation with federal financial assistance.

Inter-Urban Railway Equips Camp Dodge Completely

The Inter-Urban Railway handles heavy steam railroad freight traffic and does a general interchange business through the Iowa Transfer Pool Yard operated by the Des Moines Union Railway, which cares for all steam road interchange in the vicinity of Des Moines. At this yard direct connections are secured by the Inter-Urban Railway with the Chicago, Rock Island & Pacific, the Chicago, Great Western and the Fort Dodge, Des Moines & Southern Railroad.

In addition to this, at Granger transfer is secured with the Chicago, Milwaukee & St. Paul Railway, although most of the interchange with this railway is done at Perry. At Altoona, near the eastern end of the system, interchange is secured with the Chicago, Rock Island & Pacific. At Colfax connection is made with the Colfax Northern, which is a 7-mile line running into an extensive coal field. At Colfax also, interchange is possible with the Chicago, Rock Island & Pacific Railway.

One of the noteworthy facts in connection with the operation of the Inter-Urban Railway of Des Moines is that Camp Dodge, with accommodations for about 25,000 troops is located approximately 12 miles northwest of Des Moines. *This camp, which is virtually a city, was constructed of material hauled in more than 10,000 cars over the electric line. This included the transportation of building materials, supplies, food, munitions, cattle and horses.*

In connection with this camp the electric line not only furnishes an unlimited freight service, which is comparable with that found on steam roads, but also operates a very extensive passenger service.

Des Moines is an important city, and the soldiers travel frequently. To meet this situation on an electric line steam railroad coaches have been secured from roads in the vicinity of Des Moines. Ordinarily the electric locomotives haul freight, but on Saturdays and Sundays, when the passenger traffic is very heavy, they also haul trains of twelve 25-ton trailers. The company has also eight passenger motor cars which have been regeared for train operation and haul from six to seven passenger cars.

Long before the creation of the big camp, several industries on this line were heavy tonnage producers. One of these is a gravel pit, served by the Beaver Valley division on which Camp Dodge is located. From this pit 316,800 tons, or more than 6600 carloads, have been taken in one year. This is more than three times as much output as obtained from any other gravel pit in the State. A number of coal mines of various capacities are also located on this line. Five of these supply more than 4000 tons per day to be handled.

Twelve grain elevators on the Inter-Urban company's lines also bring considerable traffic. Other industries are an ice plant with fifty cars per day in winter, several clay-products plants, one asphalt paving plant and several canning factories. Seven miles of the railway are equipped with block signals, and the Beaver Valley division is rapidly being double-tracked to Fort Dodge.

When Camp Dodge was established it was thought that it would be impossible for the electric line to handle all the traffic. However, the steam lines, the nearest of which was within 1 mile of the camp, while another was 3 miles away, did not extend their lines into the camp. Hence all this traffic had to go by the electric line.

The electric line's service has proved satisfactory beyond all expectations of the government officials. Here is an example of what is done regularly: Often in making troop movements, it is necessary to have very long trains, consisting of baggage and passenger cars. Recently one 60-ton electric locomotive moved a train of sixteen sleepers and two baggage cars to the interchange point, where the steam line actually had to break the train in two because the branch line locomotives could not haul the entire train.

Oct. 2, 1917, is cited as a typical day. On that day, 26,145 tons were moved in 504 cars, nearly 52 tons per car.

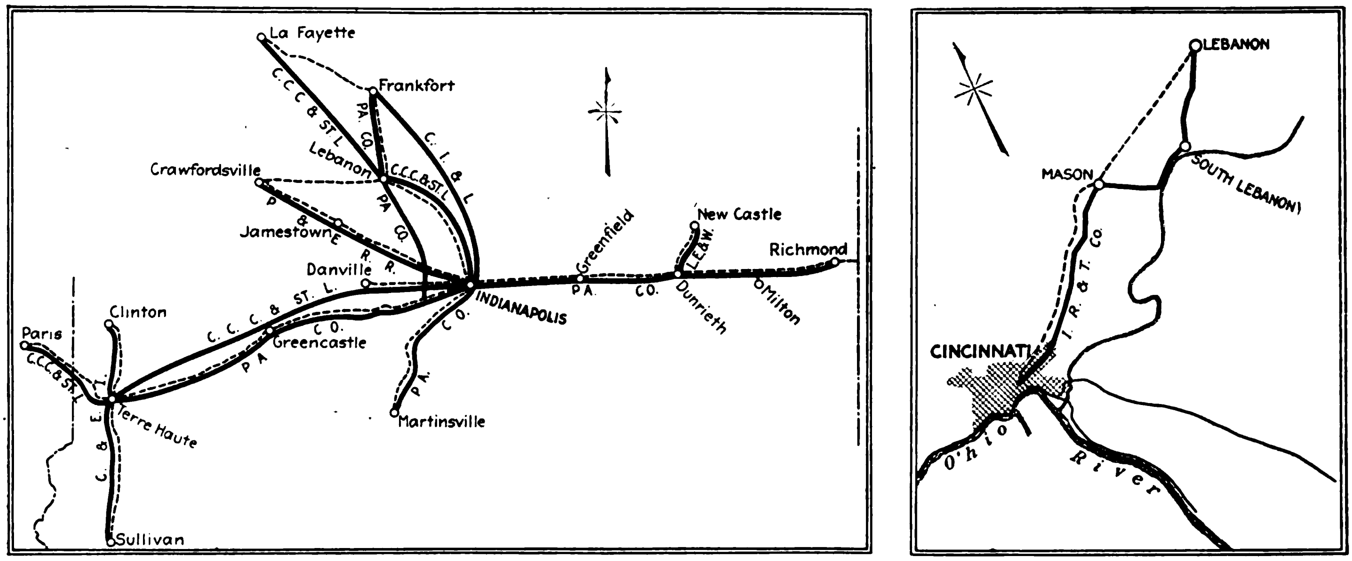
Heavy Tonnage Freight Service Waterloo, Cedar Falls & Northern Railway

On the main line of the Cedar Rapids & Waterloo division, freight service is performed by five 60-ton locomotives equipped with four 250-hp. motors, which are capable of making the run of 60 miles between Waterloo and Cedar Rapids in three hours. The capacity of these locomotives is such that an 800-ton train can be handled at 24 m.p.h., and the type of control equipment on these locomotives is specially laid out to meet the demands of heavy traffic on this line. The company also has an extensive freight terminal at Waterloo, in connection with a belt-line along which are located many traffic producing industries. The line switches more than 70 per cent of the steam road tonnage entering Waterloo to these industries.

A Short Big Freight Carrier—Mason City & Clear Lake Railroad

The Mason City & Clear Lake Railroad, one of the earliest interurban systems, has always depended very largely on its freight traffic. The building up of this line is interesting in that it is only 16 miles long and the actual freight route only 10, and on the whole system there is only 5.45 miles of yard track. This line is built on private right-of-way and is not restricted in any way from the standpoint of operating methods.

On the shore of Clear Lake near one end of the line is a large ice house, which during the winter is filled with ice, and a salesman is put on during the summer to take orders for it. The freight revenue from this enterprise, which is very heavy, with the other freight handled on the line, brings the revenue up to more than $30,000 a year, making the average amount per ton of freight 53 cents. During 1917 this line handled 58,172 tons of freight.



DUPLICATION OF SERVICE—AT LEFT, TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY. AT RIGHT, INTERURBAN TERMINAL & RAILWAY COMPANY—(See page 895)

New Indianapolis Freight Terminal Relieves Congestion

Indianapolis, the long time interurban center of the United States, has helped to foster some of the most important interurban systems of the country. Owing to the rapid development of l.c.l. freight, however, the facilities there became entirely inadequate some time ago. Hence it has been necessary to build a new freight terminal about 1 mile from the present one, which adjoins the passenger terminal.

Although this new terminal is located 1 mile from the center of the city, shippers have not been inconvenienced owing to the general use of motor trucks, which make the run from the heart of the city to the new freight house in a little more than five minutes. A complete description of the new terminal was published in the ELECTRIC RAILWAY JOURNAL of Aug. 11, 1917.

One of the noteworthy features is the terminal layout, which will make possible really rapid handling of l.c.l. and carload freight. Practically all difficulties in the transit of freight from the shippers' trucks through the freight checker and into the freight house have been eliminated.

The first of the new freight terminal buildings has been completed. This development is to include three freight houses, two outbound and one inbound. The former are to be of the following dimensions: 30 ft. x 660 ft. and 30 ft. x 470 ft., with a 50-ft. driveway between them and tracks on the outside of each. The inbound freight house is to be 50 ft. x 450 ft., with a 40-ft. driveway.

When this terminal was laid out, more teamway was allowed in proportion to the house area than is usual in steam terminal design, for it is found in connection with handling electric freight that there is more delay from trucks and wagons, owing to their greater number. Moreover, the use of loops materially helps to clear the yard by reducing the number of switching movements.

Thirteen tracks will ultimately run straight through the terminal yards, being separated only by buildings and driveways. All the platforms are 10 ft. wide. Sufficient space for two lines of trucks and wagons is provided, and this space extends the full length of the adjoining straight track. Only five tracks, at present, are on the north side and three on the south side of the completed building. Granite block will be used in paving all driveways.

This terminal performs an important function in the effort of interurban electric railways to assist the government in lessening the serious situation on the steam lines. The building of this terminal should be helped in every possible way by the government. It has been somewhat delayed by lack of financial resources.

Indianapolis Could Give More Off-Peak Service

While the interurbans radiating from Indianapolis have been doing an extensive passenger and l.c.l. freight business for years, most of them are important trunk lines. Single-car operation and, in some cases, motor-car and trailer operation have been characteristic of electric freight operation in this territory.

In many cases the roads find it necessary to handle freight movements practically on passenger schedule. Most freight cars are geared to the same speed as the passenger cars. Furthermore, they are frequently operated during the day, sandwiched between limited and local passenger trains. Yet plenty of freight could be handled during the off-peak hours. In fact, the shortage of warehouse space in Indianapolis has led many of the lines to handle their freight at night, thus improving the load factor. More freight could be handled in this way.

The physical facilities for freight handling, however, are limited, and federal financial aid is needed to place the lines in the proper shape. For instance, sidings are short and often stub-ended, available only for two or three cars and sometimes only one car. In other cases curves, or city fire plugs within clearance lines, prevent handling M. C. B. equipment, or special work will not take M. C. B. wheel flanges.

The Indianapolis Union Railway, or Indianapolis Belt, has been operating for more than twenty years and, naturally, is centrally located, for the city has grown around it. With the extensive development of freight haulage in this city, the electric railways might eventually consider the construction of a belt line, say for two-thirds of the distance around Indianapolis, to give two general entrances for south and west lines and north and east lines.

The Indianapolis electric freight terminal averages 2100 freight cars a month, practically the same as the Detroit United Railway's big terminal. There are eleven through-car routes between Indianapolis and Fort Wayne, four between Indianapolis and Dayton, one to Zanesville, and two to Lima and Cleveland.

Recently the lines radiating from Indianapolis changed their methods of freight operation. Freight cars operate during the night, starting out about 6 p.m. and coming back early in the morning with a return load of milk and other farm products and merchandise. This was found necessary because it was impossible to secure sufficient rolling stock to handle all the traffic. Loading cars at the station during the day and having them on the road at night permitted the use of cars in a more efficient manner, for in the day they virtually were part of the freight house and gave increased warehouse capacity. Therefore the practice in Indianapolis at the present time is to have trail cars and some motor cars "set out" during the day for loading at the freight house. The trailers in taking the l.c.l. freight are loaded as "set out" cars for different points, while the motor cars are generally used as "peddler" cars.

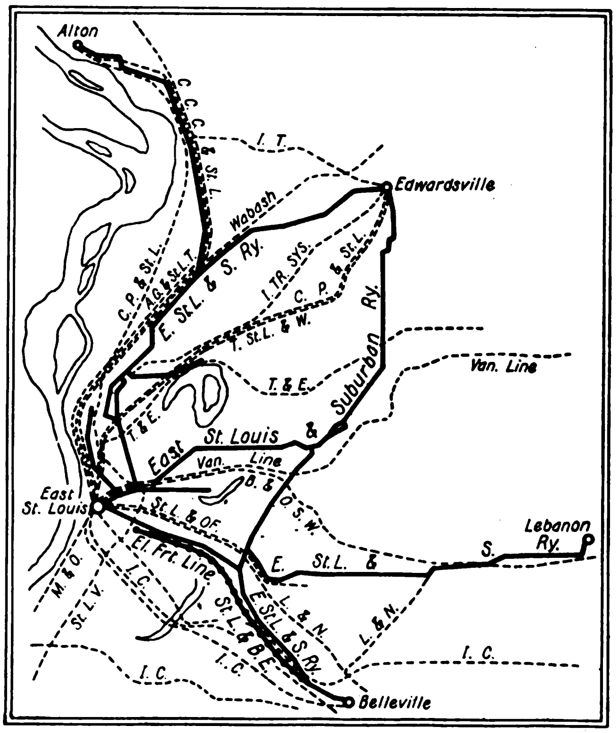
Non-agency stations are cared for by the freight crews. They unlock these stations and place the goods inside ready for delivery to the shipper in the morning. At the larger stations the night employees assist the train crews to handle the freight. Under this arrangement freight can be received as late as 4.30 p.m. at the freight house and will arrive in Terre Haute, Ind., or Paris, Ill., for the next morning delivery.

Interurban lines entering Indianapolis use standard steam railroad classification, including the steam railroad methods of billing and accounting. With the renewal of franchises restrictions in many cities and towns in Indiana a more extensive electric freight development is possible.

Union Traction System Can Handle 25 Per Cent More Freight

The Union Traction Company of Indiana, operating through the central part of the State, is one of the oldest interurban lines in the country. This system includes more than 400 miles of line connected with more than 4000 miles of electric railway. While the company does not conduct what is known as heavy-tonnage freight business, it handles freight by means of motor-freight and express cars and trailers.

Points such as Terre Haute, Louisville, Dayton, Fort Wayne, Lima, Toledo, Detroit, Sandusky, Cleveland, Columbus, Zanesville, South Bend, Benton Harbor, St. Joseph, Jackson, Saginaw, Bay City, Grand Rapids, and others can be reached by this network.



RIPE FOR FREIGHT RELIEF—EAST ST. LOUIS & SURBURBAN AND ST. LOUIS & BELLEVILLE ELECTRIC RAILWAYS

Undoubtedly there are many points where this electric railway could relieve the steam lines of local traffic, through handling all local freight and also in many cases interchange operation, as at present there is no extensive interchange with steam railroads.

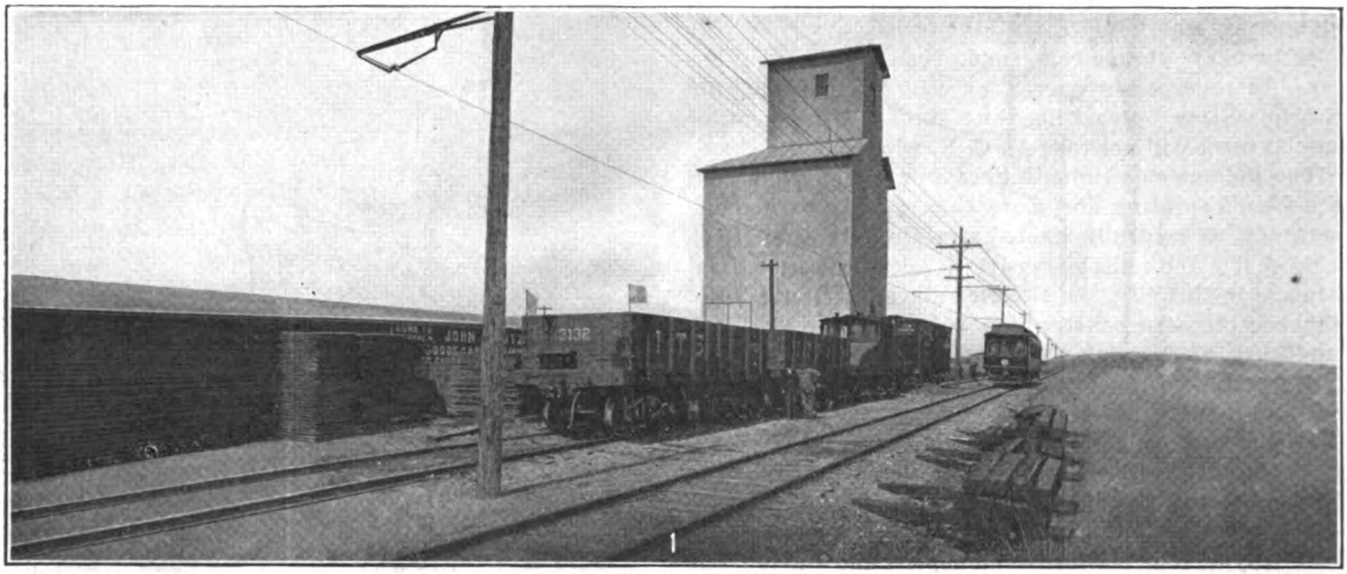
Short, But Important—Winona Interurban Railway

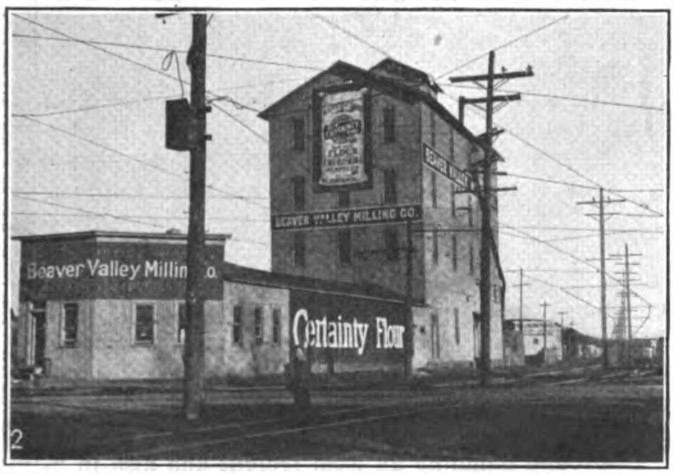
The Winona Interurban Railway, operating between Goshen and Peru, Ind., over a distance of 70 miles, connects at Goshen with the Chicago, South Bend & Northern Indiana Railway, which in turn connects with the Chicago, Lake Shore & South Bend Railway at South Bend.

The South Bend connection forms an important junction point in the through-haul of freight from Indianapolis to Benton Harbor, *via* the Union Traction Company of Indiana, the Winona Interurban Railway and the Southern Michigan Railway—lines popularly known as the route of the "Cannon-Ball Express." The Southern

Michigan Railway connects, at Benton Harbor, Mich., with the Graham & Morton steamship line, which operates a boat service between Chicago and Benton Harbor.

For the last two years the Winona Interurban Railway has been hauling a considerable amount of Chicago freight to and from the territory reached by its line. At Peru, Ind., it connects with the Union Traction Company of Indiana and the Fort Wayne & Northern Indiana Traction Company. The Winona line also interchanges at Peru with the Chesapeake & Ohio and Wabash Railroads. The track and special work is so constructed that standard M. C. B. steam road equipment can be operated over the entire system. The Winona Interurban Railway is able to render considerable relief in handling carload interchange traffic with the Wabash Railroad at Peru. At present it is handling on an average sixty carloads a month, not including the l.c.l. shipments. These, collected into carload lots, would equal another sixty cars.





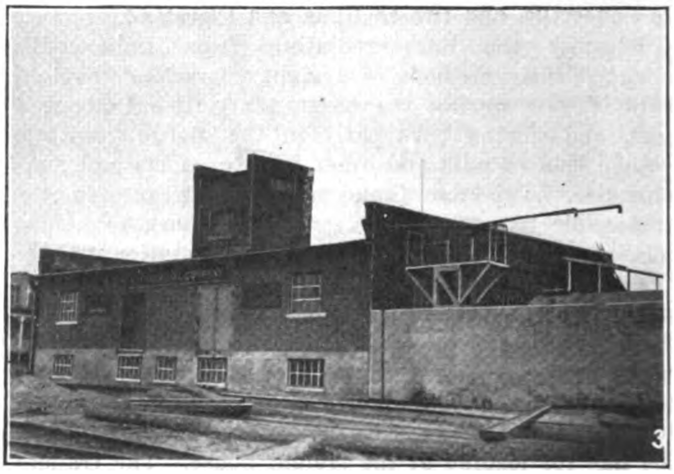


Fig. 1—Grain Elevator, Illinois Traction System
Fig. 2—Grain Elevator, Inter-Urban Railway of Des Moines. Fig. 3—Standard Oil Company—Aurora, Elgin & Chicago Railway
ELECTRIC RAILWAY FREIGHT-PRODUCING INDUSTRIES

With respect to the general freight service that can be rendered by the Winona Interurban, equipment is now available to handle from ten to fifteen more cars a day. Although it is a short line, it forms an important link in a through route. Moreover, its location is such that it gives a north and south line crossing territory that is served by trunk-lines running generally east and west. Thus the Winona Interurban Railway would be able to save considerable detour of freight. Carload freight could be taken from any of the interchanging steam lines and handled for distribution to any point in the territory.

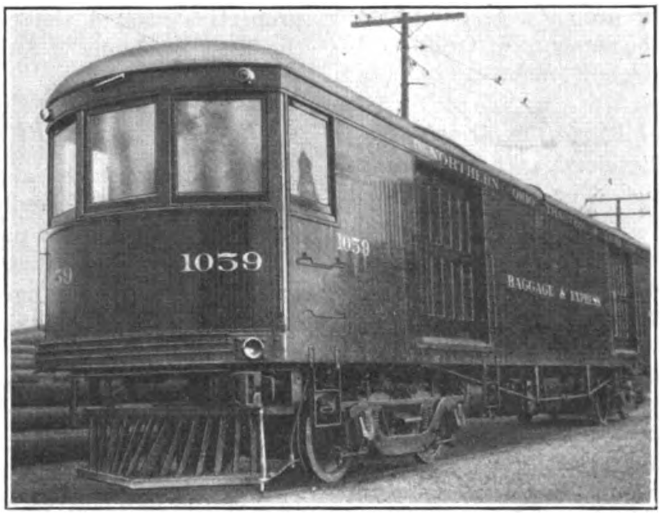
The "Cannon-Ball Express," previously mentioned, is a through freight service from Indianapolis to Warsaw and, in fact, to Benton Harbor, Mich. This servic eis maintained by a trailer loaded for Indianapolis, leaving Benton Harbor at night and going *via* the Southern Michigan Railway to Goshen. At this point a Winona interurban motor car picks it up and proceeds to Peru, where it generally picks up a Union Traction Company trailer. By the time the train reaches Indianapolis, therefore, it is a regular three-car freight train. Return service is given from Indianapolis in similar manner, the train leaving at approximately 6 p. m. The service has been noteworthy in many respects, especially in the transportation of perishable commodities.

Extensive Plans Held Up in Cincinnati

The electric railway interests of Cincinnati have extensive plans for the development of the express and freight business on the interurban lines entering this city. This plan contemplates the use of the bed of the old Miami & Erie Canal as an entrance through the city to the downtown district. This would bring the electric lines downtown in a depressed right-of-way to a point where the lines could be advantageously connected with a loop.

The work on this plan has temporarily been held up on account of the inability of civic authorities to settle on a definite scheme for financing the general improvement of transportation in Cincinnati. This condition has restricted the development of interurbans in the surrounding territory, owing to the city system being broad gage and not standard. With the contemplated development carried out, the two electric systems—the Ohio Electric and the Indianapolis & Cincinnati Railway—will be large factors in relieving the congestion in that territory.

The Interurban Railway & Terminal Company, which lays claim to having put up the first interurban electric freight terminal in the United States, has been doing an extensive motor-car freight business for several years, running each day a single freight motor-car over the Rapid, Suburban and Cincinnati & Eastern divisions. The Rapid division runs from Kingston to Lebanon; the Suburban from Cincinnati to Bethel, and the Cincinnati & Eastern from Cincinnati to Richmond.



INTERURBAN FREIGHT MOTOR CAR, NORTHERN OHIO TRACTION & LIGHT COMPANY

The Rapid division is paralleled throughout most of its length by a steam railroad, the Cincinnati, Lebanon & Northern. This was originally built as a high-water line to permit the Pennsylvania System to get into the city with freight during the flood periods of the Ohio River. It is also operated at other times, however, as there is a considerable freight movement over it.

The Interurban Railway & Terminal Company, although primarily a passenger road, could readily take over practically all of the steam passenger traffic and a great deal of the local freight between Cincinnati and all common points. In fact, the two lines are so close to each other after leaving Cincinnati limits that only a fence or pole line separates them for a great part of the distance to Lebanon (see page 900).

Since this steam line was developed for a high-water service, it must enter Cincinnati over an extremely heavy grade, a condition which calls for a prodigal use of locomotives. For example, two steam locomotives are needed to haul seven freight cars over the grade leaving the Cincinnati terminal. The trains move so slowly that not infrequently coal thieves board the cars and within a block or two throw half a ton or more off by the roadside! An actual occurrance of this kind was witnessed by the writer.

The local commuter service of the Cincinnati, Lebanon & Northern is also handled in a costly way. A three-car passenger train will pull out of the terminal with a light American-type engine, and a switcher will couple on as soon as the train gets into the yard. These two locomotives then labor up the grade with three cars!

This instance is cited to disclose the absurdity of overloading a set of steam rails and underloading a parallel set of electric rails. Even if this particular steam road is not overloaded, it is obviously using equipment extravagantly. The passenger business could be handled to better advantage by the interurban railway, because the steam line is primarily designed for freight, and it could be electrified to advantage to improve its operation in that field.

Cleveland Has Possibilities

For some years Cleveland has had what is really an interurban package-express service. Although this meets a certain need, it does not fulfill the demands of the shippers in Cleveland and the surrounding territories. Shippers who have been interested in interurban freight haulage from Cleveland to local points for nearly fifteen years assert that they have been unable to secure what they consider an advantageous arrangement for handling freight out of Cleveland on the interurban railways.

Because of this absence of l.c.l. electric freight, shippers, especially jobbing houses, find themselves restricted in dealing with the small towns near Cleveland. *So interested were these shippers in electric freight haulage that six years they helped to secure permits for the electric railways to haul freight trains of up to three cars through the streets of Cleveland.*

The only line out of Cleveland with extensive freight operation is the Cleveland, Southwestern & Columbus Railway. The Northern Ohio Traction & Light Company, Akron, however, expects shortly to have extensive freight service over its lines into Cleveland.

The present electric railway freight movement in and out of Cleveland *via* the package-express system amounts to about twenty-five cars a day. The Electric Package Agency is carrier for the Cleveland, Southwestern & Columbus Railway, the Northern Ohio Traction & Light Company, the Lake Shore Electric Railway and the Cleveland, Painesville & Eastern Railroad. Only the first-named line, as already noted, handles considerable freight business of its own.

There is a movement on foot in Cleveland that may considerably help both the passenger and the freight situation. To improve realty values in a district known as Shaker Heights, the promoters constructed a 3-mile electric railway at their own expense and turned it over to the Cleveland Railway for operation. This line is now in successful operation and the plans are ultimately to extend it over a private right-of-way into the heart of Cleveland to a projected passenger and freight terminal near the Square. The steam belt-line operating around Cleveland is to come down the same right-of-way parallel to the electric line.

The same interests are building a large steam railroad freight terminal which is connected through the belt line to the New York Central Railroad and the Pennsylvania Railroad. When this project is fully developed, the electric railways will easily be able to tie into this main trunk line by constructing a few miles of new track. Only one or two lines may not be able to make connections readily.

Northern Ohio Traction & Light Company Twenty-four-Hour Freight Service

Freight service is now operated continuously throughout the twenty-four hours by the Northern Ohio Traction & Light Company to help relieve the congestion on steam lines and assist the government in the movement of food and war supplies. The service is given between Akron, Cleveland and Canton. The property is so situated that it could handle an enormous amount of freight. Indeed, its only limit is its present inability to obtain rolling stock.

The time of transit for freight via the electric line is four hours from Canton to Cleveland, while by steam it would be from four to ten days. This is not necessarily caused by the inefficiency of the steam railroads, but by the difference in the operating conditions. It takes time to move carload shipments on the railroads, while a large amount of freight handled on the electric line consists of l.c.l. merchandise, making it possible for one car to make three or four round trips daily.

One of the important obstacles to the extension of electric railway freight business is the lack of terminal facilities. The Northern Ohio Traction & Light Company, however, feels that it would be able to solve this problem to a certain extent if its freight service were operated at night only.

2800 Miles of Ohio Trolley Used Almost Exclusively for Passengers

The electric railways in Ohio are contemplating a more extensive operation of freight service, as they thoroughly realize the great possibilities of helping along this line in our national emergency. There are 2800 miles of interurban lines in the state used for little else than passenger service. Already electric freight trains run out of Toledo daily. This could be extended to every line in the state.

Through Akron the electric line could handle local freight and leave the main lines of the Baltimore & Ohio, the Erie and the Pennsylvania Railroads free to rush food supplies and coal. The Cleveland & Lake Erie could be used exclusively as a coal carrier. The Toledo & Ohio Central Railroad and the Hocking Valley Railroad could be used for coal only, and *the thousands of miners now idle, through lack of empty cars, would be able to earn a living wage and at the same time would relieve the acute coal shortage.* The Cleveland, Southwestern & Columbus; Columbus, Marion & Bucyrus, and Columbus, Delaware & Marion Railways are so located that they would form an important freight route to Columbus and other points.

East St. Louis Ripe for Freight Relief

Of the relief afforded through an electric line absorbing local traffic, in a radiating metropolitan district, the East St. Louis & Suburban Railway serves to illustrate well the possibilities.

Passenger service is maintained by high-speed two-car limited trains with free parlor car between East St. Louis and Eads' Bridge Stations to Alton, Ill. These trains make the 26-mile run in fifty-five minutes, the run being divided as follows: In East St. Louis, 2.34 miles; interurban, 22.31 miles to Alton and in Alton 1.5 miles. The 22.31 miles of interurban running is made in forty minutes.

Through this service an average of 1000 people a day travel on the limited trains, and the last steam railroad has recently taken off its local passenger service between East St. Louis and Alton, Ill. Now this same property is in a position to give further relief by handling all local freight along the same line. By increasing their freight and passenger handling facilities, many properties around the country could do the same as the East St. Louis & Suburban Railway.

St. Louis & Belleville Electric Railway Is A Freight Line Outright

This road operates a freight line between East St. Louis and West Belleville, doing interchange service with three belt lines: namely, St. Louis & Merchants Bridge Terminal Railway, Venice & Crondulett Railway and Alton & Southern Railway. All three of these connect with twenty-three steam lines entering St. Louis, thus giving interchange connections to these lines and to the St. Louis & Belleville Electric Railway.

About 100 cars a day are interchanged on the St. Louis & Belleville electric line. Twenty cars a day are used for general freight business operating on the line. Two 50-ton locomotives are used to handle this service. The trains operate on a special schedule according to the demands of the coal mines located on the system.

The line is 14 miles long. It has a yard at Twenty-first Street, East St. Louis, consisting of fourteen tracks, with a capacity of 300 cars. Team tracks in East St. Louis at the Twenty-first Street yard have a capacity for unloading thirty cars at a time. Included in the rolling stock of this line are more than 530 40-ton coal cars. While these cars go off the electric line, they are restricted to the East St. Louis and St. Louis district. Practically no l.c.l. business is done by this road.

The industries located on this line are the Excelsior Machine Works, which usually furnish about two carloads a day; the American Carbon Paper Company, which furnishes about three carloads a day, and the following coal mines: Suburban mine, 600 tons, or fifteen-car capacity a day; Superior mines, 800 tons, or twenty-car capacity a day; Avery mines 650 tons or sixteen-car capacity a day and Harmony mine 400 tons, ten-car capacity a day.

During the recent cold weather the steam roads around St. Louis could not deliver the coal, and the electric locomotives handled thirty-seven cars while the steam locomotives could not move. The electric locomotives were used for the purpose of bucking snow and clearing their own tracks.

The East St. Louis & Belleville Electric Railway has always interchanged steam road cars, thirty to forty at a time to a train. The maximum grade is 3½ per cent to 4 per cent, but as the road is built on its own private right-of-way, there are no other physical restrictions. The last coal mine is only 9 miles from East St. Louis, but on the last 4 or 5 miles delivery tracks are located.

More than 3000 cars loaded with building material have been delivered for the improvement of the city streets between the eastern limits to East St. Louis and Belleville, thus making 5½ miles of the finest road of its kind in the country. Other commodities transported by this line have included coal, rock, cement, mine supplies, rails, powder and sand.

Pittsburgh's Hills a Barrier

The narrow valleys and steep hills of the country near Pittsburgh make interurban railway construction extremely difficult. Nevertheless two róads are successfully handling much local freight and passenger traffic, namely, the Pittsburgh, Harmony, Butler & New Castle Railway and the Pittsburgh, Mars & Butler Railway. Both interurbans run to Butler, but the former also serves Evans City and New Castle. The two lines to Butler have carried in one year over 22,000 tons of freight.

The Pittsburgh Railways also operates an interurban line to Washington and Charleroi, over which both freight and passenger traffic is handled. Moreover, the West Penn Traction Company has an extensive network of lines in Westmoreland County, southeast of Pittsburgh.

Since Pittsburgh is a highly developed industrial center, there should be ample opportunity for increased freight service. The topography, however, is largely responsible for slow growth.

Owing to the extensive freight-producing characteristies of the Pittsburgh district, the interurbans entering Pittsburgh will, with proper encouragement, be able to increase their freight-handling facilities considerably. The territory served makes good use of the passenger facilities, and undoubtedly more can be done for the development of freight carrying than is now the case.

Packers Recognize Advantages of Electric Freight

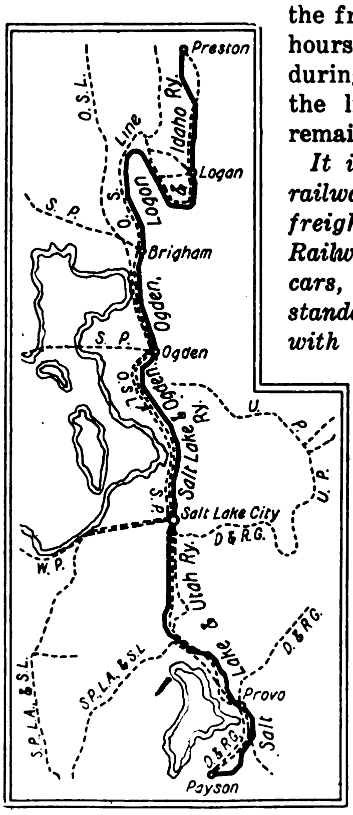
Big possibilities exist in numerous communities for relief to meat packers and Kansas City, generally since the completion of the new Kansas City Freight Terminal. Since the completion of this terminal the trolley freight service has made it possible for packers every day to ship their products.

St. Joseph, Mo., is the location of packing houses belonging to Kansas City packers, and the Kansas City, Clay County & St. Joseph Railway assists considerably in making it possible to equalize the supply of these two markets. *Formerly, four to six days were consumed for a shipment between one of these cities, while on the electric line three hours is the maximum.* There are numbers of other cases in different parts of the country where packers are taking advantage of such service.

All interchange freight is handled in foreign cars, over existing connections with the steam roads.

Big Development in Kansas City From Small Beginning

Kansas City, like several other large cities, has developed a comprehensive electric railway freight terminal. This is operated by the Kansas City Freight Terminal Company. Owing to the fact that at first freight cars could only be moved at night, delays were encountered. Eighty-four cars of freight at one time stood on the tracks of the Kansas City Railway. In order to relieve this situation, the Public Service Commission permitted the railway to operate the freight service between the hours of 6 a. m. and 4 p. m. during the day on part of the line and all day on the remainder.



Salt Lake & Utah Railroad
Bamberger Electric Railroad
(Salt Lake & Ogden Railway)
Utah-Idaho Central Railroad
(O. L. & I. Ry.)

DUPLICATION OF SERVICE—ELECTRIC RAILWAYS OF UTAH (See page 895)

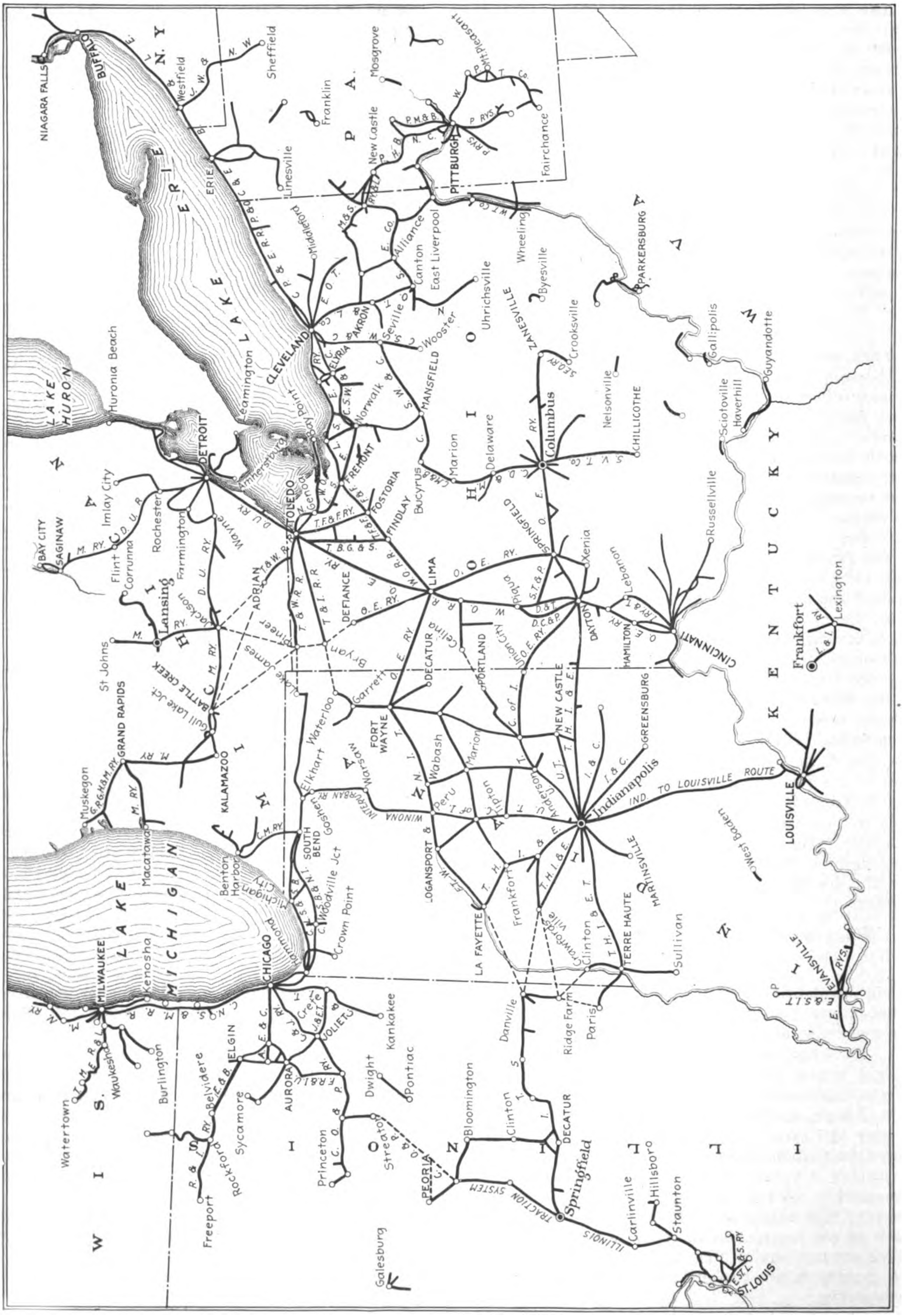
It is unusual to find a city railway handling steam road freight cars. The Kansas City Railways not only owns freight cars, but switches and hauls standard steam railroad cars with an electric locomotive on a 12-mile line between Dodson and Westport Station. This latter point is the southern, residential district of Kansas City. Years ago this route was known as the old Westport & Belt Railway, which was a steam "dummy" line.

In recent years much passenger traffic has been diverted from this by constructing new routes, by operating more cars on one of the newer lines, the Country Club route, and by a commission order permitting switching in the day time.

Lumber yards, coal yards, and other similar industries receive freight cars billed *via* the Kansas City Railways.

A most significant phase of this increase in freight operation is the wonderful service rendered to grocers and merchants along the line. *In Kansas City there are two of the largest retail grocers who secure their supplies from Chicago in carload shipments direct to their branches along the electric line. Many companies and individuals pool their shipments to secure combined full carloads routed direct to them over electric lines.*

The company handles a large number of steam road cars every day between its lines and the Missouri Pacific and 'Frisco Railroads. At Dodson terminal, which is the steam road interchange point, there is a receiving track 900 ft. long.



LAKE ERIE
LAKE HURON
LAKE MICHIGAN
N. Y.
PA.
OHIO
MICHIGAN
INDIANA
ILLINOIS
WIS.
W. VA.
KENTUCKY
NIAGARA FALLS
BUFFALO
Westfield
Sheffield
Franklin
Mosgrove
Linesville
ERIE
New Castle
PITTSBURGH
Mt. Pleasant
Fairchance
Middlefield
Alliance
Canton
East Liverpool
Wheeling
PARKERSBURG
CLEVELAND
AKRON
Seville
Wooster
ELYRIA
Norwalk
Uhrichsville
Byesville
ZANESVILLE
Crooksville
MANSFIELD
Marion
Delaware
Columbus
Nelsonville
CHILLICOTHE
Gallipolis
Guyandotte
Sciotoville
Haverhill
Huronia Beach
Leamington
Amherstburg
DETROIT
Imlay City
Rochester
Farmington
Wayne
Flint
Corunna
BAY CITY
SAGINAW
Lansing
Jackson
St Johns
ADRIAN
TOLEDO
Genoa
FREMONT
FOSTORIA
FINDLAY
Bucyrus
DEFIANCE
LIMA
SPRINGFIELD
Xenia
Piqua
DAYTON
Lebanon
HAMILTON
CINCINNATI
Russellville
Frankfort
Lexington
Bryan
Pioneer
Lake James
BATTLE CREEK
Gull Lake Jct.
GRAND RAPIDS
KALAMAZOO
Muskegon
Macatawa
Benton Harbor
Michigan City
SOUTH BEND
Goshen
Elkhart
Waterloo
Garrett
Warsaw
FORT WAYNE
DECATUR
Celina
PORTLAND
Union City
NEW CASTLE
Wabash
Marion
Peru
Tipton
Anderson
Indianapolis
GREENSBURG
LOGANSPORT
Woodville Jct
Crown Point
Hammond
CHICAGO
MILWAUKEE
Kenosha
LA FAYETTE
Frankfort
Crawfordsville
MARTINSVILLE
TERRE HAUTE
Clinton
Sullivan
Ridge Farm
Paris
Danville
LOUISVILLE
West Baden
EVANSVILLE
Watertown
Waukesha
Burlington
Belvidere
ELGIN
Freeport
Rockford
Sycamore
AURORA
JOLIET
Kankakee
Dwight
Pontiac
Princeton
Streator
PEORIA
Bloomington
Clinton
DECATUR
Springfield
Galesburg
Carlinville
Hillsboro
Staunton
ST. LOUIS
IND. TO LOUISVILLE ROUTE
WINONA INTERURBAN
ILLINOIS TRACTION SYSTEM

Solid lines show existing roads. Dotted lines indicate connections that would make through-route operation more flexible

ELECTRIC RAILWAYS OF THE CENTRAL STATES

The new terminal is near the central warehouse and wholesale district, thus requiring only a short haul practically on the level. This terminal has been in operation several months, and its advantages are already producing increased traffic and uniform commendation from shippers and merchants. A great advantage that the shippers find is that goods for the various points on the different lines now may be delivered by one trip, which saves much time.

Electric Line Not Permitted to Build Siding

The Kansas City & Western Railway, which is one of the members of the Kansas City Freight Terminal Company, has been handling general interurban freight for a number of years. It offers direct shipment from Kansas City to Leavenworth, where there are several large institutions, including the State penitentiary and its allied industries.

Although this company is fully capable of handling freight to Fort Leavenworth, the administrative officials would not allow the electric railway to construct a siding because the steam facilities were considered sufficient. As the electric line is not permitted to lay its siding, the possibility of direct shipment into this fort is eliminated, all supplies being delivered by the steam railroads, which have platforms at the fort.

On the other hand, the merchants of Leavenworth have enjoyed so great an increase in retail trade due to the presence of troops that the freight business of the Kansas City & Western Railway increased more than 23 per cent within the last year.

The Kansas City, Kaw Valley & Western Railway, now operating between Kansas City and Lawrence, will be extended to Topeka. Carload freight is handled by two electric locomotives, and interchange transfer service is carried on between the electric line and the Rock Island, Kansas City Southern and Kansas City Terminal Railroads through the terminal connection near Kansas City. More than twenty carloads of freight are interchanged each day. L.c.l. freight is handled by four 50-ft. motor-freight cars and one 40-ft. trailer. Each of these cars has a 60,000-lb. capacity.

Why Not Use Electrics More?

Economically, the electric line has its value in the community served, in many cases being responsible for the development and enhancement of real estate values. For this reason we should consider whether the electric railways of this country, embracing as they do practically one-seventh as much mileage as the steam railroads, and with a capitalization at the last census of approximately $4,700,000,000, and annual operating revenues of approximately $565,000,000, should not do more of the freight transportation of which this country now stands in such great need. Nevertheless the freight earnings of the electric roads in 1912, the year of the last available data, amounted to less than 2 per cent of the total operating revenue.

It is in the interest of the public that the present investment in both steam and electric lines be used to the fullest extent possible before providing at large expenditures other freight haulage facilities that are uneconomical and unable to move great quantities of freight at any one time.

This is an opportune time for the various states to look into the possibilities of "regulating" the motor truck, for there should be no unnecessary expenditure and duplication of investment.

Where Through Routes Are Most Desirable

A very large number of freight car routes are now in daily operation over various electric railway systems of this country. *The fact that these routes exist shows that there are possibilities in long distance freight*

Some Through Freight Rates in the Central States

THROUGH CAR ROUTES FROM INDIANAPOLIS

There are now in operation out of Indianapolis a large number of interurban freight car routes to points throughout the Central States. Several are listed below:

1. From Indianapolis to South Bend, Ind., and Benton Harbor, Mich., via
    Union Traction to Peru,
    Winona Interurban to Goshen,
    Chicago, South Bend & Northern Indiana, to South Bend,
    Southern Michigan Railway to Benton Harbor, Mich.,
    making a three-line operation.
2. From Indianapolis to Garrett, Ind., via
    Union Traction, via New Castle to Bluffton,
    Fort Wayne & Northern Indiana Traction to Fort Wayne,
    Fort Wayne & Northwestern Traction to Garrett, where connection is made for Wells Fargo Express.
3. From Indianapolis to Dayton, Ohio, via
    Union Traction through Anderson, Muncie, and Union City,
    Ohio Electric Railway, to Dayton.
4. From Indianapolis to Louisville, Ky., via four lines:
    Interstate Public Service to Seymour,
    Indianapolis & Louisville to Sellersburg,
    Louisville & Northern Railway & Light to Jeffersonville,
    Indiana Southern to Louisville.
5. From Indianapolis to Dayton, Ohio, via two lines:
    Terre Haute, Indianapolis & Eastern Traction to Richmond,
    Ohio Electric Railway to Dayton.
6. From Indianapolis to Logansport, via
    Union Traction.
7. From Indianapolis to Wabash, Muncie and Kokomo, via
    Union Traction.
8. In addition to this through service, occasionally car loads go from Indianapolis to Toledo, Ohio, via connections at Fort Wayne, Ind., and Lima, Ohio; also carload movements to Kendallville, Ohio, via Fort Wayne, Michigan City, Ind., via South Bend; Columbus and Zanesville, Ohio.
9. The Terre Haute, Indianapolis & Eastern Traction Company loads daily freight cars from Indianapolis to Terre Haute; Danville, Ill.; Crawfordsville, Ind.; New Castle; Lafayette, Ind.; Frankfort, Ind.; Martinsville, Ind., all routed via its own line.

Freight from Indianapolis is transferred at Terre Haute for Sullivan and Clinton, Ind., and Paris, Ill.; at Dayton, Ohio, to all stations on the Ohio Electric Railway; Dayton and Troy Railway; Western Ohio Railroad; Dayton, Covington & Piqua Traction Company; and other stations on the Ohio Electric.

THROUGH ROUTES FROM DETROIT

Regular daily merchandise service is handled by the Detroit United System from Detroit to a number of Michigan points, including Saginaw, Bay City, Flint; Detroit to Battle Creek, Kalamazoo, Grand Rapids, and other points in the western part of the State via Jackson.

Detroit to Lima and Dayton, via
    Detroit United to Toledo,
    Toledo, Bowling Green & Southern, to Findley,
    Western Ohio to Lima and Piqua,
    Dayton & Troy to Dayton.

The Ohio Electric Railway System operates extensive through-line freight service over its entire system, and also a considerable interline service.

The network of interurbans throughout the central territory is so constructed that it is possible for practically any point on the inter-connecting lines to be reached. With the proper connecting up with the Indiana and Illinois systems additional freight routes could be established.

With the interurbans operating in Cleveland and Akron territory, a more extensive freight service will be possible to Toledo, Detroit, Columbus, Findley, Lima, Fort Wayne, Dayton and all principal cities located on the interurbans of the Middle West. Also, shipments could be made to Youngstown, Ohio; New Castle, Pa.; Buffalo and Utica, N. Y.; Erie, Pa.; Pittsburgh, Pa.; Alliance, Ohio and other points.

The Lake Shore Electric Railway operates through freight service between Cleveland and Detroit via the Detroit United.

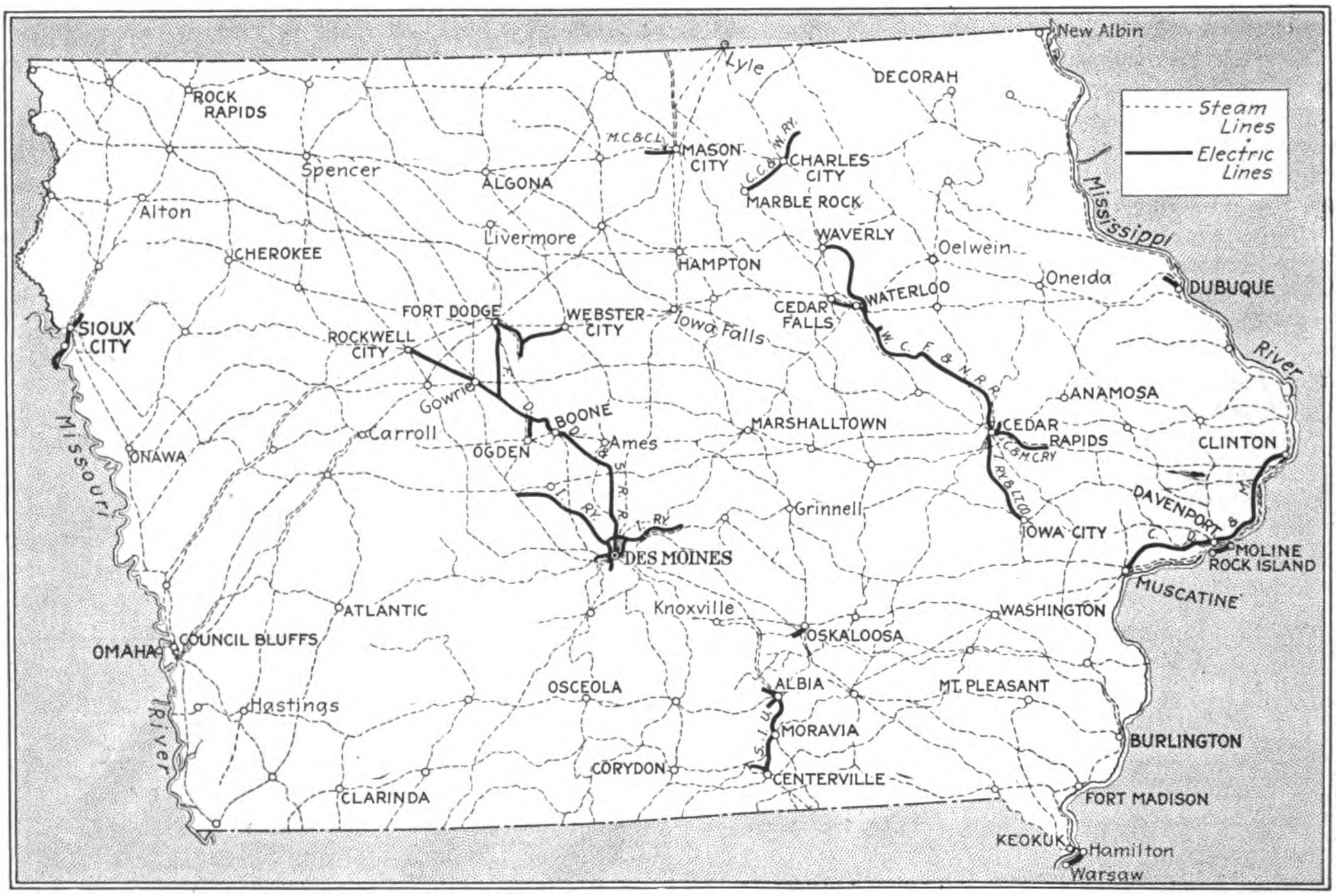
transportation by electric railways that have not been fully developed. While there are many restrictions which prevent a more extensive use of this valuable service in its present form, it is of inestimable value. The dispatch of freight, especially by through-car route, is of such importance that some lines find it necessary to place these through cars on limited passenger trains to expedite long distance shipments, thus giving the shipper the very best service.

In connection with the through routes that now exist, a general survey of the situation and possibilities for more of this long distance freight operation may be of interest.

There are short stretches of country separating some of the interurban properties where, it would seem, consideration should be given by one or the other or both companies for building the connecting link to handle through freight and passenger traffic. Also it would in several instances relieve the steam railroads of short-haul traffic.

Referring to the map on page 916 of the Central States, it will be noted that the electric railway systems of Illinois, principally the Illinois Traction System, are not physically connected with those of the other Central States; namely, Indiana, Michigan, Ohio. To get a through haul from St. Louis to Buffalo and points East the gap between Danville, Ill., and any one of several points in Indiana should be closed. Possibly the most feasible procedure, from the standpoint of interurban traffic, would be to build between Crawfordsville, Ind., and Danville, a distance of only 40 miles, thus giving direct connection into Indianapolis. However, there are one or two other places where union could be made. That which would require the shortest section of track appears to be between Ridge Farm, Ill., on the Illinois Traction System, and Paris, Ill., (20 miles) on the Terre Haute, Indianapolis & Eastern Traction Company. There is also the possibility of closing the gap between Danville, Ill., and Lafayette, Ind. (45 miles.)

Traffic values and construction costs would naturally be the governing factors, but with the assistance of the Federal Government, there is no reason why this construction should not be considered. With a through route provided, it would be possible to make shipments from St. Louis, Mo., to Toledo, Detroit, Indianapolis, Dayton, Columbus, Cleveland, Buffalo and other points, with great relief to the steam roads.


Steam Lines
Electric Lines
New Albin
Lyle
DECORAH
ROCK RAPIDS
M.C.&C.L.
MASON CITY
C.C.&W.RY.
CHARLES CITY
MARBLE ROCK
Spencer
ALGONA
Alton
Mississippi
WAVERLY
Oelwein
CHEROKEE
Livermore
HAMPTON
Oneida
DUBUQUE
CEDAR FALLS
WATERLOO
FORT DODGE
WEBSTER CITY
Iowa Falls
SIOUX CITY
ROCKWELL CITY
W.C.F.&N.R.R.
River
Gowrie
F.D.D.M.&S.R.R.
ANAMOSA
BOONE
MARSHALLTOWN
CEDAR RAPIDS
Missouri
Carroll
Ames
C.&I.M.C.RY.
ONAWA
OGDEN
CLINTON
I.U.RY.
C.R.&I.C.RY.
DAVENPORT
Grinnell
IOWA CITY
MOLINE
ROCK ISLAND
DES MOINES
MUSCATINE
ATLANTIC
Knoxville
WASHINGTON
OMAHA
COUNCIL BLUFFS
OSKALOOSA
River
ALBIA
MT. PLEASANT
OSCEOLA
Hastings
S.I.I.C.RY.
MORAVIA
BURLINGTON
CORYDON
CENTERVILLE
CLARINDA
FORT MADISON
KEOKUK
Hamilton
Warsaw

The Fort Dodge, Des Moines & Southern Railroad, the Inter-Urban Railway of Des Moines and the Waterloo, Cedar Falls & Northern Railway are heavy freight carriers running generally north and south

ELECTRIC RAILWAYS OF IOWA, SHOWING NETWORK OF STEAM LINES

A study of the map of the Central States will show other places where the construction of short stretches of track would establish more direct routes between important points. For instance, the gap between Portland, Ind., on the Union Traction Company, and Celina, on the Western Ohio Railroad, would greatly assist in eliminating the extra mileage in through-car movements from Indianapolis to Lima, Toledo, Cleveland, and other points.

Connecting Kalmazoo and Dowagiac, Mich., or electrification of the K., L. S. & C. Ry. between Kalmazoo and Toquin, Mich., via Benton Harbor would shorten freight haul to Indiana and other points.

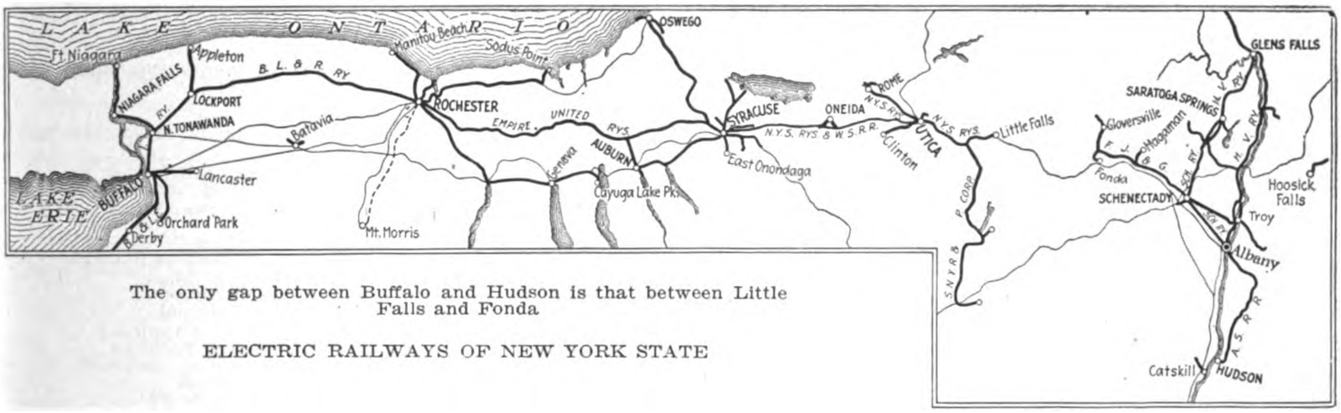
There already is a well-defined route between Terre Haute, Columbus, Dayton, Springfield, Indianapolis and Zanesville; also between Indianapolis and Benton Harbor, via South Bend. There is also no difficulty in reaching Louisville from Indianapolis.

Investigation proves that considerable roundabout mileage is necessary in handling shipments from West Central Michigan points to Toledo and Southward. If the short gap between Jackson and Adrian or Battle Creek and Adrian, were closed, it would be possible to interchange freight from the Michigan Railway System through the Toledo & Western Railroad, and Toledo Terminal Railroad, with any steam or electric line entering Toledo. This would also make it perfectly feasible for a through shipment to go from Muskegon or Grand Rapids, Mich., to Cleveland or Buffalo, via the electric railway, or to any points in northern and central Ohio; from Grand Rapids to Cincinnati or Louisville, or even to St. Louis, by filling the gap between Danville, Ill., and Crawfordsville, Ind.

Another helpful connection could be made between Jackson or Battle Creek, Mich., and Pioneer, Ohio, on the Toledo & Western, and to Bryan, on the Toledo & Indiana, with possibly an extension south to Defiance, Ohio, where it would reach the Ohio Electric System. This extension would permit the handling of freight from western Michigan for Toledo and other Ohio and Indiana points by a direct electric route.

Owing to the extensive trunk-line steam road service between Toledo and Chicago, east and west, it is difficult to say whether an electric extension in that section is necessary now, irrespective of the fact that this territory needs electric railway service. However, a tying together of South Bend, Ind., and Pioneer, Ohio, could relieve the steam roads of much local traffic.

One more link worth consideration is between Waterloo, Ind., on the Fort Wayne & Northwestern Railway, and Bryan, Ohio, on the Toledo & Indiana Railroad. This would greatly shorten the haul from Grand Rapids, Kalamazoo, Battle Creek, Jackson, Toledo and Detroit to Indianapolis, St. Louis and Louisville.


LAKE ONTARIO
Ft. Niagara
Appleton
NIAGARA FALLS RY.
LOCKPORT
B. L. & R. RY.
N. TONAWANDA
Batavia
Manitou Beach
Sodus Point
ROCHESTER
EMPIRE UNITED RYS.
OSWEGO
Lancaster
LAKE ERIE
BUFFALO
Orchard Park
Derby
B. & L.
Mt. Morris
Geneva
AUBURN
Cayuga Lake Pk.
SYRACUSE
ONEIDA
N.Y.S. RYS. & W. S. R.R.
East Onondaga
ROME
N.Y.S. RYS.
UTICA
Clinton
N.Y.S. RYS.
Little Falls
P. CORP.
S. N. Y. R. R.
Gloversville
Hagaman
F. J. & G.
Fonda
SARATOGA SPRINGS
H. V. RY.
SCH. RY.
SCHENECTADY
GLENS FALLS
H. V. RY.
Hoosick Falls
Troy
SCH. RY.
Albany
A. S. R. R.
Catskill
HUDSON

The only gap between Buffalo and Hudson is that between Little Falls and Fonda

ELECTRIC RAILWAYS OF NEW YORK STATE

Conclusions

1. The undisputed economic value of the electric railway is thoroughly evidenced by the foregoing brief covering existing conditions on interurban railway systems. From a purely economic standpoint, existing electric railway facilities should be used to their fullest capacity before the development of any other type of freight transportation is attempted.

2. The investment in electric railway systems of the present day is so great that it would be most uneconomical practically to disregard a highly developed system of transportation service such as electric railways can render under present conditions.

3. Many interurbans are handling traffic which is commensurate with that of steam railroad service, and where facilities exist they are in a position to handle practically all short-haul traffic in their respective territories.

4. Federal assistance to the electric railways by supplying cars, improving physical alignment and freight terminal facilities would place the interurban railways in a position to handle a large percentage of the short-haul freight which is now congesting the steam railways.

5. Furthermore, the expenditure required to place the electric railways in the condition above mentioned, would not amount to one-tenth of that which would be needed for the extension of motor-truck freight haulage in the same territory now being agitated.

Therefore, immediate relief can be secured for the steam railroads through assistance from an existing facility which only needs proper fostering to become immediately an important factor in our national emergency and for the future. In order to affect this, there should be:

Universal interchange of freight rolling stock between steam and electric lines that can handle steam rolling stock, and federal financial aid to those electric lines that would be able to do so with the proper assistance.

Tabulation of Replies Received from War Board Questionnaire Sent to Electric Railways in Relation to Relief They Can Afford Steam Railroads

FREIGHT SERVICE

EASTERN MILITARY DISTRICT

Name of Company	Nature of Relief Afforded	Steam Road Affected
Westchester Kennett & Wilmington Electric Railway (Pennsylvania)	Can handle all local less carload freight in territories served.	Pennsylvania Railroad Baltimore & Ohio Railroad
Ephrata & Lebanon Traction Company (Pennsylvania)	Could arrange to handle a great portion of less carload freight in this territory.	Philadelphia & Reading Railroad Cornwall Railroad
Yonkers Railroad Company (New York)	Can handle less carload freight locally and with connecting lines.	New York Central Lines
Buffalo, Lockport & Rochester Railway, (New York)	Can handle 50 per cent of carload and less carload freight in its territory.	New York Central Lines
The Western New York & Pennsylvania Traction Company (New York and Pennsylvania)	Can handle carload and less carload freight greatly in excess of present demand.	Buffalo, Rochester & Pittsburgh Railroad Erie Railroad Pennsylvania Lines Pittsburgh, Shawmut & Northern Railroad
Chambersburg, Greencastle & Waynesborough Railway (Pennsylvania)	Could handle freight.	Western Maryland Railroad Cumberland Valley Railroad
North Branch Transit Company (Pennsylvania)	Could handle all local freight, express and mail.	Delaware, Lackawanna & Western Railroad Pennsylvania Lines Philadelphia & Reading Railroad
New York State Railways (New York)	Can relieve steam lines of all local less carload freight between common points.	New York Central Lines Pennsylvania Railroad Lehigh Valley Railroad
Southern New York Power & Railway Company (New York)	Can handle less carload freight.	Delaware & Hudson Railroad Ulster & Delaware Railroad Lackawanna-Western Railroad West Shore Railroad New York Central Lines
Orange County Traction Company (New York)	Handles less than carload freight.	Erie Railroad Central New England Railroad
Northwestern Pennsylvania Railway (Pennsylvania)	Handles carload and less than carload freight; can handle all in its territory.	Bessemer & Lake Erie Railroad Pennsylvania Lines
Poughkeepsie & Wappingers Falls Railway (New York)	Can handle less than carload shipments locally and in connection with boat line.	Central New England Railway
Albany Southern Railroad (New York)	Can handle all carload and less than carload business in its territory.	New York Central Lines Boston & Albany Railroad
Elmira, Corning & Waverly Railway (New York and Pennsylvania)	Can handle less than carload, local shipments between Elmira and Waverly. Could handle like shipments between Elmira and Corning if franchise restrictions were removed.	Erie Railroad Delaware, Lackawanna & Western Railroad
Buffalo & Lake Erie Railway (Pennsylvania and New York)	Now handling large amount of less than carload freight. With added equipment and changes in terminals could double present business.	New York Central Lines New York, Chicago & St. Louis Railroad
Conestoga Traction Company (Pennsylvania)	Practically all local freight, less than carload and considerable carload freight under certain conditions.	Pennsylvania Lines Philadelphia & Reading Railroad
North Jersey Rapid Transit Company (New Jersey)	Provided proper grant could be secured in Patterson, N. J., considerable relief could be afforded by making a connection with the Hudson River line and the Public Service lines.	Erie Railroad
Schenectady Railway Company (New York)	Some relief could be afforded in the handling of less than carload freight.	New York Central Lines Delaware & Hudson Railroad
Bridgeton & Milville Traction Company (New Jersey)	Can handle less than carload freight between Bridgeton and Port Norris.	Central Railroad of New Jersey
York Railways Company (Pennsylvania)	Slight relief in handling less than carload freight.	Pennsylvania Lines

NORTHEASTERN MILITARY DISTRICT

Name of Company	Nature of Relief Afforded	Steam Road Affected
Exeter Hampton & Amesbury Street Railway (New Hampshire)	In conjunction with other electric railways in Northeastern Massachusetts and New Hampshire less than carload freight for the towns and cities served could be handled.	Boston & Maine Railroad
Concord, Maynard & Hudson Street Railway (Massachusetts)	Can handle less than carload freight.	Boston & Maine Railroad
Interstate Consolidated Railway (Massachusetts)	Now operating service, which could be increased for less than carload shipments.	New York, New Haven & Hartford Railroad
Worcester Consolidated Street Railway (Massachusetts)	Now handling less than carload freight, could handle more.	Boston & Maine Railroad New York, New Haven & Hartford Railroad Boston & Albany Railroad
St. Albans & Swanton Traction Company (Vermont)	Could take care of less than carload freight between terminals.	Central Vermont Railroad
Shore Line Electric Railway (Connecticut)	Could handle more carload and less than carload freight than now handled.	New York, New Haven & Hartford Railroad Central Vermont Railroad
Atlantic Shore Railway (Maine)	Can relieve steam roads of all less than carload freight and all carload except Biddeford.	Boston & Maine Railroad
Brockton & Plymouth Street Railway (Massachusetts)	Can relieve steam roads of a portion of less than carload freight between Boston and Plymouth.	New York, New Haven & Hartford Railroad
Cumberland County Power & Light Company (Maine)	Now relieving railroads by performing switching service. Also handle carload and less than carload freight.	Maine Central Railroad Boston & Maine Railroad Grand Trunk Railroad
Union Street Railway (Massachusetts)	Could partially relieve steam road of freight service between New Bedford and Fall River.	New York, New Haven & Hartford Railroad
Springfield Street Railway (Massachusetts)	Can absorb some of the freight traffic between Springfield, Worcester, Fitchburg and Providence, which could be augumented by additions to facilities and equipment.	New York, New Haven & Hartford Railroad Boston & Maine Railroad Boston & Albany Railroad Central New England Railroad Central Vermont Railroad

Tabulation of Replies Received from War Board Questionnaire (Continued)

Name of Company	Nature of Relief Afforded	Steam Road Affected
New Bedford & Onset Railway (Massachusetts)	Could partially relieve steam railroad of freight traffic in territory served.	New York, New Haven & Hartford Railroad
Boston & Worcester Street Railway (Massachusetts)	Handling less than carload freight and can handle more with additional equipment which is promised in April.	Boston & Albany Railroad Boston & Maine Railroad New York, New Haven & Hartford Railroad
	SOUTHERN MILITARY DISTRICT	
Charleston Consolidated Railway & Lighting Company (South Carolina)	Can handle local freight, less than carload, to Charleston Navy Yard and other manufacturing plants on Navy Yard and North Charleston division.	Southern Railway Atlantic Coast Line Seaboard Air Line
	SOUTHEASTERN MILITARY DISTRICT	
Union Traction Company (Tennessee)	Handle all less than carload freight business in its territory.	Louisville & Nashville Railroad
	SOUTHWESTERN MILITARY DISTRICT	
Oklahoma Railway (Oklahoma)	Can handle all local traffic and inter-line business provided through rates are installed.	Atchison, Topeka & Santa Fe Railroad Chicago, Rock Island & Pacific Railway
Sand Springs Railway (Oklahoma)	Can handle all freight business between Tulsa and Sand Springs.	Missouri, Kansas & Texas Railway
	WESTERN MILITARY DISTRICT	
Pacific Electric Railway (California)	*Local Carload Freight*: Could relieve steam roads between Los Angeles and points common to both lines where team track service is all that is required, and in case of private industry track where interchange switching arrangements are in effect. This would result in substantial relief. *Less than Carload Freight*: Could relieve steam roads of local merchandise freight from Los Angeles to four stations, amounting to approximately 8,000,000 lb. per month. It is estimated that thirty cars per day would be saved to the steam railroads, in addition to the depot switching at Los Angeles and delivering stations.	Southern Pacific Company Los Angeles & Salt Lake Railroad Atchison, Topeka & Santa Fe Railway
Pacific Northwestern Traction Company (Washington)	Can handle practically all less than carload freight between Seattle, Ballard, Everett. And can handle more of the carload freight between these same points, particularly where team track loading or delivery will suffice.	Great Northern Railway Northern Pacific Railway Chicago, Milwaukee & St. Paul Railway
Puget Sound Electric Railway (Washington)	Can entirely relieve steam roads of less than carload freight in territories served. Can handle all carload freight in territories served where team track loading or delivery is required. With terminal co-operation of steam roads can handle a greater proportion of through Seattle-Tacoma carload freight.	Southern Pacific Company Great Northern Railway Chicago, Milwaukee & St. Paul Railway
Salt Lake & Utah Railroad (Utah)	Can take care of all carload and less than carload business in their territory which will amount to about three times their present handling. One 50-ton locomotive held in reserve and not being used. Has steam-line connections and can be of great relief in this territory.	Denver & Rio Grande Railroad Los Angeles & Salt Lake Railroad Utah Coal Railway Union Pacific System Western Pacific Railroad
Bamberger Electric Railroad (Utah)	Can handle carload and less than carload freight in its territory and jointly with connecting electric lines. All power generated hydroelectric plant, thus considerable coal saving would result.	Oregon Short Line
Willamette Valley Southern Railway (Oregon)	Can handle carload and less than carload freight.	Southern Pacific Company
Peta Luma & Santa Rosa Railway (California)	Can handle all freight shipments between San Francisco, Peta Luma, Santa Rosa and Sebastopol.	Northwestern Pacific Railroad
	CENTRAL MILITARY DISTRICT	
Cleveland, South Western & Columbus Railway (Ohio)	Can practically take care of all local freight business between terminals (Cleveland, Wooster, and Bucyrus).	New York Central Lines Baltimore & Ohio Railroad Erie Railroad Pennsylvania Lines
Milwaukee Electric Railway & Lighting Company (Wisconsin)	Could relieve steam roads of carload and less than carload freight from Milwaukee to Waukesha, Oconomowoc, Watertown, Burlington, Wauwasota, North Milwaukee, South Milwaukee, Cudahy, Mukwonago, Racine and and Kenosha.	Chicago & Northwestern Railroad Chicago, Milwaukee & St. Paul Railway Wisconsin Central Railroad
The Interurban Railway & Terminal Company (Ohio)	Could relieve steam lines operating in the same territory of all less than carload freight between Cincinnati and Lebanon.	Pennsylvania Lines (Cincinnati, Lebanon & Northern Railway)
Western Ohio Railway (Ohio)	With present equipment little relief could be afforded but with additional equipment and improved terminal facilities practically all freight business in territory served could be handled, including a great amount of through business between Dayton, Lima, Toledo and Detroit.	Lake Erie & Western Railroad Baltimore & Ohio Railroad
Fort Wayne & Decatur Traction Company (Indiana)	Can handle all freight business in its territory between Fort Wayne and Decatur. With Erie and Cloverleaf connection, could handle additional carload business to and from Fort Wayne destined to points beyond Decatur.	Erie Railroad Toledo, St. Louis & Western Railroad
Omaha, Lincoln & Beatrice Railway (Nebraska)	Can handle all carload and less than carload shipments to territory served by connection with Missouri Pacific.	Missouri Pacific Railroad Chicago, Rock Island & Pacific Railway
Wisconsin Traction Light, Heat & Power Company (Wisconsin)	Can very materially relieve steam lines on carload and less than carload in city served.	Chicago & Northwestern Railway Chicago, Milwaukee & St. Paul Railway
Minneapolis, Anoka & Cuyuna Range Railway (Minnesota)	Carload and less than carload freight and switching service.	Northern Pacific Railway Great Northern Railway

Tabulation of Replies Received from War Board Questionnaire (Continued)

Name of Company	Nature of Relief Afforded	Steam Road Affected
Toledo & Western Railroad (Ohio)	Can handle both carload and less than carload freight.	New York Central Lines Detroit, Toledo & Ironton Railroad Cincinnati Northern Railroad Wabash Railroad
Dayton, Covington & Piqua Railway (Ohio)	Can handle all carload and less than carload freight except livestock.	Dayton, Toledo & Chicago Railroad Pennsylvania Lines
Milwaukee Northern Railway (Wisconsin)	Can handle all less than carload freight in its territory. If it had track connection with Chicago & Northwestern at Cedar Grove, could remove necessity for carload freight from points north from passing through Milwaukee.	Chicago, Milwaukee & St. Paul Railroad Chicago & Northwestern Railroad
Springfield & Xenia Railway (Ohio)	Can handle all less than carload freight between terminals.	Pennsylvania Lines.
Chicago Elevated Railways (Illinois)	If granted an ordinance by the city of Chicago could handle great amount of less than carload freight.	Chicago freight terminals of many railroads.
Chicago, North Shore & Milwaukee El. Railroad (Illinois and Wisconsin)	Could handle carload and less than carload freight. Could handle Chicago packinghouse freight to Fort Sheridan and Great Lakes Naval Training Station. Could also facilitate the moving of carload freight by having E. J. & E. (Chicago Outer Belt Line) deliver carload shipments for points between Highland Park and Milwaukee to this line, thus eliminating the delay in handling through Chicago, which would tend to avoid congestion in Chicago terminals.	Chicago & Northwestern Railway Chicago, Milwaukee & St. Paul Railway
Fort Wayne & Northwestern Railway (Indiana)	Can handle 200 tons per day with additional terminal facilities at Fort Wayne.	Grand Rapids & Indiana Railway New York Central Lines
Union Traction Company of Indiana (Indiana)	Can handle 25 per cent. more less than carload.	Lake Erie & Western Railroad Big Four Railroad Pennsylvania Lines Wabash Railroad Toledo, St. Louis & Western Railroad Chesapeake & Ohio Railroad Central Indiana Railroad Monon Railroad
Ohio Electric Railway (Ohio)	Handles carload and less than carload freight.	A number of railroads in the central, southwestern, western and northwestern portions of Ohio.
Clinton, Davenport & Muscatine Railway (Iowa)	Can handle carload and less than carload freight. Can afford considerable relief by closing four agency steam road stations.	Chicago, Burlington & Quincy Railroad Chicago, Milwaukee & St. Paul Railway Chicago, Rock Island & Pacific Railway
East St. Louis & Suburban Railway (Illinois)	Can afford relief in the transportation of less than carload freight.	Vandalia Railroad Baltimore & Ohio Railroad Big Four Railroad Chicago & Alton Railroad Wabash Railroad Chicago, Peoria & St. Louis Railroad Illinois Central Railroad Louisville & Nashville Railroad Southern Railroad
Fort Wayne & Northern Indiana Traction Company (Indiana)	Handles less than carload freight.	Toledo, St. Louis & Western Railroad Wabash Railroad Pennsylvania Lines Grand Rapids & Indiana Railway Lake Erie & Western Railroad New York Central Lines Nickel Plate Railroad Erie Railroad
Toledo, Bowling Green & Southern Traction Company	Can relieve steam lines of 50 per cent. of less than carload freight and some carload freight.	Baltimore & Ohio Railroad New York Central Lines Toledo & Ohio Central Railroad Wabash Railroad
Rock Island & Southern (Illinois)	Could handle all carload and less than carload freight in its territory.	Rock Island System
Toledo & Indiana Railroad (Ohio)	Can handle all freight traffic between Toledo and Bryan.	New York Central Lines
Mahoning & Shenango Railway (Ohio)	Can relieve steam roads of practically all less than carload freight in its territory provided additional facilities were installed.	Erie Railroad New York Central Lines Pennsylvania Lines Baltimore & Ohio Railroad Pittsburgh & Lake Erie Railroad
Chicago & Interurban Traction Company (Illinois)	Can handle additional less than carload freight.	Chicago & Eastern Illinois Railroad
Eastern Wisconsin Electric Company (Wisconsin)	All less than carload freight.	Chicago & Northwestern Railroad Soo Line
Lake Shore Electric Railway (Ohio)	Handle large amount of less than carload freight.	New York Central Lines Nickel Railroad Pennsylvania Lines
Grand Rapids, Grand Haven & Muskegon (Michigan)	Can care for all less than carload freight shipments orginating at its terminals.	Grand Rapids & Indiana Railway Pere Marquette Railroad Grand Trunk Railway
Detroit United Railway (Michigan and Ohio)	Can handle twenty-five additional flat or gondola cars per day now handled by steam roads. If box cars are provided can handle twenty or thirty additional cars per day.	Michigan Central Railroad New York Central Lines Grand Trunk Railway Detroit & Toledo Railroad Canadian Pacific Railway Detroit, Toledo & Ironton Railroad Detroit Terminal Railroad Wabash Railroad Pere Marquette Railroad Ann Arbor Railroad Baltimore & Ohio Railroad Hocking Valley Railroad Pennsylvania Lines Wheeling & Lake Erie Railroad Toledo & Ohio Central Railroad Toledo Terminal Railroad Detroit, Bay City & Western Railroad Cincinnati Northern Railroad

Tabulation of Replies Received from War Board Questionnaire (Continued)

Name of Company	Nature of Relief Afforded	Steam Road Affected
Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company (Minnesota)	Well located for use as a belt line.	Chicago, St. Paul, Minneapolis & Omaha Railroad Chicago, Milwaukee & St. Paul Railroad Chicago, Great Western Railroad Chicago, Rock Island & Pacific Railroad
Michigan Railway (Michigan)	Can handle both carload and less than carload freight; has considerable equipment, warehouse and team track delivery at all stations.	Pére Marquette Railroad Grand Rapids & Indiana Railway Michigan Central Railroad Grand Trunk Railroad New York Central Lines
Aurora, Elgin & Chicago Railroad (Illinois)	Handles carload and less than carload freight. Possibilities for extending less than carload freight business if able to provide proper terminal facilities at Chicago, are great. Carload business now being handled quite extensively and is prepared to handle team track freight to all points along the line and to industries reached by other lines.	Chicago & Northwestern Railway Chicago, Burlington & Quincy Railway Chicago, Milwaukee & St. Paul Railway Chicago, Great Western Railroad
Ohio Valley Electric Railway (Ohio and West Virginia)	Handles less than carload freight.	Chesapeake & Ohio Railroad Baltimore & Ohio Railroad Norfolk & Western Railway Detroit, Toledo & Ironton Railroad Cincinnati, Hamilton & Dayton Railway Ashland Coal & Iron Railroad
Mason City & Clear Lake Railroad (Iowa)	Can absorb all carload or less than carload into Clear Lake, having joint tariffs with all steam lines. Can perform switching service between steam roads in Mason City.	Chicago, Milwaukee & St. Paul Railway Chicago, Rock Island & Pacific Railway Chicago, Great Western Railroad Chicago & Northwestern Railway and Minneapolis & St Louis Railroad
Northwestern Ohio Railway & Power Company (Ohio)	Can handle all less than carload and most of carload shipments to all points served.	Wheeling & Lake Erie Railroad Lake Shore & Michigan Southern Railroad Lakeside & Marblehead Railway
Eastern Wisconsin Electric Company (Wisconsin)	Can handle all less than carload freight for Sheboygan Falls, Plymouth and Elkhart Lake.	Chicago & Northwestern Railway Chicago, Milwaukee & St. Paul Railway
Evansville Railways (Indiana)	Can absorb all less than carload freight between Evansville, Mount Vernon, Rockport, Indiana, and Henderson, Ky., and carload freight between Evansville and Rockport.	Louisville & Nashville Railroad Southern Railway Louisville, Henderson & St. Louis Railway Illinois Central Railroad.
Chicago, Lake Shore & South Bend Railway (Indiana and Illinois)	Can handle practically all local freight between its terminals.	Baltimore & Ohio Railroad Chesapeake & Ohio Railway Grand Trunk Railway Michigan Central Railroad New York Central Lines Pennsylvania Lines Wabash Railroad

Asphalt Mastic Makes Good Shop Floor

Twin City Rapid Transit Company Has Had Such Floor in Use for Six Years With Excellent Results

IN AN ACCOUNT of the then new forge and structural shop of the Twin City Rapid Transit Company, Minneapolis, Minn., published in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 11, 1913, page 674, mention was made of an asphalt mastic floor which was at the time something of an experiment. The editors of this paper recently addressed an inquiry to W. J. Smith, master mechanic of the company, for the purpose of learning how satisfactory the floor had proved. It will be remembered that the floor is a 1½-in. layer of asphalt mastic laid on a concrete foundation. The composition is 65 per cent gravel, rock and bank sand and 35 per cent mastic and flux.

In reply to the inquiry Mr. Smith states that this floor has given excellent satisfaction. It has had hard service but no repairs have been necessary and it is in first-class condition to-day with the one exception that it is somewhat marked up where the pieces of heavy material have been piled or where jack screws and heavily loaded horses have stood. Sometimes from 20 to 30 tons of steel has been piled in a small space and the weight of this material caused the bars and sections to mark up the floor, especially in warm weather. However this has never caused any great trouble although it somewhat mars the appearance of the floor. Where the floor has not been subject to this heavy piling it is smooth and free from cracks and in fine condition.

Experience has shown that when a floor of this kind is laid it is very important to have firm ground or if it is to be laid on a reinforced concrete slab to have this in good condition. This mastic asphalt floor is made of the same material and is laid in practically the same way as paving asphalt, with the possible exception that a larger proportion of finely crushed rock is mixed with the asphalt. The company uses the same material on the back platforms of all passenger cars. When first used there was some trouble with the floor becoming soft in warm weather, but this difficulty was overcome by using a larger proportion of finely crushed rock. As much of this fine rock was used as could be worked into the mixture without preventing the possibility of troweling it out. It is important to use a flux to coat the concrete. Any contractor familiar with putting down asphalt pavement could do a satisfactory job on floor work. The more service the floor gets the better it appears to be, as it gradually becomes smooth and firm but never hard and slippery.

It would be an excellent plan to use a light steel reinforcing over the concrete slab to prevent any cracking in the asphalt that might occur as the floor gets old. Expanded metal lath would be satisfactory.

Passenger Cars Rearranged for Freight Hauling

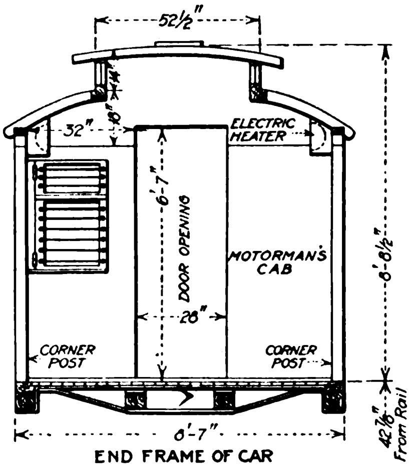
MANY electric roads are anxious to do their bit by hauling freight and express but they have insufficient equipment available. It is quite possible that there are many old passenger cars in existence which could be turned into emergency freight cars or combination freight and passenger cars at comparatively little expense. Cars already provided with side entrances are readily adaptable to a type necessary for handling freight.

An interesting study of the changes necessary for such an alteration is illustrated in the accompanying drawings. The car considered in this study is one of the wooden cars used on the elevated lines of the Brooklyn Rapid Transit Company but now superseded.

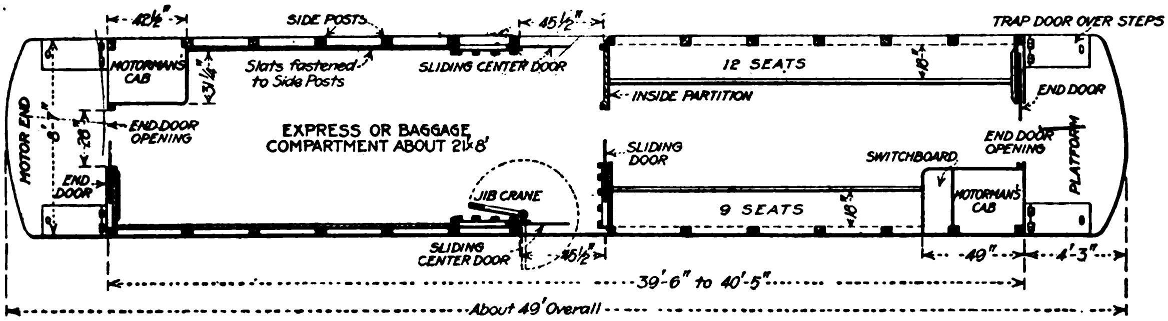
The drawings show a method of providing a baggage and express compartment by removing the seats and heater equipment from a little more than one-half the length of the car body and by partitioning off this space from the passenger compartment. These cars have side doors at present not in use. By removing the seats the side doors are made available for the handling of freight. No changes in the windows are suggested other than to provide bars and slats across them to prevent injury. It would be advisable to provide a substantial floor and the suggestions include the laying of a floor on top of the present one. The removal of the seats would necessitate shifting the heater equipments which are at present installed under them. These could be readily reinstalled overhead along the sides of the car. With this arrangement a space approximately 21 ft. x 8 ft. x 7 ft. would be provided for freight. The car axles and springs are of ample design to withstand a load of 10,000 lb. per axle.

The passenger compartment still provides seats for twenty-one passengers, which is sufficient for many lines during periods when the traffic is light and when the hauling of freight and express can be carried on to the best advantage. By limiting the freight haulage to such periods no increase in power house or line capacity is necessary. These cars are at present equipped with two 150-hp. motors mounted on one truck, and in the reconstruction of the baggage and express compartment it would be desirable to locate this over the motor truck end so as to utilize the freight load to give increased traction. The capacity of the equipment is sufficient so that where train operation is possible trail cars could be included in the train make-up. Under ordinary service conditions a five-car train could have two trailers weighing with load about 26 tons each without exceeding the capacity of the equipment. Multiple-unit control is already provided so that train operation is possible without any equipment changes.

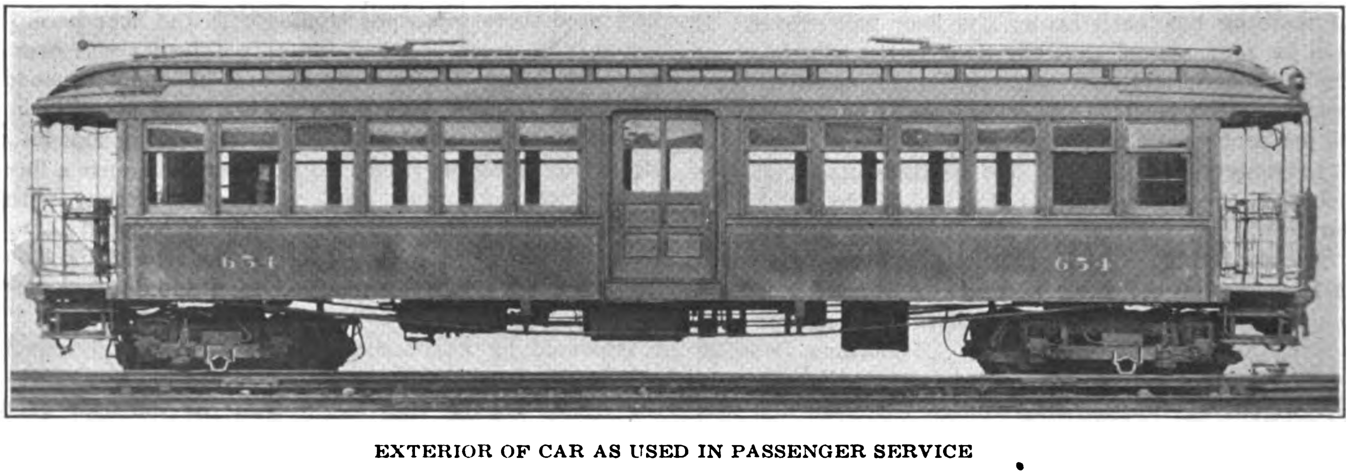
A conservative estimate of the cost for making these changes based on the present-day prices of labor and material is $350 per car with no allowance for scrap materials.


52½"
32"
ELECTRIC HEATER
6'-7"
DOOR OPENING
MOTORMAN'S CAB
26"
CORNER POST
CORNER POST
6'-8½"
42⅞" From Rail
6'-7"
END FRAME OF CAR

FREIGHT COMPARTMENT WITH HEATERS OVERHEAD


42½"
SIDE POSTS
45½"
TRAP DOOR OVER STEPS
MOTORMAN'S CAB
Slats fastened to Side Posts
SLIDING CENTER DOOR
12 SEATS
18"
INSIDE PARTITION
END DOOR
MOTOR END
6'-7"
20"
END DOOR OPENING
EXPRESS OR BAGGAGE COMPARTMENT ABOUT 21x8'
SLIDING DOOR
SWITCHBOARD
END DOOR OPENING
PLATFORM
END DOOR
JIB CRANE
9 SEATS
18"
MOTORMAN'S CAB
SLIDING CENTER DOOR
45½"
49"
4'-3"
39'-6" to 40'-5"
About 49' Overall

RECONSTRUCTED CAR WITH BAGGAGE AND EXPRESS COMPARTMENT



EXTERIOR OF CAR AS USED IN PASSENGER SERVICE

LETTERS TO THE EDITORS

Scale Impedes Hot Water Circulation

MONONGAHELA VALLEY TRACTION COMPANY

PARKERSBURG, W. VA., MARCH 18, 1918.

To the Editors:

I have read with interest the article on "Circulating Water in Car Heaters" which appeared in the issue of the ELECTRIC RAILWAY JOURNAL of Feb. 2, 1918, page 239. Our method of handling heaters of this type is as follows:

In early fall before the stoves are fired for the winter the piping system is thoroughly cleaned out. This is done by disconnecting the expansion chamber above the stove, and connecting the city water pressure to one pipe while the other is extended outside of car. The pressure is left on until clear water only comes from the system. This removes all sediment, scale, etc., and thoroughly cleans the system, leaving it full of clean water with nothing to obstruct circulation. The water will not circulate if the system is clogged even to a slight extent. Circulation is started by heating the water in the usual manner.

C. W. FOLWELL, Master Mechanic.

Mr. Beeler Gives Further Data on Washington Skip Stop

WASHINGTON, D. C., May 6, 1918.

To the Editors:

In the past the common practice in introducing the skip stop in any city has been to begin with one or two lines only in the outlying districts and to continue using all stops in the business district as hitherto. In the choice of the new stopping places, arbitrary rules have often been used to determine the locations, such as the omission of every other stop. This has resulted in the poor location of some of the stops. Frequently the stopping places, even with the skip stop system, have been left unnecessarily close together.

In Washington, the matter was handled on an entirely different basis, which from the results obtained would seem to be the right one. The system was inaugurated first in a very small part of the most congested district over a stretch of but 2300 ft. of track, where a number of important lines converge. This was in the heart of the business section. It was made to apply to all lines operating over this track in such a way as to relieve the congestion. This effected an immediate improvement on all lines entering this section, and the results reached far beyond the congested point.

The stopping points in the congested district were located a little more than an eighth of a mile apart and proved immediately satisfactory. The stops were located so as to get the best results from a traffic standpoint and not according to any arbitrary rule. Some of them were placed on the near side of the street and some on the far side.

An interesting detail of the plan is the location of stopping places where lines diverge, so that the cars on one line do not hold back the cars of the other line. This is done by making the stops in both directions beyond the junction points, the near side stops being on the track approaching the junction, and the far side stops on the track leaving the junction. This feature alone has had a marked effect in reducing congestion.

After the system had been in use in this particular location in Washington for about two months, it was extended to another portion of the business district where the congestion was nearly as severe as in the first case. Still later it was made to include the entire city and also the suburban territory near by. A recent tabulation of the distances between stops in Washington shows that the average is 818 ft., or six-and-one-half stops to the mile. Following is a table showing the average distances in the District of Columbia:

	Average Distance, Ft.	Number per Mile
City districts	596	7.03
Suburban districts	965	5.47
Average all stops	818	6.46

By the inauguration in Washington of the skip stop system in the business district first, and of course the same plan could be followed equally well in any large city, an immediate improvement is made in the service on all lines entering this district, and the way is prepared for further improvement when the system is extended to the residence districts. If, however, the plan is started in the residence districts first, according to the usual plan, delays will still occur in the congested district, which will make it difficult to show any improvement in service. In fact, the delays are likely to be aggravated by the cars rushing into the congested territory and piling themselves up in each other's way so that all that has been gained outside is lost down town.

The new schedules which have been adopted show a decrease in running time amounting to from 10 to 15 per cent. The saving in time has not been used to take cars off the routes but to give more frequent headway, so that the public obtained at once a double improvement in faster and more frequent service.

An interesting result is that the improvement in speed is much more marked than would be indicated by the decrease in running time. This is due to the fact that under the old system the cars rarely were able to keep on schedule and on the rush hour trips were usually from five to ten minutes late. A idea of the improvement can be had from the following statement of one of the government officials:

> Since I have been located here I have been living at some distance from the office, so that I have had to use the street cars. Since the inauguration of the skip-stop system I find that the ride which formerly required twenty minutes in the morning or evening now requires only about ten minutes. The improvement is due, I think, to the great amount of time that was formerly lost in loading and unloading on account of the extremely crowded condition of the cars, and a great deal more time was lost due to the fact that the cars run at very close intervals at certain times of the day, so that the stopping of one car frequently held back several others.

Signs bright and distinct were placed exactly opposite the point where the car step was to stop. Another important feature is to limit the stopping places for interurban lines entering the city to a greater extent than those for city cars. The interurban stops on one line here are designated by distinctive signs, which are placed wherever possible on the same stanchion as those for city cars.

I have found a most important point to be the exercise of good judgment in the location of individual stops. After the places for stopping have been definitely located, those responsible must not lose their nerve but must make no changes other than those conclusively proved to be the proper thing. Of course there must be some good reason for each stop, but the spacing must at the same time be as nearly uniform as practicable. Staggered stops may be employed to advantage in some instances, although the straight skip stop has generally been found preferable in Washington.

Much publicity was accorded the installation of the new stopping plan by many news stories and large notices carried in all the cars for a week prior to the changes. These were most important factors in insuring the success of the skip stop.

JOHN A. BEELER.

More About Track Spiral Standardization

MINNEAPOLIS STREET RAILWAY COMPANY,
MINNEAPOLIS, MINN., MAY 6, 1918.

To the Editors:

The writer has examined the track spirals as proposed by E. M. T. Ryder and finds that two of these are substantially the same as the standard spirals which have been in use by this company for several years. There would be no particular change in the conditions so far as operating is concerned if our curves were laid out by the use of the proposed new formulas. The companies manufacturing special work state that there would be no economy in using the new formulas but they would produce more varieties of templates with no reduction of expense.

The writer agrees with A. E. Harvey in his conclusions as given in your issue of April 20, and would be willing to co-operate with other companies if the committee on way matters of the American Electric Railway Engineering Association adopts and recommends these spirals as good practice to be used in the future so as gradually to eliminate the different methods which are now in use.

GEORGE L. WILSON,
Engineer Maintenance of Way.

Electric Railways vs. Motor Trucks

NICHOLS-LINTERN COMPANY, INC.
RAILWAY MATERIALS.
CLEVELAND, OHIO, May 4, 1918.

To the Editors:

You may be interested in seeing the inclosed copy of a letter which I have sent to-day to the transportation department of the Cleveland Chamber of Commerce.

WILLIAM LINTERN, President.

LETTER TO CHAMBER OF COMMERCE

May 4, 1918.

The Chamber of Commerce,
Transportation Department,
Cleveland, Ohio.

Gentlemen:

Probably due to our association with electric railways, we believe that the same effort applied to get local shipments handled by them will be of greater benefit to the country than by motor trucks. The efficiency of the electric road undoubtedly can be made greater than is possible for any system of highway transportation when the distance exceeds say 20 miles. The proper propaganda to awake the shippers and the electric railway people to the great possibilities right at hand for handling all freight within their areas will solve our congestion problems with the greatest economy to the country.

Consider the capacity of say three electric railway cars handled by two men to, say, Toledo, as against motor truck transportation.

Seemingly the electric railway people are not awake to their possibilities, due mostly to their financial status. They will require sympathetic co-operation on the part of shippers and bankers, as well as the various municipal authorities who, by the way, will find the problems of road upkeep a perplexing one under heavy motor transportation. Every ton transported by the electric railways decreases the labor demand for direct transportation as well as for road and motor upkeep.

The real solution for freight transportation within the areas served by the electric railways is utilization of the service they are capable of rendering.

At the present time the science of road building is not up to building roads that will stand under the strain of heavy motor transportation. Why experiment when the maintenance of electric roads can be figured accurately?

Respectfully yours,
THE NICHOLS-LINTERN COMPANY.
By William Lintern, President.

AMERICAN ASSOCIATION NEWS

Convention Committee Holds Meeting in Cleveland

A MEETING of the convention committee of the American Electric Railway Association was held in Cleveland on Tuesday of this week. Those in attendance were Charles L. Henry, Indianapolis, chairman; B. A. Hegeman, Jr., New York; Thomas Finigan, Chicago; R. P. Stevens, Youngstown, Ohio (representing the Transportation & Traffic Association); F. R. Phillips, Pittsburgh (representing the Engineering Association), and R. E. MacDougall, Rochester, N. Y. (representing the Claims Association); John J. Stanley, Cleveland, Ohio; James B. Mortimer, New York; E. F. Wickwire, Mansfield, Ohio and E. B. Burritt and H. C. Clark of the New York office of the association. F. W. Brooks, Detroit, was also in attendance at the committee meeting for a short time.

After a general discussion of the convention arrangements, a sub-committee on program was appointed consisting of Messrs. Mortimer, Hegeman and Clark who later during the meeting presented a definite program which was discussed. It will be made public as soon as definitely decided upon.

E. F. Wickwire was appointed chairman of the entertainment committee with power to choose his associates.

The committee also drew up a tentative allotment of the various items of expense in connection with the coming convention.

In the recent Centennial edition of the *News-Record* of Springfield, Ill., the Illinois Traction System carried a striking and beautifully illustrated full-page advertisement showing the progress made in the 100 years of Illinois history in transportation facilities. When Illinois was admitted to the Union in 1818 the streams and ox-teams were about the only means of transportation. Successive pictures bring the reader down to the present-day modern electric interurban cars.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

How Cleveland Looks at It

Considers Cleveland Railway Assumed Liberal Attitude Toward Employees in Wage Discussion

The favorable turn in affairs in connection with the Cleveland (Ohio) Railway wage dispute has resulted in expressions of satisfaction by business men who are interested in the production of war materials and in the general welfare of industrial and commercial progress. In particular, it is recognized that J. J. Stanley, president of the company, adopted a very generous course in finally relinquishing the demands for an open shop and the employment of women as conductors. As Mr. Stanley has explained it was his idea so to place the company that it would be able to furnish proper service under all conditions. In this he has been successful for it is understood that the men will agree to consider the question of the employment of women, if it becomes impossible to secure men.

The feeling is general in Cleveland that the men are unreasonable in their demand for an increase of 25 cents an hour in their wages. The maximum is now 35 cents. The present rate of fare is the maximum under the service-at-cost grant and it would be far too small to cover the additional amount that would have to be collected to advance pay. In fact, it has been regarded for some time as almost certain that the fare would eventually have to be increased even with the present wage scale in force.

A date for a hearing before the federal board will be fixed as soon as possible. It is the desire of both sides to get the matter out of the way, so that the new basis may be adapted to the operating cost. Until this is done, all those with a material interest in the conditions under which the company operates will be working in the dark, since any new wage fixed must date from May 1.

Session on Chicago Proposal

In stating the basis on which they would negotiate with the city in drawing up a unified plan of operation, Leonard A. Busby, spokesman for the surface and elevated railways, asked that the city allow the companies 1¾ per cent more interest per year than had been recommended by the Chicago Traction & Subway Commission. This was refused on May 3 by the sub-committee of the City Council on local transportation. The sub-committee also rejected the idea of allowing the companies a maximum return of 8 per cent on their investment. The action of the sub-committee was unanimous.

Walter L. Fisher, special counsel for the committee, again proposed his plan for having a board of trustees take over the control of the unified lines and operate them at cost. The sub-committee did not pay much attention to Mr. Fisher's latest appeal.

Before the sub-committee convened Alderman Henry D. Capitain, chairman of the main committee, prepared a chart showing just what was demanded by the companies and about what the city stood for in the proposed negotiations.

Summarized, the various proposals are:

Traction & Subway Commission—Recommends an indeterminate franchise, a period of thirty years being mentioned, for a new corporation to operate the unified surface and elevated lines and to build a subway system. A limit on the return to the companies of 8 per cent is fixed.

Companies—Want what is allowed by the commission and an additional return of 1¾ per cent.

Mr. Fisher—Proposes a plan for having a board of public spirited citizens take over the lines and operate them at actual cost.

The sub-committee will meet again in a day or two to continue the negotiations.

Wage Increase Hinges on Fare Raise

Negotiations between the executive board of Division 517 of the Amalgamated Association of Street Railway Employees, representing the motormen and conductors of the Gary (Ind.) Street Railway and the Gary & Valparaiso Street Railway, and the two companies have been concluded and an agreement has been signed. By the terms of the agreement a substantial increase in pay will be given to the employees of the companies when the Public Service Commission of Indiana grants to the Gary Street Railway the right to charge a straight 5-cent fare in the cities of Gary, Hammond and East Chicago. The bonus payment agreed upon will increase the wages of the men on the Gary lines to the scale that is in force in the city of Chicago.

The Gary Street Railway filed its application with the Public Service Commission in February, asking permission to charge a straight 5-cent fare in the cities of Gary, Hammond and East Chicago and to discontinue the sale of six-for-a-quarter tickets. The commission has not yet set the matter for hearing.

Short Kansas Strike Settled

Road to Fort Leavenworth Was Tied Up By Insistence of Men Upon Unionization

The striking trainmen of the Kansas City-Western Railway, Kansas City, Kan., returned to work on the afternoon of May 3, after the company had put several cars in service with loyal employees. Service was restored by the company at the request of the army representatives. The immediate necessity was a Red Cross event on the line from Fort Leavenworth. Soldiers from that post were carried on the cars.

The men struck on the afternoon of April 18. They demanded a contract with the union, which was organized after the trainmen had quit their jobs. There was no other demand at any time. At a meeting of trainmen on May 3, attended by officials of the company, the demand was made again for a contract with the union. C. F. Holmes, president of the company, told the men that contracts with organizations had little value and that he did not care to tie himself up with them. The final proposal of Mr. Holmes to the men, made that afternoon, was that there would be no discrimination against union men, and that he would be glad to treat with any employee from time to time. He was soon informed that the men were returning to work and by May 3 the city cars in Leavenworth, the cars from the fort, and the interurban cars between Kansas City and Leavenworth were again in operation.

Mr. Holmes made this statement:

THE COMPANY'S OFFER

"I agree to reinstate every employee of the company that was in the employ of the company on April 1, 1918. Every such employee, without regard to whether he is a union or non-union man, may remain as long as he performs his duties in a proper manner. I further agree to make no objection to the men continuing with the union organization and will not discriminate against union men. It is my desire that the men shall have fair wages and hours and fair treatment and consideration in every respect, and I shall be glad to treat with any of the employees from time to time in regard to any question they wish to take up. This is for acceptance in order that service may be resumed at once."

The strike started among the men operating the local lines in Leavenworth. Mr. Holmes announced that if the Public Service Commission grants increased fares, the company will readjust the wages of the men.

New Draft of Proposed Boston Relief Bill

Relief Measure for Boston Elevated Changed to Meet Suggestions of Governor and Others

The House members of the committees on metropolitan affairs and street railways of the Legislature of Massachusetts have prepared a redraft of the Boston Elevated Railway relief bill. Several changes have been made in the measure as a result of conferences with the committee on ways and means and because of the attitude of Governor McCall as recently made public.

SOME OF THE CHANGES IN THE BILL

One provision which has now been inserted specifies that if at the end of ten years of public control the property goes back to private control, it shall do so under a service-at-cost plan. The so-called option section, which specifies the terms under which the State may take over the property during a ten-year period, has been entirely rewritten, and a provision added to the effect that the option provided for shall not affect the right of the State to acquire the road at any time by exercise of the right of eminent domain. A new section also provides that if any part of the act is declared unconstitutional, the validity of the remainder of the act shall not be affected thereby.

A redrafted section now provides that the act shall take effect only when it has been accepted by a majority of all the stock of the Boston Elevated Railway, and by a majority of the stock of the West End Street Railway, and when the company shall certify that $3,000,000 of preferred stock, for rehabilitation and reserve, shall have been issued, and at least 30 per cent of it paid for in cash. The provision of the original bill that members of the Legislature may be eligible for service on the board of trustees has been stricken out.

Governor McCall declined to state whether he will approve the bill in its present form, in a press interview granted soon after its preparation had been completed. He was pleased that the committees have adopted his suggestion that the bill should not be made a permanent contract between the company and the State, but is to be limited to ten years, under trustees appointed by the terms of the bill. The Governor does not consider the payment of the trustees to be desirable, and he is strongly of the opinion that the trustees should be appointed by the Governor and not by the Mayor of Boston. To representatives of the press he said:

KEEP THE ROAD OUT OF POLITICS

"I have no doubt that Mayor Peters would select excellent men, but Mr. Peters will be Mayor of Boston for only four years. If the Mayor of Boston is to have the appointment of two of the trustees, it would mean that the control of the Boston Elevated Railway would become a big issue in Boston politics, because these trustees are to have control, not alone of the company's finances, but also of the employment of men in its service. Then again, the trustees should operate the system in the interest of the entire community which it serves, rather than in the interest of any individual city or town. These are some of the reasons why I believe that the Governor should have the appointing power, particularly in view of the fact that the Executive Council will be a check upon any unwise selections."

The bill was brought up for discussion in the House on May 8, and various amendments were introduced. One of these provides for a referendum on the measure at the next State election to the voters of Boston and the suburban cities and towns in which the company operates. It appears to be recognized among the leaders on Beacon Hill, however, that such a postponement of relief would be disastrous to the company and the communities alike. Other amendments offered tend to bring the bill into accord with the views of Governor McCall as expressed in his recent communication to the committee members having the bill in charge.

So far no opposition has been shown to the general plan of passing a public control measure with provision for fare adjustments necessary to meet the full cost of transportation service in the metropolitan district.

PRESIDENT BRUSH HOPEFUL

To a representative of the ELECTRIC RAILWAY JOURNAL M. C. Brush, president of the company, said on May 8 that the outlook was bright for the passage of a constructive bill of fundamental value and nation-wide significance, equally fair to the interests of the public, car-riders, stockholders and employees. The bill has probably not reached its final form, and during the next few days interest will center upon the discussion of proposed amendments.

Detroit Strike Settlement Basis

The two propositions presented by the Detroit (Mich.) United Railway to its trainmen for the settlement of the recent short strike were as follows:

"1. The men to go back under the old conditions and wages and submit all differences to the Federal Mediation Board for adjustment, the award to take effect on June 1, or

"2. Go back to work at the following rates: First three months, 35 cents an hour; next nine months, 40 cents an hour; thereafter, 45 cents an hour.

"Other differences, if any, raised by either side to be adjusted by the Federal Mediation Board.

"It is understood that no discrimination shall prevail against the employment of women and colored men as necessity arises."

The men selected the first proposition. Company officials had been negotiating with a committee representing the Amalgamated Association for the purpose of adjusting, if possible, the demands made by the union, the last meeting adjourning at 5 o'clock on the afternoon of April 22 to meet again at 2 o'clock on the afternoon of April 25, at which time it was thought that a conclusion would be reached.

Nothing transpired to warrant any belief that the negotiations would not continue in an orderly way, it being understood that arbitration would follow any possible failure to reach an agreement. On the night of April 23 some of the men congregated and in violation of their agreement called a strike to take effect at once, no notice being given to the company of their intention.

Agree on Pittsburgh Wages

The likelihood of a strike of the employees of the Pittsburgh (Pa.) Railway would seem to be entirely removed. Representatives of the union and the receivers of the railway following separate, protracted conferences with United States District Attorney E. Lowry Humes, who acted as mediator, announced on May 4 that a tentative agreement had been reached on the men's demands for higher wages.

The men had demanded an increase of 10 cents an hour. This would have given them from 42 to 50 cents an hour, according to length of service. In the conferences that were held the receivers offered an advance of 2 cents an hour and the men's representatives are understood to have scaled their demand to 8 cents.

In the first stages of the conferences, concessions in regard to working conditions were tentatively accepted by the men, so that only the wage question remained for final settlement.

The motormen and conductors of the company on May 6 accepted the wage scale agreement reached in joint conference. The vote was 1925 for ratification and 526 against it.

The new agreement will continue for a year. It dates back to May 1, and provides an increase in pay of 5 cents an hour distributed as follows: First six months' service, 37 cents; first year, 39 cents; second year, 41 cents; third year and thereafter, 45 cents. Men reach the maximum pay after three instead of five years' service.

Extra pay is provided for overtime work. On holidays the men will receive time and a half pay after eight and one-half hours' work; on straight runs, time and half pay after eleven hours' service on runs which must be completed within 12½ hours; on swing runs time and a half pay after fourteen hours' service on runs which must be finished within fifteen hours. Extra men for anything inside of five hours' work will receive $2 instead of $1.65. For reporting for extra work the men will receive 50 cents instead of 25 cents, in case they are not assigned.

News Notes

Six-Cent Wage Increase Asked.—Requests have been made by the employees of the Wilmington & Philadelphia Traction Company, Wilmington, Del., for an increase in wages of 6 cents an hour, to become effective on May 13.

Southern Road Increases Wages.—An increase in pay to all employees of the Columbus (Ga.) Railroad, effective at once, was announced on May 1. The new schedule ranges from 23 to 30 cents an hour, the men being paid according to the length of service. The increase just made, which is the second this year, amounts to 2 cents an hour.

Seek Wage Increase.—The employees of the Shore Line Electric Railway, Norwich, Conn., have asked for a minimum wage of 35 cents an hour and a maximum of 45 cents an hour, and time and a half for all working hours in excess of nine hours. The present wages are, minimum, 28 cents and, maximum, 35 cents an hour, with 10 cents an hour additional for overtime work.

Increase in Wages in Allentown.—The Lehigh Valley Transit Company, Allentown, Pa., has announced a voluntary increase in wages of the trainmen of 2 cents an hour. This is the second increase granted since the first of the year. The rates paid are now 31 cents an hour for first-year men, 32 cents for second-year men, 33 for third-year men, 34 for fourth-year men and 36 for those in the employ of the company five years or longer.

Will Not Recognize Union.—The sympathetic strike involving all organized trades in Waco, Tex., called to aid the striking conductors and motormen of the Texas Electric Railway, has been declared off by labor leaders. This action was taken after federal mediators had advised such a course. This leaves the railway strike just where it was. The company has been operating cars with little inconvenience. It has announced that it will not recognize the union. This is the only point of difference between the strikers and the company.

Union Activity Restrained.—The Nashville Railway & Light Company, Nashville, Tenn., recently secured an injunction to prevent its conductors and motormen from being organized into a branch of the Amalgamated Association of Street & Electric Railway Employees of America. A bill recently filed in the chancery court charges that J. B. Lawson, an agent of that union, had been in the city several days endeavoring to organize the men. The bill further states that the men could not join the union without violating the two-year contract entered into with the company on June 30, 1917. The injunction was granted on that ground.

President Has Power to Take Over Lines.—Under the amendment to the emergency shipping fund provisions of the urgency appropriation act, approved by President Wilson on April 22, 1918, the President is authorized "to take possession of, lease or assume control of" any street or interurban railway, or cars, franchises or parts thereof, when necessary for the transportation of government shipyard workers. The compensation is to be determined by the President, but if the amount is unsatisfactory to the person entitled to receive it, he will be paid 75 per cent of this amount and may then sue the government to recover the balance of his just compensation for the property devoted to public use.

Barclay Parsons & Klapp to Report on Cleveland.—The Cleveland (Ohio) Rapid Transit Commission has arranged with Barclay Parsons & Klapp, New York, N. Y., to make a survey and preliminary engineering plans for the underground terminal and subway system which is proposed for that city. This was made conditional upon the approval by the Federal Capital Issues Committee of a $100,000 bond issue to cover the expense. It is believed that the survey and plans will cost about $50,000. H. M. Brinkerhoff, consulting engineer of the firm, estimates that the survey can be made and preliminary plans completed in about six months. Should the bond issue be approved, negotiations will be closed for the preliminary work.

Stone & Webster Texas Men Meet.—Managing officials of the Stone & Webster properties in Texas met at Houston recently for a conference with M. M. Phinney of Boston, president of the company, and with L. C. Bradley of Houston, district manager for the company in Texas. It was agreed that none but imperative improvements and extensions should be undertaken during the war, but that every effort should be directed toward keeping up the high standard of efficient service with the equipment on hand. Conservation, both in electric power and in materials and equipment, was the keynote of the conference. It was agreed that the companies in the various cities should cooperate with the government to the fullest so as to do their part in winning the war.

To Work on New Cincinnati Contract.—E. W. Edwards, chairman of the Cincinnati (Ohio) Rapid Transit Commission, and Chris Schott have been appointed by the commission to serve with two members of the City Council on a conference committee to work out terms for a new franchise agreement with the Cincinnati Traction Company. C. W. Culkins, street railroad director, has compiled figures showing that the city would have received more money from the company under the contract declared void by the Supreme Court than under the old 6 per cent plan. The difference is due to the fact that the gross receipts of the company have fallen off about $50,000 since the first of the year, as compared with the same period a year ago.

Increased Wages on Indiana Union Traction.—Announcement was made on May 4 that an increase of 2 cents an hour has been granted to the interurban and city trainmen of the Union Traction Company of Indiana. The advance in wages was unsolicited by the employees. It will date back to April 1. The increase will add approximately $25,000 annually to the payroll. The wages of interurban men, which under the old schedule were 24 to 34 cents an hour, will be advanced to 26 to 36 cents an hour. Conductors and motormen operating city cars in Anderson, Muncie, etc., will receive a wage scale of 22 to 27 cents an hour instead of 20 to 25 cents. Trainmen on the Broad Ripple line, operating between Indianapolis and Broad Ripple, will receive 23 to 29 cents an hour in place of the wage scale of 21 to 27 cents an hour formerly in effect.

More Discussion in Toledo.—F. R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio, invited representatives of the carmen's and electrical workers' unions to meet with him on May 3. As a result the impression became general that the company had some kind of a proposition to make in an effort to settle the wage question. Mr. Coates said after the meeting that no one seemed to have changed his mind in the least and as long as this was true little could be done. It had been reported that the men were willing to accept less than 10 cents an hour increase, as demanded, but this was not apparent in the discussion at that time. No plan had been advanced by the City Council for allowing the company a rate that would warrant an increase in wages. The company, as a result, was not prepared even to make a suggestion on the matter of wages.

Wage Increase in San Francisco.—An increase of wages to the platform men of the United Railroads, San Francisco, Cal., effective immediately, was announced on April 22. The new rate raises the minimum from 30 cents to 33 cents an hour and gives a 2-cent advance after six months' work. A sliding scale then becomes effective. This provides for an increase of 1 cent an hour for each subsequent year, up to a maximum of 42 cents an hour. The yearly increase goes to each man upon the anniversary of his date of employment. The former wage of 30 to 42 cents was established last November. It was fixed to increase the scale 5 cents an hour maximum to those who had remained with the company during the August strike last year. The present increase is the fourth made during the presidency of Jesse W. Lilienthal. When he became the head of the company the scale ranged from 25 to 33 cents an hour.

Financial and Corporate

Northern Electric Finances

Application Made to California Commission for Approval of Amended Reorganization Plan

The reorganization committee of the Northern Electric Railway, Chico, Cal., has filed with the California Railroad Commission an application for approval of an amended plan of reorganization, which plan has received the approval of a majority of the respective creditors of the company.

A new corporation will be created to take over all of the properties of the Northern Electric Company, the Northern Electric Railway, the Northern Electric Railway Company—Marysville and Colusa Branch, and the Sacramento & Woodland Railroad. This will be done by foreclosure of the various bond mortgages and by the committee purchasing the properties at the foreclosure sales and turning the same over to a new corporation.

The new corporation will not assume any of the indebtedness of the present companies. It will have a capital stock of 52,000 shares of the par value of $100 each, or $5,200,000, divided into $1,902,200 first preferred—dividend not to exceed 6 per cent non-cumulative to be paid out of surplus and net profits, first to first preferred and next to second preferred stock—$957,800 second preferred and $2,340,000 common.

The company will create an issue of 5 per cent twenty-year bonds amounting to $5,500,000 divided into Class "A" bonds for $2,012,400 on which the interest is to be a fixed charge from July 1, 1917, Class "B" bonds for $951,200. on which the interest is to be a fixed charge from July 1, 1919, and prior thereto only to the extent of net earnings, Class "C" bonds for $1,268,200 on which the interest is to be a fixed charge from July 1, 1922, and prior thereto only to extent of net earnings, and Class "D" bonds for $1,268,200 on which the interest is to be a fixed charge from July 1, 1927, and prior thereto only to the extent of net earnings.

Class "A" bonds are to be callable at 102 and Classes "B," "C" and "D" are to be callable at par.

A sufficient number of Class "A" bonds will be sold to provide for prior liens, receiver's certificates, receiver's expenses and fees, trustees' expenses, reorganization expenses, repairs, reconstruction, rolling stock, equipment, and for such other purposes necessary to the accomplishment of the plan of reorganization as may be approved by the committee.

The amount of securities actually issued by the new corporation will depend to some extent on the assessments paid by the various classes of creditors. In the original application, authority was asked to issue stocks, bonds and notes as follows:

Stock		$2,000,000
First mortgage bonds		500,000
General Mortgage Bonds		5,284,000
(a) To be exchanged for bonds held by public	$3,106,000	
(b) To be exchanged for bonds pledged	$2,178,000	
Income mortgage bonds		6,980,000
(a) To be exchanged for bonds held by public	$1,030,000	
(b) To be exchanged for bonds pledged	$5,482,000	
(c) To be pledged for present unsecured debt	$ 468,000	
Five-year notes to be issued in lieu of notes and claims to be assumed		6,498,770
(a) Face amount of notes and claims	$6,093,590	
(b) Unpaid interest on notes to June 30, 1915 (plan provides that all unpaid interest on notes shall be added to face of new note)	$ 405,179	
Interest coupons representing unpaid interest on bonds up to July 1, 1915		266,871
Total stocks, bonds and notes		$21,529,641

Adirondack Line to Be Sold

The property of the Adirondack Lakes Traction Company, Gloversville, N. Y., is to be sold at public auction in Gloversville on June 12. The sale will be made by Frank S. Sexton, trustee under the company's mortgage. The amount due is $100,000 of principal and $73,500 of interest from July 1, 1903. The sale is at the request of holders of more than one-third of the bonds outstanding, the principal being declared now due under terms of the indenture.

The Adirondack Lakes Traction Company, a 5-mile line, is the successor of the Mountain Lake Railroad. The old company was covered by a $100,000 mortgage, the one referred to above. In 1903 the company suffered a serious accident, which drove it into bankruptcy. The property was afterward sold, subject to the mortgage, to a syndicate which organized the Adirondack Lakes Traction Company.

A controlling interest in the new company was subsequently acquired by the Fonda, Johnstown & Gloversville Railroad. The property has continued operation by the Adirondack subsidiary, but not at a profit. Now, unless the line is purchased by outside interests, it is expected that operations will be discontinued after the sale. None of the foregoing, of course, has any bearing whatever upon the credit and financial standing of the Fonda, Johnstown & Gloversville Railroad.

Hearing on Abandonment

Receiver Tells Commission Fares Must Be Increased or Part of Road Abandoned

George Bullock, receiver of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., told Commissioner Barhite of the Public Service Commission for the Second District, at a hearing in Buffalo on April 29 that unless the company received permission to increase its rate of fare between Fredonia and the New York State line, it would be forced to abandon this part of the route and scrap its line between the two points. For the last fiscal year there was a deficit of $45,000 for this division. He declared that a rate of 2½ cents a mile should be established.

Commissioner Barhite said informally that the commission had no authority to fix the rates of fare in towns where the company has agreements relative to fares, but that the commission would go over the evidence and make what it considered a fair proposition so that the matter could be submitted to the towns.

Officials of Fredonia, Westfield, Brocton and other towns and cities between Fredonia and the New York State Line attended the hearing. They agreed to co-operate with the company so it would not be necessary for it to abandon this part of its Buffalo-Erie line and scrap this division.

After hearing the evidence of the railway, Commissioner Barhite recommended that the company file with the commission a concrete proposition, covering all points it desires the commission to consider, including the proposed increase in rates. This proposition in turn will be submitted by the commission to the communities along the division.

Pending the efforts of the company to adjust this matter, no action will be taken in regard to the company's application to the commission for the right to abandon its belt line around the city of Dunkirk.

St. Louis Deposits Urged

Richard McCulloch, president of the United Railways, St. Louis, Mo., has sent circulars to all stockholders of the company notifying them of the passage and signing of the franchise settlement ordinance and calling attention to its provisions that the company's capitalization must be reduced to conform to a valuation of $60,000,000. The circular says that before the company accepts the ordinance it is desirable to know what capital value will be established by the State Public Service Commission and whether the commission will authorize an increase in fares. Pending the settlement of these issues, Mr. McCulloch urges holders of stocks and bonds to turn over their securities to the reorganization committees, which have been formed, so that if the franchise bill is accepted the company's capitalization may be reduced.

Expenses Almost Consume Revenues

Kansas City Railways Net for 1918 Will Fall $1,200,000 Short of Meeting Its Fixed Charges

The Kansas City (Mo.) Railways at a hearing on April 29 and 30. before the Missouri Public Service Commission, presented extensive exhibits of its revenues and expenses during the last four years, and especially during the last six months of 1917 and the first three months of 1918. The figures showed that the operating expenses are increasing at a rapid rate and now almost consume the entire revenues, leaving practically nothing for interest and dividends. The company borrowed $400,000 in December to meet interest charges. The accompanying statement gives the recent earnings record.

According to the company's calculations, the earnings for the calendar year 1918, after the deduction of operating expenses and fixed charges, will be $1,520,690 less than they were during 1917. Upon Dec. 31, 1918, the net earnings will fail by $1,242,639 to meet the fixed charge and by $1,551,623 to equal 6 per cent return upon the fair value of the property.

PROBLEMS OF WAGES AND FUEL

A feature of the hearing was the emphasis placed on higher wages and the cost of fuel. In regard to the former point several employees testified that except for long service and property in Kansas City they would long ago have accepted more remunerative positions with better hours. Officers of the employees' organization testified that they had with difficulty kept many of the workmen on their jobs, urging them to wait until the commission had had a chance to grant increased fares, in which case the company would be able to pay better wages. The testimony of the men seemed to impress many local business men at the hearing.

As for the cost of fuel, the evidence indicated that the fuel bill had increased 103.23 per cent in three years, or $1,110,170. Under the former contract, the company was securing coal at $2.16 a ton; it has recently been paying $3.80 a ton. Fuel oil was formerly $0.785, and it is now $2.38. In spite of the higher cost, the coal is not of as good a quality, and the company is having trouble getting enough to keep the plant operating.

It had a contract for Illinois coal, but the coal company, though tendering on the contract, cannot deliver because Kansas City has been placed outside the zone within which Illinois coal can be delivered. Furthermore, the railway has tried in vain to get some definite indication from the fuel administrators as to when the ban may be lifted. It is in a quandry in the making of contracts with Southwestern operators because of the uncertainty as to whether Illinois coal will be allowed in Kansas City, under a modification of zoning orders such as is said to have been made in other districts.

The company has been conducting a conservative but persistent campaign of publicity in regard to its fare application. The work has included newspaper displays, car cards, a weekly bulletin distributed on the cars, and pamphlets designed to prepare the public for a favorable decision by the commission. The entire campaign is based on the necessity for service of the best possible quality, emphasis being placed on the fact that the company would not make a profit from higher fares, and that the cost of service must be met if any utility is to be maintained in Kansas City.

FIRST SETTLEMENT WITH CITY

It is already apparent that the publicity effort has been exceedingly serviceable. There is practically no fight against the higher fare in Kansas City, except from city officials, and no opposition, except from this source, to the submission of the question to the Public Service Commission. A recent change of city administration has a bearing on the situation which cannot now be gaged until the new officials have had opportunity to act. They were scheduled to present their case at an adjourned hearing on May 9.

The Kansas City Railways recently made its first settlement with the city. The franchise provides that the surplus income shall belong to the city, but that it shall be expended for extensions and improvements until $6,000,000 has been so used. This total shall be added to capital account, and the city's surplus thereafter shall go toward the purchase of the property. There was a provision, however, that the personal injury claims accumulated during the receivership should be a prior lien on the surplus, and that these might be paid from the first surplus or financed by certificates payable over thirty years. A later agreement with the city provided that the claims should be paid before the city began to share.

CITY SHARE NOW $98,000

During March the claims, which had finally been collected, were paid with the exception of a few, for which a reserve fund of $200,000 was set aside. The surplus earnings of the company from the date of the franchise to June 30, 1917, were $1,235,387. With claims paid amounting to $351,806 in cash and $584,911 in certificates, and the $200,000 of reserve, the city's share remaining was $98,589. A certificate was given the city indicating this amount of participation in the company. Since June 30, 1917, there has been no increase in the city's interest; the company had not even made 6 per cent on the investment.

COMPARATIVE INCOME STATEMENT OF KANSAS CITY RAILWAYS FOR PERIODS FROM JULY 8, 1916, TO MARCH 31, 1918

	Jan. 1, 1918 to Mar. 31, 1918	July 1, 1917 to Dec. 31, 1917	July 1, 1916 to June 30, 1917
Revenue from transportation	$1,558,009	$3,368,555	$6,909,602
Revenue from other operations	25,830	52,502	100,520
Revenue from power	252,346	571,093	1,041,966
Operating revenues	$1,836,186	$3,992,150	$8,052,089
Maintenance of way and structures	$136,352	$294,251	$802,060
Maintenance of equipment	125,375	233,036	374,899
Maintenance of power plant and buildings	60,726	117,619	65,153
Power—operating	303,088	442,005	734,957
Conducting transportation	500,551	962,136	1,866,037
Traffic	87	6,335	2,041
Board of control	7,214	11,783	31,307
Injuries and damages after July 8, 1914	168,550	209,525	321,755
Amortization of franchise	250	500	1,000
General and miscellaneous	105,875	280,114	322,722
Total operating expenses	$1,408,071	$2,557,308	$4,521,934
Taxes	128,851	261,155	473,149
Auxiliary operations—power	289,214	574,328	644,070
Total operating expenses and taxes	$1,826,137	$3,392,792	$5,639,155
Operating income	$10,049	$599,358	$2,412,934
Special operating expenses account "Injury and Damage Claims Prior to July 8, 1914"	3,427	1,218	853,398
Gross income	$6,622	$598,139	$1,559,535
Miscellaneous income—company	$4,468	$1,963	$18,815
Miscellaneous income—joint	1,828	6,192	17,669
Total	$6,296	$4,229	$36,484
Net income	$12,919	$602,368	$1,596,019
Surplus above 6 per cent on capital value to be applied as provided in the franchise	....	....	413,984
Company's share of income	$12,919	$602,368	$2,010,004
Deductions from company's income:			
Bond interest	$378,053	$725,451	$1,442,568
Bond discount and expenses	7,235	4,004	1,523
Services of registrars and trustees	....	2,254	4,032
Interest on Kansas injury and damage certificates	1,735	3,471	6,937
Interest on -issouri injury and damage certificates	8,774	17,549	34,342
Taxes	....	....	1,106
Miscellaneous	910	16,847	....
Premium on bonds retired	....	....	....
Total deductions	$396,709	$769,578	$1,490,510
Profit and loss	$383,790	$167,210	$519

* Deficit.

Union Traction Net Falls

Heavy Cost of Operation Overbalances Increase in Receipts — Purchase of Coal Mine Beneficial

The great decrease in net income, from $188,745 in 1916 to $42,142 in 1917, on the part of the Union Traction Company of Indiana was caused by the large increases in the cost of practically every item of operating expense. The gross revenues gained $277,124 or 9.93 per cent, but the expenses increased $407,638 or 25.22 per cent.

The net income for 1917 therefore showed a decrease of $146,603. After deduction of sinking funds, a deficit of $17,649 was shown, to be compared with a surplus of $132,227 for 1916, a decrease of $149,876,

The complete comparative figures are given in the table below.

The earnings and expenses of the Muncie-Portland line for the first six months of 1916 are not included in the figures stated for that year, operation of that line by the Union Traction Company of Indiana not having been begun until July 1, 1916.

The operating expenses for 1917 included $366,641 for maintenance of way and structures and $227,902 for maintenance of equipment, making the total sum charged for maintenance of the property $594,543. This equalled 19.40 per cent of the gross earnings for the year, equivalent to $1,406 per mile of single track operated, exclusive of city tracks of other companies at Indianapolis, Logansport and Wabash.

A total of $169,097 is the net amount charged for additions and betterments for the year, $147,195 being the amount expended on way and structures, including track, bridges, buildings, lands, and the like. Of this sum the lessor companies, the Muncie & Portland Traction Company and the Indianapolis, New Castle & Eastern Traction Company, contributed $47,000 for expenditures on or for the leased properties. These expenditures are in addition to $20,846 advanced during the year to the Traction, Light & Power Company and expended for light and power equipment, and are also in addition to the $59,791 paid out on account of sinking fund.

The rapidly advancing prices and the scarcity of coal early in 1917 compelled attention to the matter of insuring an adequate supply of coal at reasonable cost. After consideration of several plans, the company joined with the Indianapolis Traction & Terminal Company, the Terre Haute, Indianapolis & Eastern Traction Company and the Fort Wayne & Northern Indiana Traction Company in the organization of the Shirley Realty Company, which purchased an operating coal mine in Sullivan County, Ind. The purchase was financed through the sale of the preferred capital stock of the Shirley Realty Company, amounting at par to $265,000. The entire common capital stock of the company, amounting at par to $135,000, is held equally by the four traction companies mentioned, which take the output of the mine in equal proportions. Control of this mine has been of substantial benefit, in respect to both the supply of coal and the price.

The company has just petitioned for authority to advance the base interurban rate of 2 cents per mile. This rate is the maximum fixed by the 2-cent fare law. It is not believed that that law applies to interurban companies, but it clearly does apply to the steam railroads, with whose lines the interurban companies are in direct competition. An increase in this base fare appears to be imperative, however, if the company is to continue to furnish proper service. The appeal of the company to the commission in the matter of fares is reviewed briefly on page 935 of this issue.

Miscellaneous statistics for 1916 and 1917 are shown in the accompanying table.

	1917	1916
Passengers carried, interburban lines	11,307,816	9,992,101
Passengers carried, city lines	8,375,460	8,497,814
Total passengers carried	19,683,276	18,489,915
Freight handled (tons)	100,234	90,300
Express handled, exclusive of Wells Fargo & Company Express (tons)	7,816	7,689
Mileage of cars, interurban lines	6,915,933	6,558,913
Mileage of cars, city lines	1,675,822	1,722,141
Total mileage of cars	8,590,755	8,281,054
Coal consumed at all plants (tons)	120,045	96,850
Power generated (a. c.) at all plants (kw.-hr.)	50,397,180	47,652,790
Power generated (d. c)) at all plants (kw.-hr.)	28,591,247	28,191,304

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Revenue from Transportation:				
Passenger	$2,588,176	84.40	$2,332,219	83.62
Baggage	8,966	00.29	9,475	0.34
Parlor chair and special car	7,787	00.25	11,225	0.40
Mail	1,836	00.05	1,821	0.06
Express	107,330	03.50	91,844	3.29
Milk	15,011	00.48	24,882	0.89
Freight	262,721	08.59	250,560	8.99
Total	$2,991,830	97.56	$2,722,026	97.59
Revenue from operation other than transportation:				
Station and car privileges	$ 13,478	00.44	$ 10,337	0.38
Parcel rooms and storage	1,028	00.03	998	0.04
Rent of tracks and facilities	2,922	00.09	7,558	0.27
Rent of equipment	2,510	00.08	4,246	0.15
Rent of buildings and other property	9,050	00.29	8,412	0.30
Power	44,867	01.49	35,196	1.25
Miscellaneous	776	00.02	567	0.02
Total	$ 74,636	02.44	$ 67,314	2.41
Operating revenues	$3,066,466	100.00	$2,789,342	100.00
Way and structures	$ 366,641	11.95	$ 310,067	11.10
Equipment	227,902	07.46	172,406	6.15
Power	496,420	16.18	279,578	10.02
Conducting transportation	547,091	17.84	476,084	17.06
Traffic	16,218	00.52	11,689	0.49
General and miscellaneous	369,334	12.04	349,422	12.52
Extraordinary flood expense	....	......	16,726	0.59
Total	$2,023,609	65.99	$1,615,972	57.93
Net operating revenue	$1,042,857	34.01	$1,173,370	42.07
Taxes	142,589	4.65	136,460	4.89
Operating income	$900,268	29.36	$1,036,910	37.18
Other income	16,531	0.54	16,983	0.61
Gross income	$ 916,799	29.90	$ 1,053,893	37.79
Deductions	874,657	28.52	865,148	31.02
Net income	$ 42,142	1.38	$ 188,745	6.77

War Finance Directors Confirmed

The Senate has confirmed the appointment as directors in the War Finance Corporation of Messrs. McLean, Harding and Meyer. The President has sent to the Senate the nomination of Clifford M. Leonard of Illinois in place of Allen B. Forbes, who found himself unable to accept appointment. The organization of the corporation was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for May 4, page 875.

Financial News Notes

New West End Director.—Eugene C. Huttman. Quincy, Mass., has been elected a director of the West End Street Railway to succeed Charles A. Williams.

Report of Central Line.—The income statement of the Chicago, Harvard & Geneva Lake Railway, Walworth, Wis., for the year ended Dec. 31, 1917, shows the following items: Gross revenues, $39,032; operating expenses and taxes, $24,796; net revenues, $14,236; bond interest, $3,375; interest on bills payable, $1,169; net income, $9,692.

Portland Stock Decreased. — The Portland Railway, Light & Power Company, Portland, Ore., has filed articles showing a decrease in the capital stock of the company from $40,000,000 to $35,000,000. The amendment to the articles of incorporation was authorized at the annual meeting of the stockholders in Portland on April 3.

Sold Under Foreclosure.—The property of the Northern Cambria Street Railway, Patton, Pa., was sold on March 31 by the Cambria Title, Savings & Trust Company, Ebensburg, Pa., trustee, to M. D. Kittel, A. W. Buck, James H. Allport, W. H. Deulinger and W. B. Adair, representing the bondholders. A meeting of the bondholders was called for May 1 at which time it was proposed to elect a board of directors and other officers.

Bond Hearing Closed.—The Public Service Commission for the Second District of New York on May 4 heard the petition of the Southern New York Power & Railway Corporation, Cooperstown, N. Y., for an amendment of an order of the commission on Oct. 19, 1916, so that there shall be authorized a $5,000,000 mortgage and the issuance of $1,000,000 in bonds, the rate of interest to be fixed by the directors and not to exceed 6 per cent. Decision was reserved. The application, filed on April 11, was noted in the Electric Railway Journal of April 20, page 784.

Appeals Frontier Decision.—The Erie Railroad Company has filed with the Public Service Commission for the Second District of New York, a petition for a rehearing and a revocation of the commission's order of March 19 last, granting permission to the Pennsylvania and the Delaware, Lackawanna & Western railroads to acquire the stock of the Frontier Electric Railway. The commission will take immediate action upon the petition. It was held by the commission in a memorandum which accompanied its order of March 19 that the record showed that the entire shipping interests of the Niagara frontier demanded that the application be granted.

Pittsburgh Valuation Work Started.—The joint commission of five engineers selected to value the property of the Pittsburgh (Pa.) Railways, as noted in the Electric Railway Journal of March 23, page 582, has held several meetings to perfect the organization. Ford, Bacon & Davis, whose valuation manager, J. A. Emery, is one of the company's representatives, have placed on the property forty men, including accountants and mechanical, electrical and civil engineers. Thus far the activities have been of a preliminary nature, in subdividing the work and in preparing forms. It is planned to secure the reproduction cost new and the original cost of the railway.

Would Issue New Stock—The Union Street Railway, New Bedford, Mass., has an application pending before the Massachusetts Public Service Commission for permission to issue $812,500 of new stock. The proceeds will be applied to paying for a new power station. The company now has $1,635,000 of stock outstanding. On this it is paying dividends of 8 per cent. Testifying for the company, H. A. Gilman of the banking firm of Estabrook & Company, Boston, said that unusual competition existed in the securing of capital. Because of this it is necessary to offer attractive prices to prospective investors. Street railway securities were wanted by no one now, and they were being disposed of in large quantities by those holding them. He accounted for this condition by the publicity thrown upon the affairs of the companies. H. H. Crapo, president of the company, believed that the securing of capital through a stock issue would relieve the banks now supplying money for the undertaking. He pointed out that there has been no change in the capitalization of the company since 1909. Since 1900 the company has added $1,500,000 to the value of the road. The floating debt is $375,000.

Receiver Would Cancel Debt.—Wallace B. Donham, receiver of the Bay State Street Railway, Boston, Mass., on April 24 was authorized by the United States District Court to pay and cancel $27,000 of the bonds of the Lowell, Lawrence & Haverhill Street Railway. Mr. Donham also desired to liquidate an indebtedness of $50,000 to the Salem Five-Cent Savings Bank on a short-time note, but the hearing on this matter was put over temporarily. The receiver stated in his petition that under the mortgage of the Lowell, Lawrence & Haverhill Street Railway, the sinking fund provisions require the payment of $27,000 annually. The short-time note now held by the Five-Cent Savings Bank was part of the $50,000 which the Bay State Street Railway borrowed on March 15, 1917, for one year through the Old Colony Trust Company, Boston. Of the total amount, $135,000 was used at that time in refunding bonds of the Old Colony Street Railway, the remainder, amounting to $717,000 in cash, was used by the Bay State, which gave as collateral for the entire loan $1,196,000 of the bonds of the Boston & Northern and the Old Colony Companies. The Salem Bank purchased a $50,000 collateral note with the collateral security. Mr. Donham has asked for authority to liquidate the note by allowing the bank to keep the collateral.

Electric Railway Monthly Earnings

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$1,975,211	$36,768	$1,938,443	$191	$1,938,252
1m., Mar., '17	1,721,480	31,312	1,690,168	225	1,689,943
12m., Mar., '18	19,850,979	373,635	19,477,344	2,648	19,474,696
12m., Mar., '17	13,391,411	268,593	13,122,818	127,917	12,994,901

CUMBERLAND COUNTY POWER & LIGHT COMPANY PORTLAND, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$211,037	*$188,824	$22,213	$70,702	†$48,489
1m., Feb., '17	217,275	*164,986	52,289	66,304	†14,015
12m., Feb., '18	3,068,576	*2,126,916	941,660	829,466	112,194
12m., Feb., '17	2,911,408	*1,843,347	1,068,061	810,201	257,860

EL PASO (TEX.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$103,875	*$66,475	$37,400	$6,513	$30,887
1m., Feb., '17	111,254	*64,067	47,187	5,312	41,875
12m., Feb., '18	1,274,162	*813,815	460,347	69,477	390,870
12m., Feb., '17	1,141,886	*693,623	448,263	60,290	387,973

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$181,822	*$125,615	$56,207	$38,977	$17,230
1m., Feb., '17	148,284	*104,970	43,314	36,761	6,553
12m., Feb., '18	2,152,766	*1,425,212	727,554	455,470	272,084
12m., Feb., '17	1,953,997	*1,248,750	705,247	439,456	265,791

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$3,649,670	*$2,025,425	$1,624,245	$1,175,342	‡a$713,525
1m., Mar., '17	3,682,520	*1,833,961	1,848,559	1,014,102	‡a897,837
9m., Mar., '18	30,144,018	*16,896,992	13,247,026	9,998,674	‡a5,601,780
9m., Mar., '17	29,576,392	*14,364,560	15,211,832	9,000,085	‡a6,740,664

LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$141,162	*$111,370	$29,792	$36,297	†$6,505
1m., Feb., '17	118,242	*87,189	81,053	34,382	†3,329
2m., Feb., '18	282,717	*226,677	56,039	72,423	†16,384
2m., Feb., '17	247,748	*183,116	64,632	63,756	†4,124

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$198,928	*$127,155	$71,773	$40,626	$31,147
1m., Feb., '17	197,593	*118,630	78,963	40,970	37,993
12m., Feb., '18	2,454,308	*1,596,230	858,078	489,526	368,552
12m., Feb., '17	2,408,600	*1,469,090	939,510	505,200	434,310

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$237,353	*$141,189	$96,164	$28,238	‡$77,509
1m., Feb., '17	158,578	*96,565	62,013	29,114	32,899
12m., Feb., '18	2,740,100	*1,534,565	1,205,535	858,108	‡906,024
12m., Feb., '17	1,967,490	*1,175,735	791,755	347,465	444,290

PENSACOLA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$35,228	*$23,829	$11,399	$7,996	$3,403
1m., Feb., '17	26,909	*15,083	11,826	7,800	4,026
12m., Feb., '18	368,874	*222,194	146,680	94,020	52,660
12m., Feb., '17	288,287	*162,614	125,673	92,462	33,211

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$2,262,611	$1,463,493	$799,118	815,670	†$16,552
1m., Feb., '17	2,205,349	1,274,258	931,091	813,678	117,413
8m., Feb., '18	19,761,968	11,855,406	7,906,562	6,496,713	1,409,849
8m., Feb., '17	18,490,282	10,363,493	8,126,789	6,514,716	1,612,073

TAMPA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$87,102	*$47,303	$39,799	$5,261	$34,538
1m., Feb., '17	90,359	*45,766	44,593	4,372	40,221
12m., Feb., '18	992,187	*569,706	422,481	57,836	364,645
12m., Feb., '17	972,512	*522,768	439,744	52,351	387,393

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$835,293	$614,391	$220,902	$160,696	$60,206
1m., Mar., '17	916,605	610,439	306,166	150,094	156,072
3m., Mar., '18	2,457,390	1,881,090	576,300	466,130	110,170
3m., Mar., '17	2,641,912	1,799,459	842,453	435,069	407,384

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*Includes taxes. †Deficit. ‡Includes non-operating income. *a*Includes accruals under rapid transit contracts with city payable from future earnings.

Traffic and Transportation

Lehigh to Increase Fares

Statement by President Fehr Gives Reasons for Changes to Go Into Effect on May 1

The Lehigh Valley Transit Company, Allentown, Pa., has made application to the Public Service Commission of Pennsylvania for an increase in some of its rates, effective on June 1. The company is advertising the reasons why it is compelled to seek increases in fare. A statement in explanation made by H. R. Fehr, president and general manager of the company, says:

THE REASON WHY

"The Lehigh Valley Transit Company had hoped that it would be possible to get through the war without having to raise rates. The company, in common with all other public utility companies, has been forced to meet large increases in operating costs. The cost of power has increased 136 per cent since 1915; the same amount of power cost us over $200,000 more in 1917 than before the war. We have advanced wages four times since the war began, while a further increase of 2 cents an hour in the wages of motormen and conductors became effective on May 1. Our increased labor cost aggregates over $275,000, or approximately 50 per cent. Every class of material which enters into our operations has largely increased in price. Wire costs 100 per cent more than it did before the war. The cost of journal bearings for car trucks has increased 269 per cent, motors and parts therefor 75 per cent to 144 per cent. Car wheels, for which we formerly paid $18.75, now cost $45. We formerly paid $31 a ton for rails, while they now cost us $75 a ton. Ties have advanced from 49½ cents to 75 cents each. Everything we buy and use costs us from 50 per cent to 358 per cent more than three years ago.

"It is necessary for us to increase our revenues to offset at least a portion of these increased expenses.

"President Wilson has said that 'it is essential that these utilities should be maintained at their maximum efficiency, and that everything reasonably possible should be done with that end in view.'

"We have reached the point where our service would be impaired unless we can secure additional revenues.

WHAT THE CHANGES MEAN

"I want to make it very clear that the rates are not increased for the purpose of increasing dividends. We estimate the additional revenue will about equal the increase in our power bill, leaving unprovided for the other increases in expenses which have occurred. In revising the rates we have endeavored to localize the increases to those classes of service in the handling of which we were incurring a heavy loss.

"In general, the changes in rates effective on June 1, 1918, are as follows:

"The length of the fare zones for local service on the Philadelphia Division has been standardized as nearly as possible on a 2½ mile zone basis. The fare on the limited cars from Allentown to Philadelphia has been increased 5 cents.

"The length of the fare zones on the Slatington Division has also been equalized, increasing the cash fare between Allentown and Slatington 10 cents.

"Our new interurban rates are much lower per mile than the rates approved by the Interstate Commerce Commission and the various state commissions.

"In accordance with established precedent, we have, in so far as possible, abolished reduced rate round trip tickets, charging double the one way rate.

"Commutation rates have been standardized on the basis of 4 cents a zone. We are at the same time greatly extending the commutation privilege. Anyone traveling regularly through two or more specific fare zones can purchase at any of our ticket offices a forty-six, fifty, fifty-four or sixty-trip commutation book, as he may elect, good for the calendar month."

Columbus Company Urges Relief

The most recent higher-fare advertisements of the Columbus Railway, Power & Light Company, Columbus, Ohio, consist of material based upon the recent statements by President Wilson and Secretary McAdoo in regard to the necessity of adequate rates for public utilities. The company filed its request for immediate financial relief with the City Council on February 25, six days after the President indicated what ought to be done in such circumstances.

According to one of the advertisements, which are issued over the signature of Samuel G. McMeen, president, the Council without a hearing, without knowledge and without any consideration, except what could be made in seven minutes by seven men, refused to carry out the plea for relief.

Another advertisement says that the people of Columbus have up to now been complacent over the failure of the Council to act as recommended by the President. Inasmuch as they have responded to every other appeal of the government, this complacence must be attributed to interest in the great things of the war, which interferes with a complete consideration of the duties at home. But is it too much, the advertisement continues, now to ask that the City Council follow the recommendations of the President?

Increase for Kansas Line

Kansas City-Western Railway to Charge Two Cents a Mile Between Leavenworth and Kansas City

The Public Utilities Commission of Kansas on May 4 granted the Kansas City-Western Railway the right to charge 2 cents a mile straight on the business between Leavenworth and Kansas City. The company filed its application for a 2-cent rate in November, 1914. In January, 1918, it amended the application, asking for a 2½-cent rate, on the through traffic, and revision of the local schedules. The revision of the local schedules is now being worked out by the company and the commission. The company had been selling tickets for one-way trips between Leavenworth and Kansas City at 50 cents, with round trips for 75 cents. It had also been selling commutation tickets on the following basis, with the rates per trip as indicated for the 25-mile ride: Fifty rides in one year, $14—28 cents per trip; fifty rides in ninety days, $11—22 cents per trip; twenty-five rides in six months, $7.50—30 cents per trip; twenty-five rides in sixty days, $6—24 cents per trip.

OLD RATES ONE CENT A MILE

These rates were obviously in some cases under 1 cent a mile. The rate of 75 cents for single round trips was 1½ cents a mile. The commission's order allowing the company to charge a straight 2 cents a mile rate on the through traffic, provides 50 cents a trip, with no reduction for round trip tickets. The 50-cent fare, however, takes the patron to the company's terminals in Kansas City, Kan., Fourth and Minnesota, and Leavenworth, Third and Delaware.

The route to these terminals is to be exactly 26 miles, but the commission "threw off" the extra mile. At the Kansas City terminal the Leavenworth line connects with the Kansas City Railways and the city fare of 5 cents is collected by the latter company. In Leavenworth, the Kansas City-Western operates the local line.

The commission made no increase in the fare on the Leavenworth city lines to the Soldiers Home and to a mining camp, outside the city limits, where the fare continues at 5 cents.

There was no opposition to the increase in the through traffic fare between Leavenworth and Kansas City. At a hearing on May 1, at Leavenworth, city officials and business men requested the commission to grant the increase.

The interurban has much traffic from residents along the line. It has operated a zone system of fares on a 5-cent basis. The new schedule is to be on the mile basis. Though rates will not in general be much changed for regular patrons, the revenue being probably from 1 1/3 to 1½ cents a mile, when tickets are bought providing for forty rides in thirty days between specific points. Local casual traffic probably will pay the 2-cent-a-mile rate.

Hearing on J. & P. Rates

Company Wants Two and One-Half Cent Fare in Missouri—Conditions Different from in Kansas

The second hearing of the Public Service Commission of Missouri on the application of the Joplin & Pittsburg Railway for a 2½-cent-a-mile rate on the Missouri end of the company's line was held in Kansas City on April 29. The 5-cent zone arrangement operating on the Missouri part of the system brings returns of about 1.9 cents per mile now.

The hearing in Kansas City dwelt largely on the question of valuation upon which the return of the company would be based. The engineers of the commission considered the increased value of real estate, but made no allowance for the present increased value of equipment, on the theory that the present high costs are abnormal. All equipment was figured in the valuation on the basis of what it cost. Engineers testified that not more than $5,000 of equipment had been bought at war prices.

CONDITIONS IN KANSAS

It will be remembered that the company was authorized by the Kansas commission to charge 2 cents a mile in that State outside of the towns. The old Kansas rates, figured from the receipts under the 5-cent zone system, gave 1.6 cents per mile; the zones usually included the short ride from the interurban terminals in the towns, no distinction being made between urban or outside origin or destination of passengers. Present orders issued by the Kansas Public Utilities Commission permitted the company to charge a 5-cent city fare within city limits, and the company is now trying out the new system with 2 cents a mile on interurban business before deciding whether to make a new application for a 2½-cent fare in Kansas.

While the company is hoping that the Kansas rate will provide adequate revenues, it is realized that 2 cents a mile outside cities in Missouri would prove inadequte as the hauls inside the cities in Kansas are short, usually about a mile. For this service 5 cents is received. In Missouri, however, the hauls in the cities are longer. There they sometimes run to 4 or 5 miles, and only 5 cents is received for the hauls within the city. It is therefore necessary to get slightly more for the hauls in Missouri outside the city to make up for the long city hauls.

Find Trenton Equipment Poor

The investigators sent out by the State Board of Public Utility Commissioners of New Jersey to inquire into the operation and maintenance of the Trenton & Mercer County Traction Corporation made a report to the commission on May 7.

H. C. Eddy, senior inspector of traffic for the commission, had charge of the Trenton survey. He testified that there was a striking lack of discipline among the employees of the company, and that the rules of the company for the operation of its cars were persistently violated. He introduced photographs showing overcrowding of cars and defective tracks and cars. Mr. Eddy said that while the company had sixty double-truck and forty single-truck cars, only seventy-eight were operated. Of the forty single-truck cars, only twenty-five were fit for operation. He said the poor condition of the cars was due to deferred maintenance. According to Mr. Eddy, facilities at the carhouses for repairing cars were inadequate.

Skip Stop for Kansas City

City Representative on Board of Control Presents Plan to Eliminate from 10 to 12 Per Cent of Stops

Robert T. Woods, city member of the Board of Control of the Kansas City (Mo.) Railways, has presented a skip-stop plan to the City Council for approval. This plan proposes the use of the three types of skip stop, that is, "odd and even," "alternate return" and "full skip," separately and in combination over about twenty-eight lines.

It is not proposed to skip any stops in the inner retail business zone, bounded by the Missouri River and by Twenty-fourth, McGee and Washington Streets. Outside of this district there are now 1301 possible passenger stops on lines proposed for skip stops in Missouri, one-way safety stops being excluded. Under the proposed plan 398 of these stops, or about 30 per cent, would be permanently skipped.

In the traffic checks made it was found that an average of 502 of the 1301 possible stops, or about 39 per cent, are actually skipped under present conditions because no passengers desire to leave or board at these points. It is thus obvious that many of the designated places where cars will be scheduled to stop will not be used at times.

The proposed plan is estimated to result in reducing the number of stops by from 10 to 12 per cent. The average distance between possible stops on the twenty-eight lines under consideration is now 422 ft., corresponding to twelve and a half stops per mile. Under the proposed skip-stop plan the average distance between possible stops is 598 ft., corresponding to eight and four-fifths stops per mile.

In the foregoing plan transit lines running only through the business section in Missouri, or having a limited mileage in Missouri, and some suburban stub lines have not been included. These are no doubt subject to special treatment. The Troost and Brooklyn lines have not been included, because the "odd and even" skip stop has already been in successful operation for seven years. The Prospect and Woodland lines, it is said, are susceptible of further development of the skip-stop idea by the application of the "odd and even" system during rush hours.

Interurban Wants Increase

Indiana Union Traction Asks Commission to Sanction Advance of One-Half Cent a Mile

A petition for an increase in rate of fare from 2 cents to 2½ cents a mile was filed with the Public Service Commission on May 6, by the Union Traction Company of Indiana. The company sets out the higher cost of material, labor and taxes since the outbreak of the European war and especially since the United States entered the war in April, 1917. A list of prices of 1914 as compared with 1918 is included in the petition.

EXPENSES INCREASED 25.22 PER CENT

The gross revenue of the company increased for 1917 over 1916 a total of $277,124, or 9.93 per cent, but the expenses of operation increased $407,638, or 25.22 per cent, thus making the increase in 1917 greater by $130,513 than the gain in gross revenue. These figures do not include $167,097 expended in 1917 for the improvement of the system.

The petition then takes up the first three months of 1918:

"The gross operating revenues of petitioner for the first three months of 1918 being the latest period for which complete figures are available, decreased from $659,357 for the like period of 1917 to $644,164, a total of $15,193, or 2.15 per cent, and the expenses of operation and maintenance for the same period increased from $428,275 for the like period of 1917 to $514,985, a total increase of $86,709, or 20.21 per cent, thereby creating a loss of $100,840 in net operating revenue for the three months, as compared with the like period of 1917."

The petition says that net revenues must be increased to maintain efficient service. The company has never paid any dividends on its common or second preferred stock, and in 1914 it discontinued paying dividends on the $1,000,000 of first preferred stock, "which represents actual cash expended in the construction, extension and betterment of said system."

PROMPT HEARING ASKED

The fixed charges for 1917 were $874,657, or including sinking funds, $934,448. For 1918 the amount will be practically the same. According to the petition net revenues cannot be increased by decreasing expenses of operation and maintenance without at the same time reducing service and impairing the property.

In 1914 the "copper zone" system of 1 cent a half-mile was established by the Public Service Commission. The petition filed on May 6 asks for a prompt hearing on the request for an increase to 2½ cents a mile.

The report of the company for the year 1917 showing how the heavy cost of operation overbalanced the increase in receipts is digested on page 923 of this issue

Decision in Tacoma Franchise Test Case

State Supreme Court Holds Commission Not Vested With Power to Raise Fares Beyond Statutory Limitation

The Supreme Court of the State of Washington on April 27 at Olympia, denied the application of the Tacoma Railway & Power Company for a writ directing the Public Service Commission to investigate the company's financial condition, and to raise fares or grant other relief necessary. In its decision, the court holds that the Public Service Commission has no authority to permit railways to charge more than a 5-cent fare within the city limits, or to relieve a company of any of its franchise obligations.

NOT MORE THAN FIVE CENTS IN CITY

The court holds that the public service commission act limits the authority of the commission, and specifically provides that not more than a 5-cent fare shall be charged within city limits by a railway serving the community. According to the court the act does not give the commission authority to relieve the companies of any franchise obligations. The remedy of the companies is declared by the court to be legislative rather than judicial. The decision of the seven judges was unanimous. It was written by Judge John F. Main.

The court holds that the Public Service Commission has power to regulate rates so long as these do not exceed 5 cents, and to require adequate and sufficient service within this limitation, having due regard to the right of the company to earn a reasonable return upon the value of the property devoted to public use. This language is interpreted to mean that while a railway cannot avoid payment of gross earnings tax, paving charges, contribution to the cost of bridges, and other requirements included in the franchise it accepted, and may not charge more than a 5-cent fare, it can be required to furnish only such service as it may under these conditions and still earn a reasonable return upon the value of its investment. In case of congested traffic, it will remain for the commission to decide whether the company can be ordered to operate additional cars, or otherwise improve its service, within the statutory restrictions, as to franchise conditions and fare limitations which the court holds to be clear and decisive.

In brief, the court decision sustains the power granted cities by the enabling act of 1890 to authorize or prohibit the construction of railways upon its thoroughfares against the contention of the railway interests of Seattle and Tacoma that through the public service commission act the police power of the State had later been extended over franchise jurisdiction. The franchise right is held to be a clear and specific grant by the State to the city of authority to impose terms and conditions upon which its streets may be used, a transfer by the Legislature to the city of the whole of the State's police power for this purpose. The Supreme Court, in its decision, said in part:

"Whether the Legislature has power to confer upon the Public Service Commission the right to abrogate conditions in franchises to street car companies which had been granted prior to passage of the Public Service Commission law is not before us and we neither express nor intimate an opinion thereon.

"The public service law is remedial legislation and should be given liberal construction for the purpose of carrying out the will of the Legislature, but the rule of liberal construction does not mean that the court shall write conditions and provisions into the statute where the Legislature has passed none, or write out of the act a section which the Legislature has placed there when the various sections of the statute are not in irreconcilable conflict and may be harmonized."

J. B. Howe, general counsel for Stone & Webster, had argued that section 25 of the public service law, fixing street car fare limit at 5 cents and section 53 of the same act, requiring adequate, sufficient service upon condition that the company be able to earn a reasonable return upon its investment, were in conflict when it had been proved to the commission that the company could not furnish adequate service when its income was not sufficient to pay a reasonable return, and that section 53 as the latter enactment, took precedence over 25.

The Supreme Court holds section 25 to be an express mandate of the Legislature that fares are not to exceed 5 cents and there was no intention by section 53 to confer power upon the commission to abrogate the express declaration. By assuring the company a reasonable return within the franchise conditions and fare limitation imposed the court brings the two sections into harmony and holds the act thus declarative to the plain intent of the Legislature. As to further consideration the court says:

THE COURT'S WORDING

"If, as found by the commission, the revenue of the petitioner, based upon a 5-cent fare, is not sufficient to provide adequate service, and at the same time afford reasonable and proper income, the remedy is with the legislative branch of the government and not with the court. It is the duty of the court to construe the law as it finds it. The writ is denied."

The case came up from Tacoma on application by the Tacoma Railway & Power Company for a writ of mandate directing the Public Service Commission to order adequate service, regardless of franchise requirements and fare limitation, if the commission found these prevented the company supplying such service. In a previous hearing the company had pleaded better service impossible on present earnings.

Commissioners F. R. Spinnings and A. A. Lewis, rendered a majority opinion holding the commission powerless to abrogate franchise requirements and to increase the fare above 5 cents. At the same time they declined to order increased service on the company's showing of inability to do so on its income and still make a reasonable return.

Chairman E. F. Blaine held the commission to be invested with power to abrogate any franchise or fare conditions that prevented the rendering of adequate service, and by private counsel appeared before the Supreme Court in support of the writ asked by the company W. V. Tanner, as Attorney-General, was to appear for Spinning and Lewis, but on the morning the hearing was called they refused to verify Mr. Tanner's presentation of their case on the ground that it was technical rather than decisive of the issue involved.

SEES CITY AS VICTOR

Hugh M. Caldwell, Corporation Counsel of Seattle, in discussing the decision said:

"The decision sustained the contention we have been making to the effect that the Public Service Commission has no authority to grant an increase in rates above the 5-cent maximum fixed by the Statute, nor to relieve the companies of any of their franchise obligations.

"The decision as I understand it, means that the Public Service Commission must now decide in favor of the city, in the case which it has held under advisement since last July, in which we contended that the commission has no jurisdiction to relieve the Puget Sound Traction, Light & Power Company of its franchise obligations."

A. W. Leonard, president of the Puget Sound Traction, Light & Power Company, in a recent communication to the Mayor and City Council, asked that the franchise provisions of the company be suspended during the period of the war, without prejudice to the right of the city to enforce them thereafter. The particular franchise provisions which the company desires set aside during the period of the present emergency are the 5-cent fare limitation, the requirement to pay 2 per cent of its gross earnings into the city treasury, and the requirement that it pave its right-of-way and 18 in. on each side of the tracks on paved streets. In his communication, Mr. Leonard called attention to the far-reaching effect of the decision in which the Supreme Court held that the Public Service Commission was without authority to relieve a utility company of its franchise obligations. Mr. Leonard's communication was referred to the franchise committee of the Council.

Mayor Hanson has urged the city authorities to be very careful before changing the terms of the original grant without a vote of all the people of Seattle. The Mayor points out that the company now comes to the City Council for relief which it failed to obtain from the Public Service Commission and the courts. He regards it as unfortunate that the company did not approach the city authorities in the first place. He says the city is interested in service first, last and all the time.

Denver Fare Appeal

Company There Wants Increased Fare or Other Relief from Burdensome Conditions

The Denver (Col.) Tramway on May 3 filed with the Public Utilities Commission of Colorado a petition for increased fares or other relief. The petition recites that because of the increase in the cost of labor and material and the necessity for further increasing the wages of employees and the imperative requirements in track construction, new rolling stock and replacements of equipment, the company requires greater revenues than are produced by the 5-cent fare. The company is publishing its petition in full in all the daily newspapers and is asking thorough, frank consideration of the problem by the entire community.

EMPLOYEES APPROVE MOVE

The Tramway Brotherhood, composed of all tramway employees, discussed the company's situation at several meetings prior to the filing of the petition. Resolutions were adopted by the Brotherhood similar to resolutions passed by the committee of twenty-one employees which had previously conferred upon the same subject. These resolutions follow:

"Resolved, that it is the sense of this committee that, first, tramway employees have full confidence in the fairness of the officers of the company and their desire and effort to deal squarely with the men in wages and working conditions; second, that the tramway employees should earnestly help the company to secure higher fares; third, that while we feel we should have and fully expect higher wages than we are now receiving, we believe that the best and most important help of the employees is first to stand solidly by the management in the campaign for higher fares and see that no one in the company or out of the company is permitted to rock the boat on the wage question."

In its petition the company does not suggest what relief the commission shall give and does not ask for any specific increase in rates nor any specific interest return, but leaves all to the commission's findings after consideration of the facts.

On May 6 the commission ordered a complete inventory and appraisal of all tramway property. The entire commission organization will be put to work on the application.

Bay State Zone Case Closed

Main Points in Zone Location Tentatively Settled in Bay State Street Railway Rate Case—General Principles Reviewed

S. H. Pillsbury, counsel for the Bay State Street Railway, informed the Public Service Commission of Massachusetts at a recent hearing on the company's proposed zone rates that as the result of conferences with municipal representatives and citizens in the various communities served by the road, the main questions of zone location had been very nearly settled. A number of the suburban communities had requested the establishment of special commutation tickets; but W. B. Donham, receiver of the company, felt that it would be inexpedient at this time to take up the question of additional tickets, on the ground that if general commutation tickets were to be established in the suburban districts or interurban zones, where workingmen's tickets only exist, it would involve an adjustment of the latter.

Both of these matters (Bay State schedules No. 75 and No. 62) are under consideration by the commission for decision, having been formally heard during the winter. The company holds that it cannot attempt to deal with the matter of general commutation tickets until after the board has acted.

Mr. Pillsbury said that the general principle of the zone system appeared to be satisfactory to almost everybody engaged in the conferences.

Robert B. Stearns, vice-president of the Bay State Company, then reviewed the conferences held by the company's representatives and to community groups, discussing in detail the local zone and fare points gone over.

Representatives of Revere expressed a desire for a 6-cent fare to Boston, pointing out that this rate obtained between Malden and Boston on the Bay State lines. It was indicated by the company that the special tickets planned, if applied to Revere, would give a 6¼-cent off-peak rate to Scollay Square, as well as a 7-cent all-day rate.

EXTENTION OF ZONE LIMITS DESIRED

Various extensions of the zone limits were requested by representatives of the Lynn district and were tentatively conceded by the company. Saugus representatives desired a lower minimum than a 6-cent fare and suggested covering two zones for 5 cents; but the company did not feel that it could reduce the minimum rate below 6 cents. These conferees also desired that the zone limits be not made a point, but an area to cover, say, the first and second pole stops in either direction beyond the zone limits outlined in the company's zone schedule No. 77.

Mr. Stearns said that the establishment of a zone area limit rather than a zone point limit would lead to extremely bad practice in overlapping zones with very difficult fare collection problems, with a reduction of revenues and an interminable amount of trouble, not really essential to the successful application of the zone system. An extension of zones was also desired to reduce the rate to Lynn, the intimation being given that patronage would otherwise be deflected to a paralleling steam line. The company could not see its way clear to this concession and pointed out that the steam railroad fare from Franklin Park station to Lynn was 10 cents against a present 6-cent rate and proposed 8-cent rate, with an intermediate off-peak proposed ticket rate of 6¼ cents and an all-day ticket rate of 7 1-7 cents on the Bay State road.

WORKINGMEN'S TICKETS A PROBLEM

In Peabody, the company was disposed to adopt a workingmen's ticket to Lynn with transfer to any part of the city zone in Lynn, at a rate of 11.2 cents, or 70 per cent of the cash fare, as between the cities of Lynn and Salem. This was in place of a 10-cent rate proposed by Peabody representatives, and was designed to facilitate travel between the plants of the General Electric Company at Lynn and the neighboring communities of Salem and Peabody.

Mr. Stearns said that the Danvers zone points were acceptable in conference, and that the company inclined toward a 7-cent workingmen's ticket from Danvers to any part of the city zone of Peabody, Beverly or Salem. The receiver had under consideration the propriety of adjusting the rates between certain outlying points through the medium of a reduced rate ticket, perhaps good all day and sold at a higher rate than the workingmen's ticket. On such event the workingmen's tickets paralleling such reduced rate tickets would be cancelled.

For Essex, Mass., it was urged that the fares established were excessive and would destroy business. It was contended that a low fare would promote traffic, but the company pointed out that while such might apply to the cities, it was doubtful if there was any short-haul traffic to promote in such a district as Essex. It was also pointed out that while the company was reducing the city fare unit in its new schedule, it was also materially cutting down the length of haul. No concessions could be offered by the company for North Reading, which will have the regular rate per mile on its through line and a somewhat higher rate on a spur line which has a very low traffic density, and is under consideration for abandonment. The company was willing to extend the city zone limit in Lowell from Keefe Square to Pleasant Street, but did not favor concessions to the Vesper County Club in view of the automobile travel to and from the latter. Workingmen's tickets were conceded to Billieria Center from Lowell at 9.8 cents and to High Street to and from Lowell at 8.4 cents. Receiver Donham could not agree with Lake View Park summer cottage residents that reduced rates should be granted to persons fortunate enough to spend their summer in the country.

There was some demand for a wholesale extension of the stub ends of the city zones into the outer zones, but this could not be conceded. A relocation of the traffic center to the intersection of Lawrence and Essex Streets, Lawrence, was agreed upon, with a statement by the company agreed to by the representatives of the community that there was no occasion for the company to establish a public waiting room on a city system. The company agreed to consider establishing a special ticket at 8½ cents per ride from Elm Square, Andover to Lawrence, to avoid jitney competition which is not desired by the best opinion in Andover.

Representatives of Newburyport desired two 3-cent zones in place of the two 2-cent zones outside the Massachusetts northeastern line leaving the city, combined with a 5-cent fare on the latter. It was suggested that the Bay State Company institute these 3-cent zones so that residents of the community concerned could ride to the middle of the second zone for 3 cents instead of 4 cents as at present planned. The Bay State Company felt that the zone points should be left as planned, but was ready to establish a charge of 3 cents per mile.

PATRONS SOUTH OF BOSTON REASONABLE

With regard to the lines south of Boston, Mr. Stearns said that representatives of the Quincy district requested that the first zone on the Rockland-Braintree route south of Lincoln Square should be at the rate of 2 cents instead of 2.5 cents. The company considered this a reasonable request and was willing to act on the matter favorably, in view of the density of population on this route. It was also willing to extend the limit of workingmen's tickets from Alger's Corner to Eastondale Post Office.

The company was asked to establish a workingmen's ticket at the rate of twenty rides for $1.50 between North Dighton and the Taunton city zone in place of the scheduled 10-cent fare. The receiver felt that no concession in this matter should be made at present in view of the serious inroads of the various demands upon the company's estimated revenue.

Minor changes in zones or ticket arrangement were looked upon favorably by the company in conferences with representatives of the Bridgewater district, Brockton, Fall River and other communities in the southeastern part of Massachusetts. At Fall River there was some demand for a 5-cent fare from points in the city zone to the transfer station with a 1-cent transfer or through ride charge. Combined with some zone changes outside, but the company could not concede any general change in fares in one city without treating the other cities uniformly.

It appeared that the zone rates now proposed meet the conditions better than general suggested changes of local origin. Under the new schedule the longest ride for 6 cents is about 3 miles.

The hearing was closed after a detailed discussion of the local effect of the proposed zone system was presented by representatives of the cities and towns affected.

Indianapolis Case Serious

Local Company Unable Promptly to Meet Its Franchise Obligations Because of Insufficient Funds

The Indianapolis Traction & Terminal Company, Indianapolis, Ind., notified the city of Indianapolis on May 1 that owing to the fact that the revenues of the company had not produced sufficient funds, due to war conditions, the company would be unable promptly to pay the franchise tax of $30,000 due the city on May 1.

REVIEW OF FARE MOVEMENT

The company has been seeking for several months past to present its case to some public body in an effort to obtain the elimination of the reduced rate tickets sold on the city lines in Indianapolis and to establish a straight 5-cent fare.

At the hearing on the petition of the company before the Public Service Commission in November, 1917, the commission ruled that it did not have jurisdiction in the case. An appeal was taken to the Circuit Court of Marion County, but the court sustained the ruling of the commission. The case was then appealed to the Supreme Court of the State and argued on Feb. 7, but no decision has yet been handed down in the matter.

Efforts to have the city authorities take action to modify the franchise contract so as to provide an increase in fares which will produce sufficient revenue to meet increased operating expenses have failed to obtain results.

AROUSING THE PUBLIC INTEREST

As a result of the failure of the company to pay its franchise tax on May 1, the interest of the newspapers and the public has been drawn to the case. In a quarter page advertisement on May 5, the company states that it has for months been seeking some official body that had the power and willingness to hear the facts relative to its need for more revenue in order to give adequate service; that Indianapolis is not getting adequate service at present because an average of thirty cars a day are left in the carhouses on account of lack of men to run them; that the employees deserve more pay, but that the company is unable to increase wages under present conditions. An appeal is made to the citizens to insist that some public authority take up the question of railway service in Indianapolis, investigate it thoroughly and act in the public interest.

Transportation News Notes

Pottsville Asks for Higher Rates.—The Eastern Pennsylvania Railways, Pottsville, has filed an application for an increase in fares.

Toronto May Use Women.—The Toronto (Ont.) Railway proposes to advertise for women for use on its cars at the same rates of pay received by men.

Paducah Increase Allowed. — The Board of Commissioners of Paducah, Ky., has granted the request of the Paducah Traction Company for an increase in fares from 5 cents to 6 cents.

Skip Stops for Seattle Suburban Line.—The Seattle & Rainier Valley Railway, Seattle, Wash., has petitioned the City Council for permission to discontinue seventeen stops on its line, as a means of providing faster service. The petition has been referred to the franchise committee.

Commerce Body Urges Fare Increase.—The Chamber of Commerce of Trenton, N. J., on May 6 filed with the Board of Public Utility Commissioners a petition asking for increased fares for the Trenton & Mercer County Traction Corporation. The City Commission is opposed to the proposed increase.

Patriotic Number of Utility News.—Dan G. Fisher, who edits *Texas Utility News*, the company paper of the Texas Power & Light Company, has given the April issue a distinctly patriotic aspect. Many of the articles relate to the war, there is a double-page group of the Red Cross Girls of the Dallas office, and the honor roll of the company appears on the two final pages.

Another Illinois Company Wants Increase.—The Sterling, Dixon & Eastern Railway, Dixon, Ill., has filed a petition with the Public Utility Commission of Illinois asking for a 6-cent fare in Dixon and Sterling, a 10-cent fare between Dixon and the State Epileptic Colony and a 30-cent fare between Sterling and Dixon, with transfer privileges included in the increase to 30 cents between the two cities.

Passengers Asked to Step Inside.—The Trenton & Mercer County Traction Corporation, Trenton, N. J., is having distributed to its patrons by members of the Mercer County Central Labor Union cards bearing the following request: "Please step inside the car. In the interest of safety and better service, passengers are asked not to stand on the platforms when there is room inside the car. Peter E. Hurley, general manager."

Ten-Cent Fare in Manistee. — The City Council of Manistee, Mich., has passed an ordinance raising the regular city fare on the Manistee City Railway to 10 cents, with a commutation rate of three tickets for 25 cents and seven for 50 cents. The fare has been 5 cents for adults, with 2½ cents for school children. Manistee has a population of about 13,000. The railway there is controlled by the Commonwealth Power, Railway & Light Company.

Tariff Changes Put Off.—The Public Service Commission of the Second District of New York has ordered that the operation of tariff schedule of the Binghamton Railway, proposing to effect a stoppage of sale of reduced rate tickets, be further suspended until June 29. Residents of Binghamton and Johnson City filed a complaint against the railway and the commission began an investigation. It is stated that an extension of time has been asked by the interested parties to give them further opportunity to adjust the differences.

Northampton Fare Hearing Set for June 11.—A hearing upon the proposed increase in fares on the Northampton, (Mass.) Street Railway has been set for June 11 by the Public Service Commission of Massachusetts. Counsel for the company and for the citizens of the territory served agreed at a preliminary hearing in Boston on May 7 to a postponement pending action by the Legislature on a general service-at-cost bill for electric railways exclusive of the Boston Elevated, for which a public control bill has been drawn.

Will Not Act on Bridge Fares.—The Public Service Commission of the First District of New York has replied to Alderman Vladeck saying that until "the city entered in the proper kind of a contract" with the Bridge Operating Company, a subsidiary of the Brooklyn Rapid Transit Company operating cars over the Williamsburg Bridge, it would take no action looking toward a reduction in the fare charged on the line. The company is now operating under a temporary permit. Alderman Vladeck wanted the fare reduced from 2 cents to 1 cent.

Vancouver Ads Reproduced. — The British Columbia Electric Railway, Ltd., Vancouver, B. C., has published in the form of a sixteen-page pamphlet the series of advertisements recently used in the Vancouver daily papers. The advertisements appear in the same size as they did in the newspapers. Their purpose was to make the patrons of the company acquainted with its business, and they covered the general fundamental principles of electric railway economics. They are now reprinted for those interested in the complete story of utility operation.

New Fall River-Newport Tariff.—A new passenger tariff has been announced by the Bay State Street Railway for Fall River, Newport and intermediate points. It becomes effective on May 29 and increases the fare between Newport and Fall River, 6 cents, though at either end transfer privileges are operative within the city limit. The fare in Newport and in Middletown remains 5 cents in each zone. The only change made is in reality the splitting of Portsmouth into two zones, as Fall River already has the 6-cent fare.

Adverse Report on Women Conductors.—Operation of street cars is one of the last occupations into which women should be "lured or forced." Such is said to be the conclusion reached as the result of an official investigation by the Federal Bureau of Labor Statistics, made in New York City by Benjamin M. Squires. The full report will appear in the May issue of the *Monthly Review of Labor Statistics*, now on the press. According to the preliminary announcement of the findings, Mr. Squires believes that "it must be evident to any thinking person that it is practically impossible to make the conditions of street railway employment even tolerably endurable to women employees." Two adverse conditions are said to be the length and the irregularity of the hours.

Public Service Hearings Resumed—The hearings on the higher-fare application of the Public Service Railway, Newark, N. J., which were last noted in the ELECTRIC RAILWAY JOURNAL of April 6, were continued on May 8 and 9. After the long adjournment city counsel began the cross-examination of company witnesses, the first being Thomas Conway, Jr., professor of finance at the University of Pennsylvania. Mr. Conway expressed himself as favoring the principle of the service-at-cost plan and also as sympathetic toward a zone system. He said, however, that he was opposed to the chopping up of properties into zones without careful study. He thought that a horizontal increase in unit fare, at least as a temporary measure, would be best, and then, if advisable, the zone question could be investigated as rapidly as possible.

Fare Increase Granted to Peekskill Company.—The village trustees of Peekskill, N. Y., have passed a resolution. authorizing the Peekskill Lighting & Railroad Company to increase its fare from 5 to 6 cents, with the stipulation that it reopen the Putnam Railway between Peekskill and Oregon. This road got a separate franchise when the Rev. Dr. Ladd, Oregon, organized and built it. Later it was leased by the Peekskill company which abandoned it a month ago because of jitney competition. Residents along the line have banded together and agreed to patronize the Putnam line, and the Peekskill company can collect another cent on all lines if it resumes operations to Oregon. Fares which were raised in Peekskill several weeks ago without the village's consent were reduced again as a result of the Court of Appeals decision.

Metal Ticket Supply Exhausted.—The Dallas (Tex.) Railway has experienced such a lively demand for the new metal tickets, which are sold at twenty-two for $1 for regular adult fares and forty for $1 for children's half fare or school students' fares, that it has been found necessary to order an additional supply. The company at first ordered 50,000 of the regular adult fare tickets, 50,000 of the school students' tickets and 10,000 of the children's half-fare tickets. The company has placed an order for 50,000 more of the adult fare tickets and 10,000 more of the children's half-fare tickets. The new cash fare register boxes have been installed on all cars in the city and the metal tickets are now in use.

Jitneys a Problem Again in Portland.—On May 17 the voters of Portland, Ore., will be asked to pass upon the ordinance providing for the regulation of jitneys in that city. The City Council unanimously voted to place on the ballot an ordinance providing for a bond of $1,000 for each jitney operated, or a bond of $10,000 for any organization operating more than ten cars. The Jitney Drivers Union backs this measure, and under its terms the union could operate any number of cars by providing one bond. An independent driver entering the business would have to furnish a bond of $1,000. The Portland Railway, Light & Power Company is circulating initiative petitions to secure sufficient signatures to permit of a second ordinance being placed on the ballot providing for jitney regulation.

Fare Cases of Small Jersey Roads Heard.—The Board of Public Utility Commissioners of New Jersey on May 7 held hearings in the cases of the Atlantic & Surburban Railway, Pleasantville, and the Jersey Central Traction Company, Keyport, which are seeking higher rates. The Atlantic & Suburban Railway wants to increase the rate from Pleasantville to Absecon from 5 cents to 6 cents, and from Pleasantville to Somers Point or Atlantic City from 10 cents to 12 cents. The Atlantic City & Shore Railroad also has an application on file for an increase between Pleasantville and Atlantic City from 10 cents to 12 cents. A hearing will be held later on the matter. The Jersey Central Traction Company wants to increase its fare from 5 cents to 7 cents from Perth Amboy to other towns.

Electric Included in New England Increase.—Increases in class freight rates ranging between 5 and 15 per cent, and in passenger rates to 2¾ cents a mile on New England railroads were allowed on April 27 by the Interstate Commerce Commission. The commission ordered that mileage rates be increased to an average of 2⅝ cents, and authorized other changes in passenger schedules. Among the changes is one providing for increased zone fares on the Providence, Warren & Bristol branch of the New York, New Haven & Hartford Railroad as proposed, subject to further consideration as indicated in the report. This line is operated by electricity. It extends from Providence to Warren, R. I., where it divides into two branches, one running to Bristol, R. I., and the other to Fall River, Mass. The distance from Providence to Fall River is 19.4 miles and from Providence to Bristol 16.19 miles.

Personal Mention

V. J. Hanley has resigned as train dispatcher of the Eastern Wisconsin Electric Company at Oshkosh, Wis., to enlist in the engineering corps.

John Bauer has resigned as master mechanic of the Eastern Wisconsin Electric Company at Oshkosh, Wis., to enlist as a mechanic in the aviation corps.

George Hudson, formerly with the Tampa (Fla.) Electric Company, is now superintendent of equipment with the Monongahela Valley Traction Company at Fairmont, W. Va.

B. L. Grooms, for some time superintendent of transportation of the Savannah (Ga.) Electric Company, is now filling a similar position with the Key West (Fla.) Electric Company.

Joseph E. Bonfils, Jr., agent for the Bluegrass Traction Company, at Paris, Ky., has accepted a position in the auditor's office at Lexington. He has been succeeded at Paris by S. E. Borland.

C. Brazel, auditor of the Ottumwa Railway & Light Company, Ottumwa, Iowa, has been appointed auditor of the construction department of the Northern States Power Company, with headquarters at Minneapolis.

Prof. Dugald C. Jackson, in charge of the department of electrical engineering at the Massachusetts Institute of Technology, has been commissioned a major in the Engineer Reserve Corps and has been ordered "over there."

J. F. Owens,, vice-president and general manager of the Oklahoma Gas & Electric Company, Oklahoma City, Okla., was elected president of the Oklahoma Gas, Electric & Street Railway Association at the annual convention in Oklahoma City on April 22-24.

William N. Bissell, assistant treasurer of the Houghton (Mich.) County Traction Company and Houghton County Electric Light Company, has resigned to enlist with the Headquarters Department Thirteenth Engineers, Railway, U. S. Army, American Expeditionary Force.

Le Roy T. Harkness, who is now a major in the United States Officers Reserve Corps, attached to the ordnance section and engaged in administrative duties at Washington, has resigned his postion as chief of rapid transit under the Public Service Commission for the First District of New York.

H. A. Cowgill, formerly with the traction department of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., is now general superintendent of the Mansfield Public Service & Utility Company. The Mansfield system has now the equivalent of 22 miles of track including the interurban railway to Shelby.

Garrett O. House, whose appointment as superintendent of the St. Paul (Minn.) City Railway, Twin City Lines, was noted briefly in the ELECTRIC RAILWAY JOURNAL for May 4, will take office on or about May 20. Mr. House is a native of New York State. For fifteen years previous to 1904, when he came to St. Paul, he was engaged in civil engineering work, municipal, state and railroad. He acted as city engineer of Poughkeepsie, N. Y., for several years and was an assistant engineer under the State engineer of New York State engaged in the enlargement of the Erie Canal and State highways. He was identified with the location and construction of the Troy & Sand Lake Electric Railway and also with the change in motive power on Poughkeepsie City Railway from horses to electricity. In 1904 Mr. House went to St. Paul as the representative of Eastern capitalists promoting the public utility corporation now known as the Northern States Power Company. He helped to obtain the necessary franchises and directed the installation of steam and electric equipment. In 1909 Mr. House performed special work, directing the installation of large, electrically operated coal docks for the North Western Fuel Company at Superior, Wis., including 13,000-volt trolley lines and all auxiliary equipment. Since 1912 Mr. House, as general superintendent, has reorganized and readjusted the business methods and equipment of the St. Paul Water Department. His administration has gained the confidence and approval of the general public in St. Paul and demonstrated his ability as a technical-business executive.

G. O. HOUSE

Alfred Sweeney, who has been assistant general manager of the Cumberland County Power & Light Company, Portland, Me., since last October, has been appointed general manager of the Lewiston, Augusta & Waterville Street Railway, which is controlled by the Cumberland County Power & Light Company. Mr. Sweeney will hereafter make his headquarters at Lewiston instead of Portland, but still retains his connection with the Cumberland County Power & Light Company. A portrait and biography of Mr. Sweeney were published in the ELECTRIC RAILWAY JOURNAL at the time of his advancement from assistant to the general manager of the Cumberland County Power & Light Company to the position of assistant general manager.

Obituary

Thomas H. Smallman, vice-president of the London (Ont.) Street Railway and a prominent citizen of London, is dead.

Arnold von Siemens, of Siemens & Halske, is dead, according to a dispatch from Berlin. He was born in Berlin in 1853.

Frederick G. Brownell, who constructed the first street railway in Muncie, Ind., is dead at his home in Malden, Mass. The line, known as the "dummy," was operated by small locomotives. After the system in Muncie was electrified Mr. Brownell went into other business.

B. P. Waggener, one of the promoters of the Atchison Railway, Electric Light & Power Company, Atchison, Kan., and afterward a vice-president of the successor company, the Atchison Railway, Light & Power Company, now included in the properties of the Illinois Traction System, died at his home in Atchison recently at age of seventy-one.

Joseph Speidel, prominent in business and banking circles in Wheeling, W. Va., is dead. Mr. Speidel was born in Wheeling seventy-five years ago. He founded the Speidel Grocery Company many years ago. Later he became interested in other business enterprises and at one time is said to have held the controlling interest in the Wheeling & Elm Grove Railway, now included in the system of the West Virginia Traction & Electric Company, Wheeling.

John J. Cummings, president of the McGuire-Cummings Manufacturing Company, Chicago, Ill., and chairman of the board of directors of the Chicago & West Towns Railway, died on May 4 in Chicago after a short illness. Mr. Cummings had been associated with his brother, Walter J. Cummings, in the manufacture of street and interurban railway cars and trucks for the last fifteen years. He was also financially interested in several electric railway properties, one of which is the Denver & Inter-Mountain Railroad, Denver, Col., now owned by the Denver Tramway. He is survived by his widow and three children.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Recent Incorporations

***Cooke County Transit Company, Lewiston, Mont.**—Incorporated to construct a line from a point near Gardiner along the Yellowstone River to the Lamar River to Soda Butte Creek. Capital stock, $1,500,000. Tom Stout, Lewiston, is among the incorporators.

Cincinnati & Dayton Traction Company, Cincinnati, Ohio.—Incorporated as a reorganization of the Cincinnati, Dayton & Toledo Traction Company, which is operated as a part of the Ohio Electric Railway. Capital stock, $1,250,000. Among the incorporators are J. M. Hutton, chairman of the bondholders, protective committee, and Leo J. Van Lahr, vice-president of the Columbus, New Albany & Johnstown Traction Company.

Franchises

Mobile, Ala.—The Mobile Light & Railroad Company has received a franchise from the City Council to construct a single track connecting with the track now on Charleston Street at the intersection of St. Emanuel Street, southwardly along St. Emanuel Street to Texas Street and westwardly on Texas Street to connect with the line on Cedar Street. The construction of the line is intended to furnish street car service for shipyard employees.

Chester, Pa.—The Philadelphia Rapid Transit Company has received a franchise from the City Council granting permission to make various improvements and extension to its traction system to facilitate the transportation of workers to the munition and shipyard plants in Chester and Eddystone.

Track and Roadway

Shore Line Electric Railway, Norwich, Conn.—It is reported that the Shore Line Electric Railway will reconstruct its tracks at Ocean Beach, New London. Heavier rails will be laid.

New Orleans Railway & Light Company, New Orleans, La.—Work will be begun at once by the New Orleans Railway & Light Company on the construction of an extension to the proposed site of a shipbuilding plant on the Ship Basin and Industrial Canal.

Winnipeg (Man.) Electric Railway.—It is reported that the Winnipeg Electric Railway will complete work involving the expenditure of $2,000,000.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—All efforts have been temporarily abandoned by the Washington, Baltimore & Annapolis Electric Railroad to secure permission to loop its cars around the block bordered by Thirteenth Street, New York Avenue, Twelfth Street and H Street.

Boston (Mass.) Elevated Railway.—The new Mystic River bridge of the Boston Elevated Railway has been practically completed. The bridge is a part of the new elevated structure which is being built by the company to Everett. The structure is double-tracked and extends a little more than a mile from Sullivan Square to a temporary terminal station near Bowdoin Street. It is expected that the line to Everett will be ready for operation early in the fall.

Kansas City (Mo.) Southern Railroad.—Electric power will be installed by the Kansas City Southern Railroad on its drawbridge across the Neches River at Beaumont, Tex.

***Scottsbluff, Gering & Southern Railway, Scottsbluff, Neb.**—Plans have been proposed by A. D. Bowen, Grinnell, Iowa, to the Commercial Club of Scottsbluff, for the construction of an electric railway to connect Scottsbluff and Gering. The following committee was appointed to investigate the plans: H. Leslie Smith, Cullen Wright, Fred H. Roberts, William Morrow and T. L. Green.

Public Service Railway, Newark, N. J.—The routes of the Woodbury and National Park branches of the Public Service Railway from Camden will be changed through Washington Park at the request of the Government, which is building a large bag-loading and distributing plant along the Delaware River.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The City Commission has granted permission to the Trenton & Mercer County Traction Corporation to string its wires on poles on South Broad Street, between Liberty Street and Cedar Lane, belonging to the Public Service Corporation and the Bell Telephone Company.

Cincinnati (Ohio) Traction Company.—Mayor John Galvin has requested the Cincinnati Traction Company to proceed at once with the construction of an extension of its Warsaw Avenue line.

Lake Shore Electric Railway, Lorain, Ohio.—Work has been begun by the Lake Shore Electric Railway on its Cromwell extension.

Philadelphia, Pa.—Mayor Smith and Director of City Transit Twining recently conferred on the status of transit work now in progress. Director Twining reported that construction operations have been stopped everywhere except in the City Hall section of the Broad Street subway, where the contractor has about 300 men working.

Levis County Railway, Levis, Que.—It is reported that the Levis County Railway contemplates improvements to its electric railway amounting to $150,000.

Seattle (Wash.) Municipal Railway.—The Board of Public Works, Seattle, recently awarded to the Industrial Machinery Company, Seattle, contract for 514 gross tons of 60-lb. No. 1 relay rails at $68 a ton, including angle bars, to be used in the construction of the new municipal railway into the industrial district. C. Geske & Company, Seattle, received the contract for material and construction of the second section of the elevated line, beginning at a point 500 ft. north of West Spokane Street, on East Marginal Way, then on West Spokane Street to the west line of Kipsap Avenue. Initial work on the extension of the municipal car system was begun recently when grading commenced on the portion of the line between Holgate and Horton Streets, which is to be a surface railroad.

Shops and Buildings

Piedmont & Northern Electric Railway, Charlotte, N. C.—The 4 C's Company, Charlotte, has been awarded a contract for the construction of a passenger station for the Piedmont & Northern Electric Railway at Charlotte. The structure will be 40 ft. x 110 ft., one-story, semi-classic style, exterior trimmed with tapestry stone and brick.

Lake Shore Electric Railway, Lorain, Ohio.—Work will soon be begun by the Lake Shore Electric Railway on the construction of a new station in the village of Huron.

Power Houses and Substations

Kansas City (Mo.) Railways.—A contract will soon be awarded by the Kansas City Railways for the erection of a substation at 1017 Oak Street, to cost about $25,000.

Manila Electric Railroad & Light Corporation, Manila, P. I.—The J. G. White Management Corporation, New York, N. Y., recently placed an order with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., for a new 7500-kva. turbine as an addition to the power house installation of the Manila Electric Railroad & Light Corporation, which it controls.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Scrap Dealers Allowed a Commission on Sales

The War Industries Board Acts Favorably On the Application—Strict Conditions of the Order

For a while the impression prevailed that dealers in scrap metal would not be allowed a commission by the War Industries Board in handling their business, although they requested it urgently. The board, however, has acted favorably on the application, deciding that 3½ per cent would be allowed, effective May 1. The formal order to that effect follows:

1. Consumers of scrap iron and steel employing an agent to purchase scrap for them, at their discretion, may pay as compensation for such service, a sum not exceeding 3½ per cent of the agreed price at which such material is to be delivered, in cases where the agent guarantees the quality and delivery of an agreed tonnage of the material. This compensation shall be shown as a separate charge in billing; the material may not be invoiced at any price in excess of the maximum announced.

2. Under no circumstance may a dealer or broker split or divide this extra sum which may be allowed him by a mill with any other dealer, broker or producer, and the highest price that any one under any circumstances may pay is the maximum price as stated in the announcement of the War Industries Board under date of March 26, 1918.

Price at Shipment—Rigid Rule on Rails

Orders Only Accepted by Mills at Their Convenience for Rolling and Shipping

A report that there is a scarcity of all sections of rails with only occasional lots from unexpected rollings available for immediate shipment is confirmed by the large producers. One of the Eastern mills is about to roll 80 to 85-lb. sections and has made a few sales of "seconds" from stock. Industrial railways are constantly in the market for medium section rails, running from 75 to 85 lb., and mining roads and lumber camps are seeking to place orders for light sections. Government contractors are also buying rails and track supplies, including frogs and switches and switch stands. Some of these orders are being placed directly by the government.

Some time ago the ELECTRIC RAILWAY JOURNAL mentioned that a leading Eastern subway system was in the market for 10,000 tons of heavy sections for its 1919 requirements. The company is still seeking to place the order. The mills decline to accept its terms it was stated by one of the largest steel rail producing concerns in the country. This concern stated that rails of this kind were all of special rolling, and that there had been no change in price, 500 ton lots, A.S.C.E. standard rails, being quoted at $65 a ton; smaller quantities at $70 to $80 a ton.

To-day this and other plants will not take orders except at the convenience of the mill for manufacturing and shipment. The price is to be that prevailing at the time of shipping only. This is the rule and it is rigidly enforced. Merchant steel for miscellaneous electric railway material comes in such small lots, in comparison to rails, that it is hard to say when a rolling would be made.

Record Coal Production

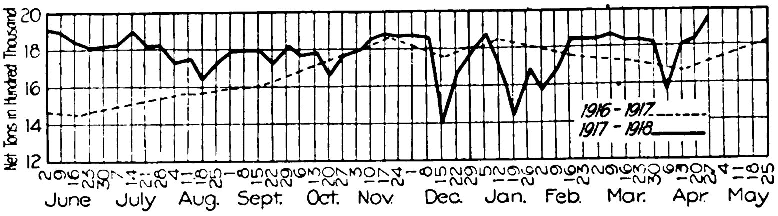
Bituminous Output Still Rising—Last Week of April Shows Highest Rate in Twelve Months

The week ended April 27 recorded not only the highest rate of production of bituminous coal during the past twelve months, but the third successive week of rising production, it is reported by the Geological Survey.

Production of bituminous coal (including lignite and coal made into coke) is estimated at 11,668,000 net tons, an increase of 5.7 per cent over the preceding week. The average production per working day is estimated at 1,946,000 net tons compared with 1,840,000 net tons last week, and 1,680,000 net tons during April, 1917.

Production for the month of April, 1918, is estimated at 46,478,000 net tons, an increase of 4,400,000 net tons, or 10 per cent over April of last year. Production for the four months ended April, 1918, is estimated at 181,992,000 net tons, an increase of more than 5,000.000 net tons or 3 per cent compared with the same four months of 1917. There has also been an improvement in car shortage conditions to mines.

Anthracite shipments slightly increased during the week of April 27.



BITUMINOUS COAL PRODUCTION SHEET

Weatherproof Wire Marked Up

Increasing Cost of Cotton is the Cause—Scarcity of Tin May Affect Rubber Covered

Weatherproof wire has responded to the increasing cost of cotton by an advance of from 1 to 2 cents a pound recently. Cotton has more than doubled in cost within a year and therefore weatherproof manufacturers feel justified in adding their extra expense to the finished article. In fact, the cost of production has steadily been going up fractionally for some time. Jute, which is used as an insulating material on copper cable, is also high and difficult to obtain, and therefore a revision of quotations may also be made on the goods.

A difference of figures is noted with various producers. One large company, selling in quantities, quotes 26½ cents a pound for weatherproof, declaring no change in price has occurred for several months. A second manufacturer of equal standing, which specializes on power house orders, quotes from 25 to 26 cents, and states it is glad to handle all business it can get at that figure. With 23½ cents as the government price on raw copper the concern says it finds ample margin in such transactions. A third firm, which also sells almost exclusively to power houses, confessed it was high in naming 27½ cents.

Jobbers estimate their requirements on a 30 cent base, the ELECTRIC RAILWAY JOURNAL, in its "Electric Railway Material Prices," in this department, quoting weatherproof, in 100-lb. lots, New York, 30.40 to 34¼ cents; Chicago, 33.42 to 38.35 cents, which has ruled for some time. Jobbing houses accept these prices, but it is probable an order of some size may be booked on a closer figure. One prominent distributer has notified the trade of an advance of 2 cents a pound, effective at once.

Rubber covered wire, on account of the unprecedented cost of tin, may also be subjected to a revision if the metal goes much higher. This week Straits tin cannot be bought at any price, and it is nominally quoted over $1 a pound, with a possibility of $1.50 next month. Chinese tin, not so pure as Straits and containing a greater percentage of arsenic, but answering perfectly for coating bare copper wire for rubber operating, sold at $1, May arrival, during the week.

Transformer Demand Has Dropped Considerably

Shipments Can Now Be Made Under Six Months on All Sizes and Types

Since early last fall transformer business has dropped from the high level occasioned by the entry of the United States into the war. Present-day demand is probably in the neighborhood of 70 per cent of what it was ten months to a year ago. During the past few weeks the demand has been noticed to rise somewhat, and indications are for a continuance of the present volume of business.

While it is true that the manufacturers have by no means entirely caught up with old business, deliveries are now much closer to normal. In some sizes and types stocks are beginning to accumulate. Present manufacturing capacity is now in excess of the current demand.

Shipments on all sizes, even for special construction, are now being made well under six months. On regular equipment shipments unless for stock can be had from four weeks to four months. Only recently some very large power transformers were tested and shipped slightly under sixteen weeks.

There does not seem to be any tendency toward lower prices, while there is some talk by manufacturers of higher prices if raw materials continue to advance. Present contracts, of course, will not be affected, but new contracts may be made on a different schedule or price basis. Boiler plates and cotton thread are at present the most alarming of the raw materials. Transformer oil deliveries are now in better condition, and the supply of oil drums is freer.

New Magnet and Controller Company Incorporated

Ohio Electric & Controller Company, 5900 Maurice Avenue, Cleveland, has been incorporated with a capital stock of $200,000 for the purpose of manufacturing lifting magnets and electrical controlling devices. Lifting magnets will be built at once and controlling devices later. The officers of the new company include F. W. Jessop, president; W. B. Greene, vice-president, and A. D. Walter, secretary and treasurer. Mr. Jessop was formerly works manager of the Electric Controller & Manufacturing Company, Cleveland. He has had an extensive experience in the manufacture of lifting magnets and apparatus for the control of motors.

Machine Tool Delivery Is Improved

Quick Shipments Increase Cost—Manufacturers Swamped With Orders—Exports Curtailed

With the general line of machine tools, such as lathes, milling machines, boring appliances, shapers, hammers, shears, slotters, and general power house and railway repair shop equipment, deliveries have improved. This is particularly true of the smaller machines and tools of every kind when shipped out of stock, to quote one manufacturer of prominence, who said deliveries could be made in sixty days, subject to embargoes of course. As this is up to the buyer or consignee the manufacturer was not borrowing trouble on that account. Other manufacturers were of the opinion that deliveries were worse than ever, a year and a half being named, at normal cost, with no relief in sight. Further, when quick delivery is specified the cost is immediately advanced if not infrequently doubled.

Generally speaking the railways and power houses purchases are below the average, reports affirm. Still, considerable business is being transacted; but the sales usually represent only what is essential to keep the properties in workable condition. That the buying is not entirely negligible a manufacturer, speaking of the improvement in the shipping situation, and is largely due to the catching up with orders.

No change in price had been made recently, although the revisions on a higher level had been regular, from time to time, dependent chiefly on the metal market. Prices were now at the top, it is believed, with the government's fixed quotations on iron and steel, but finished products were so far exempt from the official schedule. If a further increase was made it would be owing to the scarcity and high wages of labor. Workmen, it is reported, are hard to retain on account of the methods followed where government contracts on the "cost-plus" basis are encountered. This is said to apply especially in the Philadelphia district, where mechanics command the market. It is held that these contractors can keep on raising wages on this plan, with the government as a quasi-partner, and the increased price granted carries with it no responsibility, but is simply passed along and goes in the bill ultimately rendered.

Besides having this to contend with the machine tool manufacturers are finding it more difficult to obtain the kind of machines in urgent demand. On this score considerable anxiety is expressed. In this connection it is explained that for big machines, such as lathes, planers, and similar tools, none are to be had at any price. Only two concerns have the equipment, facilities and organization for making tools of this caliber and they are swamped with orders.

At one time the exportation of machine tools was a heavy and important branch of the business. With the entrance of the United States into the war this has fallen away. The exporting of machine tools of every description, excepting to Great Britain, France and other allied European powers, is prohibited unless under license, which amounts to its curtailment. After this country and its war allies are served—and they about absorb the entire output—the remaining neutral nations get little, if anything.

Government Buys 100,000 Freight Cars

Last week's ELECTRIC RAILWAY JOURNAL, in this department, furnished the particulars of the 30,000 freight car order placed by Director-General McAdoo. On May 2 an additional order for 70,000 cars, mentioned at the time, was allotted. Several manufacturers of electric railway rolling stock secured a portion of this large lot. The aggregate cost of the entire 100,000 cars is between $250,000,000 to $300,000,000. The apportionments among the builders follows:

Bettendorf Company	3,000
Cambria Steel Company	3,000
Haskell & Barker Works	8,000
Keith Car Manufacturing Company	1,000
Laconia Car Company	1,000
Lenoir Car Works	2,000
Liberty Car & Equipment Company	1,000
Magor Car Corporation	1,000
Mount Vernon Car Manufacturing Company	4,000
Pacific Car & Foundry Company	2,000
Pressed Steel Car Company	14,000
Pullman Company	8,000
Ralston Steel Car Company	4,000
St. Louis Car Company	1,000
Standard Steel Car Company	15,000
Also pending to the Barney & Smith Car, Dayton, Ohio	2,000

Rolling Stock

United Traction Company, Albany, N. Y., is reported as rebuilding a number of cars, converting them into trailers. The work is being done in the company's own shops.

Worcester (Mass.) Consolidated Street Railway is reported as planning to construct six trail cars to be used on its Fitchburg & Leominster Street Railway line.

Tampa & Sulphur Springs Traction Company, Tampa, Fla., has just rebuilt four open-type cars into closed front-entrance cars, with a seating capacity of forty-eight.

Brooklyn (N. Y.) Rapid Transit Company has placed an order for fifty trail cars of the center-entrance type. The Jewett Car Company received the order for the car bodies. The order for the trucks went to the J. G. Brill Company.

Tacoma (Wash.) Municipal Railway, through C. D. Atkins, commissioner of public works, is reported as saying that the city is considering the purchase of ten cars now on sale at Minneapolis, Minn. Seattle is also negotiating for twenty of the same lot, and the agent in charge will report the condition of the second-hand rolling stock to the officials of both cities.

Trade Notes

Walter A. Zelnicker Supply Company, St. Louis, Mo., has just issued its Bulletin No. 241, listing second-hand rails, cars and other rolling stock.

Springfield (Mo.) Traction Company has purchased twelve double equipments of Westinghouse 506-AN-2 motors, and K-63-B control. This type of motor was incorrectly given in a recent issue of this paper. These equipments were purchased through the St. Louis Rail & Equipment Company.

Guaranty Trust Company, New York, N. Y., has issued a fifty-two page pamphlet entitled "War Finance Corporation Act." This gives not only the official text of this new act but also an excellent synopsis of it and an index to this synopsis. The pamphlet also contains a foreword describing the general objects of the enactment.

D. R. Morris, assistant engineer, valuation department, New York Central Railroad (Buffalo and East), and previously in the signal department of several railway companies, has joined the forces of the Federal Signal Company as sales engineer. He will be located at the New York Office, 52 Vanderbilt Avenue.

J. M. Riordan, until recently sales engineer of the Grant Lees Gear Company of Cleveland, Ohio, and formerly representing the Fellows Gear Shaper Company of Springfield, Vt., in the Central States, is now connected with the sales orginazation of the Cleveland Milling Machine Company at Cleveland.

The International Western Electric Company has filed articles of incorporation under the laws of the State of Delaware with a capital stock of $20,000,000. The company proposes to manufacture all kinds of electrical instruments and machinery and to engage entirely in foreign trade. The incorporators are: William O'Keefe, E. E. Aberle and J. H. Dowdell of Wilmington, Del.

New Advertising Literature

General Electric Company, Schenectady, N. Y.: Bulletin describing its pressure governor for alternating-current or direct-current circuits, No. CR 2922, and its bulletin No. 57,419, illustrating parts of type FP-10 oil circuit breakers.

General Electric Company, Schenectady, N. Y.: Bulletin No. 44,678, superseding bulletin No. 4894, illustrates and describes the G. E. drum-type controllers for railway service. The company has recently developed a new type of line breaker equipment for use with drum controllers which is a decided improvement over the olden type, and in the bulletins this line breaker is set forth in detail.

Electric Service Supplies Company, Philadelphia, Pa.—Catalog entitled "International Fare Registers," illustrating and describing the company's fare registering devices in detail. Every part of the mechanism is given careful treatment and the particular work of each part minutely explained, giving the electric railway superintendent or manager a clear and succinct idea what they accomplish. A copy of this catalog will be mailed on application to the company.

Arthur Power-Saving Recorder Company, New Haven, Conn.: "Decreased Power Consumption and Increased Safety" is the title of a booklet just issued. This describes the company's recorder and the connections necessary in its installation. Details are given of the results attained and the advantages to be expected from the use of these instruments. A discussion of records, how they are worked out and the best methods for following these up in order to obtain the desired results is also included.

National Board of Fire Underwriters, Chicago, Ill.: Code for construction and tests of electrical appliances has been issued by the National Board. The book gives general information concerning the Underwriters' Laboratory and its organization, including the electrical council, the industry council and methods of procedure in examining, testing and reporting upon electrical appliances. Codes are given for wires, conduits, armature cables, cartridge fuses, map switches, cable and cut-out boxes, signs, panelboards, knife switches, cut-out bases and lugs. The book is bound in a loose-leaf leather binding and is designated as volume one.

NEW YORK METAL MARKET PRICES

	May 1	May 8
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26 ¼ to 26½	26¼ to 26½
Lead, cents per lb	7¼	6.62½
Nickel, cents per lb	50	50
Spelter, cents per lb	7½	7.32½
Tin, Chinese,* cents per lb	96	$1
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

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*No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 1	May 8
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6¼
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	*$34.00	*$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 1	May 8
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	28¼ to 34¼	30.40 to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	....	$65.00
Russian rails, per gross ton	....	$60.00
T-rails, high (Shanghai), cents per lb	4¼	4¼
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanised wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80% to 82-3%	80% to 82-3%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	79%	79%
Car window glass (double strength, all sizes AA quality), New York, discount, F. O. B. factory	80%	80%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	12 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.20
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl.	$2.65	$2.65
Cement (carload lots), Chicago, per bbl	$2.71	$2.71
Cement (carload lots), Seattle, per bbl	$3.05	$3.05
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.60	$1.62
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	43½	44½

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* Government price.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, May 18, 1918 *Number 20*

Are You Making the Best Possible Use of These Special Monthly Issues?

FOR several months now one issue of this paper in each month has been devoted especially to the shop, track, line and power departments. In planning these issues we invited several specialists to furnish each a series of articles dealing with the fundamentals of the technical departments of the electric railway. Each issue now consists of two technical divisions, one dealing with the general principles and the other illustrating from all departments in all parts of the country the application of these principles in every-day work.

It has undoubtedly occurred to many readers of these special issues that they have in their hands an unparalleled educational opportunity. If they were paying a correspondence school a large fee for this material they would appreciate it still more. There is a comprehensive plan underlying both the longer articles and the shorter ones which is already apparent through careful reading of the articles. This plan should work in well with the ambitions of young men for the best available information in their several lines, and it should be used by men in responsible positions in training the younger men under them. The articles could be readily made the basis of regular study, their topics could be discussed at company section and shop meetings, or quizzes could be held upon them from time to time with the voluntary attendance of the more ambitious youngsters, etc.

The writers of the articles are making considerable sacrifice of time and energy for the benefit of the industry. This will not have been in vain if the industry is making the best possible use of the fruits of their thought and experience.

Standardization in General and on Track Spirals in Particular

A MOST interesting and instructive discussion was started by E. M. T. Ryder in an article in the issue for April 6 on the standardization of track spirals. In all of this there has been apparent a hope that ultimately the condition of standardization may be approximated, for only thus will it be possible to reduce materially the number of spirals now in use. It would appear that there are more obstacles in the way of standardizing track spirals than in standardizing other elements of electric railway equipment, if that is possible. Those who have discussed the matter appear to feel that however desirable ultimate standardization may be it can only be brought about gradually.

Starting with the assumption then that ultimate standardization is desirable and not impossible, two inevitable facts must be faced. First, there must be visualized somehow a picture of the standards towards which progress is desirable. In the second place steps must be taken successively and consistently in the direction of the desired goal. No one will deny that immediate standardization of track spirals or anything else is impracticable. Even if all way engineers could agree on what they would like to have it would take time to enable them to get it. Mr. Ryder, after painstaking analysis, has outlined what he considers to be the ideal toward which to work. Mr. Angerer thinks that a less elaborate system would be better. It seems to us to be up to the American Electric Railway Engineering Association, and initially to its commitee on way matters, to take all of this material now available and set up some kind of a group of standards towards which progress may be directed. It is true that committee work is now in abeyance, but it must in time be resumed, and when it is resumed it might well take up this matter of track spirals.

On principle, standardization is right. It conduces to economy, and if sufficiently flexible it need not involve stagnation. There are difficulties in the way of bringing it about, but the very effort to establish a standard is stimulating and has tangible engineering value. To repeat, standardization without stagnation is the desideratum.

Demands for Higher Fares Come From All Sides

RECENT developments throughout the country would seem to indicate that organized labor is beginning to see the light on the question of increased revenues for electric railways. This applies at least to that portion of the working classes who owe their daily bread to utilities of this kind. While this may suggest a selfish motive, the point probably is the stronger because these employees have at last come to realize that existing rates of fare will not cover increasing operating costs, including the larger wages which they are seeking.

For some years past, one of the strongest arguments of dissatisfied trainmen in arbitration proceedings has been the very evident increased cost of living. They may have overlooked the fact that the employing companies also had to exist under conditions where mounting costs of supplies met them on all sides. Labor began to take a broader view of the situation when some settlements were made on the promise from the companies of higher wages when the added burden could be afforded.

Within the past few weeks the employees of the New York Railways Company received encouragement from the chairman of the Public Service Commission when they urged franchise modifications which would permit higher fares. In St. Louis organized labor joined in the appeal to the State commission for increased revenues for the employing company. And now comes one of the official organs of the Amalgamated Association which asks editorially: "Where it can be honestly shown that increased fare rates are necessary to meet operating costs, why should they be denied? Why should a traction company be forced to carry passengers at a loss?"

And so the tide of public sentiment mounts higher and becomes more forceful. The people are coming to appreciate that they must have service at any cost, because without service industry of all kinds will suffer. The higher wage inducement in other occupations is having its effect, and if the people want transportation facilities they must be willing to pay the price which will enable the companies to hold their present forces and maintain or add to existing equipment. The public authorities who are called upon to act in cases of this kind must indeed be blind and deaf if they cannot see and hear the evidence which is so overwhelming.

The Essential Nature of the Electric Railway Business

THE greatest thing about the electric railway business is that, in common with other primary forms of transportation, it is essential to the welfare and the development of the country. This characteristic of essentiality makes the business a fascinating one and holds thousands of capable men in it even through times of stress and of rival attractions in other lines. At the moment the public demands more in the way of electric railway transportation than it seems willing to pay for. This, however, is a transient condition which ultimately will redound to the benefit of the industry. It will do so for at least two reasons: First, the general educational effect of the railway pressure for increased fares will be ultimately to make the public reasonable. Furthermore, the reflex influence on the railways themselves will be in the direction of improved service with the best procurable operating economies.

In his recent company section address on "Our Job," abstracted in the issue of this paper for May 4, N. W. Bolen raised and answered the question as to why men remain in electric railway work under the present strenuous conditions. His only answer to this was that to the men fitted for the work it makes an irresistible appeal. If one is "called" to this work he will stay by it through thick and thin. If he has at any time a tendency to feel a little blue all that is necessary is a freshening of the conviction that his work is worth while because it furnishes something which the people cannot do without.

What is true with regard to the operating side of the business is equally true of the manufacturing side. Railway men cannot give good service without good equipment. Cars are needed and will continue to be needed, fitted with modern motors, controllers, brakes and all sorts of economical and convenient devices. These cars must roll on rails supported on modern ties, and they will require power which must be produced cheaply and transmitted economically. Reliable signals must make possible the safe and speedy operation of these cars. To be sure, the railways are not buying maintenance supplies as they would in normal times and few extensions are being made. But even now in the aggregate the business is a tremendous one, and when the railways again come into their own, as they must do in the reasonably near future, the wear and tear of these "off" years will be made good and the arrested growth will be compensated for by well considered expansion.

A Well-Deserved Honor for the Rhode Island Company

SOME weeks ago the ELECTRIC RAILWAY JOURNAL offered a silver cup to the company section of the American Electric Railway Association which should be organized with a charter membership larger than that of the Rhode Island Company section. This was done by way of seconding the challenge of that section to electric railway companies generally to exceed its achievement of organizing with 216 members. In making its offer the JOURNAL did not have in mind the award of the cup to the Rhode Island Company section itself, but further consideration made it seem eminently fitting that this company should have the cup and hold it until the challenge had been met. The cup has therefore been purchased and a picture of it appears on the "Association News" page in this issue. It has been accepted by the association, under whose auspices it will be fittingly awarded at an early date.

There are now twelve company sections in the association, all, we believe, accomplishing a worthy purpose and forming an admirable connecting link between managers and men. While few in numbers these sections represent a very much larger fraction of the total mileage and rolling stock than the number and membership would indicate. Through the wide publicity given to their proceedings they are exerting a powerful influence throughout the industry. As has been pointed out in these columns before, these sections are needed now if they ever were, which is to say that they are needed now very much indeed. The publishers of this paper hope that the cup will serve at least to focus attention, from time to time, upon the duty which devolves upon those companies which can do so to form company sections in their ranks. It will at least provide an impulse for starting new sections off with the greatest possible accelerating force.

In this connection it is interesting to note the charter memberships of the earlier formed sections. From association headquarters we learn that grouped according to number of charter members these were as follows: Public Service Railway 156; Cumberland County Power & Light Company 145; Chicago Elevated Railroads and The Connecticut Company 138 each; Toledo Railways & Light Company 120; Capital Traction Company 78; Newport News & Hampton Railway, Gas & Electric Company 60; Washington Railway & Electric Company 53; Milwaukee Electric Railway & Light Company 48; Denver Tramway 32; and Manila Electric Railway & Light Company 18. These data show what a remarkable start the Rhode Island Company section has had, but the present memberships of several of the sections prove that it ought to be possible to do even better yet.

Automatic Operation as a War Measure

THE use of automatic devices in car equipment has received increased attention during the past year. Such equipment may be properly considered as war necessities since it is aiding electric railways to solve their labor problems at this time of great demand for experienced men. As motormen, conductors and other railway employees enlist or are called to their country's service, others must do their work. Experienced men are hard to find and it takes time to develop new men so that they may become efficient car operators. Manifestly, the simpler the operating devices are, the quicker the men can be made experts. This is war work. Many of the men have gone. Others are needed to replace them. Their jobs should be made as pleasant as possible so they will be filled with enthusiasm for their work.

There is still another problem coming—one we do not like to think of. Soon some of the brave lads will be returning to us with an arm or a leg gone or some other defect resulting from their service. We would be glad to see them at their former work again. A real field for automatic appliances in car operation is thus opened up for the use of men who have been physically incapacitated from the war. For this work, we want all the improvements possible injected into car operation and we want the idealists and the progressives to help to the limit of their resources in developing such devices.

Why Shopmen Leave Electric Railway Service

NINE times out of ten the man who throws up his job gives as his unanswerable reason the laconic reply: "To get more money." Perhaps this little story from life will bring out one reason why the railway shopman, not only in these times but always, is so willing to move.

An engineer accustomed to checking railway payrolls was requested to check some labor force accounts for an electric contracting firm. Conceive his astonishment when he found that 75 cents per hour was being paid for wiremen whereas he knew that railways paid 30 to 40 cents for the same work.

His first thought was that the work must have included overtime or was of special character for which the men were allowed double time. But this was not so—it was straight time and at regular rates of pay. Can you blame the railway shopman for "leaving home"? Railways are not getting many young technically trained men at present, either. Where do such men go? They may be found in the big manufacturing plants, and they "fight shy" of electric railway properties.

Superintendents of equipment are not to blame for the deplorable labor situation in their departments. They know the way out but unfortunately are rarely supplied with data that would enable them to prove definitely that the traffic losses due to poor maintenance labor are big enough to justify the payment of the prevailing rate of wages at least. When shopmen are rated properly and are paid for their ability to prevent accidents and delays in service, then and only then will they "stay at home."

"Nothing Is Ever Settled Until It Is Settled Right"

SOMETHING certainly is "rotten in the state of Denmark" when cities like Rochester, Syracuse and Utica can be forced to undergo weeks of turmoil and ill-feeling, and finally stoppage of street railway service, before a routine question such as a new wage scale can even be started toward settlement.

The New York State Railways operates the lines in the above cities. It is the largest electric railway company in the Second Public Service (upstate) District.

The company was perfectly willing to pay its men more but said it could not—its income was not enough.

Call it a strike or not—the point is that enough men quit work in Rochester on May 11 to stop the service and didn't go back to work till May 14. The company promised to raise the pay and take its chances on proving to the satisfaction of the city authorities that it couldn't afford to raise wages unless fares were increased.

This situation grew directly out of the Court of Appeals decision that no matter what the necessities of the company, the Public Service Commission has not the power to raise fares if they are established in the franchise. The city authorities must amend the franchise.

The company has been ready to show the facts ever since last August. Meantime, it is compelled to go on pocketing losses.

In Syracuse there is no franchise limitation, but in Rochester there is. The company enjoys public goodwill, generally speaking, in Syracuse. In Rochester a certain degree of ill-will has been developed. Just how or why need not be discussed.

In one city the company might get the consent of the city authorities to raise fares. In the other city it might fail, though the need were just as great.

The important point of it all is that here is an intolerable situation.

It were fruitless to discuss whether company, city or employees should most be blamed. The moral is plain: the State Legislature should put the Public Service Commission in full power over the affairs of the public utilities.

It was supposed in 1907 that this had been done. The people certainly wanted it done.

To leave matters as at present is to invite repetitions of the Rochester-Syracuse-Utica incidents, or worse. It will still further discourage investors from furnishing capital for the extension of street railway facilities and deprive the public of its needed service.

In any readjustment of the public service law, a speedier settlement of rate matters must be provided. At present, not only in New York State but in most others, a company must be actually suffering losses before it can apply for consideration. It cannot forestall losses with the most ordinary quality of business foresight, and it takes months and months to come to conclusions, while the losses go on.

Of the thirty odd cases put before the upstate commission in New York nine months ago, relief to companies has come to only three or four. Relief, apparently, cannot come to the rest for several months more, at least.

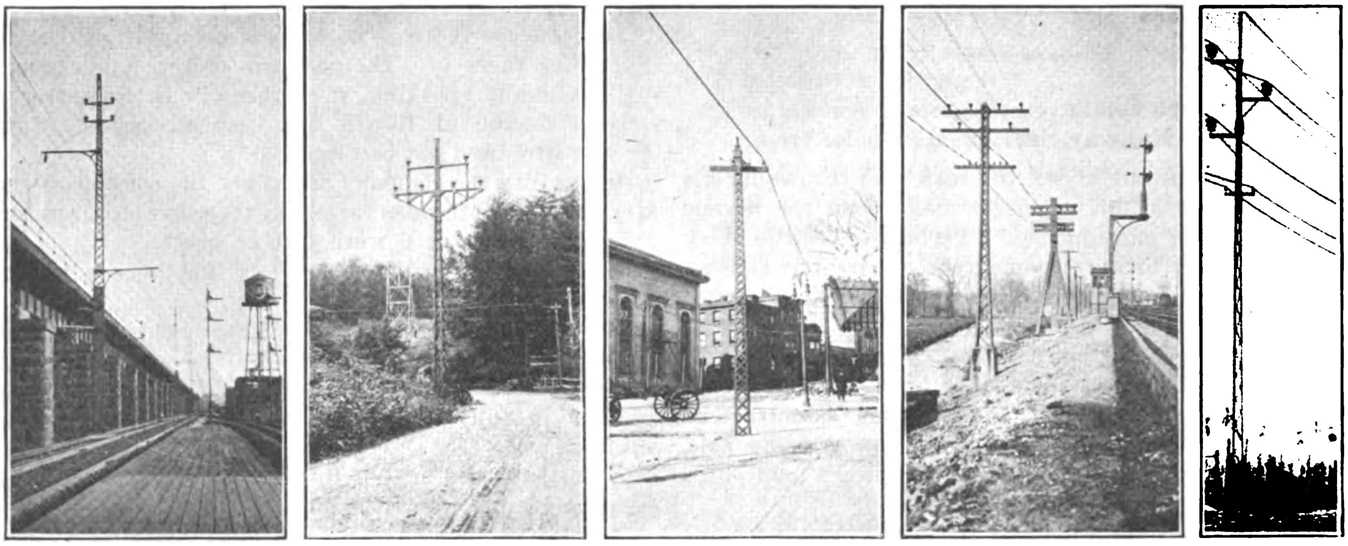
This is one thing, certainly, that "is rotten in the state of Denmark."

Virtues and Limitations of Steel Supports in Overhead Construction

By Charles R. Harte
Construction Engineer
The Connecticut Company, New Haven, Conn.

Greater Permanence and More Attractive Appearance of Steel Poles and Towers Bring Them into Keen Competition with Wood Poles for Supporting Transmission Lines and Aerial Contact Conductors

IN FAVOR of the use of wood poles in overhead construction are low first cost, ease of framing for any construction, comparatively light weight facilitating both field transportation and erection, and ease of climbing. On the other hand they have to answer for rather short life, involving not only replacement of the pole itself at frequent intervals, but also inevitable injury at such time to the attachments; for liability of burning in case of current leakage or of grass or other fires near by; and in many instances for the appearance if not the fact of obstruction to traffic. With a public not entirely in sympathy with the owners, such appearance is quite likely to lead to agitation for underground construction.



Pole in Restricted Space, Pennsylvania Railroad, Philadelphia Electrification

Pole Used to Avoid Right-of-Way Difficulties, Connecticut River Power Company

Trolley Pole Used at Albany, N. Y.

Pole, with Legs Slightly Curved, Used by New York Central Railroad

One-Piece Expanded Pole Supported Transmission Line

SEVERAL TYPES OF LATTICED STEEL POLES

The permanent poles divide naturally into several groups, namely, latticed steel poles, steel towers, tubular poles and concrete poles. The last-named will not be taken up in the present article.

Latticed steel poles are the least common and generally speaking—although there is at least one exception, the Bates pole—the most costly. In fact, until the appearance of the exception referred to, latticed poles were used chiefly in special cases where towers required too much room and tubular poles failed to give the necessary strength. For trolley service they have had some use in a few cities, and they are rather attractive in appearance, but the large amount of labor involved in their construction makes the cost excessive. For heavier service the section is usually square, with angles for corners and latticing outside. If the legs are slightly curved outward at the base, as in the case of the New York Central Railroad poles, the effect is much more pleasing than that produced with a straight taper.

Fabricated lattice poles, being almost invariably used to meet special conditions which fix the dimensions, possibly require special designing. This is best done jointly by the line engineer and the designing engineer of the shop which is to build them, in order that on the one hand the service requirements shall be met and on the other that so far as possible the details follow the regular practice of the shop. Sometimes special construction requires special details, but in the majority of cases this is unnecessary or can be avoided by unimportant changes in the main design. In a small shop doing a large variety of work with a limited equipment special designs and details do not make so much difference, but in a large establishment equipped for quantity production variations from the routine practice not infrequently double both cost and time of production.

The Expanded Type of Pole Is Promising

The latticed pole which is an exception to the high cost of the majority of types, and which seems to have a considerable field before it is, at least up to a length of 35 ft., made from a single piece of metal, an H-beam of special section. The web of this is first slit properly by a special rotary punch, and then, after heating, the flanges are pulled apart, the web sections forming the equivalent of lattice bars, with the marked advantage that they do not require riveting. For lengths above 35 ft. two sections are spliced together. While at least at present the available stock and apparatus limits the size and capacity it would seem that heavy service square poles might well be fabricated with considerable economy by using two poles of suitable size of this type with lattice bar or plate connections. They have been employed and, it is claimed, very successfully as legs for short towers.

It's Fun to Put up a Steel Overhead Structure

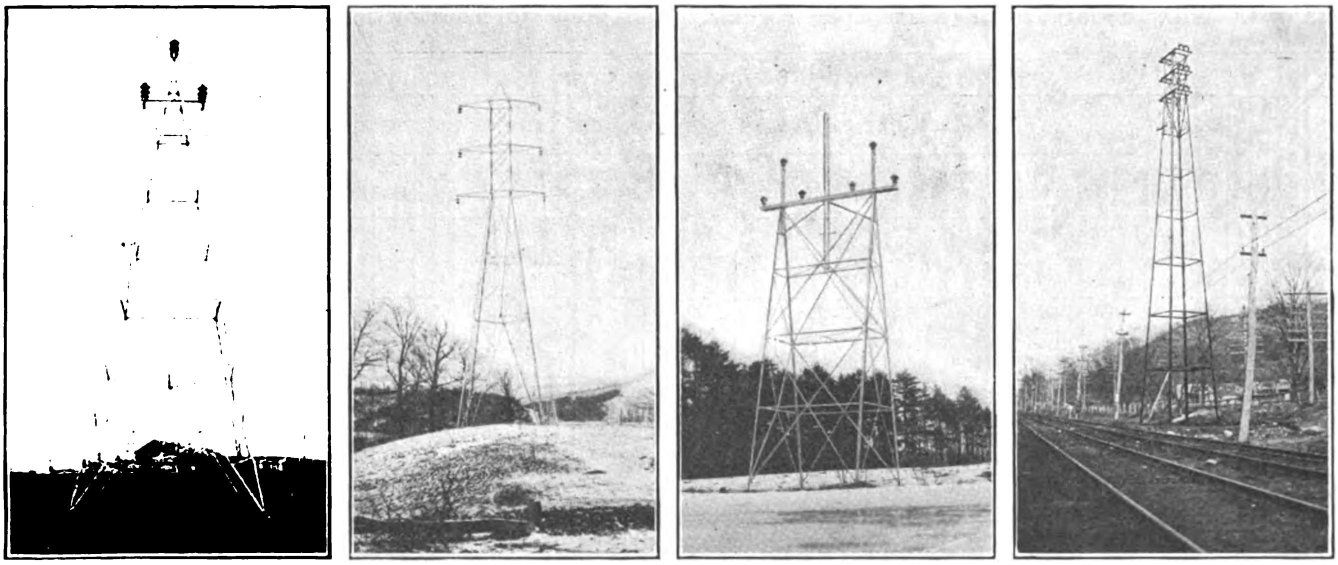
Grading insensibly into poles are the steel towers, which are used very extensively on transmission lines of voltages above 22,000; and to a constantly increasing extent on the lower voltage lines. Their ability to carry long spans and thus reduce the number of insulators and their insurance against interruptions is supplemented by comparatively low cost.

We Owe Something to the Windmill Tower

While in the past there have been designs without end, there is to-day a tendency toward standardization. The steel towers first used were straightaway windmill towers, including the operating platform at the top. The platform long ago disappeared, but the general design, with light angle legs and long and lighter braces, still persists and the towers give good service too. Breakdowns, due to failure of the designers to recognize the limitations of the type, led to the development of a more rugged design. In this heavy angle legs were designed to carry all the stress, whereas in towers of the very light type it was expected that every member would take a share of the load. Finally, as a compromise between the two extremes there has been developed the scheme which is generally credited to the Italian engineer Semenza, the use of flexible supports.

The supports of a line must carry the vertical dead load due to the weights of the half spans either side. In addition, when the wind blows there is a force at right angles to the line and each span pulls in the direction of the line. As these forces in general oppose each other the support needs to meet only the *difference* in pulls. If they are balanced, either by making spans and deflections equal or increasing the sag properly on the longer span, the support need only have enough strength to carry the dead load as a column, and sufficient stiffness across the line to meet the maximum wind effort. Further, other things remaining unchanged, increasing or decreasing the sag decreases or increases the pull in exactly the same relation. For sags which are quite small in proportion to length of span, a very slight decrease or increase in the length of the conductors or, what is practically the same, an equal increase or decrease in the distance between supports without change in the length of conductor between them makes a very considerable decrease or increase in the sag. As a result there is a corresponding increase or decrease in the pull. A difference in pull, if not excessive, is automatically balanced by a small deflection of the support. In case one conductor breaks, the frame twists as well as bends, but if structural connections and wire ties are good it will usually hold up, and in many cases can be repaired.

The anchor towers for flexible construction are usually standard type square towers with such modifica-



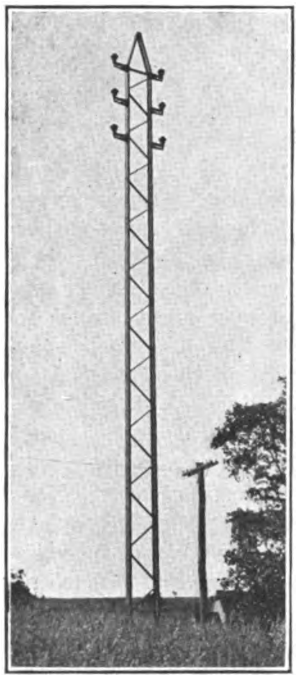
Square Tower on the Line of the Niagara, Lockport & Ontario Power Company

Double-Circuit Tower on the Transmission Line of the Schenectady Power Company

Tower Used for Transmission Line of Connecticut River Power Company

Heavy Type of Tower on the Lines of the Hoosatonic Power Company

TYPICAL STEEL TOWERS USED ON TRANSMISSION LINES

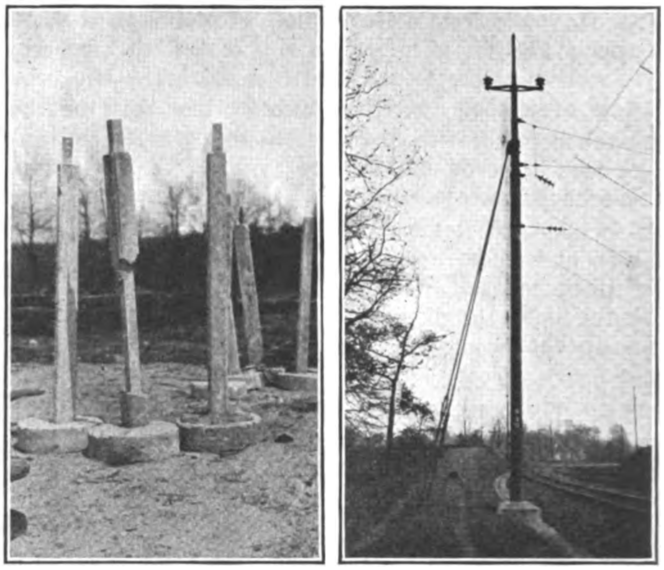


Flexible Tower, Berkshire Street Railway

tion at the top as may be necessary to carry the anchor insulators. The intermediate supports are generally the so-called A-frames with channel-iron sides and braces, the latter being horizontal, and round rod diagonals. These are almost always fabricated in the shop and sent out complete except for the insulator brackets, which are as a rule of malleable iron, and are bolted on in the field. A form which also is frequently used is practically a latticed pole, having no horizontal bracing, the diagonals being angles or channels with the ends bent so they can be riveted to the legs on the center line of the webs.

Judiciously used, the flexible support scheme is exceedingly good; but unfortunately its reputation has suffered because of overenthusiasm of some of its advocates. With anchors at proper intervals, the lengths of which will depend upon the conditions and will vary from one to six per mile, and with a ground wire securely attached to each frame so it acts as a continuous tie, a flexible support line should be practically as dependable as one with rigid towers. If it is not so anchored, however, there is a possibility of stresses accumulating at one span under heavy loads, breaking the conductors and wrecking the line back to the nearest anchors. The use of guys in the direction of the line often obviates the necessity for some of the anchor towers.

Peculiar conditions demand special designs of towers, but for the average case there are several lines of stock design from which there can be chosen a form practically if not quite as good as a special type, and at much less cost. With the larger bridge companies regularly making towers, and at least one company specializing in them, there is less occasion for insisting on high factors of safety than was the case a few years ago. Furthermore the designs have been so rationalized that it is possible to get a fair idea of the probable behavior under load. Practically any reputable concern which has had considerable experience in building towers can furnish either directly or with very little modification, a stock design which fully meets requirements. For this purpose a broad specification of the service required is necessary, including in this data as to the loads to be sustained and whether pin or suspension-type insulators are to be used. In the latter case particular attention must be given to insure that there are ample clearances for a swinging conductor.



AT LEFT, STUB TOWER FOOTINGS PROTECTED BY CONCRETE CASTINGS (Note how protection has been broken; this is the chief difficulty with this type of footing), AT RIGHT, HEAVY TUBULAR POLE WITH ROD GUYS, PENNSYLVANIA RAILROAD, PHILADELPHIA ELECTRIFICATION

As to what stress a tower should stand in the direction of the line there is considerable difference of opinion. The National Electrical Safety Code requires that for grades of construction A, B and C, in regions of

TABLE I—DEFLECTIONS OF EXPANDED POLES FOR GIVEN LOADS (MANUFACTURERS' DATA)

Section	Length in Feet	Set in Ground, Ft.	Base of Pole in Inches	Weight in Pounds	DEFLECTION IN INCHES UNDER VARIOUS DEFLECTING FORCES																											
					200 Lb.	400 Lb.	600 Lb.	800 Lb.	1000 Lb.	1200 Lb.	1400 Lb.	1600 Lb.	1800 Lb.	2000 Lb.	2200 Lb.	2400 Lb.	2600 Lb.	2800 Lb.	3000 Lb.	3200 Lb.	3400 Lb.	3600 Lb.	3800 Lb.	4000 Lb.	4200 Lb.	4400 Lb.	4600 Lb.	4800 Lb.	5000 Lb.	5200 Lb.	5400 Lb.	5600 Lb.
4 In.	20	4	7½	246	0.23	0.65	1.04	1.61	2.34	2.92	3.27	4.62	5.17	5.74	6.13																	
	25	5	8¾	308	0.63	1.63	2.18	3.50	4.50	5.63	7.00	9.06																				
	30	5½	9¾	370	0.75	2.25	3.81	5.63	8.18	10.25																						
	35	6	10	430	0.88	2.63	5.00	7.88																								
5 In.	20	4	9¾	322	0.23	0.45	0.71	1.08	1.42	1.75	2.14	2.70	3.58	4.39	5.64	6.15																
	25	5	10½	403	0.44	1.03	1.53	2.25	2.94	3.65	4.31	5.25	6.65																			
	30	5½	11½	483	0.81	1.31	2.05	3.12	4.62	5.50	7.18																					
	35	6	12½	564	1.06	2.06	3.31	4.56	6.00	7.56																						
6 In.	20	4	11¾	404	0.18	0.31	0.45	0.58	0.74	0.83	1.11	1.35	1.66	2.11	3.42	4.46	5.99	6.69														
	25	5	12½	506	0.50	0.87	1.25	1.62	1.87	1.87	2.87	3.62	4.50	5.75	7.25	8.75																
	30	5½	13¾	607	0.50	0.87	1.25	1.62	2.31	2.93	3.37	4.12	5.12	6.56																		
	35	6	15	708	0.63	1.25	1.88	2.50	3.38	3.88	4.88	5.63	6.63																			
7 In.	20	4	13	498	0.11	0.18	0.26	0.34	0.43	0.49	0.65	0.79	0.97	1.24	2.00	2.61	3.51	3.76	4.02	4.26	4.47	4.69	4.92	5.17	5.43	5.70	5.93	6.17	6.42			
	25	5	14½	622	0.29	0.51	0.73	0.95	1.10	1.10	1.68	2.12	2.63	3.37	3.70	4.07	4.40	4.71	5.04	5.34	5.61	5.89	6.18	6.49	6.81	7.15						
	30	5½	16	747	0.30	0.54	0.78	0.98	1.35	1.71	1.97	2.41	3.00	3.84	4.22	4.60	4.97	5.32	5.69	6.03	6.33	6.65	6.98	7.33								
	35	6	17½	871	0.37	0.73	1.10	1.47	1.98	2.27	2.86	3.30	3.89	4.98	5.47	5.97	6.45	6.90	7.38	7.82	8.12											
8 In.	20	4	15	585	0.07	0.12	0.17	0.22	0.28	0.31	0.42	0.50	0.62	0.79	0.87	0.95	1.03	1.10	1.18	1.25	1.35	1.42	1.49	1.56	1.64	1.72	1.79	1.86	1.93	2.00	2.08	2.16
	25	5	16½	731	0.19	0.33	0.47	0.61	0.70	0.70	1.07	1.35	1.68	2.15	2.70	2.94	3.18	3.40	3.64	3.86	4.05	4.25	4.46	4.68	4.91	5.15	5.35	5.56	5.78	6.01	6.25	
	30	5½	18¾	877	0.20	0.35	0.48	0.62	0.86	1.10	1.26	1.50	1.54	2.45	2.85	3.10	3.35	3.50	3.83	4.06	4.26	4.47	4.64	4.92	5.17	5.43	5.65	5.88	6.12			
	35	6	20	1023	0.24	0.47	0.70	0.94	1.26	1.28	1.83	2.11	2.48	3.18	3.50	3.81	4.12	4.41	4.72	5.00	5.25	5.51	5.79	6.07	6.38	6.69						

Above table of deflections from actual test by dynamometer readings taken one-tenth length of pole below top.

TABLE II. TUBULAR STEEL POLES—DEFLECTIONS AND LOADS

Length of Pole	Description of Poles								Pole set 6 ft. 0 in. in ground—load applied and deflection measured 18 in. from free end, probable deflections when held and loaded as stated													Greatest Safe Load	Length of Pole
	Size and Kind of Pipe				Weight of Pole	Section Lengths			Load in Pounds Applied 18 in. from Free End of Pole														
	Butt		Middle	Top																			
	Standard	Extra Heavy	Standard	Standard		Butt	Middle	Top	100	500	600	800	1,000	1,200	1,400	1,600	1,800	2,100	2,400	2,700	3,000		
(Ft.)					(Lb.)	(Ft.)	(Ft.)	(Ft.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(In.)	(Lb.)	(Ft.)
28	5	....	4	3	385	18	7	6	1.23	....	....	....	....	....	....	....	....	....	....	....	....	443	28
28	....	5	4	3	495	18	7	6	.90	4.52	5.42	....	....	....	....	....	....	....	....	....	....	603	28
28	6	....	5	4	509	18	7	6	.65	3.24	3.89	....	....	....	....	....	....	....	....	....	....	692	28
28	....	6	5	4	681	18	7	6	.46	2.28	2.73	3.64	....	....	....	....	....	....	....	....	....	993	28
28	7	....	6	5	645	18	7	6	.39	1.93	2.32	3.09	....	....	....	....	....	....	....	....	....	992	28
28	....	7	6	5	906	18	7	6	.26	1.27	1.53	2.04	2.55	3.06	3.57	....	....	....	....	....	....	1,525	28
28	8	....	7	6	791	18	7	6	.25	1.23	1.48	1.98	2.47	2.97	....	....	....	....	....	....	....	1,366	28
28	....	8	7	6	1,058	18	7	6	.17	.84	1.01	1.34	1.68	2.02	2.35	2.69	3.03	....	....	....	....	1,990	28
28	9	....	8	7	951	18	7	6	.17	.83	.99	1.32	1.65	1.98	2.31	2.64	2.97	....	....	....	....	1,817	28
28	....	9	8	7	1,218	18	7	6	.12	.59	.71	.94	1.18	1.42	1.65	1.89	2.12	2.48	2.83	....	....	2,527	28
28	10	....	9	8	1,137	18	7	6	.11	.57	.68	.90	1.13	1.36	1.58	1.81	2.04	2.37	2.71	....	....	2,432	28
28	....	10	9	8	1,393	18	7	6	.08	.41	.50	.66	.83	1.00	1.16	1.33	1.49	1.74	1.99	2.24	2.49	3,205	28
29	5	....	4	3	393	18	7	7	1.45	....	....	....	....	....	....	....	....	....	....	....	....	422	29
29	....	5	4	3	503	18	7	7	1.07	5.35	....	....	....	....	....	....	....	....	....	....	....	575	29
29	6	....	5	4	520	18	7	7	.76	3.83	4.58	....	....	....	....	....	....	....	....	....	....	658	29
29	....	6	5	4	692	18	7	7	.54	2.67	3.21	4.28	....	....	....	....	....	....	....	....	....	947	29
29	7	....	6	5	659	18	7	7	.45	2.26	2.72	3.63	....	....	....	....	....	....	....	....	....	946	29
29	....	7	6	5	920	18	7	7	.30	1.49	1.79	2.38	2.98	3.58	4.17	....	....	....	....	....	....	1,450	29
29	8	....	7	6	811	18	7	7	.29	1.44	1.73	2.31	2.88	3.46	....	....	....	....	....	....	....	1,304	29
29	....	8	7	6	1,078	18	7	7	.20	.98	1.18	1.57	1.96	2.35	2.74	3.14	3.53	....	....	....	....	1,900	29
29	9	....	8	7	974	18	7	7	.19	.96	1.15	1.54	1.92	2.30	2.69	3.07	....	....	....	....	....	1,733	29
29	....	9	8	7	1,241	18	7	7	.14	.69	.82	1.09	1.37	1.64	1.92	2.19	2.46	2.88	3.29	....	....	2,410	29
29	10	....	9	8	1,166	18	7	7	.13	.65	.77	1.03	1.29	1.55	1.81	2.06	2.32	2.71	....	....	....	2,320	29
29	....	10	9	8	1,422	18	7	7	.10	.48	.58	.78	.97	1.16	1.36	1.55	1.74	2.04	2.33	2.62	2.91	3,060	29
30	5	....	4	3	406	18	9	6	1.67	....	....	....	....	....	....	....	....	....	....	....	....	403	30
30	....	5	4	3	516	18	9	6	1.23	6.16	....	....	....	....	....	....	....	....	....	....	....	550	30
30	6	....	5	4	539	18	9	6	.88	4.39	5.27	....	....	....	....	....	....	....	....	....	....	629	30
30	....	6	5	4	711	18	9	6	.62	3.08	3.70	4.93	....	....	....	....	....	....	....	....	....	906	30
30	7	....	6	5	682	18	9	6	.52	2.60	3.12	4.17	....	....	....	....	....	....	....	....	....	903	30
30	....	7	6	5	943	18	9	6	.34	1.71	2.06	2.74	3.43	4.12	....	....	....	....	....	....	....	1,387	30
30	8	....	7	6	840	18	9	6	.33	1.65	1.99	2.65	3.31	3.97	....	....	....	....	....	....	....	1,245	30
30	....	8	7	6	1,107	18	9	6	.23	1.12	1.35	1.80	2.25	2.70	3.15	3.60	4.05	....	....	....	....	1,815	30
30	9	....	8	7	1,008	18	9	6	.22	1.10	1.33	1.77	2.21	2.65	3.09	3.54	....	....	....	....	....	1,655	30
30	....	9	8	7	1,275	18	9	6	.16	.79	.95	1.26	1.58	1.90	2.21	2.53	2.85	3.32	....	....	....	2,305	30
30	10	....	9	8	1,205	18	9	6	.15	.74	.89	1.18	1.48	1.78	2.07	2.37	2.66	3.11	....	....	....	2,220	30
30	....	10	9	8	1,461	18	9	6	.11	.56	.67	.90	1.12	1.34	1.57	1.79	2.02	2.35	2.69	3.02	....	2,920	30
31	5	....	4	3	413	18	9	7	1.95	....	....	....	....	....	....	....	....	....	....	....	....	387	31
31	....	5	4	3	523	18	9	7	1.44	7.18	....	....	....	....	....	....	....	....	....	....	....	527	31
31	6	....	5	4	549	18	9	7	1.02	5.09	6.12	....	....	....	....	....	....	....	....	....	....	603	31
31	....	6	5	4	721	18	9	7	.72	3.58	4.29	5.72	....	....	....	....	....	....	....	....	....	867	31
31	7	....	6	5	696	18	9	7	.60	3.00	3.60	4.80	....	....	....	....	....	....	....	....	....	865	31
31	....	7	6	5	958	18	9	7	.40	1.98	2.38	3.18	3.97	4.77	....	....	....	....	....	....	....	1,325	31
31	8	....	7	6	860	18	9	7	.38	1.90	2.29	3.05	3.81	....	....	....	....	....	....	....	....	1,192	31
31	....	8	7	6	1,127	18	9	7	.26	1.30	1.55	2.07	2.59	3.11	3.63	4.15	....	....	....	....	....	1,740	31
31	9	....	8	7	1,031	18	9	7	.25	1.27	1.52	2.03	2.54	3.05	3.56	....	....	....	....	....	....	1,585	31
31	....	9	8	7	1,299	18	9	7	.18	.91	1.09	1.46	1.82	2.18	2.55	2.91	3.28	3.82	....	....	....	2,205	31
31	10	....	9	8	1,234	18	9	7	.17	.85	1.02	1.36	1.70	2.04	2.38	2.72	3.06	3.57	....	....	....	2,125	31
31	....	10	9	8	1,491	18	9	7	.13	.64	.77	1.02	1.28	1.54	1.79	2.05	2.31	2.69	3.07	3.45	....	2,795	31
32	5	....	4	3	427	19	9	7	2.17	....	....	....	....	....	....	....	....	....	....	....	....	371	32
32	....	5	4	3	545	19	9	7	1.61	8.02	....	....	....	....	....	....	....	....	....	....	....	505	32
32	6	....	5	4	568	19	9	7	1.14	5.70	....	....	....	....	....	....	....	....	....	....	....	578	32
32	....	6	5	4	749	19	9	7	.80	4.01	4.82	6.42	....	....	....	....	....	....	....	....	....	832	32
32	7	....	6	5	720	19	9	7	.68	3.37	4.05	5.40	....	....	....	....	....	....	....	....	....	830	32
32	....	7	6	5	995	19	9	7	.45	2.22	2.67	3.56	4.45	5.33	....	....	....	....	....	....	....	1,275	32
32	8	....	7	6	888	19	9	7	.43	2.14	2.57	3.43	4.28	....	....	....	....	....	....	....	....	1,143	32
32	....	8	7	6	1,169	19	9	7	.29	1.46	1.75	2.33	2.92	3.50	4.08	4.67	....	....	....	....	....	1,665	32
32	9	....	8	7	1,066	19	9	7	.29	1.43	1.72	2.29	2.86	3.43	4.00	....	....	....	....	....	....	1,520	32
32	....	9	8	7	1,348	19	9	7	.20	1.02	1.22	1.63	2.04	2.45	2.85	3.27	3.67	4.28	....	....	....	2,115	32
32	10	....	9	8	1,274	19	9	7	.19	.96	1.15	1.53	1.92	2.30	2.69	3.07	3.46	....	....	....	....	2,035	32
32	....	10	9	8	1,545	19	9	7	.14	.72	.86	1.15	1.44	1.73	2.02	2.31	2.59	3.03	3.45	....	....	2,680	32
33	5	....	4	3	439	19	10	7	2.48	....	....	....	....	....	....	....	....	....	....	....	....	357	33
33	....	5	4	3	555	19	10	7	1.83	....	....	....	....	....	....	....	....	....	....	....	....	487	33
33	6	....	5	4	582	19	10	7	1.30	6.49	....	....	....	....	....	....	....	....	....	....	....	555	33
33	....	6	5	4	764	19	10	7	.91	4.56	5.47	....	....	....	....	....	....	....	....	....	....	798	33
33	7	....	6	5	739	19	10	7	.77	3.83	4.60	....	....	....	....	....	....	....	....	....	....	797	33
33	....	7	6	5	1,015	19	10	7	.51	2.53	3.04	4.05	5.07	6.08	....	....	....	....	....	....	....	1,255	33
33	8	....	7	6	910	19	10	7	.49	2.43	2.92	3.89	4.87	....	....	....	....	....	....	....	....	1,098	33
33	....	8	7	6	1,192	19	10	7	.33	1.65	1.99	2.65	3.31	3.97	4.63	5.30	....	....	....	....	....	1,605	33
33	9	....	8	7	1,094	19	10	7	.33	1.62	1.95	2.60	3.25	3.90	4.55	....	....	....	....	....	....	1,460	33
33	....	9	8	7	1,376	19	10	7	.23	1.16	1.39	1.86	2.32	2.78	3.25	3.71	4.18	....	....	....	....	2,035	33
33	10	....	9	8	1,308	19	10	7	.22	1.09	1.31	1.74	2.18	2.62	3.05	3.49	3.93	....	....	....	....	1,955	33
33	....	10	9	8	1,579	19	10	7	.16	.82	.98	1.31	1.64	1.97	2.30	2.63	2.95	3.28	3.94	....	....	2,580	33
34	5	....	4	3	454	20	10	7	2.75	....	....	....	....	....	....	....	....	....	....	....	....	343	34
34	....	5	4	3	575	20	10	7	2.03	....	....	....	....	....	....	....	....	....	....	....	....	467	34
34	6	....	5	4	601	20	10	7	1.44	7.21	....	....	....	....	....	....	....	....	....	....	....	531	34
34	....	6	5	4	792	20	10	7	1.01	5.08	6.09	....	....	....	....	....	....	....	....	....	....	768	34
34	7	....	6	5	763	20	10	7	.86	4.28	5.13	....	....	....	....	....	....	....	....	....	....	767	34
34	....	7	6	5	1,053	20	10	7	.56	2.81	3.37	4.49	5.62	....	....	....	....	....	....	....	....	1,177	34
34	8	....	7	6	939	20	10	7	.54	2.71	3.25	4.33	5.42	6.51	....	....	....	....	....	....	....	1,057	34
34	....	8	7	6	1,235	20	10	7	.37	1.85	2.22	2.96	3.70	4.44	5.18	....	....	....	....	....	....	1,543	34
34	9	....	8	7	1,128	20	10	7	.36	1.81	2.17	2.89	3.62	4.34	5.07	....	....	....	....	....	....	1,405	34
34	....	9	8	7	1,425	20	10	7	.26	1.29	1.55	2.07	2.59	3.11	3.63	4.15	4.67	....	....	....	....	1,955	34
34	10	....	9	8	1,348	20	10	7	.24	1.21	1.45	1.93	2.42	2.90	3.39	3.87	4.36	....	....	....	....	1,885	34
34	....	10	9	8	1,634	20	10	7	.18	.92	1.10	1.46	1.83	2.20	2.56	2.93	3.29	3.84	4.39	....	....	2,480	34
35	5	....	4	3	469	21	10	7	3.03	....	....	....	....	....	....	....	....	....	....	....	....	331	35
35	....	5	4	3	595	21	10	7	2.23	....	....	....	....	....	....	....	....	....	....	....	....	450	35
35	6	....	5	4	620	21	10	7	1.59	7.97	....	....	....	....	....	....	....	....	....	....	....	515	35
35	....	6	5	4	820	21	10	7	1.12	5.60	6.72	....	....	....	....	....	....	....	....	....	....	741	35
35	7	....	6	5	787	21	10	7	.95	4.73	5.68	....	....	....	....	....	....	....	....	....	....	738	35
35	....	7	6	5	1,091	21	10	7	.62	3.12	3.75	4.99	6.24	....	....	....	....	....	....	....	....	1,135	35
35	8	....	7	6	968	21	10	7	.60	3.01	3.61	4.82	6.02	....	....	....	....	....	....	....	....	1,018	35
35	....	8	7	6	1,278	21	10	7	.41	2.05	2.46	3.28	4.10	4.92	5.74	....	....	....	....	....	....	1,485	35
35	9	....	8	7	1,162	21	10	7	.40	2.01	2.41	3.22	4.02	4.82	....	....	....	....	....	....	....	1,355	35
35	....	9	8	7	1,474	21	10	7	.29	1.43	1.72	2.29	2.87	3.44	4.02	4.59	5.17	....	....	....	....	1,885	35
35	10	....	9	8	1,388	21	10	7	.27	1.35	1.62	2.16	2.70	3.24	3.78	4.32	4.87	....	....	....	....	1,818	35
35	....	10	9	8	1,689	21	10	7	.20	1.01	1.21	1.62	2.02	2.42	2.83	3.23	3.64	4.24	....	....	....	2,390	35

heavy loading, the wind pressure shall be taken at right angles to the direction of the line and shall be assumed, for cylindrical surfaces, at 12 lb. per square foot of protected area for grade A, 7 lb. for grade B, and 4 lb. for grade C. The conductors are figured as being covered with a layer of ice, increasing the conductor diameter by 1 in., while the supports are figured as bare. For flat surfaces these pressures are to be increased by 60 per cent, making them 19.2, 11.2 and 6.4 lb., respectively. Latticed faces are taken as having an area 50 per cent greater than actual, to allow for the effect of the wind blowing through the spaces and so against the inside of the opposite face, unless this gives a total pressure greater than would result if the structure were solid. In this case the latter value should be used.

Steel structures are required to have a minimum factor of safety of two against these stresses. The use of guys to secure this is considered undesirable although they can be used if necessary. In the latter case if the support can deflect much the guys must be capable of taking all the stress, the support being considered as acting only as a strut.

When steel supports or towers are used which will not stand as great stresses longitudinally as those prescribed for the transverse strength, anchor towers capable of withstanding the total pulls of all the conductors up to a maximum of 10,000 lb. plus one-half the excess above 10,000 lb. shall be placed at intervals not greater than ten spans apart.

The code requirements have in mind protection to the individual and do not apply to lines in the country, but maintenance of service practically demands similar construction standards. And there is a point in this connection which is often missed. The transmission or distribution lines, even when most substantially built, represent but a very small percentage of the total cost of the system. The interest on the idle investment plus the loss of revenue during a short shutdown due to a line failure will very nearly pay the difference between "cheap and nasty" construction and a first-class line.

Steel Templates Are Best in Setting Tower Footings

Tower foundations are of several types. For structures subject to heavy stresses large concrete footings with anchor bolts are usually employed. A plan which is being followed more and more is to use "stubs," which are practically short extensions of the tower legs with a piece of channel or angle iron at right angles at the end, forming an inverted T. These are sometimes bedded in concrete in place, and sometimes have concrete cast about them at a central yard. More and more frequently they are set directly in the earth, with some rock filling if the tower is to carry heavy stresses or if the ground is soft. Bolts or stubs are best placed by means of a template made of structural steel, which holds them in exactly correct position until the concrete is set or the earth is rammed. Wood templates are cheaper in first cost but are easily injured, and the cost of correcting one wrong footing even in good country, particularly if, as is usually the case, the trouble is not discovered until the tower is raised into position, will eat up the "economy" and more.

Of the other metal supports the diamond, tripartite, and several other special forms of poles are used to a very limited extent. The diamond pole consists of two parts of high strength steel of V-shape, with specially flanged edges. When properly interlocked these form a diamond section which is set so that the main strains come in the line of the diagonals. While this pole is light and strong the joints are said to render it particularly subject to corrosion. Its chief use is for trolley overhead. The tripartite pole has three legs of Bessemer steel, each of U-section, of such dimensions that each size just fits inside the next larger. The legs are held, with the "round" out, by means of spreaders and collars. Of these there is a large variety, so that a great many combinations of leg sections can be made with any one of many tapers. There have been several installations of this type of pole on transmission lines, notably those of the United States Reclamation Service in connection with the Roosevelt Dam project in Arizona, and the Pueblo line of the Anglo-Mexican Hydroelectric Company of Mexico City, Mexico. The first line has both single and double three-phase circuits of No. 2 copper, in spans of from 300 ft. to 400 ft., on poles 40, 45 and 50 ft. in length. The Mexican line has one three-phase circuit of No. 1 copper and a pair of No. 8 telephone wires in spans of from 285 ft. to 350 ft., on poles 43 ft. 7 in. long, with one leg extended 6 ft. above the top of the pole proper to take a ground wire.

There Are Still Too Many "Standard" Tubular Poles

Tubular poles, originally made up from iron pipe, now consist of special steel tubing and are listed in innumerable combinations, while even more can be had as "specials." In 1913 the American Electric Railway Engineering Association "standardized," cutting down the number between the lengths of 28 ft. and 35 ft. to only ninety-six, there being twelve of each length. As a matter of fact it would seem entirely practicable to reduce the list to not more than thirty "regulars," for many of the sizes listed are very heavy for their strength, and it hardly seems necessary to have lengths varying by single feet.

While tubular poles are practically standard for city trolley lines they have had very little use in transmission service except when the latter lines were on trolley poles. They are, however, coming into use in heavy electrification overhead, notably on the Norfolk & Western, the Pennsylvania at Philadelphia, and the New York Connecting Railroad. In these installations poles of extra large size and strength are employed, and with the solid steel-rod guys are really more of the nature of "baby" towers than poles.

The tubular pole tends to corrode both on the inside and at the ground line, "man's best friend" playing no mean part in the latter, although to-day it is almost universal practice to buy tubular poles with a protecting "dog sleeve" extending a foot or so above the ground. Interior corrosion is less serious; it can be prevented by filling the pole with concrete, but the large majority of users believe that the cost of the protection is greater than the results warrant, and the practice is not common.

Table II, from the 1915 report of the American Electric Railway Engineering Association, gives full and most valuable details of tubular poles of standard sizes.

Getting More Energy Out of Coal in the Power Plant

By Hartley LeH. Smith
Chief of Testing Bureau
Brooklyn Rapid Transit System

Good Station Operation Involves a Knowledge of the Heating Value of the Fuels Used—Coal Cost Is So Large an Element in Total Operating Cost that Conservation in Its Use Can Effect Large Economies

THE cost of coal is so great an item in the total operating cost of producing electrical energy at the switchboard of a power plant that its efficient use effects a tremendous saving, while its inefficient, negligent use cuts down dividend rates not by fractions but by integers. This cost varies from about 55 per cent in average localities during normal times to as much as 85 per cent in districts somewhat remote from mines in these days of coal scarcity and deteriorated quality.

As mentioned in an earlier article dealing with water in steam-driven electric power plant operation, the finished product in the power plant is kinetic energy in electrical form, while the fundamental raw material, using the term "material" in a rhetorical sense only, is the potential heat energy of the coal. The coal itself as an actual material substance involves problems so numerous and difficult to handle that broad technical knowledge is needed in the boiler room for their solution. It is here that men properly equipped can do most to make the whole plant most highly efficient and produce a saving that will show to advantage in the report of power cost.

Excessive Combustible in the Ash Is Reprehensible

The chief problem with coal is to burn it. This is the engineer's problem, and it is a difficult one, although the purchasing agent may think just now that his problem is still more difficult. A lot of the coal which enters the power plant never does get burned. This fact has led many power plant operators to make the determination of combustible in the refuse a routine procedure. Probably many operators do not realize how great a loss can be occasioned by allowing refuse unduly rich in combustible to leave the plant. When the percentage of true ash in the coal is high the danger is particularly great.

Omitting refinements the approximate formula for the loss in the combustible, expressed as a decimal fraction, is:

$$\textit{Loss} = \frac{(f + y)xy}{f(1 - x)}$$

Where

f = fixed carbon in coal
y = true ash in coal
x = combustible in refuse, all in per cent.

The loss may be expressed as a percentage thus:

$$\textit{Loss} = \frac{(f + y)xy}{f(100 - x)}$$

A still simpler formula, if the fixed carbon is not known but if data are available as to the combustible in the refuse and the ash in the coal, is:

$$\textit{Loss} = \frac{xy}{(1 - x)(1 - y)}$$

Or, in per cent,

$$\textit{Loss} = \frac{100xy}{(100 - x)(100 - y)}$$

For example, if the fixed carbon is 76 per cent, the true ash is 6 per cent and the combustible in the refuse is 15 per cent, then the power plant loss is 1.1 per cent. Again, if the fixed carbon is 62 per cent and the true ash in the coal is high, say 18 per cent, while the combustible in the refuse is 30 per cent, the power plant loss is 9.9 per cent.

To avoid large losses of this kind the fires must be well burned down before cleaning, or dumping, if they are stoker fires. Such burning down is not a hardship to the fireman, and only adequate and tactful supervision is required to bring it about. Such burning down does not need to have charged against it a period of undesirably low steaming rate, for fires while being burned down are capable of making steam actively.

Clinkers Do Not Necessarily Mean Low Efficiency

The subject of clinker in the refuse is of considerable interest in this connection. Where there is much clinker there is apt to be very little combustible. The writer noticed this some years ago and called attention to it in a letter written to the editors of *Power*, in September, 1905. Some time later he was interested to find reference to the letter, with confirmation of the relationship mentioned, in Bulletin No. 325 of the United States Geological Survey.

When clinker forms with any freedom it is obvious that combustion is occurring at high temperature. A temperature high enough to melt ash does not let much carbon go unburned. Of course, no one is desirous of encouraging the formation of clinker with its attendant troubles, but there is at least some consolation in the fact that when it does form the refuse losses due to the presence of combustible are small.

The nature of the true ash primarily determines the extent of clinkering. The main point seems to be that burning all but the last bit of carbon involves the burning of some carbon which is surrounded by great quantities of ash. For this high temperature is required, and at this high temperature at least some of the ash will fuse or melt.

Some Lessons from Domestic Fuel Consumption

On the general subject of combustible in the refuse of the power plant it is interesting to turn for a moment to that of the domestic use of coal in house heaters.

Here we know that the use of the rotary ash sifter has done wonders in cutting down coal consumption. Mainly no doubt, this has come about through making the rejected ash practically true ash almost in powdered form. Another saving perhaps is through the more complete burning of the volatile matter of the coal when each charge of green coal is covered with a layer of sifted cinders.

An engineer in a recent letter to *Power* stated that last year 8 tons of coal had been burned in his heater with no sifting of ashes, while during the current year, up to the time of writing, less than 6 tons had been burned and he expected that the season's consumption would be but 6½ tons. This letter was called forth by an editorial in the same paper dealing not with ashes from house heaters rich in combustible but those from many private plants in large cities. The central stations, under present conditions, have patriotism as well as fuel economy to consider.

Buying Coal According to Specifications

On the subject of coal specifications not much need be said in these days nor apparently for some time to come on account of the general fuel situation. When, however, specifications were more useful than at present, in most cases it was the heating value of the coal which was considered the most important active control factor in business dealings between coal consumer and coal dealer. Sometimes, however, the ash and volatile matter were specified, with bonus and penalty clauses included.

The determination of heating value by means of a bomb calorimeter is now quite general practice, and where the coal is received in barges and, therefore, in units of hundreds of tons, a determination of the heat content of every barge load is frequently undertaken. The trouble and cost are looked upon as worth while even if the results are only useful for purpose of record. Where such record is available there is no doubt that extensive use is made of it in that operation known commonly as "registering a kick."

It Is Often Important to Know the Ash Fusion Temperature

Along with the growing practice of making calometric determinations of coal there are many plants which also make frequent measurements of the actual fusion temperature of the ash in the coal. This is especially true in plants having large installations of underfeed stokers, for such stokers inherently operate with high furnace temperatures. It might perhaps be more accurate to say that they operate inherently with zones of very high temperature in the fuel beds and particularly at high ratings. For this reason the ash fuses, and there is trouble with the furnace walls unless the ash of the coal has decidedly high fusion temperature.

To justify the expense of laboratory work for the measurement of fusion temperature of ash in coal shipments, etc., there must be furnished an opportunity to prevent damage by ash with low fusion temperature. This is especially true where such coal is to be kept out of underfeed stokers. It is always somewhat difficult to arrange this, for it involves a laboratory equipped and manned on a scale making possible the putting through of tests with a rush. The writer was once told by a man in considerable authority in a large plant that the men in his plant could tell how the cones of ash were going to act in the high-temperature laboratory furnace by the extent to which the coal had clinkered on the underfeed stokers. This is surely "getting the cart before the horse."

Ultimate Analyses of Coal Are Not Necessary

So far as the analysis of coal goes it may be said that no plant makes ultimate analyses. Proximate analysis is relied upon entirely. For the purpose of registering effective complaints such analysis is greatly superior to the mere determination of heating value. It furnishes ammunition for campaigns of complaint about the amount of volatile matter and a corresponding tendency to produce smoky flue gases, about the heating value, also, because the determination of ash, volatile matter and corresponding fixed carbon permits very close calculations of heating values. But the power plant man cannot kick about the moisture, for the coal man will always say that "it rained."

Just a word more about the heating value of coal. This is obtained with great accuracy in a bomb calorimeter or approximately by calculation from the result of proximate analysis, and whether or not many of the data are looked upon as worth while, anyway, just as a matter of record, it is positively essential to know the heating value of the coal so that the thermal efficiency of the station can be calculated. Every engineer nowadays wants to calculate the thermal efficiency of his plant. It is impossible otherwise for him to know what he is doing with his plant. My advice, therefore, to the power plant man who lacks a calorimeter, crucibles, gas burners and oxygen tanks is to make out a requisition for these necessaries. The boss will surely sign it.

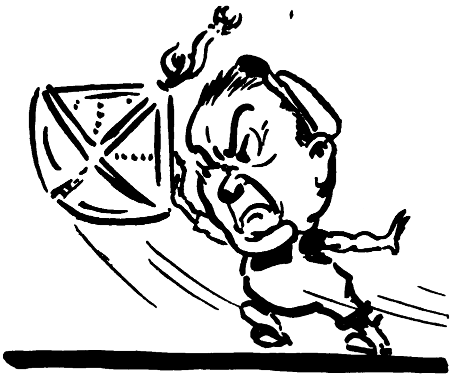
What About the Poor-Quality Coal That We Are Getting Now?

The present crisis in the coal industry has produced a great deal of irregularity in the quality of coal and it has deteriorated noticeably. A great deal has been written to explain this situation and to outline the steps that the government might take to restore conditions more nearly to normal. Lately the federal Fuel Administrator has issued regulations for the purpose of improving conditions. Power plant engineers have complained bitterly of the quality of coal which they are receiving.

Undoubtedly in many instances coal has been supplied which, because of its poor quality, has produced an alarming rise in maintenance cost of furnace equipment. In some cases, however, the poor quality has meant little more than a serious lowering of heating value. It seems to me sometimes that users of high-quality coal grow to be a pampered element in our population. Barring coal of low heating value which happens also to be characterized by low fusing temperature of ash, it seems to me to be an open question whether something other than very high-quality coal is not the most suitable for power-plant service. Of course, very high-quality coal is not used in many large power plants. There is not, in truth, enough of it to go around. Even in normal times the steamship trade takes most of this coal and it is proper that it should do so. Aside from the steamship trade really good coal should be looked upon as a luxury which only the rich among corporations can afford.

In power-plant service the dictum is sometimes heard: "The cheapest coal to buy is the cheapest coal to burn," but this is a very unsafe dictum if taken without reservation. It is, however, one which bears examination in concrete cases, but such examination has a reliable basis only in tests of the evaporating quality of the fuel. These tests should be comprehensive and planned definitely to cover a range of steaming rates wide enough to reveal possibilities of economical use of the coal under conditions of station operation possibly differing somewhat from the normal.

Such conditions may be entirely satisfactory and may, in fact, resemble those which have long been used elsewhere.


Don't Lose a Single B.T.U. Out of This Bucket of Coal

The great problem with coal, as stated before, is to burn it efficiently. We shall assume that it has been properly selected; that it is of quality not too good for the circumstances, and not too cheap, if cheapness is accompanied by the presence of clinkering qualities caused by ash with low fusing temperature. Further, we shall assume that proper supervision has been provided and good firing methods ingrained in the fireman so as to insure no large loss of combustible through the ashpits. The next question is how the heat loss up the stack is to be kept moderate or low. This is a very important question. Many people are willing to step forward to tell us how to answer it, or to write articles about it. Engineering societies spend unhappy evenings discussing it. Makers of instruments are anxious to provide equipment designed to make the solution of the problem easy. Personally I do not desire to be one of the general company of wisacres along this line.

There was a time when I was much impressed with magazine articles demonstrating so easily the enormous heat losses through the stacks occasioned by decreasing values of CO_2 (on the false basis that the flue temperature remained unchanged). The savings to be made by high CO_2 were heralded so widely that the power-plant operator who had escaped being greatly impressed thereby was surely a "wayfaring man and a fool." I was, however, much depressed by the absence of sharply definite counsel on how to get high CO_2. The articles simply said when the CO_2 percentage is high the excess air is low.

A Practical Demonstration in Efficient Boiler Operation

I found out later how to manipulate the furnaces and drafts so as to produce a high percentage of CO_2, but along with this knowledge came the conviction that such manipulation is not worth while. The following experience contributed to this conclusion.

I was conducting a series of tests on a water-tube boiler fired by an overfeed stoker using semi-bituminous coal low in ash and of a quality considered particularly suited to the station conditions. This coal had long been used in the station and on the stoker in question. There had been conferences, tests and what not for a long time in regard to the operation of the equipment. The stoker manufacturer sent an expert operator to do his bit.

The tests were made long after the stokers had been installed. They included three series of tests exactly alike except that during each of the series a different man was in charge. Each man operated with unimpeded control except in one particular, namely, that the flue draft was maintained during each eight-hour test by a man who watched constantly a draft gage connected to the flue nozzle on the boiler side of the damper and manipulated the damper so as to maintain constant draft.

Each series consisted of five tests of eight hours each, and flue drafts of 0.36 in., 0.40 in., 0.44 in., 0.48 in. and 0.52 in. water column were used. Each man operated the stoker with these drafts, there being fifteen tests in all. Each man manipulated the stoker mechanism to suit himself, adjusting the rates of coal feed and grate movement, deciding when and how to dump ashes, etc.

In every way he did what he pleased except that the draft at the flue nozzle was established for him. The coal and water were weighed, the gas was analyzed for his inspection, temperature and pressure measurements were made and displayed to his view if he cared to look at them.

High Efficiency Accompanies Low Coal Consumption

As previously stated, one man was an expert sent by the stoker manufacturer. Another was a head fireman who ordinarily did not run stokers but graduated years before and put in his time eight hours a day showing others how to do it. The third man was a good stoker operator but of no particular skill, and he was quite illiterate judged by any standards current among combustion experts. He could barely speak the English language.

Now I am not going to say that the last man beat the other two. It is not so easy as all that. At every one of the five values of flue draft the highest economy of evaporation, the highest over-all efficiency by far, was attained by the man who at each particular value of flue draft used the least coal per hour. At one draft value it was one man, at another another man. Each of the three men secured honors in the tests, but how they were divided I do not remember. Always, however, the man who with a given flue draft used less coal than the other two at the same draft was the man who won out, and by a large margin.

This conclusion that the least coal at a given flue draft corresponded to the best operation is worthy of careful thought. Does it mean the use of a thin fire? Does it argue for considerable excess air? I leave these questions to the reader as a profitable subject for his reflection. The problem is obviously a vital one if fuel consumption is to be fully controlled.

Proper Analysis Is Fundamental in Choosing Railway Motors

By C. W. Squier
Electrical Engineer

The Writer Shows How Speed-Time Graphs Are Constructed and Describes the Considerations Which Are Necessary for Proper Choice of Car Motors

RAILWAY motor characteristic curves show speed in miles per hour with a certain gear ratio and size wheel, tractive effort at the rim of the wheel and efficiency. The efficiency is usually expressed as the relation between the electrical input to the motor and the mechanical output from its armature shaft. By deducting the losses in the gears connecting the armature shaft with the car axle, we obtain the relation between the electrical input to the motor and the output at the rim of the car wheels. This relation is referred to as "efficiency with gears" and is the one most generally used, although it is desirable to have both given in order to eliminate errors made by determining gear and friction losses by different methods.

Motor characteristics form the basis of all calculations of motor performance, and in comparing motors for a particular service it is usual to replot the curves as furnished by the manufacturer, making any changes necessitated by any difference in voltage, gear ratio or diameter of driving wheels. The following formulas give the various changes in speed and tractive effort as effected by a change in gear ratio or diameter of wheels:

S = Speed ordinate for any current value on original curve.
S_1 = Speed ordinate for any current value on derived curve.
T = Tractive effort for any current value on original curve.
T_1 = Tractive effort for any current value on derived curve.
D = Diameter in inches of driving wheels for original curve.
D_1 = Diameter in inches of driving wheels for derived curve.
G = Gear ratio for original curve.
G_1 = Gear ratio for derived curve.

Then:

$$S_1 = \frac{(G \times D_1)}{(G_1 \times D)} S \text{ and } T_1 = \frac{(G_1 \times D)}{(G \times D_1)} T$$

For example, suppose we have the characteristic curve for a motor with 33-in. wheels and 15 : 69 = 4.6 gear ratio and we wish to find the desired curves for 30-in. wheels and 17 : 67 = 3.94 gear ratio.

$$\text{Speed ordinate } S_1 = \frac{4.6 \times 30}{3.94 \times 33} S = 1.061S \text{ and}$$

$$\text{Tractive effort ordinate } T_1 = \frac{3.94 \times 33}{4.6 \times 30} T = 0.942T$$

The factors by which the speed and tractive effort at any current are to be multiplied to give the derived valves are the reciprocals of each other. It should also be noted that in changing the gear ratio on the same motor, the sum of the number of teeth in the pinion and gear must remain the same.

The voltage at the terminals of a railway motor may be divided into two parts, the counter-emf. and the voltage required to overcome the internal resistance of the motor. This last component is equal to the product of the resistance in ohms by the current in amperes and is thus constant for any given current regardless of the terminal voltage. In a certain 50-hp. motor with a resistance of ½ ohm 20 volts are necessary to force 40 amp. through the windings, and for any other current the value will be proportional.

The speed of a railway motor when operating with any given current is directly proportional to its counter-emf., that is, the voltage produced by the armature conductors cutting the magnetic flux.

Thus,

$$\frac{S_1}{S} = \frac{E_1 - Ir}{E - Ir}$$

where

E is the terminal voltage for the original curve
E_1 is the terminal voltage for the derived curve
I is the current value
and r is the internal resistance of the motor

If the 50-hp. motor referred to above is operating at 40 amp. and 600 volts, the voltage required to overcome the internal resistance is 20 and the counter-emf. is 580 volts. If the voltage at the terminals is reduced to 500, with the same current, the counter-emf. will be 480 volts and the speed of the motor will be reduced in the same proportion. The ratio of 480 to 580 is 0.827 and if the speed at 600 volts was 17 m.p.h, it would be reduced to 14.06 m.p.h. at 500 volts. It is thus seen that the speed is reduced in greater proportion than the terminal voltage, for the ratio of 500 to 600 is 0.833. It follows, then, that if the resistance of a motor is known, the characteristic curves at any desired voltage can be readily calculated from the curves available.

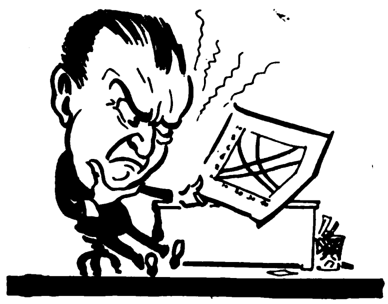
Some graphical methods for determining the speed ratio for different changes in terminal voltage were given in the issues of the ELECTRIC RAILWAY JOURNAL for March 13 and Sept. 18, 1915, and serve to illustrate these relations very clearly.

The tractive effort produced by the motor is independent of the voltage, being determined by the current alone. Hence, as long as the motor is drawing a given current the torque and resulting tractive effort will be essentially the same regardless of the voltage at its terminals.

Speed-Time Curves Show Motor Performance for a Particular Service

Before making a comparison of the service furnished by different motors, I shall discuss briefly a method for calculating and constructing the speed-time curves. The data for the duty cycle were given in the previous article in the ELECTRIC RAILWAY JOURNAL of April 20. The characteristic curves of a tapped field motor, to be used in the present calculations are shown in Fig. 1.

In starting a car resistance is placed in series with the motors, and this is gradually cut out by the action of the controller until finally the full line voltage is applied to the motors. This period of the operating cycle is known as the rheostatic accelerating period. Assume an average acceleration for this period of 1½ m.p.h.p.s. To produce an acceleration of 1 m.p.h.p.s. requires 100 lb. per ton, so that 150 lb. per ton will be required to give the acceleration desired. As the car with seated load weighs 23.56 tons, there must be 150 × 23.56 or 3534 lb. net tractive effort for the car or 1767 lb. per motor to give the required acceleration. In addition to this, the motor must produce the tractive effort necessary to overcome the train resistance, as shown by the graphs shown in Fig. 6 of my article in the issue of April 20.



Better to Sweat Over a Motor Characteristic than Over the Motors

In order to determine the point on the speed-time curve at which all of the starting resistance is cut out and the motors have full line voltage applied to them, it is most convenient to use an auxiliary curve sheet of the form shown in Fig. 2.

This method was first brought to my attention in an article by W. S. Valentine in the STREET RAILWAY JOURNAL of Sept. 6, 1902. It has been described several times since in various handbooks and technical papers.

These graphs, Fig. 2, are constructed as follows: A scale of pounds net tractive effort per motor is laid off along the horizontal axis and scales of speed and acceleration are laid off along the vertical axis. The train resistance graph, *RR*, is first plotted, showing train resistance per motor for the different speeds. The graphs of net tractive effort, *LS* and *MN*, are obtained by taking the tractive effort at any speed from the motor characteristic curves Fig 1, and subtracting the train resistance for that speed from this.

Thus at 12 m.p.h. the tractive effort with full field is 1060 lb., less 262 lb. train resistance, which leaves 798 lb. net tractive effort. These values are then laid off and the point *P* on the graph is determined. Other points are obtained in a similar manner. With tapped-field motors two graphs are obtained as shown. Since the rate of acceleration is directly proportional to the net tractive effort, a straight line drawn through zero at the proper angle will be the graph of acceleration on straight level track. In our case it required 1767 lb. per motor to give an acceleration of 1½ m.p.h.p.s. This locates the point *Q*, and the line *OQ* gives the acceleration for different values of net tractive effort. From the curve *LS* we see that 1767 lb. net tractive effort is obtained at a speed of 9.9 m.p.h. Hence the car will accelerate at the rate of 1½ m.p.h.p.s. until this speed is reached, when full line voltage will be applied to the motor.

There are many graphical methods used for plotting speed-time curves, and all possess considerable merit. My experience has shown that the step-by-step process gives a clearer understanding than others of the actual mechanics of car performance and a firmer grasp on the theory underlying the construction of the curves. After such an understanding has been obtained graphical methods are of great assistance in reducing the labor involved, especially when it is necessary to plot many curves.

In the following table are tabulated values for each step of the speed-time-curve construction. As the motor characteristic curves give tractive effort for a single motor it is more convenient to figure the pounds train resistance and net tractive effort per motor instead of per car.

Miles per Hour	Per Motor						
	Amperes		Tractive Effort	Train Resistance	Net Tractive Effort	Rate of Acceleration	Seconds from Start
9.9	90	F.F.	2,018	251	1,767	1.50	6.6
10.35	80	F.F.	1,735	253	1,482	1.26	6.93
10.35	120	T.F.	2,580	253	2,327	1.98	6.93
11.00	106	T.F.	2,160	256	1,904	1.62	7.29
12.00	88	T.F.	1,660	261	1,399	1.19	8.00
13.00	74	T.F.	1,300	265	1,035	0.87	8.97
14.00	64	T.F.	1,040	270	770	0.65	10.29
15.00	57	T.F.	870	275	595	0.51	12.01
16.00	51	T.F.	750	280	470	0.40	14.23
17.00	47.5	T.F.	650	286	364	0.31	17.09
18.00	44.5	T.F.	580	292	288	0.245	20.70
19.00	42	T.F.	510	297	213	0.180	25.41
20 00	39	T.F.	460	303	157	0.134	31.78

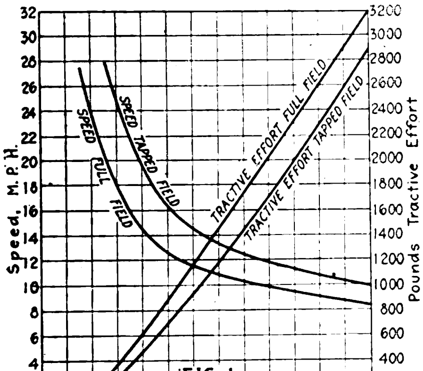


Fig. 1—Typical Motor Characteristic Curves

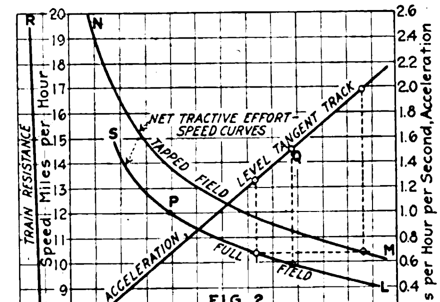


Fig. 2—Acceleration and Tractive Effort Graphs

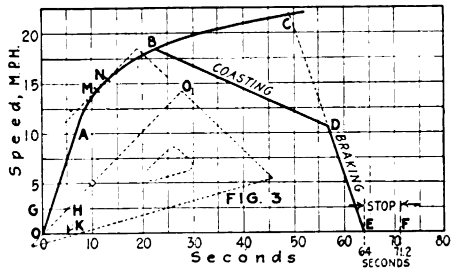


Fig. 3—Typical Speed-Time-Curve Construction

GRAPHS USED IN SPEED-TIME-CURVE CONSTRUCTION

A speed of 9.9 m.p.h. corresponds to a current of 90 amp. I have assumed a lower current limit setting of 80 amp. so that the motors operate with full field until the current falls to this value, when the change to tapped field is made. This will occur at a speed of 10.35 m.p.h. as will be seen from the characteristic curves Fig. 1.

To construct the speed-time curve of Fig. 3, we use the figures in the table as follows: As the car accelerates at a rate of 1½ m.p.h.p.s. up to 9.9 m.p.h., the time required to reach this speed is 9.9/1.5 = 6.6 seconds. This determines the point A on the curve, and the line OA represents the straight line or rheostatic accelerating period.

As the car increases its speed the current, tractive effort and rate of acceleration decrease and at a speed of 10.35 m.p.h. the current will have fallen to 80 amp. and the rate of acceleration will be 1.26 m.p.h.p.s. Since the tractive effort and acceleration decrease uniformly as the car increases in speed, we may assume without serious error that the average acceleration during this period is the average of the initial and final accelerations. The average rate of acceleration between 9.9 and 10.35 m.p.h. is ½ (1.5 + 1.26) = 1.38 m.p.h.p.s.

In using this method speed intervals greater than 3 m.p.h. should not be used. Usually an interval of 1 m.p.h. will be found very convenient. To increase the speed from 9.9 to 10.35 m.p.h., a difference of 0.45 m.p.h., at a rate of 1.38 m.p.h.p.s. requires 0.45/1.38=0.326 second, and the car reaches the speed of 10.35 m.p.h. in 6.6 + 0.326 = 6.926 seconds from the start. This gives another point on the speed-time curve, and at this point the change from full to tapped field is made, and a sudden increase in acceleration takes place. This increase in acceleration can best be followed by referring to the graphs shown in Fig. 2. From an acceleration rate of 1.26 m.p.h.p.s. with a net tractive effort of 1482 lb. on full field we reach 2327 lb. net tractive-effort and an acceleration of 1.98 m.p.h.p.s. with tapped field. A study of these graphs shows the desirability of limiting the current swing when changing to tapped field. Above this point the values of tractive effort are taken from the tapped-field tractive-effort curve. At 15 m.p.h. the current is 57 amp., the tractive effort 870 lb. per motor, the train resistance 275 lb. per motor and the net tractive effort 870—275=595 lb. per motor. Therefore the rate of acceleration at 15 m.p.h. is 595/1178 or 0.505 m.p.h.p.s. Other points are found in the same manner and the curve AC is thus determined.

Short-Cuts in Making Speed-Time Curves

In order to save time and labor in constructing speed-time curves I make use of several modifications of the preceding methods and the following has been found especially convenient:

By taking speed intervals of 1 m.p.h. and by assuming that the acceleration for any speed starts ½ m.p.h. below and continuous for ½ m.p.h. above this speed, we can omit figuring the time given in the table preceding. To illustrate this let us take the speed of 15 m.p.h., with its corresponding acceleration of 0.505 m.p.h.p.s. as found above. The slope of the speed-time curve through 15 m.p.h. is determined by drawing the line OO_1, starting from O and passing through the 5.05 m.p.h. point at 10 seconds. This corresponds to an acceleration of 0.505 m.p.h.p.s. To plot the curve take a triangle and lay one edge along the line OO_1, then slide the triangle along so as to draw the line MN for the speed-time curve parallel to OO_1, starting at 14½ m.p.h. and continuing to 15½ m.p.h. The slope for the acceleration at 16 m.p.h. starts at 15½ m.p.h. and continues to 16½ m.p.h. and so the curve is constructed with short straight lines. This provides a very rapid as well as accurate method of constructing the curve.

What Coasting and Braking Periods Mean

The speed-time curve as calculated so far shows the performance of the car while the motors are propelling it. In order to stop at a given point power must be shut off and the brakes applied. To complete the coasting and braking periods of the speed-time curve consider a run of 1200 ft. at a schedule speed of 11½ m.p.h. with a 7.2 second stop. The time required to make such a run will be (1200×3600) / (5280×11.5)=71.2 seconds. This time includes the 7.2 second stop, so that the running time, not including stop, is 64 seconds. An average braking rate of 1½ m.p.h.p.s. was specified. To construct the braking part of the curve, start at the 64 second point on the base line and draw a line through the 15 m.p.h. point at 54 seconds. The slope of this line will then be correct for the braking rate assumed. This line cuts the accelerating part of the curve at C. The curve $OABC$ is the accelerating portion with power on, CE is the braking line and EF is the stop.

The Area Under the Speed-Time Curve Is a Measure of the Distance Traveled

The distance which the car travels is most conveniently found by measuring the area under the speed-time curve. To illustrate how this area is a measure of the distance traveled, let us consider one of the cross-section squares. The area of such a square is 2½ m.p.h. × 5 seconds, and if the car could be started instantly at a speed of 2½ m.p.h. and run for 5 seconds and then stopped instantly, the speed curve would be the square $OGHK$ and the car would have traveled (2.5×5280 ×5) / 3600=18⅓ ft. Each of these square, therefore, represents 18⅓ ft. As the car is to travel 1200 ft., for this run the area under the speed-time curve must be 1200/18⅓=65.46 squares.

The part of the curve OAB with power on, DE the braking line and EF the stop, are fixed so that the only part that can be varied to get the correct area is the position of the coasting line BD. This is first drawn in a trial position and the inclosed area is obtained by counting the squares or measuring with a planimeter. If the area is found too great, the coast line is moved down, and if too small, the line is moved up and this cut and try method continued until the inclosed area is found to be correct.

To determine the slope of the coasting line, take the train resistance for the average coasting speed and compute the rate of retardation from this. In Fig. 3, the average speed for the coasting line BD is 14½ m.p.h., the train resistance is 275 lb. per motor and the rate of retardation 275/1178=0.23 m.p.h.p.s., that is, 10 seconds after power has been shut off, the speed of the car will be reduced 2.3 m.p.h. This method assumes that the coasting line is straight, which is not entirely correct, since the train resistance varies with the speed of the car and the coasting line will have a slight curvature. This curvature is so small, however, that no serious error is introduced by assuming the coasting line as straight and the slope drawn to correspond with the train resistance at the average speed.

Selecting and Caring for Hand Tools Used by Way Department

By R. C. Cram

Assistant Engineer, Department of Way and Structure,
Brooklyn Rapid Transit System

Tools and Labor Are So Intimately Related in This Department that Good Tools Well Maintained Will Pay for Themselves Many Times Over in Labor Saving Alone

THE constant effort which is being made to effect economies in track maintenance work has caused a searching inquiry to be made into many divisions of the work which in normal times have been subjected to rather superficial and desultory consideration. The subject of small hand tools used by the way department may be placed in this class.

Poor Tools Cause Waste of High-Priced Labor

Ordinarily one would not think it worth while to pay much attention to such matters as tool sharpening, control of supply of tools, overstocking, extra handling and cost of tool supply service. We have all known in a general way that we are using a great many hacksaw blades, or that our picks seem constantly to be on the way to or from the blacksmith shop, but we have not been required to economize because of a lack of an adequate supply of new tools at reasonable prices. Wartime prices for tools and supplies have put these articles upon a higher plane and we are beginning to realize how essential they are. It is brought home to us that we cannot do without the pick and shovel, or the lining bar and spiking maul any more than we can dispense with the men who use them. Consequently the fact becomes evident that it is the very antithesis of economy to pay high prices for labor and then equip it with poor tools. On the contrary, the tools and their condition should receive expert attention with the object of seeing that they are in every way fit to assist in getting full value from the laborers who use them. This point is emphasized by statistics which indicate that more than 60 per cent of the cost of track or maintenance work is spent in payrolls, for labor, and nearly all the time is spent in using tools.

Worn shovels may be easy on the men but are hard on the management

There are also numerous small supplies which are in common use, the consumption of which during a year's work is astonishingly large in quantity. A casual examination of the list of such small things as sandpaper, emery cloth, hacksaw blades, folding rules, lantern and lantern globes, kerosene oil and red flags, which have been used by the average track department in a season, will be an eye-opener to anyone who has not paid much attention to details in this regard.

Before considering either tools or supplies further it will be of interest to inquire into the practice as to the issuing of tools and accounting therefor. In the first place, there should be uniformity in practice and the entire procedure should be carefully outlined. Comparatively simple record systems should be used which will cover the progress of all tools and supplies from the storeroom to the tool box, and thence by monthly checking of the latter until the tools are returned for sharpening or replacement due to loss or breakage and until supplies are exhausted.

Each foreman should be made responsible for the economical use of tools and supplies and for all loss, breakage and misuse. Any extraordinary consumption of tools or supplies, or reported breakage of certain tools, should receive prompt attention with the view of determining whether the consumption may be due not to wear or extra work but to theft or misuse. Continued breakages may mean poor quality of material. Extra large returns of tools for sharpening, particularly from a gang confined to one class of work where use to which tools are put is uniform, should be a cause for study as to whether the tool steel is poor or whether the blacksmith work is being done poorly.

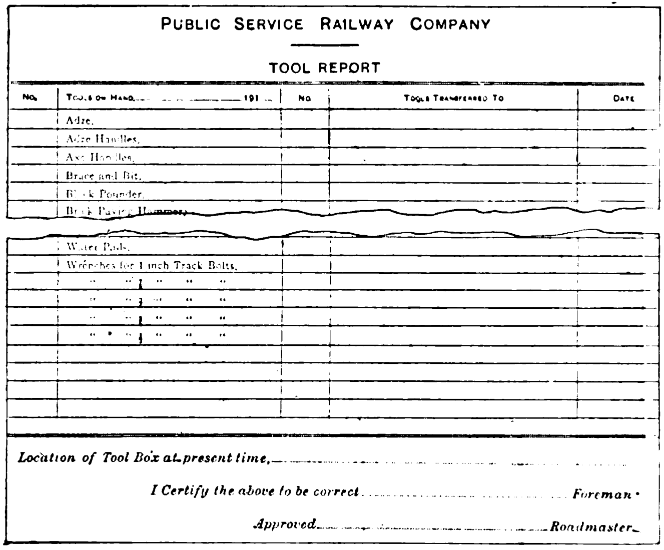
Each foreman should be required to report once a month on the contents of his tool box. The report should be on a printed form of the simplest character upon which are listed all the standard tools, with space for the few odd, little-used tools which are occasionally supplied. Such a form of tool report is shown in Fig. 1 on page 960.

On large city systems it has been found advisable to employ a tool foreman, one of whose duties is to check up the contents of tool boxes at least once a month. When such a man is employed the form of tool record shown in Fig. 2 has been found useful. In addition to this form the one shown in Fig. 4 is used to make a record of delivery for tools and supplies which are handled and consumed in large quantities during each month of a busy season. A similar form is used to make a record of tools picked up by tool cars. These forms serve to protect the foreman and the motormen and chauffeurs who make the deliveries and collections.

A Simple Order System Prevents Loss of Tools

It is not generally good practice to permit foremen to order tools directly, except in case of emergency. They should make their wants known to the roadmaster or supervisor, and no tools should be given out except on proper storeroom order signed by persons authorized to sign orders. A form of storeroom order used for this purpose is shown in Fig. 3. When foremen sign they are usually shop foremen authorized to do so. Also, some roads make a rule that no new tool shall be given out unless an old tool of like character be returned. This simple rule makes it necessary to account for losses where the old tool is not available for return and tends to create more careful use and to insure return of tools to the tool box at night.

The tool foreman occupies a position of considerable importance. Besides his duty in checking up tool boxes he generally handles the tool requisitions and secures the tools and supplies from the storeroom, sending them out to the various groups either by the regular tool-car service or by auto truck. The proper routing of a tool supply car or truck is no mean task. He also keeps a watch on the tool and supply stock in the storeroom, keeping his superior advised of conditions of stock so that they may be replenished in time to prevent delays to the work.



PUBLIC SERVICE RAILWAY COMPANY

TOOL REPORT

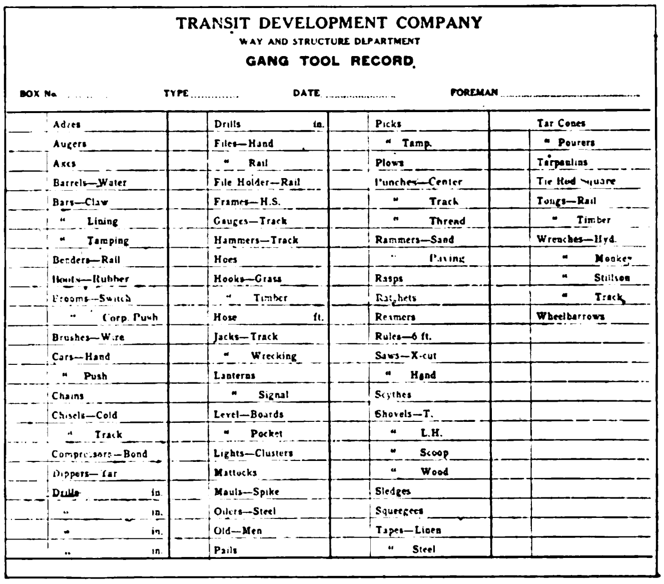
No.	Tools on Hand ____ 191__	No.	Tools Transferred To	Date
	Adze.			
	Adze Handles.			
	Axe Handles.			
	Brace and Bit.			
	Block Pounder.			
	Brick Paving Hammers.			
	Water Pails.			
	Wrenches for 1 inch Track Bolts.			
	" " " " "			
	" " " " "			
	" " " " "			
	" " " " "			

Location of Tool Box at present time, ____

I Certify the above to be correct ____ *Foreman*

Approved ____ *Roadmaster*

Fig. 1. This Form Is Useful in Reporting Contents of Tool Boxes and Provides a Record of Any Tool Transfers Made



TRANSIT DEVELOPMENT COMPANY

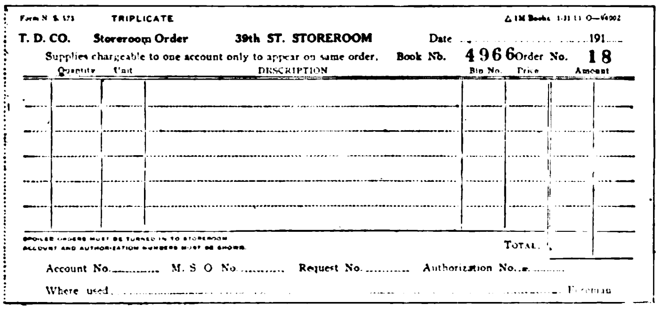
WAY AND STRUCTURE DEPARTMENT

GANG TOOL RECORD

BOX No. ____ TYPE ____ DATE ____ FOREMAN ____

	Adzes		Drills in.		Picks		Tar Cones
	Augers		Files—Hand		" Tamp.		" Pourers
	Axes		" Rail		Plows		Tarpaulins
	Barrels—Water		File Holder—Rail		Punches—Center		Tie Rod Square
	Bars—Claw		Frames—H.S.		" Track		Tongs—Rail
	" Lining		Gauges—Track		" Thread		" Timber
	" Tamping		Hammers—Track		Rammers—Sand		Wrenches—Hyd.
	Benders—Rail		Hoes		" Paving		" Monkey
	Boots—Rubber		Hooks—Grass		Rasps		" Stillson
	Brooms—Switch		" Timber		Ratchets		" Track
	" Corp. Push		Hose ft.		Reamers		Wheelbarrows
	Brushes—Wire		Jacks—Track		Rules—6 ft.		
	Cars—Hand		" Wrecking		Saws—X-cut		
	" Push		Lanterns		" Hand		
	Chains		" Signal		Scythes		
	Chisels—Cold		Level—Boards		Shovels—T.		
	" Track		" Pocket		" L.H.		
	Compressors—Bond		Lights—Clusters		" Scoop		
	Dippers—Tar		Mattocks		" Wood		
	Drills in.		Mauls—Spike		Sledges		
	" in.		Oilers—Steel		Squeegees		
	" in.		Old—Men		Tapes—Linen		
	" in.		Pails		" Steel		

Fig. 2. A Convenient Form for Recording the Tools in Use by Different Gangs



Form N. S. 373 TRIPLICATE Δ 1M Books [illegible]

T. D. CO. Storeroom Order 39th ST. STOREROOM Date ____ 191__

Supplies chargeable to one account only to appear on same order. Book No. 4966 Order No. 18

Quantity	Unit	Description	Bin No.	Price	Amount

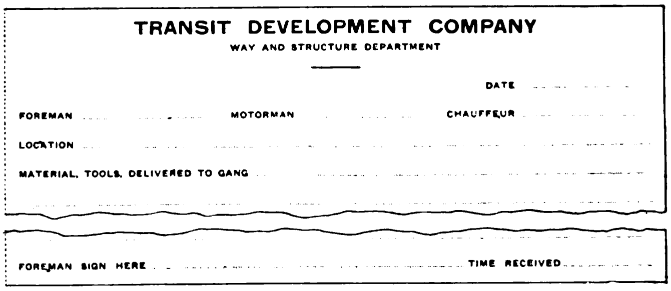
SPOILED ORDERS MUST BE TURNED IN TO STOREROOM
ACCOUNT AND AUTHORIZATION NUMBERS MUST BE SHOWN.

TOTAL

Account No. ____ M. S. O. No. ____ Request No. ____ Authorization No. ____

Where used ____ Foreman

Fig. 3. This Form Is Used for Drawing Supplies from the Storeroom and Prevents Use by Unauthorized Persons



TRANSIT DEVELOPMENT COMPANY

WAY AND STRUCTURE DEPARTMENT

DATE ____

FOREMAN ____ MOTORMAN ____ CHAUFFEUR ____

LOCATION ____

MATERIAL, TOOLS, DELIVERED TO GANG ____

FOREMAN SIGN HERE ____ TIME RECEIVED ____

Fig. 4. Delivery of Tools and Supplies Can Be Effectively Recorded by Means of This Form

GROUP OF RECORD FORMS FOUND USEFUL IN THE WAY DEPARTMENT

On moderate sized roads and those having widely separated divisions, the roadmaster generally performs many of the duties of the tool man, acting in direct conjunction with the storekeeper. In such cases tools are usually sent to the job and picked up by regular work cars when making other deliveries.

It is almost imperative that all tools be marked by stamping or branding with some form of distinguishing mark such as the name of the company and the department. Such markings should be done in a manner which will render their removal as difficult as possible, as they serve to prevent theft and interchange with tools of contractors who may have gangs working near truck gangs. For instance, the marking of shovels is of particular importance in some cities where the contractors' custom still prevails of requiring the laborer to provide his own shovel.

The number of different tools used in track work alone is quite large, as will be seen from a glance at those listed for an ordinary tool box in Fig. 2. This list contains eighty different items. Besides special tools not listed there are also the several special tools used by pavers, bonders, special-work repair men, blacksmiths, grinder men and bridge men.

There are at least eighteen distinct tools in regular use by a blacksmith, not including his anvil, forge, water keg and several types of tongs for handling the hot metal. The blacksmith, by the way, is a very important individual in any track organization, not only because of his work in joint repair and preparation of compromise joints in the field but also because of his usefulness in the repair of tools. For these reasons and because of the rather general unfamiliarity with the tools he uses, it is worth while to show them in Fig. 5.

The work of special-work repairmen calls for several special tools, particularly chipping tools for use in resetting hard centers. These are shown in Fig. 6. In addition to these the hard-center gang uses a special torch for heating babbitt or spelter to permit removal of centers, and another for heating these metals preparatory to pouring them around the centers.

Lists of the general run of track tools are given in the gang tool records shown in Figs. 1 and 2. Each gang should have a complete outfit of standard tools in sufficient number to supply every man in the gang. Extra tools and parts are also required to take the places of those which break or which must be sent to the shop for repair. Where the gangs are in cities, close to sources of supply, but a few extra tools need be carried, as those needing replacement can usually be exchanged quite readily. The section gang which is liable to be a long way from supplies naturally needs to have some extra tools to fill in until replacements can be made.

The equipment of gangs will vary considerably, depending upon the size of the gang, upon the general nature of the work, and upon whether the gang is a section gang employed upon T-rail only or whether it may be employed on girder rail in paved streets.

Special Tools Need Special Handling

The list of tools given in Table I is indicative of the average equipment for city gangs of (1) sixty men on construction work; (2) of ten men on repair work, (3) of sixteen to eighteen men on special work; and (4) of six men on section work on T-rail track. The list covers certain conditions and will be varied by roadmasters more or less in accord with local practice. For instance, roads having several divisions will be found to have at least one electric track drill as a part of each roadmaster's tool equipment. On the other hand, some large city systems prefer to control these machines from headquarters, sending them from gang to gang as occasion warrants, usually by auto trucks. Again, snow shovels are kept at headquarters and distributed only in the winter season. Even then but few gangs carry more than a half-dozen or so because it is necessary to provide hundreds of them during big snowstorms when gangs are rapidly increased for such emergencies and large numbers of shovels can best be stored and distributed from headquarters.

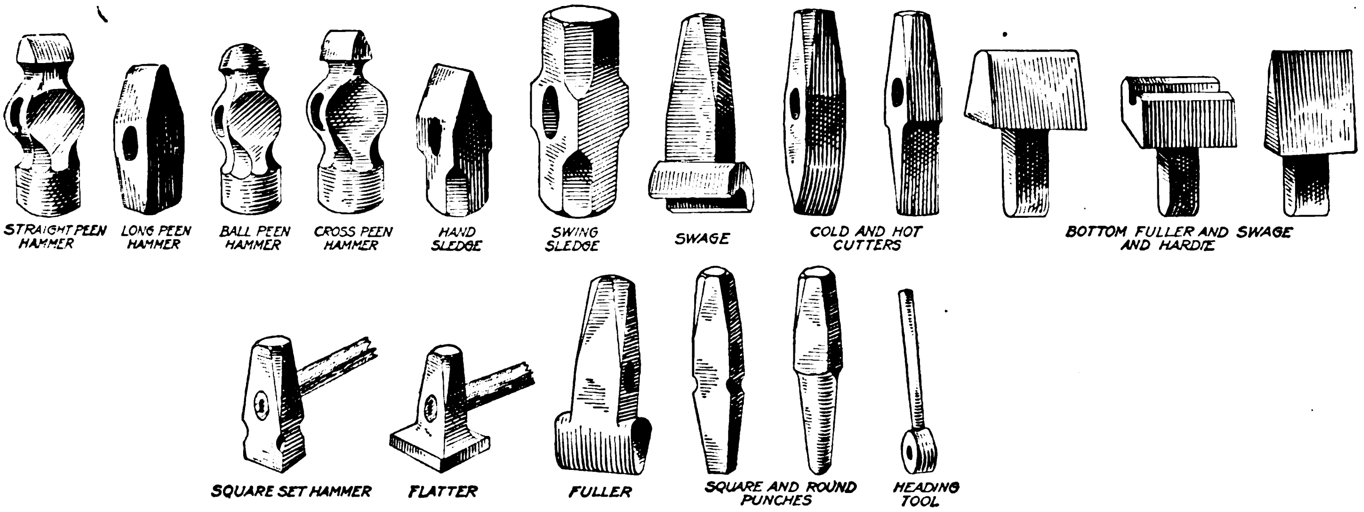


FIG. 5. THE WAY DEPARTMENT BLACKSMITH USES A WIDE VARIETY OF TOOLS

It is not the custom to provide all gangs with rail benders or jim crows. These are usually kept at headquarters and sent out, as needed, by the roadmaster. Exception is made at times to this rule for particular special-work gangs and section gangs which have to cover a large yard of T-rail track. Where a section gang has rock cuts on its portion of the line, slides are liable to occur. Such a gang must have rock drills, striking hammers, powder and fuse for emergency use.

Small Tool Standardization Has Several Advantages

The importance of having all gangs equipped with one style of each tool is worth noting. This is particularly advantageous because it allays any petty jealousies which may develop between gangs through real or fancied superiority of one style of the same tool (jacks, for instance) over another. Furthermore, if gangs are doubled up in emergencies there will be less tendency for borrowing the other fellow's good tools and returning poorer tools in their places.

It is very desirable to have standard plans of all tools. These plans will be found of great value in purchasing and inspecting them. If the making of such plans appears burdensome or unnecessary it is still possible and worth while to select them by number or description from the catalogs of the reliable supply houses and always to order the same makes and styles of those tools known to be most efficient. Standard plans of tools have another use in furnishing details for the repair and local manufacture of tools such as level boards and track gages. The standard tool plan shown in Fig. 7 is made up upon a sheet 4 in. x 6 in. with a 1-in. margin at one end for binding in loose-leaf book form.

Specifications for Tool Steel Are Important

In the selection of tools made of steel, more attention should be paid to the quality of the steel and its suitability for the work. The steam roads have given more study to this than the electric roads. For instance, the Pennsylvania Railroad has its picks made of open-hearth steel having from 0.55 to 0.75 per cent carbon, not more than 0.04 per cent each of phosphor and sulphur, and about 0.40 per cent manganese. Similarly its track chisels and track punches are made of crucible steel having from 0.80 to 0.90 per cent carbon, not more than 0.04 per cent each of phosphor and sulphur and 0.30 to 0.40 per cent manganese.

The further advantage of study of the proper quality of steel for track-tool use is illustrated by the experience of one electric railway which found in 1915 that it could substitute "Black Diamond" crucible steel at 7½ cents per pound for Jessup tool steel at 16 cents per pound and secure equally good results from tools, such as pick points, track chisels and punches, made therefrom. The saving thus effected amounted to a considerable sum in the course of a year.

The Shovel Question Will Bear Investigation

Again, the quality of steel in track shovels will bear attention, especially where the men are required to furnish their own shovels, although this practice is considered poor policy. The usual effective depth of a shovel blade is about 10 in. An inch of wear reduces its capacity nearly 10 per cent. Men have been known to take shovels off the job and deliberately have them cut down an inch or so in order to lessen the labor of using them.

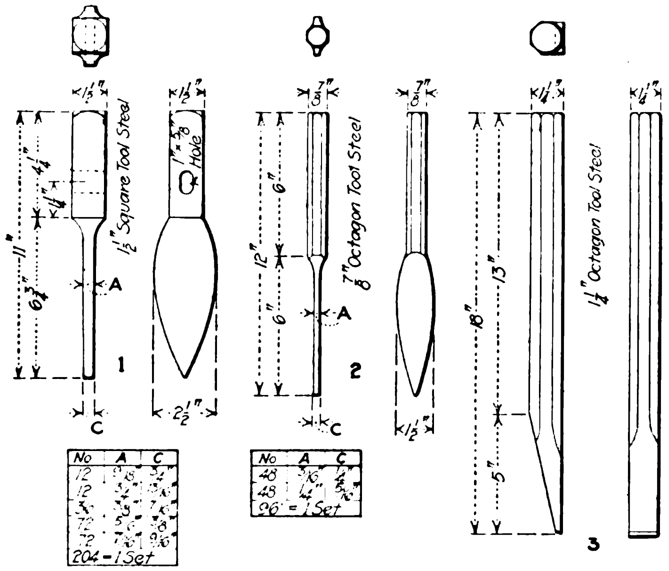


FIG. 6. THESE CHIPPING TOOLS ARE USED IN RESETTING HARD CENTERS

When a man furnishes his own shovel he will naturally buy the cheapest he can find. He will use it just as long as there is a plausible remnant of the blade left unless required to discard it after a certain wear is reached. He will not drop his shovel to do other work but will walk 500 ft. or more to his coat and hide it. He thus consumes the employer's time without result. The operating cost of a shovel is at least $2 per day. If the man is permitted to use a shovel of half the full blade length the operating cost is the same but the efficiency is decreased by one-half.

Shovels are abused by being thrown about carelessly, by having heavy tools and materials thrown upon them and by being driven into ties to pull the latter about under the rails. Only the best grade of steel will long withstand the lack of care and heavy duty thus imposed.

A shovel of fair-looking quality may be purchased for 40 or 50 cents but a shovel made from an alloy steel of exceptionally good quality may be had for 90 cents or so, and this will out-wear the cheaper shovel at least four or five to one. The introduction of special grades of alloy steel in shovel manufacture has again proved the value of selecting the best of steel for tool uses.

Worn and Broken Track Tools Can Be Repaired Profitably

The cost of new track tools has steadily increased to such an extent that the subject of the repair of worn and broken tools has become one of considerable importance. The general procedure has been very well described in an article in the ELECTRIC RAILWAY JOURNAL for March 25, 1916, from which much of the following is taken.

Ordinary track hand tools, as a rule, are not reclaimed when they become badly worn or broken, and only such repairs are made as can be readily handled by an ordinary laborer. This is particularly true of large construction jobs where a considerable item of their cost is expended in track hand tools; yet when a job is completed comparatively few of the tools are found to be good enough to turn over to the maintenance forces. Many of these worn and broken hand tools, which are discarded as useless, can be repaired profitably. Experience on some roads has demonstrated this fact, and the ease of making repairs has been considerably facilitated by the introduction of portable welding outfits. While it has been found economical to repair tools, it is also very important that the repairs be properly made to accomplish the best results. It is as essential to good workmanship and efficiency that tools should be kept in proper condition as it is to buy first quality tools. In other words, tool repairs should be concentrated at a single point where one or more men may be regularly employed in putting them in serviceable condition.

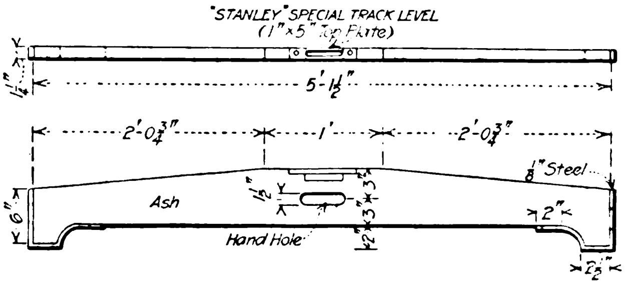


FIG. 7. A SAMPLE STANDARD TOOL PLAN FOR THE LOOSE-LEAF NOTEBOOK

A first-class blacksmith is best qualified to do this kind of work, but it must be borne in mind that not every blacksmith can repair these tools. Experience in making repairs to hand tools is a necessary requisite, hence it is better to employ one man on work of this kind and hold him responsible for the quality of the repairs made.

New Handles Can Be Put on Old Shovels

Specific cases of repairs to hand tools that pay include reclaiming good shovel blades, in which the handles have been broken, by supplying new handles. Handles in good condition may often be had by taking them from blades that are completely worn out. Another method consists in supplying a new cast-iron D-handle to replace wooden D-handles. Such a casting is shown in Fig. 8. These cost about 16 cents each.

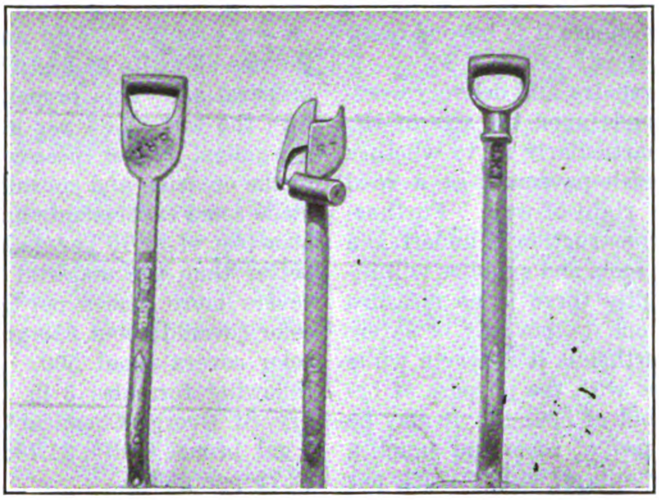


FIG. 8. DAMAGED D-HANDLES OF SHOVELS CAN BE REPLACED WITH IRON ONES

Claw bars badly worn, or with one of the claws broken, may be reclaimed by dressing the bar down to form a new claw, or if there is not sufficient stock remaining, a new claw may be welded on. It is also important, and has now become general practice, to keep picks sharp and properly tempered. The cost of the pick was once considered so small that reclaiming the old one was not worth while, but it is now considered economical to do so by welding on new points as needed. Lining bars and tamping bars may be readily restored to good condition by straightening, redressing and tempering.

Accurate Jack and Drill Repairs Pay Handsomely

Accurate workmanship when repairing spike mauls is very important. An untrue surface makes it impossible to strike a true blow, and an improperly struck blow may bend a spike or cause an accident. An improperly tempered maul soon becomes untrue when the metal is too soft, or if it is too hard pieces map chip off and cause an accident. The same requisites apply to track chisels which primarily must be purchased with steel of proper quality. A poor chisel delays the work and increases the cost of any operation. It is also very important to keep track jacks in perfect operating condition. Where several extra ones are not on hand a bad-order jack may tie up a gang. The track jack, like the track drill, is more expensive than the average hand tool, and it is not general practice to have an unlimited supply of extra ones. It is therefore important that jacks and drills not only be in good order but that they be inspected for defects occasionally, and when repairs are necessary they should be made by an expert mechanic in order to insure results. However, drill bits may be accurately sharpened on the job by the average laborer if the gang tool box is supplied with a Keystone tool grinder.

With no other track hand tools are accuracy and good repair so important as with the usual track gage and level. When these become damaged for any reason the utmost care should be exercised to see that the repairs are made properly, and after the work is completed their accuracy should be checked before they are actually used in track work. Repairs to either of these tools are difficult to make because accuracy is so essential, hence it is especially advisable to have this work done by an experienced repairman. In other words, the repairing of most track hand tools is a job for a specialist if the best results and maximum economy are to be obtained.

Repairing 10,000 Picks at Six Cents Each

As an indication of the comparatively small cost for tool sharpening and repair, it will be of interest to note that the records of one railway covering repairs to picks, lining bars and track jacks for one season show that more than 10,000 picks were repaired at a cost of about 6 cents each, while 6900 lining bars were restored to service at an average cost of 5 cents each and 186 jacks were refitted for service at a cost of 70 cents each. The records further indicate that each jack went to the shop five times during the season. The type of jacks used in

TABLE I. STANDARD LIST OF TOOLS FOR TRACK MAINTENANCE GANGS OF SEVERAL SIZES

Tools	Construction Gang 60 Men	Repair Gang 10 Men	Special Work Gang 16 to 18 Men	Section Gang 6 Men
Adzes	2	1	2	2
Axes	1	1	1	1
Bars—Claw	5	2	6	3
Bars—Lining	20	8	12	4
Bars—Tamping	20	4	12	4
Benders—Rail (furnish as needed)	..	..	..	..
Boots (furnish as needed)	..	..	..	..
Brooms—Switch	4	1	4	3
Brooms—Corporation Push	3	2	2	2
Brushes—Wire	2	1	1	..
Cars—Hand	..	..	..	1
Cars—Push	1	..	..	..
Chains	2	..	2	..
Chisels—Cold	2	..	..	..
Chisels—Track	20	8	20	2
Chisels—Asphalt	6	2	2	..
Compressors—Bond	1	1	1	1
Dippers—Water	2	1	1	1
Drills—⅞ in. (minimum number)	4	4	5	4
Drills—$\frac{15}{16}$ in. minimum number)	4	4	5	2
Drills—1 in. (minimum number)	4	4	5	2
Drills—1⅛ in. (minimum number)	4	4	5	2
Drift pins	4	4	3	..
Files—Hand—Round	1	1	..	..
Files—Hand—Flat	1		..	3
Files—Hand—Rail	1	1	1	..
File holder—Rail	1	1	1	..
Flags (furnish as needed)	..	..	..	..
Frames—Hacksaw (at least 1 doz. blades to each frame)	4	4	6	2
Gages—Track	2	1	3	3
Gages—Wood (insulated)	..	..	..	1
Grinder — Keystone tool	1	1	1	1
Hoes	4	1	2	..
Hooks—Grass	..	..	..	2
Hose—Rubber	100 ft.	15 ft.	30 ft.	..
Hydrant connection	1	..	..	..
Jack—Track	6	2	5	3
Jack—Wrecking	2	..	..	..
Jim Crows	..	..	1	1
Lanterns	50	12	35	15
Lanterns—Signal	..	..	..	3
Level—Boards	2	1	2	1
Level—Pocket	2	1	2	..
Light clusters	..	..	..	..
Mattocks	1	..	2	1
Mauls—Spike	8	4	8	4
Oilers—Steel	1	..	1	..
Old men	2	3	2	2
Pails	6	2	4	3
Picks	20	8	16	10
Picks—Tamp	..	..	..	4
Pipe—Water	250 ft.	..	..	..
Plows	..	..	..	..
Punches—Center	2	1	1	2
Punches—Track	..	..	5	..
Punches—Thread	2	2	..	..
Rammers—Sand	6	2	4	..
Rammers—Paving	1	1	..	..
Rasps	..	..	3	..
Ratchets	4	3	6	2
Reamers	2	2	8	..
Rules—6 ft., folding	1	1	1	1
Saws—Crosscut	1	..	2	1
Saws—Hand	1	1	1	1
Scythes	..	..	..	2
Shovels—Track sq. pt.	20	6	10	12
Shovels—L-H	..	..	..	4
Shovels—Scoop	8	..	..	4
Shovels—Wood	..	..	..	2
Sledges	10	3	10	1
Spike pullers	..	..	2	1
Tongs—Rail	12	4	10	8
Tongs—Tie	..	..	..	4
Tapes—Linen	..	..	1	1
Tapes—Steel	1	1	1	1
Tarpaulins	1	..	1	..
Tie Rod—Square	1	1	..	1
Wrenches—Hydrant	1	1	1	..
Wrenches—Monkey	1	..	1	1
Wrenches—Stillson	1	..	..	..
Wrenches—Compressor	1	1	1	1
Wrenches—Track	10	4	12	6
Wrenches—Tie Rod	4	1	4	1
Wheelbarrows	6	3	6	2
Water barrels	..	1	2	..

this instance cost $8.35 in 1914, hence it is beyond question that the repair was economical.

The cost of tools, supplies, repairs and delivery service varies greatly. Much depends upon the size of the road and its characteristics, particularly as to whether it be a city property with much pavement or a road operating largely in private right-of-way. Furthermore, if a large amount of reconstruction is undertaken in any one season, the cost for tools and supplies will increase accordingly. Consequently there is no measure by which the tool expenses of one system may be safely compared with another. Nevertheless it is worth while to keep track of these expenses with the purpose of being sure that they do not get out of bounds. It may be of interest to state that the cost of tools and supplies may run as high as $100 per mile of single track per year in a busy season, if the costs listed in Table II from the tool accounts for 1917 of a 550-mile city property can be taken as a guide. (The year 1917, by the way, can be considered a very "light" year due to sharp decreases in amount of work done).

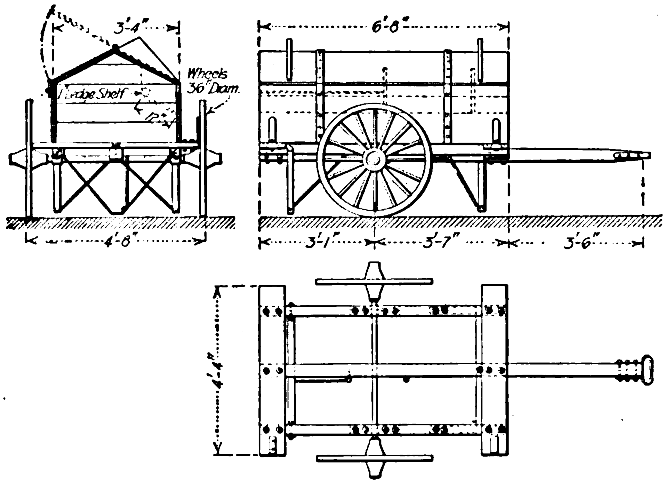


FIG. 9. A TOOL WAGON WHICH CAN BE MADE AT REASONABLE COST

Small tools and supplies, it will be noted from Table II, account for the larger portion of the tool and supply service. The supply list reads like a stock sheet of a regular hardware store, and everyone knows that small hardware is expensive.

Some of the cheapest things that are used cost a great deal in the aggregate. Lantern globes, for instance, are comparatively cheap in first cost but they are consumed in large quantities. White globes are worth about 6 cents each, while red globes cost about 20 cents each. In city work red globes are used to a much greater extent than white ones. The difference in cost on one property led to an important economy through the use of white globes dipped in a special red coloring preparation. This preparation could be purchased before the war at $3 per gallon. It is now worth $8.75 per gallon. Under these conditions the tool foreman rose to the occasion and consulted with the boss painter who made some experiments and finally produced a red color at a cost of $2.75 per gallon. This holds its color even better than the material formerly purchased and also covers more globes per gallon of color. The former color covered about 350 globes per gallon while the new color covers about 500. This color is made from the following formula: 3 lb. deep permanent red, No. 171 dry, St. George Chemical Company, 25 cents per pound; 1 gal. bronze liquid, $1.75; labor to mix, 25 cents; total, $2.75 per gallon.

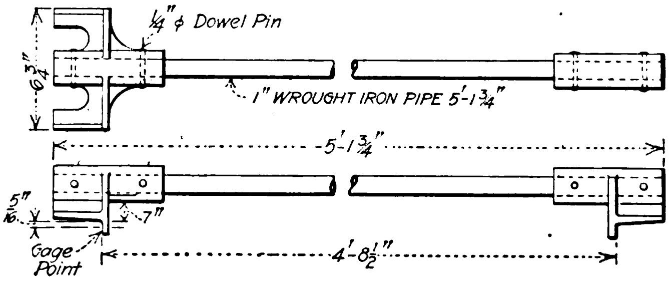
TABLE II. EXPENDITURE FOR ROADWAY TOOLS AND SUPPLIES SEASON OF 1917, ON A 550-MILE CITY RAILWAY SYSTEM

Total expenditure for 1917	$48,000.00
Average monthly expense	4,000.00
Cost of tools and supplies	30,100.00
Cost of tool-car service	10,600.00
Cost of tool repairs	7,300.00
Cost per mile single track—tools and supplies	$54.70
Cost per mile single-track—tool-car service	19.30
Cost per mile single track—tool repairs	13.30
Cost per mile single track—total	$87.30

NOTE—Tool-car service was furnished by two tool cars at a charge of $25 per day per car. Tool repairs include repairs to large machines, such as mixers, grinders, arc welders and electric drills.

Similarly, when the price of high-speed drill bits rose skyward the tool man set about using the arc welder for repairing broken bit shanks and began to get the fullest possible use of the bit points by welding on an added length of shank.

A study of the consumption of kerosene oil on one road recently developed a discrepancy of over 30 per cent between the amount of the oil which should be used for the number of lanterns in daily service and that actually drawn from stock every day. This led to the discovery that some of the oil was going to the homes of the men by devious routes, particularly during the period when oil became very scarce and high in cost. It was also found that there was much waste due to the method of distribution; to carelessness in filling lanterns; to leaky containers and to leaky wells in the lanterns. These discoveries naturally led to a radical change in the whole procedure and effected a large saving.



THIS STANDARD TRACK GAGE IS FOR USE ON TRACKS WITH GUARD RAIL

Good Tool Houses and Tool Boxes Help in Tool Conservation

On long interurban lines, the track tools are usually kept in section tool houses similar to those used by steam roads, in which case the tools are transported on the section hand cars. The latter are being displaced by gas-driven cars which have many advantages. Where the section is comparatively short or runs out from city or other headquarters, the tools and the section gang are more apt to be transported upon a regular motor flat car, which may remain on the job at the nearest siding during the day. In such cases the car is available for hauling ballast and other needed materials.

It is not practicable in city work to maintain tool

(Continued on page 965)

Steel Car Body Is Well Adapted To Resist Unusual Stresses

By Norman Litchfield

The Roof, Posts and Carlines, Side Girder and Underframe All Combine to Make a Box Girder of the Modern Car, a Form of Mechanical Structure Which With Minimum Weight Will Give the Requisite Resistance to Shock

IN THE writer's recent article on types of side frame construction it was pointed out that side frames in general could be divided into four classes: (1) sill and truss rod; (2) fish-belly girder below floor level; (3) side plate girder formed by sill, belt rail and sheathing; (4) truss formed by side sill as bottom member, side plate as top member, and window and door posts as verticals, the place of ordinary bridge truss diagonals being taken by the sheathing and the resistance to cross-bending of the posts.

Center Side Doors Impose Special Design Problems

Where center side doors are used, a modification of the plate girder is sometimes resorted to, this consisting of a patching or splicing of the two halves of the girder either by a short fish-belly girder under the door or a stiff rectangular frame around the doorway. In the latter case the center-door posts are subjected to severe bending strains, and it may be of interest to study some points in connection therewith.

From the bending moment diagram for the case cited in the previous article, the stress in the top and bottom chords at the doorway is seen to be 8571 lb. The figure on page 966 shows diagrammatically the frame members and the stresses, the assumption being made first that the frame is strictly rectangular and, second, that the rivets at the top connection of the post to the side plate are fairly close together so that the top corner may be said to approximate a pin joint in a true truss.

The doorpost then becomes in effect a beam supported at the ends *A* and *B* with a concentrated load of 24,000 lb. applied at the belt rail *C*. Hence the maximum bending moment is at the belt rail and amounts to $8571 \times 54 = 462{,}834$ in.-lb. requiring, for a fiber stress of 16,000 lb. per square inch a section modulus of 28.92. This is the equivalent of a standard 12-in. 35-lb. rolled channel. This section has a flange width of 3.3 in. and, as is pointed out in the handbook of the Cambria Steel Company, "in order to prevent undue strains in the compression flange, considered as a column, the beams should be supported laterally at distances not exceeding twenty times the flange width, this ratio being determined by the following formula, which gives the safe load for solid columns of soft steel:

$$p = \frac{18{,}000}{1 + \frac{l^2}{3000b^2}}$$

in which

p = allowable stress in pounds per square inch.
l = length between lateral supports in inches.
b = width of flange in inches.

Substituting 16,000 for p in the above formula it is found that the ratio $l/b = 19.37$, from which it may be seen that the compression flange should be supported laterally at distances not exceeding twenty times the flange width as stated above."

To follow this practice with the channel in question would require it to be supported sidewise at a distance of 66 in. between supports. While it is possible to brace the striking post sideways by a diagonal from the floor frame it is obviously impossible to do so on the pocket side as the door has to slide past the post in opening.

As the post is 84 in. long, the only resort is to the reduction in the fiber stress. Substituting in the formula $l = 84$ in., and assuming still a flange width of 3.3 in.,

$$p = \frac{18{,}000}{1 + \frac{84^2}{3000 \times 3.3^2}} = 10{,}514 \text{ lb. per square inch.}$$

This would require a section modulus of 44 or a 15-in., 40-lb. channel.

(Concluded from page 964)

houses, and as a substitute each foreman is usually supplied with a tool box or a tool wagon. These should be substantially made and must be provided with exceptionally good locks. The tool boxes are moved from job to job by work cars, usually at night, so as to be ready on the new job when the gang arrives in the morning at a new location.

The tool wagon has the advantage of portability as it can be moved by the men if necessary; it can be towed behind a motor truck or work car, and it can be quite easily loaded upon a work car by the men if skids are provided. A form of tool wagon is illustrated in Fig. 9.

Tool boxes should not be made too large in size with the view of getting all the tools for a gang of fifty or sixty men into them. Where this is attempted it will be found that it is practically impossible for the men to lift them when loaded and it requires a derrick to place them upon cars for transportation. In consequence the box must often be unloaded and loaded upon the cars when empty, which necessitates much rough handling of tools, greatly increasing breakage and consuming valuable time as well. It is far better to provide two or three boxes of moderate size, each suitable for the average sized repair gang of say twelve to twenty men.

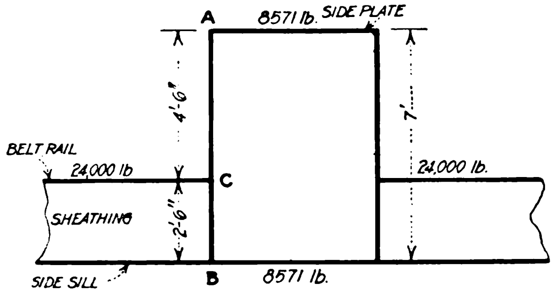
Where tool boxes are used it is customary in city work to keep a watchman at the box at all times. He keeps track of the tools, fills lanterns and puts them out on the work and he can make himself useful in sharpening tools on the portable tool grinder. The use of the watchman should not relieve the foreman of his responsibility for the tools and their fitness for service.

This is a heavy section and it is not always possible or desirable to use as great a width as 15 in. for a door post. Further study is therefore required for the most desirable post construction.

Assuming that it is desired to keep the width within a maximum of say 12 in., and the depth 3½ in., the possibilities of increased section modulus consist in the use of a built-up beam of heavy angles riveted to a web plate or box section pressed from steel plate. But the post even so remains undesirably heavy.

Saving Steel in Offsetting Effect of Side-Door Frame

In the foregoing calculations we have assumed throughout that the post was to be considered as a beam loaded at one point, the belt rail, and supported freely at each end. With regard to the lower support this assumption is not entirely fair inasmuch as the post is riveted to the sill and to the side sheathing all the way from the sill to the belt rail and, therefore, so far as the lower support is concerned, the post may be considered as a fixed beam. By special construction, such as making one flange of the built-up post a continuous piece from sill to side plate and back to sill again, thus forming an arched doorway, and providing a stiff web plate overhead riveted securely to the vertical webs of the posts, the condition of a beam fixed at both ends is approximated and the bending moment is thereby reduced one-half. This makes possible the use of a much lighter section, and the construction adds to the general stiffness of the structure and gives good results.



FRAME MEMBERS AND STRESSES IN CENTER SIDE DOOR CONSTRUCTION

Instantaneous Braking Rate May Reach 15 m.p.h.p.s.

Another consideration which enters into the design of the side posts is the bending strain to which they are subjected by the fore and aft lurch of the roof in starting and stopping, and more particularly in coupling up to another car. As already pointed out, the amount of any such force is equal to the product of the mass by the acceleration.

Repeated observations of high-speed braking rates indicate that the maximum rate of retardation is somewhere about 8 m.p.h.p.s., making it probably safe to assume for ordinary running service a rate of from 12 to 15 m.p.h.p.s. The stress figured on this basis should be added to the working stress calculated as already outlined. In coupling up, this rate will, of course, be considerably higher, the exact amount depending upon the handling of the car by the motorman and the design of the spring draft gear. These stresses occur, however, only with empty cars. They are of short duration and so do not need the same consideration as those induced by regular service operation.

The effects of these stresses are very noticeable in many old wooden cars which were built with a very heavy roof, and with the window posts cut nearly in half at the window sill in order to let the rails set in flush with the face of the post. With steel construction their effects are less noticeable, as ordinarily the sections used for window and door posts are necessarily of such depth that they automatically provide sufficient strength to resist this lurching.

Much ingenuity has been shown in the development of window posts and appliances, the merits of which cannot be discussed here. The fundamental choice is between the use of some standard rolled shape, such as a T or an angle, with wooden or steel moldings bolted thereto, and a pressed box section either with moldings or pressed from one piece. The pressed section gives the better section modulus, but on the other hand the standard section has advantages, which to some designers have appealed more strongly than the feature of strength.

The Steel Roof Had an Independent Structural Function

Practically all of the earlier types of cars were built with the so-called monitor deck, familiar to everyone. This was designed primarily to give ventilation through the use of windows set in the walls of the upper deck, which were sufficiently high above the heads of the passengers to permit of their being opened without any great discomfort.

The desire for a simpler, lighter and cheaper car construction led later to the use of the plain arch roof, with special ventilators of one type or another designed to exhaust the air from the car, fresh air being furnished either through special intakes or through the opening of doors and leakage around windows and doors.

A third type of roof is that developed by the designers of the Howe truss side frame, before mentioned, in which a sort of secondary arch is sprung from what would be the deck sills of the ordinary monitor roof. This construction gives an interior which is free from any projections to catch dirt, and at the same time it provides great stiffness and preserves the appearance of height in the interior of the car, which to some extent is lost in the plain arch roof car.

The use of steel members for the roof framing started with the first steel cars, but it was not until somewhat later that steel sheets were used for the roof itself. A little consideration will show this added very largely to the stiffness of the car, as the roof thus forms a sort of tubular structure which in itself is a girder capable of carrying considerable load. The roof also ties the two side trusses together, making together with the floor and end framing a complete steel box which is so stiff that it can be jacked up at one corner with practically no distortion.

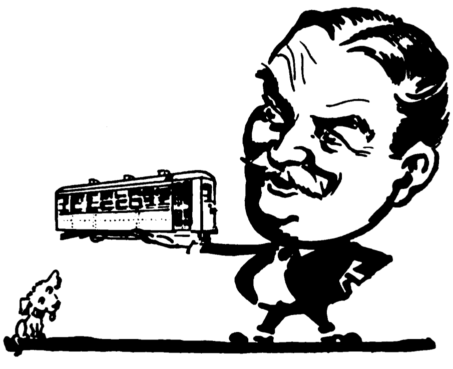
The question of the desirable strength for the carlines is covered in the postal car specifications referred to in a preceding article, the main provisions being as follows:

"The projected area of the portion of roof in square feet supported by carlines divided by the sum of the section moduli of the carlines must be not more than 100."

In using the above as a guide it should be remembered that these specifications were drawn up to cover the severest kind of high-speed service, and that therefore it is perfectly permissible to deviate therefrom for less severe features after careful study and analysis of the existing conditions has been made. On the other hand, special conditions, such as trolley pole supports, will require even stronger construction. The specification quoted is therefore cited merely as a guide or basis from which to work out the necessary design.

In the carline construction three general types have been followed. Nearly all of these are covered by patents, a statement which is also true of many of the detail points of construction already mentioned. It is the writer's purpose throughout this series of articles to point out the general underlying principles of construction, citing such examples as may throw light on the general subject, regardless of the patent situation.

The three types of construction are: (1) The combination of window posts running from the side sills to the side plates and carlines of rolled or pressed sections running from the post on one side to that on the other, the posts thus acting as abutments on which the arched carlines rest. This construction applies to both the monitor deck and the plain arch roof, and is in general use. (2) In an arch roof, a post running continuous from side sill to side sill, forming its own arch carline. This construction has been largely used on the one-man cars referred to by the writer in previous articles. (3) The use of a post running straight from the side sill to the side plate and then bent over to follow the curve of the lower deck to the point of the monitor deck sill. On the ends of these cantilever posts rest castings which support the short carlines of the upper deck. This construction is that of the Pennsylvania Railroad in some of its trunk line coaches.



What a Joy There Is in a Well-Designed Car

What Is the Best Joint for Steel Roof Plates?

Reference has been made to the increasing use of steel plate for the roof. The chief difficulty encountered in its use has been that of making satisfactorily tight joints at the splices and the eaves. In the earlier cars the designers resorted to the use of sheets tinned or leaded at the edges. The sheets were riveted to the roof member and then the joints were soldered. While this practice provided the desired degree of water-tightness, the sweating of the joints proved a slow and expensive matter. Some trouble has also been experienced from the corrosion of the sheets along the lines marking the division between the tinned and untinned portion of the sheets. This is due either to corrosive action of the original soldering flux or possibly to some electrolytic action. This method has now been largely discarded, the choice at present lying between a flame-welded joint and one formed with a gasket of heavy building paper of special type laid between the two metal parts, cold-driven rivets being employed therewith. The welded joint is probably the more desirable but has the obvious disadvantage that it is difficult to remove any one sheet which for any reason has become corroded or otherwise damaged. It is also a rather expensive process and for this reason the gasketed joint has received considerable favor. The latter has been in use sufficiently long to give good indications of its general serviceability.

It's the Car End That Takes the Buffing Stresses First

Our consideration of the various parts of car construction now leads us to a very important part, namely, the end construction. For high-speed trunk-line service we may again turn to the postal specifications, a quotation from which has already been published in a previous article. For convenience, however, it may be repeated that for electric cars where the weight of the train does not exceed 600,000 lb. it is required that the sum of the section moduli of the vertical end members shall not be less than 40, and the section moduli of the main members either forming or adjacent to the door posts shall be not less than 75 per cent of this amount.

Here again it should be borne in mind that for ordinary electric service the weight of trains above referred to is considerably greater than is customary, and for that reason due allowance may be made in the design to suit the known conditions.

To resist end blows resulting from collisions it is necessary to give consideration to the climbing effect of one car over the other. That is to say, it would be comparatively simple with the average light electric car to provide against collision effect if the floor frames met exactly in line and remained so, but unfortunately it is a familiar fact that one car practically invariably slides upward on the face of the buffer of the other car and then travels forward over the floor frame. This therefore requires either very heavy post construction as provided for in the postal car specifications or some means for preventing the sliding of one car upon the other.

This tendency to climb has been met either by the use of heavy castings set back of the buffer tending to interlock if one car climbs the other, or else by the use of transverse ribs on the face of the buffer forming channel-shapped grooves which interlock and prevent climbing. Such have proved their worth, especially in the minor collisions which are apt to occur in handling cars in storage yards.

Other means which are taken to minimize collision effects are to provide a cushioning feature, such as a wooden block back of the buffer face, or else purposely to design the steel construction of the floor to collapse slightly just back of the buffer. In this case the final shock is resisted by wide plates, known as anti-telescoping plates, set edgewise and riveted to the sills. Such plates serve to bind all the sills together and to distribute the end shocks equally among the latter.

These features are exclusive of the special spring buffing devices in general use on trunk-line service, and the use of which are not usual on cars for electric service.

Zone System for the Distribution of Bituminous Coal

By order of the Fuel Administration, the distribution of bituminous coal for the year which began on April 1, 1918, will be controlled by a zone system, which is intended to reduce the burden on the railroads, facilitate shipment of coal and keep all the mines working at full capacity. The insert map which accompanies this number shows the zones into which the country has been divided for this purpose.

THE factor that loomed largest in the fuel crisis of last winter was the lack of adequate transportation facilities. Under the plan of distribution then followed, a consumer in any part of the country was free to order his coal supply from any producing district, regardless of the length of haul involved. As a consequence, it often happened that cars and locomotives were engaged in delivering coal to distant regions that could have been served far more quickly from fields near by.

Obviously, this complete freedom of choice as to the source of coal used led to cross-hauling in addition to the utilization of railroad equipment in unnecessarily long hauls, the result being a great waste of transportation power. To prevent this needless waste and make possible an increased production to meet the war demands, the United States Fuel Administration, in conjunction with the Director General of Railroads, has announced a zone system for the control of bituminous-coal distribution for the year which began on April 1, 1918.

The zone system was adopted only after prolonged conferences with coal producers, jobbers and consumers, as well as with the traffic and operating officials of the railroads. Briefly explained, it divides the country into a number of zones, each of which must obtain its coal supply from mines that are relatively near, thus preventing abnormal and wasteful transportation movements and insuring more nearly equal distribution of cars to the mines and more steady employment of mine labor.

Of course, so radical a change in the methods of conducting the coal business will cause some inconvenience to producers and consumers and will involve additional expense in some cases. For example, the producers of Pocahontas coal may no longer ship their output to Chicago and Western points by rail; instead, they must find new markets in the East. Those plants in and around Chicago that have been burning West Virginia coal will be compelled to substitute Illinois coal, which can be obtained with less than half as long a haul. As the two fuels are of very different characters, changes in the boiler settings and methods of firing will have to be made, which will entail expense.

It is the hope of the Fuel Administration, however, that the consumer and the producer will bear these unavoidable inconveniences in the realization that the readjustment of the distribution of coal is for the welfare of the nation. In other words, they are appealed to on the grounds of patriotism.

There are exceptions to the conditions imposed by the zone system. Certain industries require coals of particular quality or characteristics, as, for example, byproduct, gas, blacksmith and metallurgical coals. If a consumer needs coal of one of these kinds and is unable to obtain it from the producing districts that are permitted to ship into the zone in which he is located, permits will be issued to allow the special-purpose fuel to be brought in from other districts.

The zone system does not affect the following bituminous coal:

1. Coal for railroad fuel, for which special arrangements will be made by the Fuel Administrator and the Director General of Railroads.
2. Coal for movement on inland waterways, which is in no way restricted by the system.
3. Coal delivered to Canada, which is subject to regulations of the Fuel Administrator.

To enable the consumer of bituminous coal to determine the districts from which he may obtain his fuel and to show the producer the zones in which he may sell his output, the accompanying map has been prepared.

It will be seen that the entire territory of the United States has been divided into a large number of irregular zones or sections, colored differently so that they may readily be distinguished one from another, and each marked with a key number. Each of these separately numbered zones has certain definite boundary lines and is restricted to the use of coals from certain districts. The Key to Consuming Zones gives a complete list of all the zones shown on the map and states the districts from which they may obtain coal. The zone boundaries when not state lines are usually through route steam railroads. These railroad lines are lettered on the insert map.

If an electric railway company wishes to find out what coals are available for its use, it should find from the map the zone in which its power station is located and note the number of the zone. Then, in the Key to Consuming Zones, under that zone number, will be found the list of producing districts from which coal can be obtained. Following this key is a list of the meanings of the terms used in the key, such as "summer" and "winter" and division of states.

The Key to Producing Districts is intended to show the producer the several zones in which he may market his product. He knows the district in which his mine is located, and on referring to this key he finds the number of the zones, as shown on the map, into which the output from his mine may be sent.

A wall map of large size, showing the same zoning in fuller detail, may be obtained from the Coal Zone Map Company, Glen Echo, Md.

Key to Consuming Zones

Zone No. 1 is restricted to coal from North Dakota, South Dakota and that received at docks.

Zone No. 2 is restricted to coal from Illinois (summer only), North Dakota, South Dakota and Iowa (the latter to points in Iowa only), and that received at docks.

Zone No. 3 is restricted to coal from Illinois, western Kentucky and Indiana and that received at docks.

Zone No. 4 is restricted to coal from Illinois and that received at docks.

Zone No. 5 is restricted to coal from Iowa, Kansas, Illinois, Missouri, Oklahoma and Arkansas.

Zone No. 6 is restricted to coal from Illinois and western Kentucky.

Zone No. 6A is restricted to coal from Illinois, western Kentucky and that received at docks.

Zone No. 7 is restricted to coal from Illinois, Iowa (the latter to points in Iowa only).

Zone No. 8 is restricted to coal from Illinois and Indiana.

Zone No. 9 is restricted to coal from Illinois, Indiana and western Kentucky.

Zone No. 10 is restricted to coal from Indiana, Illinois (from the Danville district on the Wabash Ry. only), western Kentucky (goes to Jeffersonville and New Albany only).

Zone No. 11 is restricted to coal from Virginia (on L. & N. R.R.), Tennessee (from M. R. R.), West Virginia (southern), Illinois, Indiana, Kentucky.

Zone No. 12 is restricted to coal from Indiana and Illinois (Danville district on Wabash Ry. only).

Zone No. 13 is restricted to coal from western Kentucky.

Zone No. 14 is restricted to coal from Indiana, eastern Kentucky, West Virginia (northern and southern), Virginia points on L. & N. R.R., Tennessee points on M. R.R., Michigan, Ohio points on G. R. & I. Ry.

Zone No. 15 is restricted to coal from Illinois, Indiana, Kentucky, West Virginia (northern and southern), Virginia points on L. & N. R.R., Tennessee points on M. R.R., and Michigan.

Zone No. 16 is restricted to coal from Indiana, Illinois (Danville district on Wabash Ry. only), eastern Kentucky, southern West Virginia.

Zone No. 17 is restricted to coal from Virginia points on L. & N. R.R., eastern Kentucky, Tennessee points on M. R.R., southern West Virginia.

Zone No. 18 is restricted to coal from Virginia points on L. & N. R.R., southern Kentucky and Tennessee points on M. R.R.

Zone No. 19 is restricted to coal from eastern Kentucky, Tennessee points on M. R.R., western Virginia (southern, also eastern, to points on C. & O. Ry. from Catlettsburg, Ky., to Cincinnati, Ohio).

Zone No. 20 is restricted to coal from Virginia points on L. & N. R.R., eastern Kentucky, Tennessee points on M. R.R., West Virginia (northern and southern), Indiana, Illinois (from Danville district on Wabash Ry. to points in Indiana only), Ohio and Michigan.

Zone No. 21 is restricted to coal from Virginia points on L. & N. R.R., eastern Kentucky, Tennessee points on M. R.R., West Virginia (northern and southern), Ohio and Michigan.

Zone No. 22 is restricted to coal from Virginia points on L. & N. R.R., eastern Kentucky, Tennessee points on M. R.R., southern West Virginia and Ohio.

Zone No. 23 is restricted to coal from northeastern Kentucky, West Virginia (northern and southern, also eastern, along main lines of C. & O. Ry. and N. & W. Ry. to Columbus and Cincinnati, Ohio) and Ohio.

Zone No. 24 is restricted to coal from northeastern Kentucky, West Virginia (southern, also eastern, along main lines of C. & O. Ry. and N. & W. Ry. to Columbus and Cincinnati, Ohio), and Ohio.

Zone No. 25 is restricted to coal from West Virginia (northern, also eastern, along main lines of C. & O. Ry. and N. & W. Ry. to Columbus and Cincinnati, Ohio), and Ohio.

Zone No. 26 is restricted to coal from Ohio.

Zone No. 27 is restricted to coal from Pennsylvania and Ohio.

Zone No. 28 can continue to get coal as formerly except that low-volatile coal in the Pocahontas, Tug River and New River districts on the N. & W. R. R. and the C. & O. Ry. and the Virginia Ry., and Clinch Valley districts in Tazewell and eastern Russell Counties along the N. & W. R. R., also high-volatile east of Charleston, W. Va., on C. & O. Ry. and east of Iaeger, W. Va., on N. & W. R. R. will be restricted to the District of Columbia, (except points on C. & O. Ry), Virginia, (including tidewater terminals) and points in West Virginia on the direct line of the C. & O. Ry. and N. & W. R. R. east and west bound and Virginia Ry. east bound.

Zone No. 29 is restricted to coal from Ohio, West Virginia (northern, also eastern, to points on the direct lines of the C. & O. Ry. and N. & W. Ry.).

Zone No. 30 can continue to get coal as formerly.

Zone No. 31 is restricted to coal from North Dakota, Wyoming, Montana and other fields east of the Rocky Mountains and that received at docks.

Zone No. 32 is restricted to coal from North Dakota, South Dakota, Wyoming and Montana and that received at docks.

Zone No. 33 is restricted to coal from South Dakota, Wyoming, Montana and other fields east of the Rocky Mountains, North Dakota and that received at docks.

Zone No. 34 is restricted to coal from North Dakota, South Dakota, Wyoming, Montana, Illinois (in summer), and that received at docks.

Zone No. 35 is restricted to coal from Iowa, Kansas, Missouri, Arkansas, Oklahoma, Colorado and other fields east of the Rocky Mountains, and from Wyoming.

Zone No. 36 is restricted to coal from Kansas, Missouri, Iowa, Arkansas, Oklahoma and southern Colorado.

Zone No. 37 is restricted to coal from Oklahoma, Missouri, Arkansas, Kansas, Colorado, New Mexico and Texas.

Zone No. 38 is restricted to coal from New Mexico, Colorado and Texas.

Zone No. 39 is restricted to coal from Colorado, New Mexico, Arkansas, Oklahoma and Texas.

Zone No. 40 is restricted to coal from western Kentucky, Alabama and Texas.

Zone No. 41 is restricted to coal from Arkansas, Illinois (in summer), Iowa, Kansas, Missouri and Oklahoma and to that received at docks.

Zone No. 42 is restricted to coal from Arkansas, Iowa, Kansas, Missouri and Oklahoma.

Zone No. 43 is restricted to coal from Iowa, Arkansas, Kansas, Missouri and Oklahoma.

Zone No. 44 is restricted to coal from Arkansas, Illinois, Kansas, Missouri, Oklahoma and Texas.

Zone No. 45 is restricted to coal from Alabama, Arkansas, Illinois (only on lines of St. L. S. W. Ry. and St. L. I. M. & S. Ry.), Kansas, Missouri, Oklahoma, western Kentucky and Texas.

Zone No. 47 is restricted to coal from western Kentucky.

Zone No. 48 is restricted to coal from Alabama.

Zone No. 49 is restricted to coal from Alabama, and western Kentucky.

Zone No. 50 is restricted to coal from southern Kentucky, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), western Kentucky, Tennessee and Georgia.

Zone No. 51 is restricted to coal from Alabama, southern Kentucky, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), Tennessee and Georgia.

Zone No. 52 is restricted to coal from Alabama.

Zone No. 53 is restricted to coal from Kentucky (southern, also western, to points on N. C. & St. L. and T. C. R.R. Nashville to Old Hickory and Hermitage, Tenn., inclusive), Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia, also Clinch Valley district in eastern Russell and Tazewell Counties), West Virginia (eastern, also southern on C. & O. Ry. east of Charleston and N. & W. Ry. east of Iaeger, W. Va.), Georgia and Tennessee.

Zone No. 54 is restricted to coal from southern Kentucky, Tennessee, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), Alabama and Georgia.

Zone No. 55 is restricted to coal from southern Kentucky, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia), Tennessee, Georgia and eastern West Virginia.

Zone No. 56 is restricted to coal from southern Kentucky, Tennessee, Virginia (all Black Mountain and Stonega districts in Lee, Dickenson, Wise and western Russell Counties of Virginia, and Clinch Valley districts in Tazewell and eastern Russell Counties along the N. & W. Ry.) West Virginia (eastern, on C. & O. Ry. and N. & W. Ry. and Virginian Ry.).

Zone No. 57 can continue to get coal as formerly except that coal is to be supplied generally from low-volatile fields.

Definitions

In this key the word "summer" is used to denote time from April 1 to and including Sept. 30, and "winter" from Oct. 1 to March 31.

Divisions of Kentucky are as follows: "Eastern" means all mines in eastern Kentucky on the Southern Railway (Q. & C.), L. & N., C. & O., N. & W. and Long Fork; "northeastern" means sections reached by the Sandy Valley & Elkhorn Ry., Long Fork, C. & O., and N. & W. Railroads in the Thacker, Big Sandy and Elkhorn districts; "northern" means the L. & N. sections in Hazard and Elkhorn districts; "southern" means those reached by the Southern Railway (Q. & C.) and L. & N. in Harlan, Jellico and Southern Appalachian districts; and "western" means those sections reached by L. & N. and I. C. west of Louisville, Ky.

Similarly the three districts of West Virginia are as follows: "Eastern" means those sections reached by the C. & O. and N. & W. in low-volatile fields of Pocahontas, Tug River and New River districts; "northern" those reached by the K. & M., K. & W. V. and C. & C. west of Dundon; and "southern" those reached by the C. & O. and N. & W. in Kanawha, Kenova and Thacker districts.

Key to Producing Districts

Location of Producing Districts	Numbers of Consuming Zones to which restricted
Alabama	40, 45, 46, 48, 49, 51, 52, 54.
Arkansas	5, 35, 36, 37, 39, 41, 42, 43, 44, 45, 46.
California	30.
Colorado	30, 31, 33, 35, 36, 37, 38, 39.
Docks[1]	1, 2, 3, 4, 4A, 6A, 31, 32, 33, 34, 41.
Georgia	50, 51, 53, 54, 55.
Illinois (summer)	2, 34, 41.
Illinois	3, 4, 4A, 5, 6, 6A, 7, 8, 9, 10[2], 11, 12[2], 15, 16[2], 20[2], 44, 45[3], 46[3].
Indiana	3, 8, 9, 10, 11, 12, 14, 15, 16, 20.
Iowa	2[4], 5, 7[4], 35, 36, 41, 42, 43.
Kansas	5, 35, 36, 37, 41, 42, 43, 44, 45.
Kentucky:	
Eastern	11, 14, 15, 16, 17, 19, 20, 21, 22.
Northeastern	23, 24.
Southern	18, 50, 51, 53, 54, 55, 56.
Western	3, 4, 6, 6A, 9, 10, 11, 13, 15, 40, 45, 46, 47, 49, 50, 53[5].
Maryland	57.
Michigan	14, 15, 20, 21.
Missouri	5, 35, 36, 37, 41, 42, 43, 44, 45.
Montana	30, 31, 32, 33, 34, 35.
New Mexico	20, 35, 37, 38, 39.
North Dakota	1, 2, 31, 32, 33, 34.
Ohio	14[6], 20, 21, 22, 23, 24, 25, 26, 27, 28[7], 29.
Oklahoma	5, 35, 36, 37, 39, 41, 42, 43, 44, 45.
Oregon	30.
Pennsylvania	27, 28, 57.
South Dakota	1, 2, 32, 33, 34.
Tennessee (M. R. R.)	11, 14, 15, 17, 18, 19, 20, 21, 22.
Tennessee	50, 51, 53, 54, 55, 56.
Texas	37, 38, 39, 40, 44, 45, 46.
Utah	30, 31, 33, 35, 36.
Virginia (L. & N.)	11, 14, 15, 17, 18, 20, 21, 22.
Virginia[8]	50, 51, 53, 54, 55, 56.
Virginia[9]	53, 56.
West Virginia:	
Eastern	19, 23[10], 24[10], 25[10], 29[10], 53, 55, 56.
Northern	14, 15, 20, 21, 23, 25, 29.
Southern	11, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 53.
Wyoming	30, 31, 32, 33, 34, 35.

[1] South bank Lake Superior and west bank Lake Michigan.

[2] From Danville district on Wabash Ry. only.

[3] Only on lines of St. L. I. M. & S. and St. L. S. W. Rys.

[4] To points in Iowa only.

[5] To points on N. C. & St. L. and T. C. Nashville to Hermitage and Old Hickory, Tenn., inclusive.

[6] On G. R. & I. only.

[7] From mines in Columbiana County, Ohio, only.

[8] All Black Mountain and Stonega districts in Lee, Wise, Dickenson, and western Russell Counties.

[9] Clinch Valley districts in Tazewell and eastern Russell Counties.

[10] Along lines of C. & O. and N. & W. to Cincinnati and Columbus, Ohio.

No Sudden Decline in Price Level*

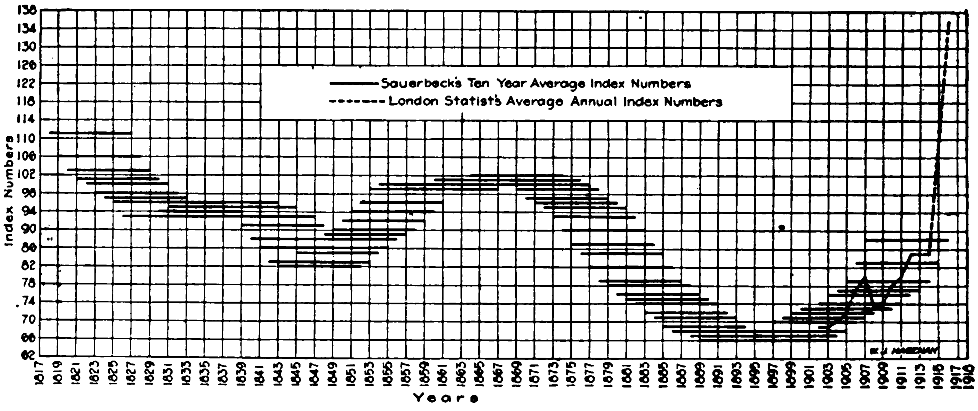
Data of a Century Show That Fall of Prices Will Be Slow Even When Peace Is Declared—Increased Utility Rates, To Be Just, Must Extend Beyond War Period

BY WILLIAM J. HAGENAH

WE ARE seeing at the present time a most important development growing out of our disturbed economic and political conditions—one which is destined to have a most far-reaching effect on the operations of public utilities. There is hardly an individual or an enterprise that has not already felt this staggering force or is not destined to feel it in the near future, but among all forms of industry which are struggling to effect a readjustment none has suffered so acutely as have the public utilities. I refer to the steadily rising level of prices, to which such decided impetus has been given by our entry into the great European war.

HOW THE UTILITY CRISIS CAME ABOUT

For more than fifteen years before the opening of the European war this country saw a gradually rising price level. Although this tendency has had several brief reversals, subsequent events have shown that these declines were merely fluctuations in the persistent movement to a higher level of wages and commodity prices. Coincident with this movement was our great industrial and commercial development. Private capital grew rich and strong on the unearned increment of a rising market.



PRICE MOVEMENTS DURING THE LAST CENTURY

The effect of these conditions on the public utilities is now generally known. With the rapid growth of urban population streets were extended in every direction and many new suburbs opened. But while the increased labor and commodity prices, interest rates and taxes caused increases in the operating expenses which were giving concern to the managements, the rates for utility service remained stationary or in many instances were reduced by public action. Moreover, these rates were being paid in a medium of exchange which was suffering a gradually diminishing purchasing power.

So long, however, as the utility had not yet reached the reasonable limit of its technical development and while the territory which it served was still far from being saturated, these increasing costs were largely offset by improvements in apparatus and methods. In fact, there are many instances where net earnings, because of especially favorable local conditions, showed annual increases. When relatively high efficiency had been realized, however, and the increase in the price level appeared to be gaining in momentum, the trend of net earnings in most instances turned definitely downward. With the reasonable limit of expansion reached, the crisis in the history of the utility industry approached. Between the pressure of increasing costs and the declining purchasing power of the dollar of income, net earnings were threatened with extinction.

This, in brief, was the condition of the utility industry when in 1914 the storm of the European war burst on the world—a war which each year has enveloped additional peoples and has gained in fury and destructiveness. With the coming of this war the level of prices, which was already at the highest point reached in a generation, turned abruptly and violently upward. Such a tendency it has maintained to this time. There is to-day scarcely an article of commerce or a form of human service which has not experienced such a great increase in price as to extend beyond every measure of comparison in the experience of men born since the close of the Civil War.

The chart reproduced with this article shows Sauerbeck's ten-year average index prices for the years from 1817 to 1916, on which I have superimposed the annual index prices of the London *Statist* in order to show what has taken place beyond the period covered by the Sauerbeck data and what the extension of the Sauerbeck data for the next few years will reveal. This is the most complete study of price movements with which I am familiar. As it covers the full period during which modern business methods have been developed and extended, it offers the most comprehensive diagram of what has happened under specific conditions and further serves as a guide to what we may look forward to as a result of the recurrence of those conditions.

From the high-price level following the Napoleonic wars to the high level of the Civil War period was approximately fifty years. Moreover, after the low point reached in about 1846, it was again fifty years before the low level after the Civil War was reached. Singularly, it is now just fifty years since the high level of prices in the Civil War period. In view of these events of the last century, covering two complete major economic cycles, in each case growing out of conditions similar to those with which the world is confronted at this time, can it be expected that following the declaration of peace in this war prices will quickly decline to the pre-war level or lower?

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*Abstract of revised transcript of informal talk before Wisconsin Gas & Electrical Association at Milwaukee, Wis., March 27.

In spite of prevailing conditions, we appear very prosperous at this time, but let us not be deceived. This is a war prosperity, and both England and Germany report the same kind of business activity. It would be more correct to say that we are extremely busy rather than extremely prosperous, since we are not creating wealth. From this period of intense activity, of strained production and increasing consumption, we shall enter a period after the war when this destruction must be paid for by the hard labor and economies of the people. The reaction will be as great as was the action, but it will be extended over a much longer period of time.

OLD PRICE LEVEL MAY NOT BE REACHED IN FIFTEEN YEARS

This does not mean that we shall at once have a serious depression. On the contrary, the necessity for urgent reconstruction and the accumulation of deferred work, together with the sentimental effect of the return of peace, will lead to considerable activity for a year or more after the close of the war. But the period of readjustment and of producing from the soil and other natural resources and by hard labor the wealth to pay for these struggles will cover many years. During this time we shall undoubtedly experience a relatively high level of prices, but with a gradually declining tendency the world over.

According to the course of the price movement after periods of great world wars in the past and in view of the special conditions with respect to the currency and banking systems at the present time, we may look forward to a considerable period of high prices, a period of business readjustment and a period of new social legislation. What this means in its full significance to individuals, to business in general and especially to public utilities, can be readily understood. The price level under which plants were built, under which franchise obligations were established and on which rate schedules were established, may not again be reached in fifteen years or even longer. It is not difficult to believe that many utility operators will not live to see the return to the price level of 1914.

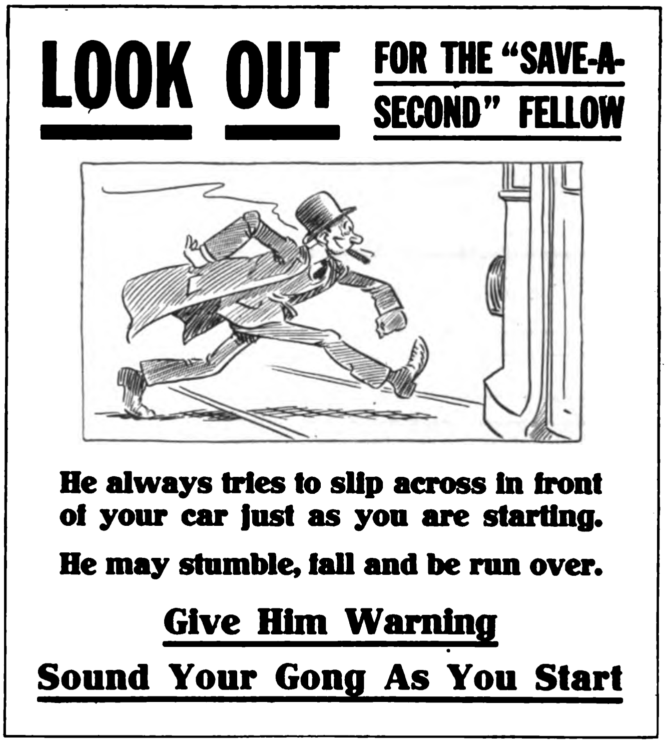
UTILITIES LOOK TO COMMISSIONS FOR JUSTICE

As a result of the present violent movement the work of the utility commissions has been enormously increased. During the decade of commission activity extending from 1907 to 1917 the almost universal results of commission investigations were reductions in rates. For the larger part of this period the rise in prices was gradual but extremely moderate in comparison with the last two years, but these increases were in many instances offset by the increased efficiency in utility operations and the great extension in service. So elastic was the industry and so quick its response to reasonable rate reductions that these years which represent an almost unbroken record of rate reductions at the same time mark the golden years of utility growth.

At the present time, however, the commissions which were quick to take advantage for the public of every economy in operation or profit resulting from improvements, are now foremost in granting relief from the pressure of high prices. Nearly 500 public utilities have received increases in rates or have been relieved from burdensome obligations by state utility commissions and by city councils within the last fifteen months. If the present tendency to permit increases in rates to offset rising costs continues, the year 1918 will see a practical cancellation of much of the work for rate reduction accomplished by these same authorities after many years of labor. It will also show that the original conception of a public utility commission as a continuing investigating body created to do justice to investor and public alike was correct, and that even in the midst of this great war, wherein every element of our national life is strained to the utmost, the desire for justice and fair play to all interests is still firmly grounded in the heart of the American public.

Growing out of the rapid increase in commodity prices are two important problems which should be developed and properly presented to the regulatory authorities. The justice and necessity of these are apparent from a study of the price movement. They are, first, the necessity of departing from the use of the five-year and ten-year average prices as a basis for rate-making appraisals and, second, the necessity for a larger return on the fair value of the property.

"His Name Is Legion"



LOOK OUT FOR THE "SAVE-A-SECOND" FELLOW

He always tries to slip across in front of your car just as you are starting.

He may stumble, fall and be run over.

Give Him Warning

Sound Your Gong As You Start

A GOOD SUGGESTION FROM THE N. S. C.

IN the special electric railway poster reproduced herewith the National Safety Council calls attention to a class of citizens whose actions are exasperating to the conscientious motorman. If the man depicted in the sketch was injured, he probably filed damage claims.

TRANSPORTATION DEPARTMENT'S OFFICE ACROSS FROM CARHOUSE

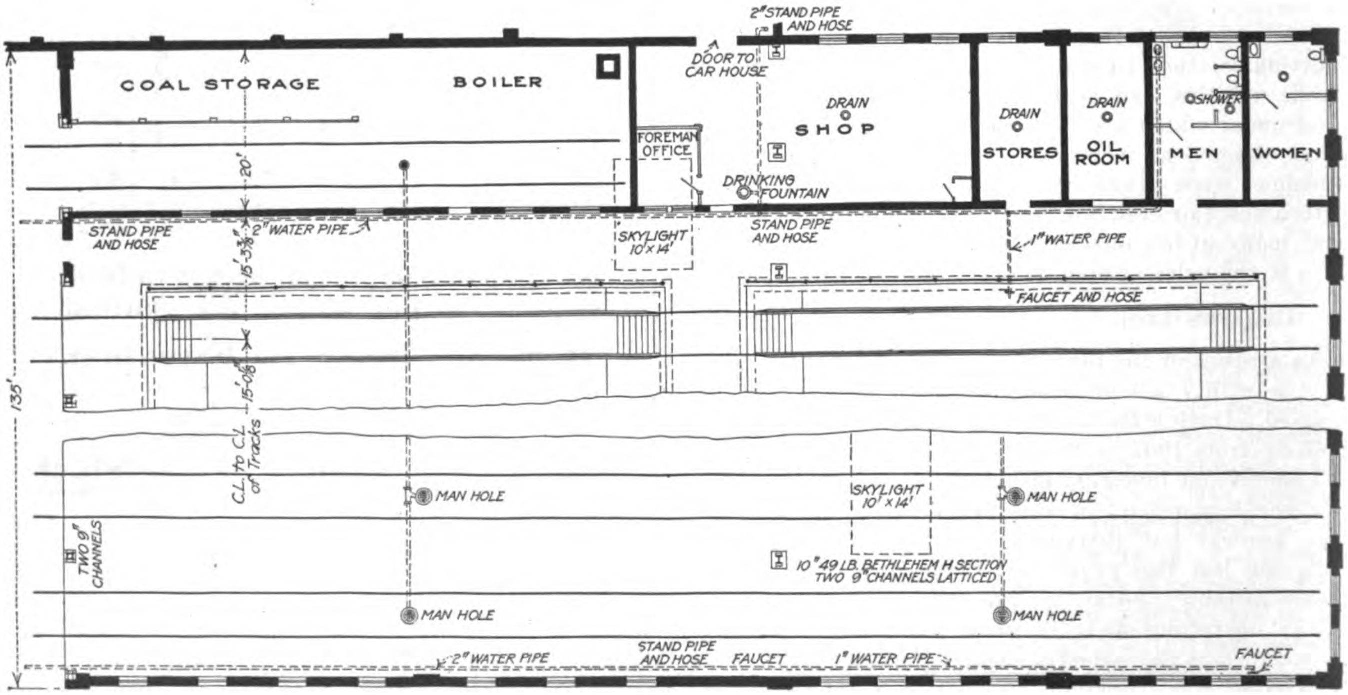
SIDE AND ENTRANCE TO CARHOUSE FROM CLEVELAND AVENUE

Columbus Inspection Shop Rebuilt As Unit, and Track Layout Improved

Inspection Shop and Track Changes at Milo Carhouse of the Columbus Railway, Power & Light Company—Car Movement Facilitated by Substituting Direct Connecting Tracks for Transfer Table

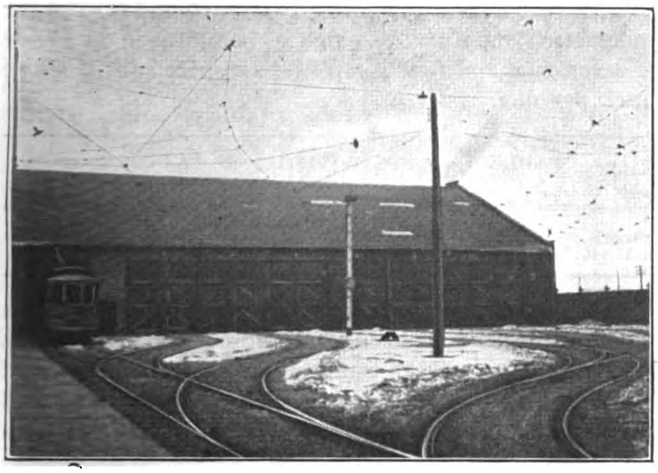
IN LINE with the present tendency among electric railways to arrange their carhouses and yards so that the handling of cars is facilitated and the most favorable and efficient working conditions are secured for making inspections and repairs, the Columbus Railway, Power & Light Company, Columbus, Ohio, has reconstructed and modernized its antiquated inspection shed at Milo. The track layout leading to this shop has also been improved. This property, which originally belonged to the Columbus Central Railroad, is the largest of the five carhouses of the present Columbus system, as nearly one-third of its transportation men work from this point. The buildings at Milo include a carhouse and an inspection shop, located as shown in one of the accompanying illustrations. The inspection shop adjoins the carhouse, about 200 ft. back from the street, and in front of the shop and switching tracks is a substation building which was formerly used for a power house.

The changes in track layout were made to give easier access to the inspection shop. The cars formerly pulled in over a track laid alongside the substation away from

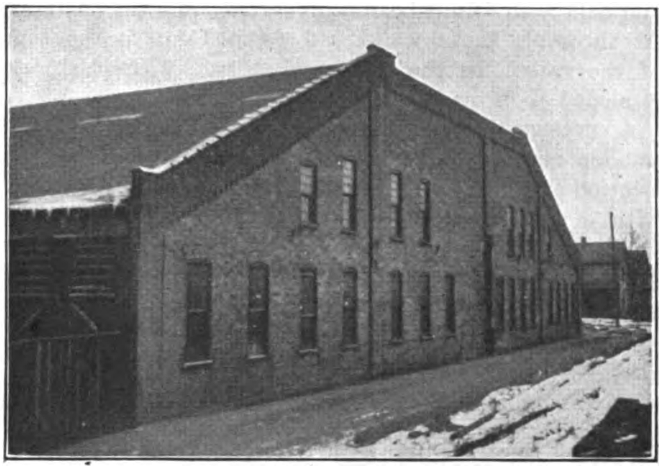


2" STAND PIPE AND HOSE
DOOR TO CAR HOUSE
COAL STORAGE
BOILER
FOREMAN OFFICE
DRAIN
SHOP
DRINKING FOUNTAIN
DRAIN
STORES
DRAIN
OIL ROOM
SHOWER
MEN
WOMEN
20'
STAND PIPE AND HOSE
2" WATER PIPE
SKYLIGHT 10'×14'
STAND PIPE AND HOSE
1" WATER PIPE
FAUCET AND HOSE
15'-3⅞"
15'-0⅛"
135'
C.L. to C.L. of Tracks
MAN HOLE
SKYLIGHT 10'×14'
MAN HOLE
TWO 9" CHANNELS
10" 49 LB. BETHLEHEM H SECTION TWO 9" CHANNELS LATTICED
MAN HOLE
MAN HOLE
2" WATER PIPE
STAND PIPE AND HOSE
FAUCET
1" WATER PIPE
FAUCET

FLOOR PLAN OF INSPECTION SHOP



ENTRANCE TO INSPECTION SHOP OVER NEW TRACK LAYOUT



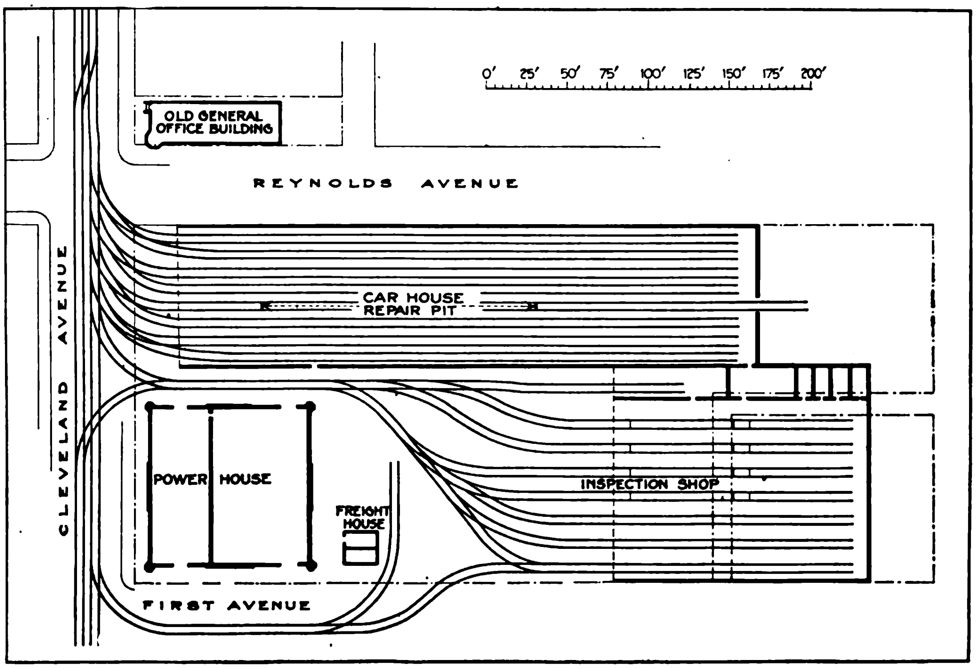
END AND PART OF ENTRANCE TO INSPECTION SHOP

the carhouse, and it had only one switch at the street. With the present layout the cars pull in from either direction over a new track laid between the carhouse and the substation and across the site of a building which adjoined the former and was used for the platform men's room.

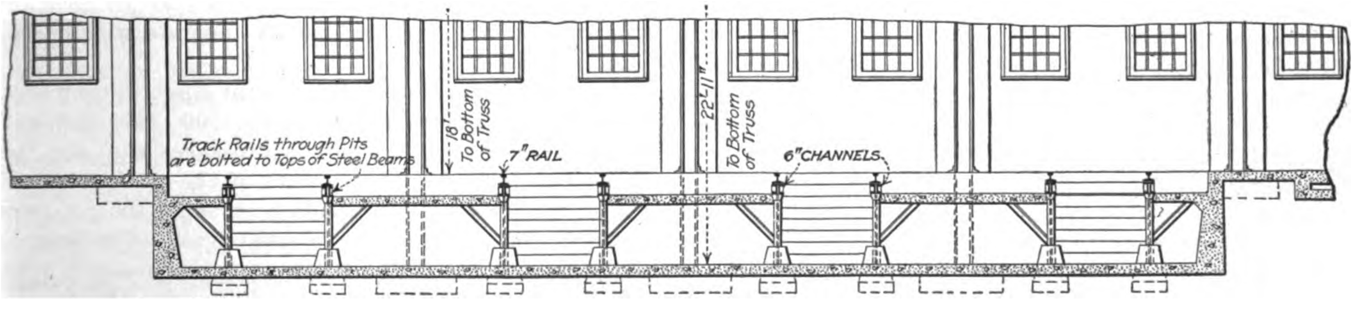
The principal building changes were made in the building now forming the inspection shop, which consists of two brick structures placed side by side. The common wall or partition, at right angles to the direction of the tracks, was replaced with a row of steel columns to support the roof, which was renewed. Sections of the front wall were also removed and steel columns with swinging doors were added to give a direct connection to all of the eight tracks entering the building. Previous to these changes a direct connection was provided for but three of the tracks, and in order to use the others it was necessary to shift the cars by means of a transfer table.

As seen from the accompanying layout, the inspection shop contains seven tracks running the entire length of the building, and several small rooms along one side. The track room is 160 ft. long and 135 ft. wide. Four tracks are constructed over pits for making inspections and repairs, and the remaining three tracks are used when cars are being washed. The entire floor is constructed of concrete, reinforced over the pits. A walk 10 ft. wide and on a level with the rail tops extends across the pits at the middle of the building.

The pit tracks are of open construction, built on short 8-in. I-beam columns, spaced 8 ft. 1½ in. apart. An 8½ ft. space between tracks gives ample room for workmen when repairing cars. Across this space is a 6-in. slab of concrete 13 in. below the top of the rails

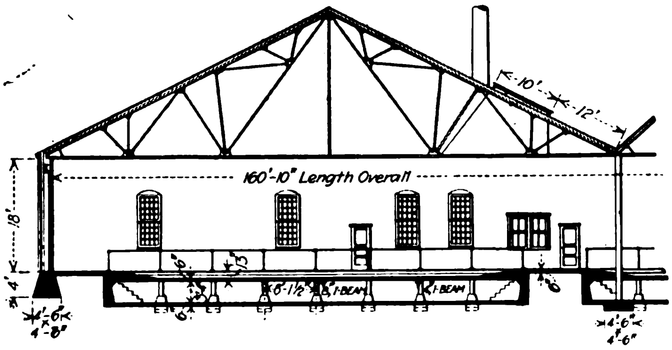

0' 25' 50' 75' 100' 125' 150' 175' 200'
OLD GENERAL OFFICE BUILDING
REYNOLDS AVENUE
CLEVELAND AVENUE
CAR HOUSE REPAIR PIT
POWER HOUSE
FREIGHT HOUSE
INSPECTION SHOP
FIRST AVENUE

ARRANGEMENT OF BUILDINGS AT MILO AND PRESENT TRACK LAYOUT, COLUMBUS RAILWAY, POWER & LIGHT COMPANY


Track Rails through Pits are bolted to Tops of Steel Beams
18' To Bottom of Truss
7" RAIL
22'-1" To Bottom of Truss
6" CHANNELS

LONGITUDINAL SECTION THROUGH PITS IN INSPECTION SHOP and held with 4-in. I-beams supported from the columns. At the ends these walks are ramped up to the tops of the rails. In the car-washing tracks the concrete is sloped to provide surface drainage.

A noteworthy feature of the arrangement of the smaller rooms along the side of the building is the location of a spacious boiler room and coal storage space, with a stub track on which fuel is brought into the building. There is also a hot-water heater in the boiler room for supplying water to the washrooms. One of the small rooms is used as a stockroom, one as a shop and one for oil storage. Special accommodations are provided for women, as it has been the practice of the company for several years to employ them as car cleaners.



SECTIONAL ELEVATION OF INSPECTION SHOP, SHOWING PIT CONSTRUCTION

The remodelling of the inspection shop permitted the removal of a small shop in the main carhouse. The latter stood near the front of the building over one of the tracks, making it impracticable to use the rear portion of this track except for the storage of sweepers or other inactive equipment. With the maximum use of this track, the building now has a running capacity of about sixty-five cars.

Since the removal of the building containing the men's room to provide space for the pull-in track, as mentioned previously, the transportation foreman's office and quarters for the men are located in a two-story brick building just across the street from the main carhouse.

Pneumatic Tie Tamping Saves on Reconstruction

THE United Railroads of San Francisco recently tried out and adopted a pneumatic tie-tamping outfit which has been found to afford a saving in cost and labor. As careful records were kept of items entering into both hand and pneumatic tamping methods it has been possible to compare the two methods in detail.

The equipment used is an 8-in. by 6-in. Ingersoll-Rand ER-1 compressor which has a piston displacement of 94 cu.ft. per minute. This compressor, sufficient for the operation of four tools, is driven by a 20-hp. motor operated by connection between trolley and rail.

An average of seven jobs in which 2692 ft. of single track was ballasted with hand tamping gave the figures as to this cost given in Table I.

Based on the same wage conditions and on the same track, namely 6-in. by 8-in. ties, 8 ft. long on 2-ft. centers, the costs shown in Table II were found typical for pneumatic tamping. These figures being based on a crew of seven men and four tampers making 180 ft. of single track per day.

TABLE I—COSTS WITH HAND TAMPING

Labor	$0.257 per foot of single track
Tools, superintendence and overhead	0.017 per foot of single track
Total	$0.274 per foot of single track
Or $1,446.70 per mile.	

Thus the saving effected by the pneumatic equipment amounts to about $686.40 per mile of single track. It is believed that a more compact roadbed can be secured by this method. Moreover, the fact that labor required is more than cut in half is considered a strong point in favor of the pneumatic method in times when the labor problem is acute.

TABLE II—COSTS WITH PNEUMATIC TAMPING

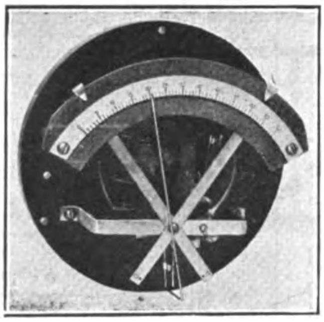
Labor, including moving	$0.117 per foot of single track
Current	0.011 per foot of single track
Maintenance, oils, superintendence and overhead	0.010 per foot of single track
Depreciation and interest	0.006 per foot of single track
Total	$0.144 per foot of single track
Or $760.30 per mile.	

The work on the United Railroad properties is under the direction of B. P. Legare, chief engineer of maintenance of way and construction.

New Pressure-Governor for Gas and Liquid Systems

THE details of a new pressure governor for controlling selfstarters used with motor-operated compressors are shown in the accompanying illustration. A graduated pressure scale and indicating needle are used to indicate the pressure and as a guide in making adjustments.

The action of the governor is dependent on the Bourdon tube which is connected to an independent discharge pipe from the pressure tank. The free end of the tube is connected mechanically to the indicator needle referred to above. After the governor has been set to the pressure range desired, it will automatically maintain the pressure within those limits on any gas or liquid system, that will not corrode the Bourdon tube. It can be used on both a.c. and d.c. circuits, and will operate within settings of from 3 to 12 lb.



PRESSURE GOVERNOR WITH CASE REMOVED

The device is made by the General Electric company, in sizes for rated pressures of 60, 100, 160, 300 and 500 lb. Governors for higher pressures can also be supplied if desired. Adjustments of the cutting-in and cutting-out pressures are made by moving the pointers shown at the top of the graduated scale. The case is tapped and drilled at the bottom for the pressure pipe and for making the electrical conduit connections.

Trolley Ear Length Is a Factor in Wire-Wear

Tests Recently Made Show That the Life of the Wire Increases Proportionately With the Length of the Ear

By G. H. Bolus
Designing Engineer, Ohio Brass Company, Mansfield, Ohio

MANUFACTURERS of overhead line material list trolley ears in all lengths from 7 in. to 15 in. Sales records show that the railway companies of the United States and Canada are purchasing more 15-in. ears than those of any other length. The average railway man doubtless has standardized on the length of ear which he has found from experience works well on his line, but it is doubtful whether he directly associates the length of the trolley ear with the wear on the trolley wire.

Some railway properties make a practice of starting their installation with a 9-in. ear, operating it until worn out and replacing with a 12-in. ear to cover up the worn spots in the wire. The next renewal would be with a 15-in. ear and later renewals would either be made with this length ear until the wire is worn out, or the ear points would be shifted and the series would be gone through again. This may sound like an answer to the question as to how many trolley ears will be renewed before the wire has worn to such a degree that its renewal is necessary, but it is not intended as such. The writer has found that local conditions so affect results that what would apply on one road would not apply at all on another.

In some cases the wire wears most at the approach side of the ear, (double-track, traffic in one direction) while in others the wear is greatest in the center under the boss. In still others it is at the leaving side. Trolley-base tension, trolley-wire tension, tightness of cross-spans and car speeds all have a bearing on the problem.

The test described gives the results obtained on a line where the wire is worn on the leaving side of the ears.

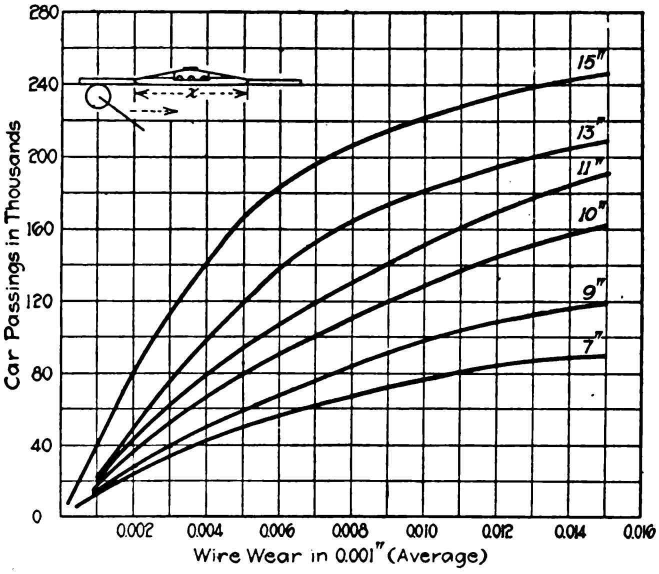
Test samples were made up from extruded metal in 7-in., 9-in., 10-in., 11-in., 13-in. and 15-in. lengths. Extruded metal was selected as uniformity, smooth surface contact and freedom from blowholes and porous spots was essential to insure reliable results. As the extruded metal was produced in lengths of 5 ft. it was easy to alter to the special lengths required for the test ears.

The trolley ears were installed in one of the large, Middle Western cities on No. 00 round Phono-Electric trolley wire which had been in use some time. Six sets of various lengths of ears were alternated on the trolley wire so as to subject them to conditions as nearly uniform as possible. The trolley tension was 1800 lb. with 100-ft. pole spacing. The road was double-track, with 40-ft. poles reinforced at the ground line. Micrometer readings were taken at frequent intervals of the wear on the trolley wire at both the approach and leaving ends of the ears until a wire wear of $\frac{1}{64}$ in. (0.015 in.) on the leaving side of the ear was recorded. When any set of ears showed $\frac{1}{64}$ in. wear they were disqualified and removed, as it was not desired to damage the contact wire unduly in the test. An accurate count was kept of all car passings. The accompanying graphs show the results of the test.

It is interesting to note that the 7-in. ear gave only about one-third of the life, in car passings, of the 15-in. ear for the same wear.

The curves appear to flatten out after the 0.015-in. wear is recorded, but this should not be taken to mean that there would be no wear beyond this point.

The writer has personally inspected trolley ears under a great many operating conditions and it has been his experience that under certain conditions, such as taut trolley wire and slack cross-span wires, short ears of 7-in. or 9-in. length will give satisfactory performance. A number of such installations are in operation in this country, principally in the East. However, where slack trolley tensions are employed, producing considerable sag between supports, there is a hammer blow which causes the trolley wire to be hammered out at the aproach of the ears. Also there is a tendency toward crystallization as the wave impulse set up by the oncoming trolley wheel is abruptly damped out at the short ear, producing a tendency towards hardening of the contact wire and early failure due to crystallization. Under this latter condition a longer ear would undoubtedly give better results.



CURVES OF TROLLEY WIRE WEAR WITH EARS OF DIFFERENT LENGTH

The graphs are not submitted as being conclusive, but they are intended to show the tendency of the short ears to wear the wire on the property where the test was made. It is the intention to make further tests along similar lines in the near future.

Fuel Conservation in Portland, Ore.

The City Council of Portland, Ore., recently passed ordinances granting permission to the Portland Railway, Light & Power Company and the Northwestern Electric Company to conserve fuel by the construction of large bins near their respective plants for storing refuse from the sawmills of the city. During the summer season when there is a shortage of water this material will probably be used in generating electrical energy.

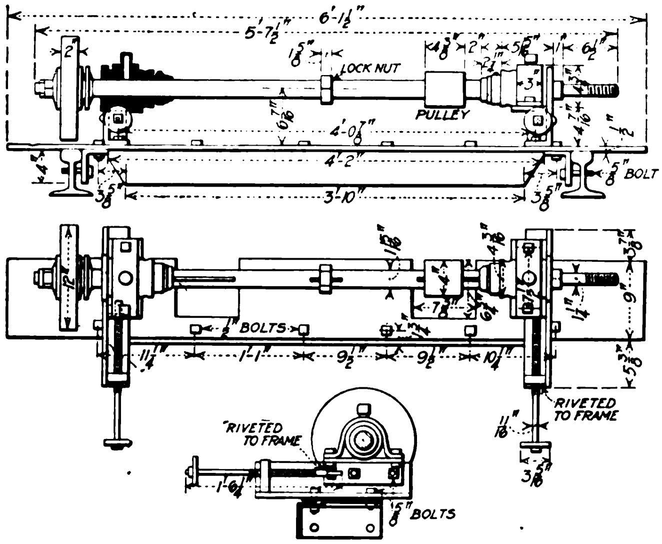
Efficient Wheel Grinder Made From Scrap Material

BY C. H. COPLEY

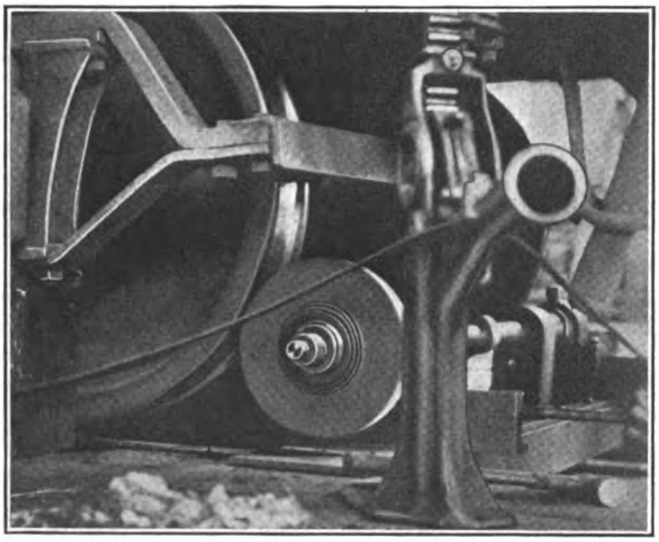
Superintendent Springfield (Mo.) Traction Company

A WHEEL grinder made in the shops of the Springfield Traction Company for our own use has been in operation since the first of the year. During the last three months 130 flat spots have been ground out. The time necessary to grind out a flat spot varies with the size of the flat from twenty minutes to two hours.

Accompanying illustrations show the construction of the grinder and its application to grinding wheels. A shaft arranged for two 12-in. x 2½-in. emery wheels is supported in bearings just inside the emery wheel. A 4-in. pulley is provided between the bearings for driving the shaft by belt from a 5-hp. direct-current motor which also drives the rest of the repair shop machinery. The bearings are mounted on guiding rails at each end and the emery wheels are fed into the work by screws working against the bearing plates. The grinder is conveniently mounted on a single base which can be laid across the track under the car and bolted down. By jacking up the pair of wheels to be ground, the operation can be carried out without the necessity of removing the wheels from the truck.



DETAILS OF WHEEL-GRINDER USED AT THE SPRINGFIELD TRACTION COMPANY'S SHOPS



GRINDING A PAIR OF WHEELS OVER THE SHOP PIT

The idea for the construction of this grinder originated from the description of a similar grinder in the ELECTRIC RAILWAY JOURNAL for Feb. 2, 1918, page 240. It was made at a cost of about $75 from old material usually found in the scrap heap.

Gas-Fired Boilers Produce Economies

AT THE annual convention of the Oklahoma Gas, Electric and Street Railway Association held in Oklahoma City on April 22-24, L. A. White, Muskogee Gas & Electric Company, presented a paper on "Gas-Fired Boilers." In this he outlined the situation in part as follows:

In many ways gas is a most attractive fuel for use under boilers. It requires no stoking and no cleaning of fires. A number of boilers may be attended and a constant load maintained independent of manual labor. In Oklahoma gas has been ridiculously cheap as compared with other forms of fuel.

The factors which govern combustion are time, space, and complete mixture of oxygen with the gas. This should be accomplished by putting the gas and air in violent agitation before entering the combustion chamber, but due to the impossibility of reaching each atom of carbon with its share of oxygen when only the proper proportions are present it is necessary to supply an excess quantity of air. Combustion must be completed befor the gases come in contact with the comparatively cool boiler tubes, therefore the necessity of a large combustion chamber.

The tendency of the present day is towards high boiler ratings and large furnaces, and when furnaces are constructed so as to prevent the flame from impinging on the tubes, boilers can be driven at 200 per cent of rating without difficulty. Most of the boilers at Muskogee were originally coal fired, and when gas burners were installed the grates were covered with firebrick, the burners, placed in the furnace door and the flame directed against a checker wall about 30 in. from the end of the burner. This arrangement proved to be satisfactory as long as the boilers were not driven hard, but as the demands on the boilers increased, the grates were removed, and the ash pit lined with firebrick. Finally most of the burners were placed in the ash pit doors thus doubling the size of the combustion chamber and enhancing the capacity of the boilers. The theory of the checker wall was that it would assist combustion by presenting an incandescent surface to the gases, thereby insuring ignition and directing the hot gases at right angles against the heating surface.

It is well known that the orifice of the burner sometimes becomes obstructed, thereby diminishing the flow of gas and necessitating cleaning. If this condition is not general the load will naturally shift to the other boilers and a high gas pressure will be carried to offset the delinquency.

The present-day fuel situation makes it imperative that furnace and boiler efficiencies be given even greater attention than in the past and that our boiler rooms be equipped with the necessary apparatus for procuring the best results.

Foot Control Mechanism Makes One-Man Car Operation Easier

Control and Air Brake Operation by Foot Pedals Leaves Motorman's Hands Free for Cashier Service

TO SIMPLIFY still further the operation of one-man cars, J. S. McWhirter, superintendent of equipment Third Avenue Railway System, New York City, has designed a method of actuating controllers and air brakes by means of foot pedals. The original object of this invention was to enable the operator to control the car movement and still leave his hands free for making change, issuing transfers, operating doors and sanders, and caring for the general safety of the passengers.

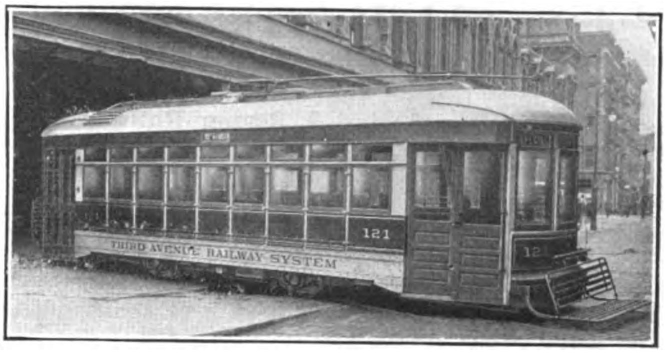
Since the device has been in operation other important advantages have been discovered. The first of these is increased safety, for a man using his hands in the operation of a car in the usual manner does not have the freedom of vision for watching the door and the boarding of passengers that is afforded when operating by the foot mechanism. Another is that when the foot pedal is in use the control and air brakes are automatically interlocked so that the motorman cannot apply power without releasing his brakes. This prevents the waste of energy that is frequently found when motormen apply power to bring a car up to the desired stopping point instead of releasing the brakes when they find that they have misjudged their stopping distance. It prevents also the rounding of curves with both power and brakes applied, for which practice some motormen also have a fondness. It further provides automatically for the proper sequence of operations in the control of the car. That is, power is dropped off before the brakes are applied and the brakes must be released before using power again.

Practical operation of the pedal equipment has shown that it promotes coasting, because the coasting position is a welcome change for the foot, and decreases waste of braking air as the operator is far less likely to "pump" on the pedal than to "fan" the brake handle.

Three cars have already been equipped with the pedal attachment and placed in service on the Chester Hill line of the Third Avenue Railway System. As this is a suburban line with a long headway, it lends itself readily to experiments in one-man car service. The cars equipped are the company's low-level type like the one illustrated. The control equipment on the cars is interlocked with the door operation so that the doors must be closed before the car can be started.

As shown in the cab views, car control is effected by operating the foot pedal which is connected by levers to the handle of the motorman's brake valve as originally installed. This operation also opens and closes the control circuit. Thus when the pedal is pressed down and released power is applied and cut off and the brakes operated in the same manner as is regularly done by the motorman operating the controller and brake valve.

With no foot pressure the pedal is in a raised position and an emergency application of the brakes results. So if the operator lifts his foot the effect of the deadman's handle is obtained. Motormen find it easier to keep the foot pedal depressed than to hold down a handle of the deadman type.



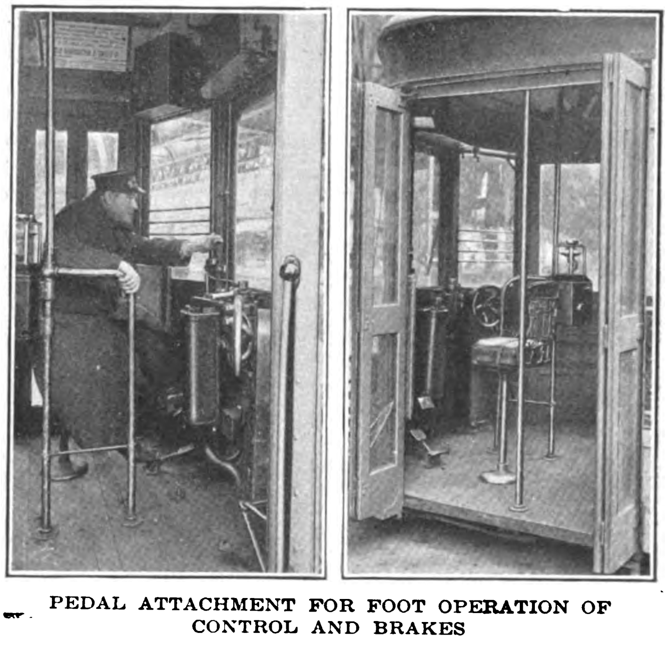
LOW-LEVEL CAR ARRANGED FOR ONE-MAN OPERATION

One of these cars has been in operation, breaking men in for service, since the middle of April. The men take readily to this mode of operation, and apparently find it easier to operate the car with one movement than by two, as is required for operating the control and brakes by hand. With very little practice the men are able to operate the car as smoothly and make stops as accurately as with hand operation and they find it less fatiguing. The present attachments do not interfere with hand operation in the usual manner if emergency should require it.

A swivel seat is arranged for the operator. This is an advantage, for it not only makes car operation by means of the foot pedal easier but it also permits the changing of position necessary to obtain a clear view of passengers boarding and alighting. Time can thus be saved at stops and additional safety to the passengers results.

It will be appreciated that in this pioneer apparatus the inventor has had to work with a controller and brake valve made for the usual hand operation. Eventually the platform controller will be eliminated entirely and the connections to the brake valve made less conspicuous. This will have an additional advantage of requiring less platform space.

Mr. McWhirter has patented his invention and negotiations are now under way with a view to making the devices standard in modern one-man car equipment with other time, labor and life-saving features.



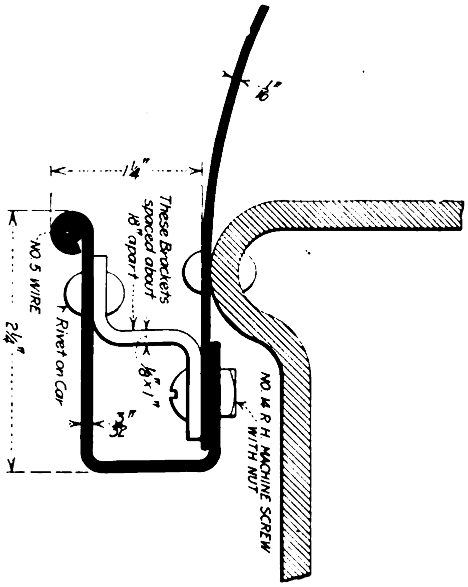
PEDAL ATTACHMENT FOR FOOT OPERATION OF CONTROL AND BRAKES

Gutters on Cars Reduce Labor of Cleaning and Protect Passengers

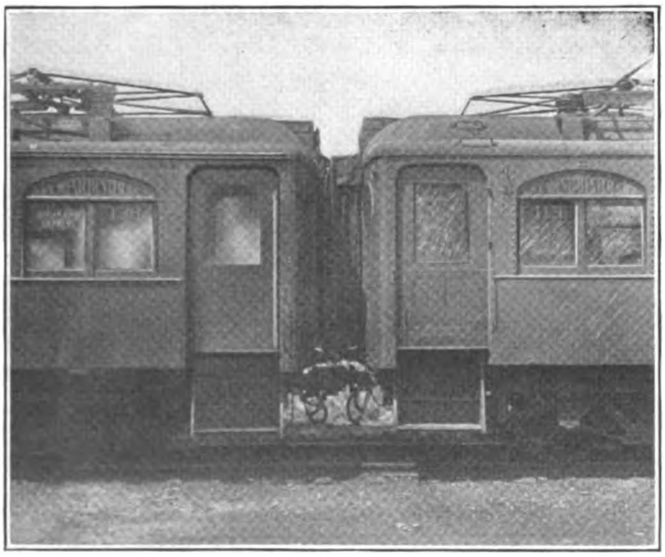
New Type of Gutter Applied to Cars of the New York, Westchester & Boston Railway

By R. R. Potter
Superintendent of Equipment

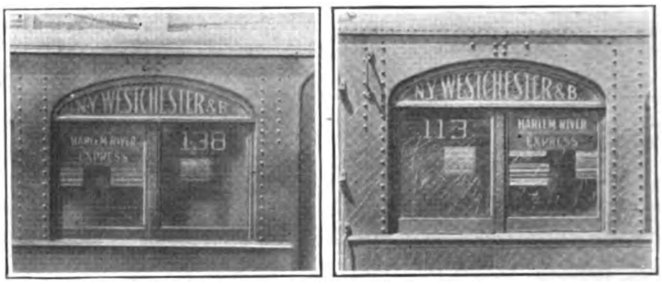
During the first years of operation of the cars of the New York, Westchester & Boston Railway a great deal of trouble was experienced with the rust and dirt from the roofs washing down over the windows and sides of the cars. A large part of this was due to the use of steel trolley wire and steel pantograph trolley shoes. Conditions were so bad that it was almost impossible to keep the windows clean and the sides of the cars in a respectable condition. Gutters have been applied to remedy the difficulty, as shown in the accompanying illustrations. These are formed of $\frac{3}{32}$-in. steel bent to proper shape and stiffened with No. 5 steel wire rolled into the rim. Stiffening brackets are installed every 18 inches.


1/16"
1¼"
These Brackets spaced about 18" apart
NO. 5 WIRE
2¼"
Rivet on Car
1/8"×1"
3/32"
NO. 14 R H. MACHINE SCREW WITH NUT

GUTTERS APPLIED TO THE LOWER ROOF SHEETS ON WESTCHESTER CARS



TWO CARS IN SAME TRAIN, ONE WITH AND ONE WITHOUT GUTTERS



CLEAR WINDOWS WHERE GUTTERS ARE APPLIED, AND STREAKED WINDOWS RESULTING FROM ABSENCE OF GUTTERS

During stormy weather the windows and sides of the car are protected from the dirty water from the roof. In addition passengers are afforded better protection when entering and leaving the side doors, as the gutters are much more efficient than the type generally applied over car doors. The illustrations indicate the trimness of appearance which the gutters give to the cars, and also the protection which they afford. The illustrations were made from photographs taken immediately after the cars had been in service during a rainstorm and before any cleaning had been done to the windows or sides of the car. The streaks left by the dirty water on the sides and windows of the cars without gutters are very noticeable. It now seems strange that all railroads do not have their cars equipped with this or similar type gutters.

Reducing Lighting Maintenance Costs

By W. C. Wefel
Light Foreman, Denver (Col.) Tramway

The series burning tungsten lamp has come into general use on electric railways and a substantial saving in power for the same illumination has resulted. It has been found, however, that tungsten lamps require more careful handling and burnt-out lamps are not as easily located as was the case with carbon lamps. This requires more time for their maintenance, which partly offsets the saving in power consumption.

In order to aid in locating burnt-out lamps we have made use of an original shunt or compensating device similar to that used with arc lamps. This has proved a great advantage, especially in one-man car operation. In these short cars but one or two circuits are necessary and by using the shunt device the operator can locate and replace a burnt-out lamp without causing an unnecessarily long delay. The use of this shunting device also permits the use of fewer and larger units for lighting other cars, thus enabling us to take advantage of the greater life given by the larger lamps.

We are contemplating making a change to larger units in some of our cars. These include the replacement of eighteen 23-watt lamps and a 46-watt headlight with nine 56-watt tungsten lamps and a 56-watt concentrated filament headlight. This arrangement requires more power, but we needed the increased illumination.

On some cars it has been the practice to connect the headlight in series with two circuits of lamps. This decreases the liability of having the headlight extinguished by the burning out of another lamp. By using the shunt device previously referred to we have found that this precaution is not necessary and the headlight can be connected in series with a single circuit.

At our eastern division carhouse we formerly used 230 16-cp. 60-watt carbon lamps grouped in five and ten-light clusters. These have been replaced with twenty-five 100-watt tungsten filament lamps which not only give us more candle power but save 41,245 kw.-hr. per year. There is also a saving in the labor required for the maintenance of these lamps which, taken with the saving in power, makes a total reduction in cost of about $500 per year at this location.

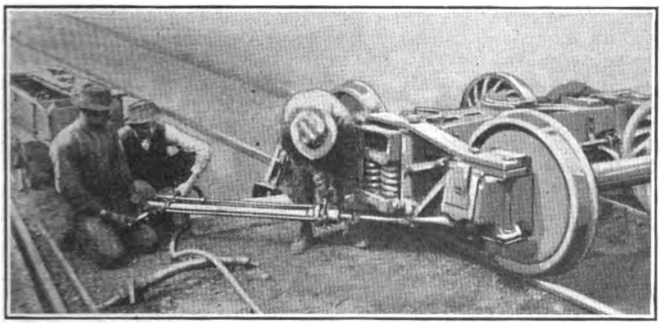
The time now consumed in making lamp repairs on our whole system is about twenty-five man-hours per day. With the changes we have made and contemplate making we expect to reduce this to ten man-hours per day. This reduced maintenance cost, together with the saving effected in power consumption, according to our estimate should produce a saving of more than $7,000 annually on yard and line lighting alone.

Air-Operated Cutting Gun Saves Time and Labor

THE Rivet Cutting Gun Company of Cincinnati, Ohio, has placed an air-operated cutting tool on the market which avoids the slow, expensive work usually done with a sledge and cutting bar. One of its principal features is its small size. It can be operated in very narrow cramped spaces and, by using a long tool, work can be done which would ordinarily require a scaffold to reach. It should prove a very useful tool in the repair shop for cutting off rivets or nuts that cannot be turned due to rust or the end of the bolts that are burred. Chipping can be done much more rapidly and with less danger to the workmen than with hammer and chisel. Where quick work, such as in clearing the track after a wreck or accident, is necessary, such a tool is of great value.

This air-operated cutting gun is most conveniently operated by three men. One guides the tool while the other two steady the extreme end. The gun weighs 65 lb. and can be operated with an air pressure of 60 lb., but from 90 to 110 lb. is desirable for heavy work.

The tool is operated by means of a handle located at the extreme end of the air cylinder. Three positions are provided for the handle: First, a cut-off position which closes the port so that the air connections can be made. Second, a return-stroke position which drives the piston to the rear end of the cylinder. Third, a forward stroke position which sends the piston forward to deliver the blow. For chipping work the valve handle is moved between the forward stroke and the return-stroke position at a convenient speed.



TAKING OFF A NUT THAT HAS BEEN BURRED

LETTER TO THE EDITORS

Safety Code Standards for Forces Acting Upon Transmission Lines

THE CONNECTICUT COMPANY

NEW HAVEN, CONN., May 11, 1918.

To the Editors:

The difficulty of "teaching an old dog new tricks" has been clearly shown in the case of the writer's article in the Feb. 23 issue of the ELECTRIC RAILWAY JOURNAL on "The Forces Which Act Upon a Transmission Line." To him the use of the wind pressure value of 8 lb. per square foot, the old standard, had become such a habit that this value was used repeatedly instead of the Safety Code values in the last paragraph of the first column on page 365, and in the example in the second column on page 366.

In the first instance, since the wind is not an element of the load considered, the fact that the value should have been 12 lb., instead of 8 lb., has little effect, but in the case of the example it is another matter. Using the correct value, the force becomes 213 lb. instead of 142 lb., the bending moments in pound-feet for the upper and lower sets of wires become 24,708 and 11,217 instead of 16,472 and 7478 respectively, and the total bending moment becomes 40,339 lb.-ft. instead of 28,364. The correction results finally in a fiber stress of 2220 lb. per square inch and factors of safety of 2¼ and 1⅝ respectively for chestnut, cypress, Southern pine and Western red cedar, and for Northern white cedars.

Under the caption "How Geography Affects the Sleet Question" appear the values of transverse pressures for the three grades of construction—A, B, C of the Code, namely 12, 7, and 4 lb. per square foot instead of the values for the three districts of loading, which are 12, 8 and 5⅓ lb. per square foot. And in this connection, the use of the word "supports" was not entirely happy, for although the discussion was dealing with wood poles, at one point previously mention was made of other types of support, and for flat surfaces the Code calls for an increase in unit pressure over that for cylindrical surfaces of 60 per cent. This higher value of course would have to be used for square sawed poles.

I am indebted to Kenneth L. Wilkinson of New York City and to Dr. E. B. Rosa of the Bureau of Standards, for bringing these points to my attention. I had hoped to "pin them on the 'printer's devil'" but reference to the manuscript puts them squarely up to the writer. It is with pleasure, therefore, that I find that the apparently overlooked inversion of the equation for fiber stress, near the bottom of the second column on page 366, is up to the compositor; the fiber stress is found by dividing the bending moment by 0.0002638 times the grand circumference cubed.

CHARLES R. HARTE, Construction Engineer.

In order to impress upon employees the opportunity for saving in little things the Toledo Railways & Light Company, Toledo, Ohio, is using some leaflets which are full of human interest. The articles are signed by F. R. Coates, president, and they give practical details of losses and possible savings on the local property.

AMERICAN ASSOCIATION NEWS

War Board Pleased With Special Freight Issue

Headquarters Will Probably Remain At Munsey Building—The Next Meeting Will Be Held on June 7

The Electric Railway War Board held a well-attended meeting at Washington on May 10. Among other topics the board discussed the article by A. B. Cole, prepared with its active co-operation, and printed in the May 11 issue of the ELECTRIC RAILWAY JOURNAL. The board thought highly of the article and is arranging to give it a wide circulation. The board accepted from the Westinghouse Electric & Manufacturing Company, through M. B. Lambert, an offer of one-half of Mr. Cole's time for any investigation which the board desires him to make.

The board discussed the law to allow 3 cents per mile fare for steam roads and considered its relation to electric railway operation; and also the relation of electric railways and the War Finance Corporation. Mr. Gadsden stated that he had written Governor Harding suggesting that in case of any application by public utilities to the corporation the National Committee on Public Utilities be given an opportunity to appear. The work of the national committee was discussed and the statement was made that A. S. Hills will move the headquarters of the Utilities Publication Committee from New York to Washington. Among other matters the desirability of having prepared popular articles of high grade on the public utilities situation was discussed.

Mr. Gadsden reported on conferences with the Shipping Board and the Navy Department with reference to assistance for electric railways from construction plants by way of furnishing platform labor at times of peak load. He also explained that the resolution affecting public utilities recently adopted by the United States Chamber of Commerce was in the hands of its board of directors for further action.

Among other matters considered were these: Mr. Burritt was instructed to send to Washington the results of an investigation on the labor shortage. The use of electric railway lines for government passenger transportation service was taken up. Mr. Gadsden stated that permanent quarters can probably be secured in the Munsey Building, which was recently considered impossible. It was agreed that Bulletin No. 1 of the Return Load Bureau, Highway Transport Commission, Council of National Defense, should be sent to all member companies. Mr. Gadsden stated that he has under discussion with the council the adoption of a resolution with reference to facilitating the use of electric railways in handling freight. Mr. Burritt brought up the subject of the supply of ties for electric railways under the proposed plan of distribution among steam roads and Mr. Gadsden agreed to take up the matter with Hon. John Skelton Williams. It was suggested that in applying the skip-stop plan some railways are not using it in the most satisfactory manner. The board will take steps to furnish information which can be used in so selecting stops, as to produce the best possible results for the public and the railways.

Rhode Island to Receive the Charter Membership Cup

IN ORDER to stimulate the company section movement to the greatest possible extent the ELECTRIC RAILWAY JOURNAL has presented to the association a silver cup to be awarded to the company section organized with the largest membership. The first to receive it will be the Rhode Island Company Section recently organized.

The following extracts from a letter sent by the JOURNAL to President J. J. Stanley explain the plan.

THE COMPANY SECTION CHARTER MEMBERSHIP CUP

In order to encourage the company section movement of the American Association, the ELECTRIC RAILWAY JOURNAL has decided to offer a silver cup to be awarded to the section having the largest number of charter members. The idea is that the cup should be passed from section to section as new sections with larger charter memberships are successively formed. After conference with Mr. Schreiber, chairman of the committee on company sections, and Messrs. Burritt and Clark of the association office, we have selected a solid silver cup, standing slightly over 11 in. high without the base and about 15½ in. high with the base.

It is proposed to letter on one side of the cup approximately the following:

> "Presented by the ELECTRIC RAILWAY JOURNAL to the American Electric Railway Association to be held by the company section with the largest number of charter members."

On the reverse side will appear substantially the following:

> "Held by the Rhode Island Company Section, No. 12, organized on April 6, 1918, with 216 charter members."

In accepting this cup on behalf of the Association President Stanley sent the following letter, dated May 13, 1918:

The American Electric Railway Association, through its secretary, Mr. Burritt, has already accepted the fine offer of the ELECTRIC RAILWAY JOURNAL of a trophy to be awarded to the company section organizing with the largest number of charter members, but I want to thank you personally for this further evidence of the JOURNAL'S interest in the association.

The conception is splendid and I am sure will have the effect of giving the company section movement the impetus it needs and deserves.

The Rhode Island Company Section, No. 12, may indeed be proud to be the first holder of the cup, but I shall be surprised if it retains the honor permanently.

The cup, which was made by the Gorham Company, has the appearance shown in the accompanying half-tone.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Short Strike in Rochester

After They Had Been Out Three Days, Men Return on Basis of Original Settlement Offer

Motormen and conductors employed on the Rochester (N. Y.) lines of the New York State Railways went on strike on May 9 and returned to work three days later. At the time the men went out they were offered an advance in wages of 4 cents an hour, but this offer was rejected. They accepted the offer, however, after they tied up the company's lines for three days. It was also stipulated by James F. Hamilton, vice-president and general manager of the company, that if the Rochester municipal authorities allow the company to increase its rate of fare from 5 cents to 6 cents, an additional wage increase will be granted.

Wages Ranged From 27 to 31 Cents

At the time the men went on strike they were receiving a sliding scale of 27, 29 and 31 cents an hour according to the length of time they had been in the company's service. They demanded a wage increase to 40, 42 and 44 cents an hour. The company said it was unable to pay this, and Mr. Hamilton has offered to submit the company's books, records, etc., to the city to show that it cannot operate at a profit and pay the men higher wages with a 5-cent fare. This investigation has already been started by the municipal authorities.

About 1300 men were involved in the strike. The company admitted that the men should have more money, but told them that the company was not in a financial condition to pay a higher wage. Loyal employees advised against a strike at the time, maintaining that the wage question could be taken up with the company after the 6-cent fare question has been solved.

Feeling, however, that the employees should have a higher wage a tentative announcement was made by the New York State Railways that a 4-cent an hour increase would be granted to the platform men as of May 1, making the rate retroactive almost nine days. Even with that announcement, the men agreed to strike and they walked out, leaving the thousands of men employed in the city's war industries without transportation facilities. After a series of conferences between representatives of the men, the federal war department, the municipal authorities and the company, the men agreed to return to work under the 4-cent an hour advance in wages.

In addition to the wage advance, the regular run men are guaranteed ten hours' work each day. Other changes in working conditions are subject to arbitration between the company and the men.

Inquiry Into Company's Finances

M. & L. W. Scudder, New York, accountants, have been engaged by the Rochester municipal authorities to investigate the financial conditions of the company. Marvyn Scudder has already arrived in Rochester and has started work on the company's books. While there is some opposition to the 6-cent fare in Rochester, it is generally believed that it will be granted if the report of the accountants is favorable to the company.

The company made no effort to operate cars. There was no disorder.

Mr. Beeler Retained in Dallas

The City Commission of Dallas, Tex., acting on the recommendation of M. N. Baker, supervisor of public utilities, has employed John A. Beeler, New York, to study its street railway transportation problems. Mr. Beeler is expected to arrive in Dallas about June 1. In the meantime Mr. Baker will study electric railway operation in Kansas City, Chicago, Toledo, Detroit, Buffalo, Dayton and Rochester, with a view to making recommendations that will improve conditions in Dallas. The Dallas Railway has also sent Richard Meriwether, general manager, to these cities. He will work with Mr. Baker on the railway traffic investigation. In announcing the employment of a traffic expert, Mr. Baker gave out a statement in part as follows:

"The rapid growth of Dallas during the last ten years has created new and complicated problems of railway operation and traffic management. Some of these problems have been solved by changes already made in the operative methods of our railways, some of them will be solved by the plans that have been made and approved for the new extensions and improvements now under way, but, allowing for the progress thus made, there are still some unsolved problems which demand study.

"It is the aim and purpose of the supervisor's department to assist the railway in finding a proper remedy for these conditions, to the end that Dallas may soon be the equal of any city in the United States with respect to the adequacy and efficiency of its traction system. With this object in view it has been decided to bring to Dallas some competent and recognized authority on traffic questions, to make a close study of the Dallas situation and prescribe the proper measures for its relief."

Fares and Wages Coupled

P.R.T. Points Out Wherein Raise in First Is Necessary Before Second Becomes a Fact

The management has acknowledged the petition of the employees of the Philadelphia Rapid Transit Company asking for an increased wage and requesting the company to petition Councils for an increase in fare in order to make this wage increase possible.

Of the 9714 employees of the company on duty 9388 have signed their names in approval of the petition, while only 326 have not signed. Thus 96.6 per cent of all the employees are working in accord with the plan.

The fact that these signatures were obtained in the face of the protests of professional trouble-makers who are seeking to serve their own ends is pointed to in a statement to the men as proof that those who have been working under the co-operative plan for the past seven years are, as they state in the petition, satisfied with working conditions and wish the present plan of representation continued.

This expression of loyalty and satisfaction from the men has been laid before the gentlemen representing the federal and State authorities to prove that there are no questions between the company and its employees requiring their services. The scope and working of the co-operative plan have been explained in detail to the public authorities, particularly the fact that the trainmen are represented at all times by a committee of their own choosing who could take up with the management all matters requiring discussion or adjustment.

The federal and State authorities have been advised that the company will deal only with the duly-elected committeemen, and that the co-operative plan will continue effective as at present administered until two-thirds of the men ask that a change be made.

The company has expressed to the men its appreciation of their willingness to co-operate in securing the increased fare necessary to make the advance of 5 cents per hour to meet the increased cost of living.

Without any increase in fare the company has already increased its wage scale so that at present it amounts to $1,750,000 a year more than it did at the time the country entered the war. Belief is expressed by the company to the men that the appeal by them to their representatives in Councils will be recognized as fair and reasonable, and that the company will be able to secure the advance in fare necessary to make possible the increased wage.

Tentative Chicago Franchise Settlement Terms

Council Committee Approves Them—Brief Review of the Proposed Provisions of Grant

Tentative approval of terms for a new franchise for the surface and elevated railways of Chicago was given by the City Council committee on May 11. The terms which were under discussion were outlined in the issue of the ELECTRIC RAILWAY JOURNAL for May 4. The provisions favored by the Aldermen were a compromise of three plans submitted previously. They are to be drafted in ordinance form for final consideration.

As they now stand, the provisions for rate of return and life of franchise do not agree with the companies' views. Neither does the proposed grant meet with the approval of the committee's special attorney, who had recommended a plan of municipal ownership and operation through a "trustee corporation." This apparently was not received seriously by the Aldermen, and there were some objections by representatives of organized labor.

The committee had previously approved an outline of physical construction for the companies under the proposed grant. This would call for the expenditure of about $100,000,000 in six years. This program has not been changed. The tentative provisions for life of franchise, rate of return and method of control are as follows:

The proposed unified corporation is to receive a franchise for thirty years, subject to city purchase at any time or taking over by the city at the end of this period subject to outstanding indebtedness. The city may also designate a licensee to take over the property after thirty years subject to outstanding liens. If neither the city nor another licensee takes over the property after thirty years the company may continue to operate without profit other than interest on the investment.

The company is to be allowed a maximum return of 6 per cent on the initial purchase price and, if earned, an additional amount ranging from two-tenths to five-tenths of 1 per cent on the capital account. In refunding outstanding bonds the company is to be allowed the cost of such refunding up to a limit of 5 per cent, this to be governed by the board of regulation and control. The company is to be allowed a return on new money only at cost, and the city's traction fund is to receive the same rate of return as this new money.

A body similar to the state public utility commission and having similar power over Chicago traction lines is to be created and called the board of regulation and control. Members are to be appointed by the City Council.

The rate of fare is to be 5 cents, with a transfer charge between surface and rapid transit lines not exceeding 2 cents. Increases and decreases in fare and transfer charges are to be authorized when necessary, but before putting into effect any increase the company may be relieved of non-transportation charges such as cleaning and sprinkling right-of-way and contributing to the cost of paving streets where it operates.

Preparation of the ordinance will be hastened with a view to getting action by the City Council before adjournment. If the ordinance is passed it will be submitted to the voters next November, and if approved by them it will go to the State Legislature for legislation which is necesary before it can become effective.

Six-Cent Wage Advance

With it Goes an Increase in Fare Backed by an Injunction Preventing Interference by City

The employees of the Toledo Railways & Light Company, Toledo, Ohio, on May 10 agreed to accept an increase of 6 cents an hour in wages. An injunction will prevent the city from interfering with the increase in the rate of fare to meet the increased wages.

The restraining order granted by Federal Judge John M. Killits to prevent the city from interfering with the company in raising its rate of fare to meet the expense of increasing wages went into effect on May 10. It was to hold until May 15, and May 14 was set as the date for hearing the case. Immediately upon being served with notice of the order Cornell Schreiber, Mayor, issued a statement in which he asked the people to abide by the court's decision.

H. L. Doherty & Company, New York, filed the case in the Federal District Court, but Frank Coates, president of the Toledo Railways & Light Company, entered a separate motion, asking for a temporary restraining order. R. H. Brunning, expert accountant, who examined the books of the company for A. L. Faulkner, representative of the United States Department of Labor, made an affidavit to the affect that it would be impossible for the company to increase the wages of the men without suffering a loss unless the rate of fare was increased. He gave the court the result of the audit he had made to support his assertions.

In granting the order the court said that it was necessary to secure the operation of the cars and to keep the complaining company from loss and the public from irreparable injury.

The rate of fare will be 5 cents straight, with a 1-cent charge for each transfer. Children under eight years of age are to ride for 1 cent. The restraining order would have allowed the company to make the fare 6 cents, if it had so desired.

According to Henry L. Doherty, chairman of the board of the company, an increase of 6 cents an hour in the wages of the men would mean an additional expense of $400,000 a year to the company, while the increase in the rate of fare made, together with the car fund which has been paid to the Federal District Court, would amount to only about $200,000 annually.

Milwaukee Trainmen's Wages Adjusted

Announcement Is Made of Ratification of Agreement for Advance of Ten Cents an Hour

It was announced on May 4 that the trainmen in the employ of The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., had ratified the agreement entered into on April 30 between the company and the labor adjustment committee of the Employees' Mutual Benefit Association. As a result of this agreement the wages of the men have been increased 10 cents an hour from May 1.

PROBLEMS DISCUSSED AMICABLY

The questions of wages, hours and working conditions had been under discussion some time prior to May 1. The labor adjustment committee of the Employees' Association was acting under the general labor contract executed between the company and the association on April 10, 1918. Under this contract the company agreed to recognize the right of the members of the association to deal collectively with the company in the matter of wages, hours and working conditions. Both parties agreed to submit to arbitration any differences which could not be settled by negotiation. The company agreed to maintain wages in accordance with the relative cost of living referred back to 1914 as soon as it was provided with the revenues necessary therefor. The labor adjustment committee conferred with the Railroad Commission of Wisconsin and ascertained that it was the commission's intention so to adjust fares as to permit fair wages to be paid and this lead up to the settlement of the subject announced on April 30.

One by one differences between the committee and the company were removed, but with the approach of May 1 and the prospect not certain that all subjects in disagreement could be adjusted by that time, it was decided to continue with the meetings and go to arbitration with such matters as had not been settled by negotiation by May 3. The understanding on this point, reached on April 29, was as follows:

POINTS OF AGREEMENT

1. Consideration of plans for an eight-hour work day shall be postponed until it becomes more generally adopted in the electric railway industry, and the government's requirements for labor are less urgent.

2. The schedules shall be so arranged that the maximum possible number of runs shall be completed in twelve hours spread-of-duty. The committee may investigate the schedules and suggest changes.

3. The wage increase shall be effective from May 1.

4. All of the wage increase to become effective May 1 shall be paid as an increase in the hourly wage scale.

5. Negotiations shall be continued and an agreement arrived at if possible

by May 1; if an agreement is not reached by May 3, the matter shall be arbitrated under the provisions of section 10 of the contract of April 10, 1918.

It was in accordance with the spirit of this preliminary understanding that the wage adjustment was effected on April 30 without the need of going to arbitration. The agreement was thereafter ratified by the members of the association.

Eight-Hour Day on Coast

The Puget Sound Traction, Light & Power Company, Seattle, Wash., has established the basic eight-hour day for the 1800 railway employees in Seattle. The order, however, requires the trainmen to work ten hours daily, overtime being paid after eight and one-half hours. The new schedule went into effect on April 27.

A. W. Leonard, president of the company, states that the purpose in adopting the principle of the eight-hour day was the betterment of service. A labor shortage existed, and the company believed that the recognition of the eight-hour day would make employment with the company more attractive. Mr. Leonard asserts that the company could ill afford to pay time and a half for overtime, but it was forced by the present emergency in the transportation situation in Seattle to make this concession.

J. S. Wallace, secretary of the union of employees, stated that while the adoption of the eight-hour principle was one of the concessions for which the men were working, the methods by which the company proposed to apply it was not satisfactory, and would not be accepted as a settlement with the company of the present disagreements.

The Tacoma Railway & Power Company, Tacoma, Wash., has also established the eight-hour day, following the order in Seattle.

Men Object to Women on Cars

It was announced during the week ended May 11 by R. J. Fleming, general manager of the Toronto (Ont.) Railway, that on account of the scarcity of men the company intended to employ women. A meeting of the employees of the company was held on the evening of May 11 to discuss this proposal, at which meeting the men passed a resolution which was concluded as follows:

"Therefore, be it resolved that, if the company insist on employing women, we will refuse to instruct or operate a car on which women are placed for the reasons set forth. And any attempt on the part of the company to discipline or discharge motormen or conductors for so doing will be met with by prompt action by members."

The company's announcement said that women would be employed and that it was intended to use pay-as-you-enter cars. It was pointed out that special provision was being made to take care of women employees, who would have special quarters and a matron in charge, and that the women would be treated the same as the men with respect to pay and hours. The women are to be required to train for two weeks, after which they will receive 30 cents an hour for the first six months, 32 for the next six months and after that 35 cents up to two years' service. They will then receive 37 cents an hour. It was stated that the project had been under discussion for some time and that the board of directors had given its sanction.

The matter is before the Ontario Railway & Municipal Board. If the board gives its approval the company will commence the reconstruction of cars to the pay-as-you-enter type. A model of the proposed type is already in the city for experimental purposes. The folding doors will be worked by air and the signal to start will be automatically given to the motorman by the showing of a light as soon as the doors are closed.

Protests against employing women workers have been received from the men employees by the company, but Mr. Fleming stated that the company would sooner employ patriotic women than the number of foreigners it now employs.

Naval Training for Technical Men

Two courses for service in the navy in steam engineering, electrical engineering and radio duties have just been announced. The first is offered by the Bureau of Navigation, Navy Department, for applicants with the following qualifications: (1) An engineering degree from a college of recognized standing; (2) Two and one-half years' practical experience subsequent to graduation; (3) Not more than thirty-five years of age; (4) Good physical condition. Tuition will be given at Annapolis for four months, after which those who finish the course successfully will receive further training ashore or afloat.

The second course is offered by the Navy Department in steam engineering only and has been established with headquarters at the Stevens Institute of Technology, Hoboken, under the guidance of Dean F. L. Pryor as civilian director. It will consist of five months' training, part of which will be given at Pelham and part on board ship and will lead to the commission of ensign. The school is open to men between twenty-one and thirty years of age who are physically qualified, of thorough ability and officer-like character and have completed the engineering course at any recognized technical school. Information in regard to this course can be obtained from Stevens Institute or of both courses from the Engineering Council, 29 West Thirty-ninth Street, New York.

The Aurora, Elgin & Chicago Railroad, Wheaton, Ill., has restored parlor and buffet car service between Aurora and Chicago.

News Notes

Wage Increase in Binghamton.—The Binghamton (N. Y.) Railway has announced an increase of 2 cents an hour in wages.

Wage Raise in Rockford.—The Rockford & Interurban Railway, Rockford, Ill., has extended to all employees a flat increase of 3 cents an hour, effective May 1.

Wage Increase in Wilkes-Barre.—The trainmen in the employ of the Wilkes-Barre (Pa.) Railway have received increases in wages to 28, 30 and 32 cents an hour, adding $56,000 to the annual payroll.

Ask Receiver for Wage Raise.—Platform men employed by the Buffalo (N. Y.) Southern Railway have made application to the receiver for an increase in wages of 2 cents an hour. The men now receive 28 cents.

City System for Peking.—Petitions for a street railway system in Peking signed by a number of Shanghai merchants are now before the Chinese government for sanction. Tientsin and Shanghai have city railway systems.

Wage Increase in Topeka—The Topeka (Kan.) Railway has granted an increase of 5 cents an hour to each trainman and 3 cents to each job and carhouse man. The former scale for trainmen was 21 to 26 cents an hour. In addition a bonus of 10 per cent is provided.

Peoria Men Want Increase.—Employees of the Peoria (Ill.) Railway have asked the company for 40 cents an hour the first year and 45 cents an hour thereafter. The present scale is 20 cents an hour the first year, 29 cents the second year and 33 cents thereafter.

Wage Bonus During War.—The Texas Electric Railway, Dallas, Tex., announced a salary increase of 3 cents an hour for all employees, effective on May 1. The advance will be paid as a war bonus, but will in no way interfere with the regular salary increases which recently became effective.

Wage Increase in Dallas.—The Dallas (Tex.) Railway announced a wage increase of 3 cents an hour effective on May 1. According to the announcement it will remain in effect during the war. The men of the line department will get an increase of 2 cents an hour and the trackmen an increase of 2½ cents an hour. The trackmen's raise went into effect thirty days ago.

Looking Toward Municipal Ownership.—At a meeting of representatives of the five border municipalities held in Windsor, Ont., on May 8, a resolution was adopted requesting the Ontario Hydro-Electric Commission to make a survey of the local electric railway system with a view to control of the lines being assumed by the municipalities in 1922, when the present franchises expire.

Labor Administrator Appointed.—President Wilson, on May 11, placed in the hands of Felix Frankfurter, New York and Washington, the task of whipping into definite form a national labor policy for the war. Mr. Frankfurter's appointment makes him "labor administrator" under Secretary of Labor Wilson. He will immediately co-ordinate under his direction the work of all the numerous labor adjustment bodies now existing in the government.

Dubuque Wage Board's Findings.—The Union Electric Company, Dubuque, Ia., has granted a flat wage increase of 5 cents an hour to all trainmen except those who have been employed more than four years. The latter receives a flat increase of 6 cents an hour. The increase is in accordance with the wage award of a board acting for both the men and the company. The demands of the men were for slightly higher rates than those granted by the board.

Increase for Cairo Men.—The Cairo Electric & Traction Company, Cairo, Ill., included in the Illinois Traction System, has increased the wages of first-year trainmen on city cars to 27½ cents an hour and for men serving beyond their first year to 30 cents an hour. Wages for first-year men on interurban lines have been increased to 26 cents an hour and for men beyond their first year to 32 cents an hour. This is an increase of 7½ cents for all men concerned.

War-Time Conference With Governor.—Representatives of the public utilities operating in Tennessee conferred recently at Nashville with Governor T. C. Rye in regard to the problems that confront the electric railways, electric light companies and the gas interests. It was brought out that the present extraordinary service demands, war conditions and other needs make imperative higher rates and larger resources if the companies are to work at maximum efficiency.

Exit the Squealing Brakeshoe.—The Interborough Rapid Transit Company, New York, N. Y., has been ordered to substitute a lubricating brakeshoe on all cars not equipped with this type. The motor cars of the "L" trains have the flanged shoes now, but a non-flanged shoe with no lubricant device, is used on most of the trail cars. No order was issued with respect to Brooklyn trains owing to the fact that within the next two years the Brooklyn Rapid Transit Company is planning to put new steel cars in operation, equipped with non-squealing brakeshoe.

Buffalo Agitators Active.—Two days before the petition of the International Railway, Buffalo, N. Y., seeking an increase in fare was filed with the City Council several hundred employees of the company made an effort to bring about a strike but without success. International officers of the carmen's union came to Buffalo and the majority of the men agreed to remain loyal to the company pending the outcome of the application for increased fares. The company has offered to increase the wages of the men 6 cents an hour if the 6-cent fare is granted.

Additional Municipal Bus Service.—An extension of municipal auto bus service in San Francisco has been ordered by city officials to serve new territory in the western addition. Fred Boeken, superintendent of the Municipal Railway, will direct the installation of the new service. The first municipal buses which were put in operation on Jan. 15 to serve as feeders to the Geary Street line were described in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 327. They cover two routes across Golden Gate Park, rendering service in what is known as the Sunset District.

Texas Companies Increase Wages.—A salary increase of 3 cents an hour was granted on May 1, to all employees of the Houston (Tex.) Electric Company, Galveston Electric Company, Galveston-Houston Interurban Railway, Beaumont Electric Company, the Port Arthur Electric Company and the Beaumont-Port Arthur Interurban. The announcement was made from the office of L. C. Bradley, Houston, district representative in Texas of Stone & Webster. The increase makes the maximum salary for city railway employees 35 cents an hour and for interurban trainmen 39 cents an hour.

Arbitration in Wheeling.—Officials of the Wheeling (W. Va.) Traction Company, West Virginia Traction Company, of the Pan Handle Traction Company and of the Steubenville Traction Company and employees of those companies have been in conference in an effort to reach an agreement on wages and other terms of service. The employees, who are receiving from 30 to 33 cents an hour demand an increase to 55 cents an hour as a maximum. Inasmuch as it has been impossible to reach an agreement it has been decided to submit the differences to arbitration. Both sides have selected arbitrators who have agreed upon a third arbitrator to be assigned by the Department of Labor.

Fuel Engineer for Pittsburgh District.—On May 8 the United States Fuel Administration announced the appointment of Thomas R. Brown, Pittsburgh, Pa., as administrative engineer for the Pittsburgh district. This appointment was made as a preliminary step toward putting into operation a general plan for fuel conservation in power plants. The program at present in effect in Pittsburgh, which will be used as a model, comprises personal inspection of every power plant, its classification and rating, based on the thoroughness with which the owner conforms to the recommendations of the Fuel Administration, and an administrative engineer in charge of the work in each state or district. It is expected that from 10 to 20 per cent of the coal used annually in industrial plants will be saved by this plan.

Programs of Meetings

Missouri Association of Public Utilities

The annual meeting of the Missouri Association of Public Utilities is scheduled to be held at St. Joseph, Mo., on May 17 and 18. The program of papers is as follows:

"Work of National Utilities Association," by Philip J. Kealy, president of the Kansas City (Mo.) Railways.

"How War Conditions Have Affected the Utilities of the State and the Nation," by H. Wurdack, president and general manager of the Light & Development Company, St. Louis, Mo.

"Problem of Manufacturing Under War Conditions," by J. S. Tritle.

"Taxes Affecting Public Utilities," by H. Spoehrer, secretary and treasurer of the Union Electric Light & Power Company, St. Louis, Mo.

New England Street Railway Club

The New England Street Railway Club will hold its monthly meeting on May 23 at the Hotel Brunswick, Boston, Mass. It will be the last get-together for the season. The speakers will be Lieut. Godfrey L. Cabot, N.R.F.C., president of the Aero Club of New England, and Lieut. Parker H. Kemble, N.R.F.C. The subject will be military aviation. Lieutenant Cabot is one of the most active promoters of the development of aerial navigation and engineering. He is vice-president of the Aero Club of America, and a member of the contest committee and marine flying committee of that organization. Lieutenant Kemble is an officer in the Naval Reserve Flying Corps. He will give a stereopticon talk, presenting a most interesting collection of airplane views, showing their development, the different kinds and how they look in action.

Arkansas Association of Public Utility Operators

The Arkansas Association of Public Utility Operators will meet in the eleventh annual convention at the Arlington Hotel, Hot Springs, Ark., on May 21, 22 and 23. The program of papers includes the following:

"Transmission Line Construction," by William Crooks, manager of the Arkansas Light & Power Company.

"Present-Day Fuel Situation," by J. F. Christy, manager of the Jonesboro Water & Light Company.

"War-Time Costs vs. Rates," by A. Patterson, superintendent of the electric department of the Southwestern Gas & Electric Company.

"Courteous Attention to Traveling Salesmen," by W. R. Herstein of the Electric Supply Company, Memphis, Tenn.

George R. Belden, S. E. Dillon, U. N. Gladson, dean of the College of Engineering of the Arkansas State University; Rev. Dr. W. N. Waldrip and Charles A. Brough, Governor of Kansas, will address the delegates.

There will be a patriotic dinner at the Arlington Hotel on the evening of May 22.

Financial and Corporate

Valuation Hearing Closed

Washington and Idaho Commissions Close Case to Determine Spokane Values for Rate-Making

The direct testimony before the Washington and Idaho Public Service Commissions in the valuation case of the Washington Water Power Company, Spokane, Wash., was concluded at the hearing on April 25. Henry L. Gray of Seattle, consulting engineer, was called as the first witness for the company. According to the figures of Mr. Gray, the total valuation of the Washington Water Power Company, with due allowance made for necessary overhead charges, was $29,938,660, of which the generating system, valued at $15,754,216, was the largest item. He valued the combined city and interurban railway at $5,068,512.

Engineer McCurrach, for the Washington Commission, on April 25 presented a supplemental report, bringing the appraisal of the Washington Water Power Company to December, 1916, as compared with June 30, 1915, the date covered in his first report. This subsequent appraisal is based on additions actually made to the property since June 30, 1915, as shown by the books of the company. Prices are based on the five-year average from 1910 to 1915. Following are the figures:

WASHINGTON PROPERTY	June 30, 1915	Dec., 1916
Railway system	$5,502,422	$5,593,214
Light and power system	13,505,694	13,814,977
Non-operating property	893,855	893,785
Totals	$19,901,971	$20,301,976
Lands—railway	$447,004	$438,453
Lands—light and power	1,114,904	1,114,232
Totals	$1,561,908	$1,552,685
IDAHO PROPERTY		
Light and power system	$2,326,669	$2,478,890
Non-operating property	42,586	42,586
Totals	$2,369,255	$2,521,476
Lands—light and power	123,560	143,203
Grand totals, Washington and Idaho	$23,956,694	$24,519,340

Another table of appraisal values was presented by Engineer McCurrach, prepared at the request of Attorney F. T. Post for the company, based on prices prevailing from 1912 to 1916, a period in which materials and labor cost more. These figures showed:

Washington totals	$23,490,484
Idaho totals	2,839,626
Grand total	$26,330,110
Increase over regular appraisal figures	$1,820,770

The appraisal of Engineer McCurrach on the railway property of the company to December, 1916, on the 1910-1915 basis shows:

RAILWAY PROPERTIES VALUES	
Spokane street railway	$4,732,521
Interurban system	860,693
Lands—Spokane railway	259,761
Lands—Interurban	178,692
Total	$6,031,667

A calculation of what he thought was a fair system of annual depreciation allowances to be made on the property of the Washington Water Power Company was presented by Mr. McCurrach, showing:

	Per Cent	Amount
Spokane street railway	3.99	$191,185
Interurban railway	3.85	32,613
Light and power, Washington	3.51	480,862
Light and power, Idaho	3.49	86,067
Total annual depreciation	3.62	$790,727

The case was concluded on April 26. Fifteen days were allowed in which to file briefs. It is expected that a decision will be rendered by June 1. This case was referred to previously in the ELECTRIC RAILWAY JOURNAL for March 23, page 584.

$22,676,277 in Bond Issues Sanctioned

The Capital Issues Committee announced on May 13 that the number of applications considered during the week ended May 11 was greater than in any previous week of its existence. The committee determined thirty-seven cases, aggregating $27,487,277, of which $4,811,000 was disapproved. In addition to the amount formally disapproved, postponement for the period of the war was secured informally of issues aggregating $4,990,000. The $22,676,277 approved included $6,777,084 of refunding obligations, so that the new issues approved aggregated $15,899,193. New issues for the corresponding period last year amounted to $14,196,500.

The committee stated that spread of the knowledge of its aims and purposes continued to be reflected in voluntary postponement of security issues, that case being cited in the city of St. Louis, Mo., which has adopted a policy of financial preparedness consistent with the national welfare. The city has notified the committee that it is going ahead with securing local authority to create certain debts and advertising the issues of bonds therefor so that they may be marketed readily at the proper time, but that it will submit for approval by the committee only such issues as are for urgent and essential purposes. The city is at present advertising some $14,000,000 of bonds which it does not propose to market until the conclusion of the war. Other municipalities in Federal Reserve District No. 8 are adopting the same patriotic course. The Milwaukee member of the sub-committee of the Minneapolis Federal Reserve District reports that the city of Milwaukee, in bringing its needs into conformity with the national interests, has reduced presently contemplated bond issues from $5,740,000 to $1,050,000.

It is pointed out that the pursuit of this policy of capital conservation throughout the country will give to the nation that financial strength which will enable it to shorten to a material degree the period within which the war can be ended with victory for democracy.

1917 Increase Ten Per Cent

Banking House Summarizes Reports of Gross Earnings for 100 Utilities—Net Falls Off 2.8 Per Cent

In a tabulation of earnings of 100 public utilities Harris, Forbes & Company, New York, N. Y., submit statistics which, because of the abnormal conditions prevailing in the public utility industry during 1917, should be of unusual interest to investors. The reports from these companies show an average increase of 10.3 per cent in gross earnings in 1917 over 1916. This is a larger percentage of increase than the average during the last ten years. The reports cover operations in thirty-nine states and in two provinces of Canada.

The banking firm's records for the last ten years show the following increases in gross earnings:

60 companies in 1908 over 1907 by 7.3%
61 companies in 1909 over 1908 by 11.3%
66 companies in 1910 over 1909 by 12.0%
70 companies in 1911 over 1910 by 9.3%
73 companies in 1912 over 1911 by 8.6%
83 companies in 1913 over 1912 by 7.4%
84 companies in 1914 over 1913 by 2.9%
86 companies in 1915 over 1914 by 2.8%
90 companies in 1916 over 1915 by 10.4%
100 companies in 1917 over 1916 by 10.3%

In commenting upon this showing the bankers say:

"It will be observed that the foregoing record shows uninterrupted annual increases in the aggregate gross earnings of these companies during the past ten years, the average annual increase being more than 8 per cent. In normal times, this tabulation alone might serve as an illustration of the stability of earnings of the well-established public utilities which, to speak generally, supply a service that is essential to the economic life of the communities in which they operate.

NET EARNINGS DECREASE ONLY 2.8 PER CENT

"Under present conditions, however, the statement is incomplete without the facts as to net earnings. These companies, in common with practically all others, have been confronted during the past year with the problems of increasing costs of labor and material and higher taxes. It is therefore most gratifying that the aggregate net earnings of the 100 companies from which we have received reports show a falling off during 1917 as compared with 1916 of less than 2.8 per cent. Furthermore, the aggregate 1917 net earnings amounted to more than two and three-quarters times the aggregate annual bond interest charges of these companies. We feel that this showing of earnings under adverse conditions is one of the most dependable indications of the desirability of public utility bonds for investment when selected with care."

Twin Cities Suffer from Higher Costs

Net Income Is Reduced More Than Thirty Per Cent By Rise in Operating Expenses and Taxes

The operating ratio, including taxes, of the Twin City Rapid Transit Company, Minneapolis, Minn., was 74.84 per cent for the calendar year 1917 as compared to 68.17 per cent in 1916. This change was due almost entirely to the increase in operating costs. The total revenues showed a slight decrease, but the operating expenses rose $468,876 or 7.5 per cent. As a result the net operating revenue decreased $475,064 or 12.1 per cent. This loss was enhanced by the increase of $208,099 or more than 29 per cent in taxes. The final result for the year was a loss of $699,497 or 31 per cent in net income. The full details are given in the accompanying statement.

During 1917 the company declared and paid the regular quarterly dividends aggregating $1,530,000, being at the rate of 7 per cent on the preferred stock and 6 per cent on the common stock. The balance carried forward on Dec. 31, 1917, was $1,285,804 as compared to $1,368,762 the year before.

The expenditures for additions and replacements during the year 1917 totaled $1,435,687. The gross passenger revenue per mile of single track operated was $22,519. The revenue passengers carried numbered 199,621,160, a slight decrease from the 199,848,096 in 1916; and the transfers redeemed were 73,678,873, a decrease from 74,425,935 the year before.

The city of Minneapolis in 1917 completed the valuation of the local property, and later had this valuation reviewed by another expert. On account of the generally disturbed conditions, however, the city is moving slowly with the franchise negotiations, but it is felt that progress is being made.

INCOME STATEMENT OF TWIN CITY RAPID TRANSIT COMPANY FOR 1916 AND 1917

	1917		1916	
	Amount	Per Cent	Amount	Per Cent
Revenue from transportation	$10,119,755	99.4	$10,130,112	99.5
Revenue from other railway operations	62,111	0.6	57,941	0.5
Total railway operating revenue	$10,181,866	100.0	$10,188,054	100.0
Way and structures	$1,031,215	10.1	$1,057,234	10.4
Equipment	781,663	7.6	780,235	7.7
Power	1,047,484	10.3	880,081	8.6
Conducting transportation	3,031,122	29.8	2,725,760	26.8
Traffic	57,137	0.6	45,550	0.4
General and miscellaneous	816,845	8.0	808,472	7.9
Transportation and investment —credit	41,950	0.4	42,691	0.4
Total railway operating expenses	$ 6,723,519	66.0	$ 6,254,643	60.4
Net operating revenue	$3,458,346	34.0	$3,933,410	38.6
Taxes assignable to railway operation	916,196	8.0	708,097	6.9
Operating income	$2,542,150	25.0	$3,225,312	31.7
Income from unfunded securities and accounts	$24,145	0.0	$26,051	0.2
Miscellaneous income	1,700	0.0	373	0.0
Total operating income	$25,846	0.2	$26,425	0.2
Gross income	$2,567,995	25.2	$3,251,738	31.9
Rent for leased roads	3,000	0.0	3,000	0.0
Interest on funded debt	989,724	9.7	984,557	9.7
Net loss miscellaneous physical property	25,586	0.3	18,621	0.2
Miscellaneous debits	11,635	0.1	8,011	0.1
Total deductions from gross income	$1,029,946	10.1	$1,014,190	10.0
Net income	$1,538,050	15.1	$2,237,547	21.9

Financial News Notes

Receiver for Florida Road.—On May 3 the United States District Court in and for the Southern District of Florida appointed Charles M. Allen receiver for the St. Petersburg & Gulf Railway, St. Petersburg, Fla.

Seeks New Security Issues.—The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has applied to the Public Service Commission for authority to issue $600,000 of bonds, to be sold at 90; and $200,000 of 7 per cent preferred stock.

Additions to Toronto Board.—The board of directors of the Toronto (Ont.) Railway was enlarged recently to provide for the addition of two new members and the president, Sir William Mackenzie, announced that Hugh Mackay, Montreal, and H. H. Pitts, Ottawa, have been appointed to fill the places.

Seeks Help to Meet Maturing Obligations.—Richard McCulloch, president and general manager of the United Railways, St. Louis, Mo., is reported to have left St. Louis for Washington to appeal to the capital issues committee, formed under the war finance corporation act, to assist the company in meeting $3,500,000 of Union Depot bonds, which are to mature on June 1.

Additions to Capital Account.—The East St. Louis (Ill.) Railway has filed with the Illinois Public Utilities Commission a petition asking for permission to increase the capital stock $210,300 and to issue $188,000 of first mortgage bonds. The proposed increase in capital stock is to reimburse the company for improvements made during the last two years.

Paid in Full.—Out of the proceeds of the sales of the collateral on Jan. 28 the holders of the $1,164,000 of 6 per cent five-year gold notes of 1914 of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind. received at the Central Trust Company, New York, $1,060.50 on each note, being payment in full of principal and accrued interest after payment of all costs and expenses.

Preferred Stock Offered.—Richter & Company, Hartford, Conn., are offering for subscription 7 per cent cumulative preferred stock of the Wisconsin-Minnesota Light & Power Company. The company has outstanding $4,622,000 of cumulative preferred stock, $2,500,000 of common stock, owned by the American Public Utilities Company and $8,925,000 of first and refunding 5 per cent bonds, including those reserved to retire underlying issues. There are also $808 000 of closed mortgage bonds outstanding issued against acquired properties.

New Accounting Classification Proposed.—Chairman Hill, of the Public Service Commission for the Second District of New York, has announced a conference on May 22 at 10 a. m. at the commission's office in Albany on the proposed new accounting classification for electric railways. The executive committee of the New York Electric Railway Association has requested a hearing, principally on requirements relating to depreciation accounting, and it is expected that some fundamental questions will be raised regarding the commission's policy in this important matter.

Dividend in Scrip.—The Middle West utilities Company, Chicago, Ill., has declared the regular quarterly dividend of 1½ per cent on the preferred stock, payable on June 1 to stock of record of May 20. The dividend is in scrip, payable in ten years, bearing interest at 6 per cent. The reason assigned for paying the preferred dividend in scrip is that inability to secure funds, except at prohibitive rates of interest, makes the conservation of the company's cash resources necessary to meet the expenditures for a constantly increasing gross business. The regular quarterly dividend of 1½ per cent was paid in cash on March 1.

Partial Abandonment.—Work has been finished tearing up 2½ miles of track of the Rutland Railway, Light & Power Company, Rutland, Vt., running from Castleton Corners to Lake Bomoseen. This material has been sold. The line was a summer line and has been operated in the past at a considerable loss, and it was decided after last season closed that it would be best to discontinue it entirely. This means a return to production of more than 300 tons of steel and the release of six or eight men for war purposes. The overhead wire will be taken down and used on worn-out portions of the local system, or transferred to other systems, as the wire is practically new.

Would Borrow $1,500,000.—The New York State Railways, Rochester, has filed with the Public Service Commission for the Second District, a petition in which it asks authority to negotiate a loan from the War Finance Corporation of an amount not to exceed $1,500,000 for five years or less upon such terms and subject to such rules and regulations as may be prescribed by the War Finance Corporation's directors. The company also asks permission to issue its fifty-year first consolidated mortgage gold bonds, bearing interest at 4½ per cent, to an amount sufficient to realize $2,230,905 at such price as may hereafter be approved by the commission, and that permission be granted to issue and pledge as collateral security to its loans, with the War Finance Corporation or others, $2,500,000 par value of the bonds.

St. Louis Tax Value Fixed.—The taxable valuation of the United Railways, St. Louis, Mo., was placed at $54,086,648 in a return made on April 13 to the State Tax Commission at Jefferson City. The company also made returns on the property of the St. Louis & Meramac River Railroad at $2,318,915 and the Missouri Electric Company—St. Charles Line—at $989,532. The total assessable property, including the subsidiary companies, amounts to $57,395,095. The return was more than double the valuation of last year, which was fixed by the State Board of Equalization at $21,925,786. That figure included the valuation of the company's franchise, which is not taxable and was not included in the latest return. The mileage of the company was placed at 423.1. The new valuation of the St. Louis & Meramac River Railroad quadrupled the return of last year. The return gave the mileage at 31.7. The taxable valuation of the St. Charles line last year was placed by the State board at $571,108. The United Railways has $1,619,000 of unassessable bonds.

New Publications

Financial Statements Made Plain

By Earl A. Saliers. Magazine of Wall Street, 42 Broadway, New York, N. Y. 96 pages. Cloth, $1.06 postpaid.

This is not an exhaustive study in regard to the technical analysis of financial statements, but it is a very readable discussion of the general principles of income-statement and balance-sheet interpretation which ought to be known by investors. Upon the mind of the average investor the book should have a clarifying and a stimulating effect. Particular attention should be directed to one observation by Mr. Saliers, i.e., that the investor should enlighten himself as to the general policy on depreciation followed by the company whose securities he contemplates buying. This is true, of course, but on this point it might be added that the public should realize more fully the need of providing rates sufficient to permit adequate treatment of depreciation.

A Bibliography of Municipal Regulation and Municipal Ownership

By Don Lorenzo Stevens. Harvard University Press, Cambridge, Mass. 410 pages. Cloth, $4 net.

This volume makes readily available to busy men information regarding the best books and articles up to Jan. 1, 1917, on the subject of regulation and municipal ownership. Covering as it does traction, electric, gas and water utilities in all their numerous regulatory phases, the book should be a valuable *vade mecum* to commissioners, operators, lawyers and others interested in the public utility industries of the country. The amount of literature on utility topics has grown to such an enormous size that some special classified index to it has become a necessity. Mr. Stevens' compilation fills the need very well. Not a little credit is due to him because of his reading of all the works listed and his insertion of brief critical annotations to facilitate the selection of material.

Cost Accounting—Theory and Practice

By J. Lee Nicholson. Ronald Press Company, 20 Vesey Street, New York, N. Y. 341 pages. Half leather, $4.

This book is most commendable because of the clear-cut way in which it charts the whole structure of cost accounting. In the midst of so many dissertations on the benefits of organization and efficiency, it is a distinct pleasure to read a book which tells so simply *how* to secure these results through cost accounting.

Mr. Nicholson conceives all cost accounting systems, no matter how involved, to be reducible to four types, as follows: the special order system, using the productive labor method; the special order system, using the process or machine cost method; the product system, using the productive labor method, and the product system, using the process or machine cost method. What differentiates these systems; when and how they are used; how they should be combined under special conditions—all this information Mr. Nicholson presents.

The author also explains how a plant should be examined before a cost system is installed, and he includes eighty basic forms as suggestive material. The book is well organized, and the reader can hardly fail to secure a better knowledge of the mechanism of cost accounting.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$76,107	*$47,448	$28,659	$19,621	$9,038
1m., Mar., '17	71,203	*40,566	30,637	18,646	11,991
12m., Mar., '18	892,825	*527,164	365,661	231,360	134,301
12m., Mar., '17	852,166	*480,146	372,020	218,071	153,949

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$151,533	*$112,174	$39,359	$30,747	$8,612
1m., Mar., '17	106,691	*74,631	32,060	29,753	2,307
12m., Mar., '18	1,467,675	*1,249,296	218,379	362,665	†144,286
12m., Mar., '17	1,248,917	*858,529	390,388	358,238	32,150

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$362,526	*$250,474	$112,052	$55,779	$56,273
1m., Mar., '17	332,389	*237,777	94,612	45,109	49,503
12m., Mar., '18	4,115,470	*3,068,439	1,047,031	586,892	460,139
12m., Mar., '17	3,657,467	*2,287,687	1,369,780	520,841	848,939

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY GRAND RAPIDS, MICH.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$1,756,688	*$1,176,802	$579,886	$488,934	$90,952
1m., Mar., '17	1,558,538	*971,164	587,374	431,079	156,295
12m., Mar., '18	20,093,104	*13,099,519	6,993,585	5,440,473	1,553,112
12m., Mar., '17	17,545,338	*9,939,686	7,605,652	5,084,279	2,521,373

GRAND RAPIDS (MICH.) RAILWAY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$108,918	*$82,553	$26,365	$19,148	$7,217
1m., Mar., '17	112,733	*75,658	37,075	17,456	19,619
12m., Mar., '18	1,292,745	*924,762	367,983	224,178	143,805
12m., Mar., '17	1,310,494	*855,330	455,164	196,711	258,453

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$587,791	*$284,257	$303,534	$217,937	$85,597
1m., Mar., '17	544,365	*244,614	299,751	218,865	80,886
3m., Mar., '18	1,702,657	*855,716	846,941	652,621	194,320
3m., Mar., '17	1,583,460	*710,273	873,187	651,299	221,888

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$218,584	*$141,476	$77,108	$40,980	$36,128
1m., Mar., '17	201,328	*137,091	64,237	40,906	23,331
12m., Mar., '18	2,471,564	*1,600,615	870,949	489,600	381,349
12m., Mar., '17	2,415,890	*1,494,407	921,483	503,298	418,185

NEW YORK (N. Y.) RAILWAYS

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$982,684	*$793,913	$188,771	$285,331	†‡$46,726
1m., Mar., '17	1,051,492	*884,491	167,701	284,261	†‡69,959
9m., Mar., '18	8,984,526	*6,898,075	2,086,451	2,548,203	†‡6,338
9m., Mar., '17	8,356,205	*6,763,177	1,593,028	2,536,386	†‡464,271

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$621,145	*††$372,058	$249,087	$178,148	$70,939
1m., Mar., '17	474,478	*262,377	212,101	184,024	28,077
12m., Mar., '18	6,387,407	††*3,855,196	2,532,211	2,139,509	392,702
12m., Mar., '17	5,592,604	*3,038,892	2,553,712	2,180,643	373,069

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Feb., '18	$919,288	*$568,365	$350,923	$206,221	$144,702
1m., Feb., '17	720,177	*440,390	279,787	189,142	90,645
12m., Feb., '18	9,826,191	*6,098,760	3,727,431	2,380,832	1,346,599
12m., Feb., '17	8,348,610	*5,168,424	3,180,186	2,227,602	952,584

* Includes taxes. † Deficit. ‡ Includes non-operating income. †† For one month $18,732 and for twelve months $234,320 included for depreciation.

Traffic and Transportation

Skip Stop for Bay State

Fuel Administrator Recommends It and Public Service Commission Promptly Indorses the Plan

James J. Storrow, fuel administrator for New England, has requested all the electric railways of Massachusetts to eliminate all unnecessary stopping places on their lines by the adoption, as a war measure, of the skip-stop plan. The maximum number of stops per mile permitted under ordinary conditions will be eight in urban districts, six in suburban and four in interurban territory. It is estimated that a possible yearly saving of more than 100,000 tons of coal can be made in Massachusetts by this plan. The fuel administrators of the other New England States are in sympathy with the skip-stop program and it is expected that they will issue similar requests to their local companies.

TEXT OF MR. STORROW'S LETTER

The text of Mr. Storrow's letter, addressed to the heads of the electric railways in Massachusetts is as follows:

"Improved weather conditions have temporarily relieved the acute coal shortage of last winter. We must all realize, however, that the outlook for next winter's steam coal supply is extremely serious and that there is likely to be an insufficient supply of coal throughout the war.

"To meet this situation all steam coal users should do their utmost to get the maximum efficiency from the coal that is available, and the electric railways must do their share.

"Every time a car is stopped and started much power is used. We therefore request all electric railways, in so far as local conditions may reasonably permit, to reduce the number of stopping places in urban districts to not more than eight to a mile, in suburban districts to not more than six to the mile, and in interurban districts to not more than four to the mile.

"This so-called skip-stop system has already been put into effect on several large electric railway lines with excellent results. In many cases it has reduced the total amount of coal consumed by these companies more than 20 per cent. At the same time the service to the public has been actually improved as it has resulted in materially speeding up the cars, reduced delays, and in general increased the efficiency of the service. This has been especially so in rush hours and in crowded districts.

"City and town officials will be urged through our local fuel committees to co-operate with the electric railways in putting this measure into effect."

Chairman Macleod's letter addressed to Mr. Storrow expresses the attitude of the Public Service Commission with respect to the proposal of the Massachusetts Fuel Administration. It reads:

"In response to your inquiry I take pleasure in saying that this commission approves of the general principle of reducing the number of stopping places on electric railway lines, provided such reduction is confined within reasonable limits. It has been amply demonstrated not only in other parts of the country but in this State, that the limitation of stops will result in a substantial saving of power, and hence of fuel, and that it may actually improve, rather than impair, service. This has been the case in Cleveland and other cities where it has been tried. Frequent stops mean slow service. By limiting the number of stops, running time can be reduced and people carried more quickly to their destinations. By the use of the skip or staggered stop system any inconvenience from such limitation can be minimized. The commission is of the opinion that on many electric railways in this Commonwealth a reduction in the number of stopping places, if reasonably and carefully made, is desirable, especially under existing conditions."

Would Charge Six Cents in Trenton

The Trenton & Mercer County Traction Corporation on May 10 petitioned the Board of Public Utility Commissioners of New Jersey for the right to increase its fares from 5 cents to 6 cents on all the Trenton divisions and the suburban lines. The company has been seeking for some time to do away with the sale of tickets at the rate of six for a quarter and charge a straight 5-cent fare, but has been unsuccessful.

The petition sets forth that, based upon the cost of operation at present prices for labor and materials, the deficit for this year will be $212,160. With contemplated additions to capital expenditures, wage increases, etc., the deficit would be further increased for the present year by $85,000, making the total deficit $297,160, at the present rate of fare, in case the additional expenditures are made.

The company declares that in case the appeal for increased fare rates is granted, it is the desire of the corporation to further increase the amount set aside annually for depreciation by $25,000, making its total appropriation for this purpose $175,000.

Statements of the company affixed to the petition show that the total wages to be paid to employees from the superintendent down for the present year will amount to $402,244 and exceed by $109,086 the total expended in wages in 1914.

Six-Cent Fare for St. Louis

Missouri Commission Split Three to Two on Questions of Jurisdiction and Adequacy of Fare

The State Public Service Commission of Missouri at Jefferson City, on May 11, by a vote of three to two ordered fares on the lines of the United Railways in St. Louis to be raised from 5 cents to 6 cents.

NEW RATE EFFECTIVE ON JUNE 1

The new rate goes into effect on June 1 and will continue for one year unless changed by a subsequent order of the commission, or by an appeal by the city of St. Louis to the courts. Universal transfers will be issued, as at present, without additional cost. Half-fare tickets will be sold at the present rate of 2½ cents each. The company is required to place tickets on sale at convenient points throughout the city, in blocks of five, ten and 100 individual fares.

The opinion and order of the commission contain about 20,000 words. The majority opinion concerns itself with two points. The first is whether the commission has the authority, under the constitution, to act in the case, and the second is whether the United Railways operating with the present fares would be able to meet its operating expenses, pay its debts and grant a wage increase to its employees. On the question of jurisdiction the opinion holds that the commission has the power to act and cites authorities.

In considering the second point, namely, the inadequacy of the fare that has been in effect, the financial and physical condition of the property, as shown by the reports of City Engineer Smith, officials of the United Railways and experts of the Public Service Commission, is analyzed and the conclusion is reached that the revenues of the company, on the present basis, would be insufficient during the coming year, especially in view of the fact that no relief would be afforded by the so-called compromise franchise ordinance recently passed and approved, within the year that the fare increase is to remain in effect.

COMMISSION RETAINS JURISDICTION

The company is ordered to make monthly reports to the commission, showing its gross earnings and operating expenses under the new system. The commission retains jurisdiction of the case, and may change the fare schedule after its engineers and accountants complete a valuation of the property. The commission has determined to make such a valuation during the coming year. In the present case the commission took $52,800,000 as the value of the property.

Richard McCulloch, president and general manager of the company, said that he would make no statement whatever in regard to the decision of the commission until he had received an official copy of the opinion and had time to read and digest it.

Winnipeg Abolishes the Jitneys

Details Are Given of the Resolution Adopted by the Council and of the Proposal of the Winnipeg Electric Railway

The jitney in Winnipeg (Man.) is no more. By a vote of twelve to five the City Council decided during March on its abolition, but several weeks elapsed before the motion was put into effect. This delay was caused by extreme amendments being proposed to the by-law, which was to eliminate jitneys by May 1. These amendments the company could not accept. The by-law was finally passed on April 29, and 200 jitneymen sought new occupations the following day.

SETTLEMENT AT FIRST DELAYED

The jitneys would have been abolished a month earlier, but certain Aldermen pressed for the insertion of a clause in the agreement accompanying the by-law, to the effect that "at no future time shall the company apply for an increase in fares." The company declared it would let the whole negotiations fall through rather than submit to that clause, and finally a clause was inserted which left the situation as it was before the fares clause question was raised. Many other amendments, such as "no seat no fare," "abolition of all running boards on cars," etc., were proposed by Aldermen, but all these were finally defeated. The by-law went through Council by a vote of ten to eight.

In one district, Westminster Avenue, which is at present not served by the Winnipeg Electric Railway, the company offered to run a motor bus service. A clause was also inserted in the agreement permitting the company to do this and to run motor buses in other parts of the city where railway lines have been ordered by the City Council.

RAILWAY BETTERS SERVICE

Following the elimination of the jitneys the railway has placed a new type of car in service. It is a remodelled car, provided with safety step, front exit, and lower car body. It is the intention of the company to remodel all its cars along these lines. The company is also putting into service immediately four trail cars, remodeled from old rolling stock. Other trail cars will be purchased in the near future.

The course run by the jitney in Winnipeg varied very little from that of the vehicle in other cities where it received a free hand. Electric railway traffic suffered severely and the matter took on a serious aspect for the Winnipeg Electric Railway. Much discussion followed in regard to the respective right of the railway and the jitneys, and finally suit was brought by the electric railway claiming $1,000,000 damages. As one of the conditions of the present settlement the company has agreed to withdraw that suit.

The text of the settlement motion as adopted by the Council is as follows:

"That the city solicitor be instructed to prepare a by-law prohibiting the operation of jitneys in the city.

"That the city solicitor prepare an agreement between the city and the Winnipeg Electric Railway binding the company to fulfill the conditions set forth in the manager's letter of March 25 to the City Council, such agreement to contain a provision for the payment of at least $25,000 per month to the credit of a joint account of the city and the company in the Bank of Montreal to be checked out on the joint authority of both the city and the company and to be used for the purpose of:

"1. Providing adequate and efficient electric railway service.

"2. Meeting expense of grounding secondaries.

"3. Clearing streets of useless poles.

"4. Protecting high potential wires to prevent accidents.

"5. Eliminating electrolysis damage, and any other expense or outlay to carry out the terms of the agreement.

"The payment in to such fund is to continue until it is decided by the public utilities commissioner that the company's obligations under the agreement have been carried out.

"It is distinctly understood, however, that the company under the terms of any agreement shall not have the right to operate within the city a system of motor busses without the consent of the Council and upon such streets as the Council may prescribe, such service shall be supplementary to the service of the company as a temporary means of giving the public adequate facilities, but shall in no sense be exclusive, it being distinctly understood that the company is not to have any greater privileges or rights than already given it by by-law 543, any contract not to extend beyond Feb. 1, 1927.

"The license inspector is directed to issue no licenses in respect to automobiles for hire pending negotiations with the Winnipeg Electric Railway, and the details of preparation and revision of contract with the said company are referred to the board of control."

THE COMPANY'S LETTER

The letter of the company dated March 25, to which reference is made in the resolution of the Council, was as follows:

"Upon the elimination of jitneys in the city of Winnipeg the company agrees as follows:

"1. Service: The company will furnish the citizens of Winnipeg adequate transportation facilities, and will at once proceed to remodel its present rolling stock, making the cars modern in every respect, with folding steps, proper front exits, latest type of lighting and improved route signs.

"2. Trailers: Center entrance, modern trail cars will be used in conjunction with extra cars during the rush hour periods.

"3. Motor buses and extensions: The company will forthwith put on motor buses to provide service on Westminster Avenue as part of its system, with the same rates of fares, transfer privileges, and will continue to operate same until it extends its car lines to serve this community and will also extend the Sargent Avenue line, 2200 ft.

"4. Percentages: The company will forthwith pay the city the 1917 percentages of gross earnings and car tax, amounting to $105,777.

"5. Million dollar suit: The company will withdraw the letter written to the city on April 4, 1917, claiming $1,000,000.

"6. Electrolysis: The company will proceed to institute and carry out the system of insulated return feeders in accordance with the recommendation of Professor Ganz, as embodied in the act passed by the Legislative Assembly.

"7. Electrolysis damages: The company will settle the action now pending by the city against the company for damages claimed to the city's water mains and underground structures by electrolysis, caused by the operation of the company's system in Winnipeg, by consenting to judgment being given in favor of the city for such an amount as shall be found to be due to the city by the company, such amount to be fixed by a referee to be appointed by the court.

"8. Grounding of secondaries: The company will perform and carry out order No. 105 of the Public Utilities Commission of Manitoba relating to the grounding of secondaries.

"9. Abandoned poles: The company will remove at its own expense from the streets of the city all poles which it may have abandoned.

"10. Span wires: The company will, in the business section of the city, wherever there are suitable buildings for the purpose, and permission can be obtained from the owners, transfer its span wires to such buildings.

"11. Steel poles: Wherever, in the business section of the city, wooden poles are worn out or have to be replaced, the same will be replaced with steel poles."

Although there were nearly 200 jitneys in operation in Winnipeg prior to May 1 their elimination has not caused any outcry, and transportation matters have adjusted themselves quickly to the new conditions.

Final Schedule Order Issued

The Public Service Commission for the First District has adopted a final order directing the Brooklyn Heights Railroad and other companies of the Brooklyn Rapid Transit System operating surface car lines, to file operating schedules with the commission and to post in the cars placards giving the "headway" and service called for in the schedule. These schedules must show the route, the car run numbers, the terminals and car depots.

Public Service Hearings Progressing

City Counsel Cross-Examines Company Witnesses on Various Points —Commission Counsel Interested in Modified Zone Systems

Hearings on the application of the Public Service Railway, Newark, N. J., for a 7-cent fare, a 2-cent charge for transfers and a 1-cent charge for second transfers were continued on May 11, 13 and 15. The resumption of the hearings was noted in the ELECTRIC RAILWAY JOURNAL of May 11.

Prof. Roswell C. McCrea of Columbia University, upon cross-examination by city counsel, explained the labor situation throughout New Jersey. He said that two interesting studies of increased living costs of workmen in the Newark and Camden shipbuilding districts had recently been completed, and that the data collected showed a rise of 40 per cent in the family cost of living.

Professor McCrea was of the opinion that the estimated decrease in traffic under higher fares would not be due to any inability on the part of some workmen to pay the higher rates out of their higher wages, but to their unwillingness to do so. He stated that the amount disbursed by workmen for transportation is a very small percentage of their income. As for the possibility of holding men in electric railway employment, the witness felt that the wages could be somewhat lower than those paid in shipyard work, on account of the permanency of railway employment.

QUERIES ABOUT ZONE SYSTEMS

Under examination by counsel for the Board of Public Utility Commissioners the next witness, Prof. Albert S. Richey, of Worcester Polytechnic Institute, outlined the physical features of the zone or mileage systems used by the Springfield Street Railway, the Rhode Island Company and the Massachusetts Northeastern Street Railway, and proposed for the Bay State Street Railway.

Regarding the success of the 6-cent fare in Massachusetts, Professor Richey stated that the flat increase had in some cases been disappointing. In the case of the Bay State Street Railway it did not give sufficient revenue. It would have given enough at the time the application was made, but when relief was granted after a year unanticipated rising prices had become prevalent. Now it is believed that the proposed mileage system will give more revenue. A 6-cent fare on the Boston & Worcester Street Railway took care of the company for a year, but in the last year the prices rose and additional revenue was needed. The company went to a mileage system because it felt that this would give more revenue than a 7 or 8-cent fare.

Professor Richey expressed his belief in the general idea of a service-at-cost plan, but stated that he did not agree with every detail of specific plans. In his opinion, an increase in fare is absolutely necessary, and a single adjustment of fares will not settle the matter permanently.

As to the practicability of a modified zone system in Public Service territory, Professor Richey remarked that the institution of such a system would not be impossible, and that it would be more equitable and ideal when fully developed. Serious difficulties, however, would have to be overcome in working out such a system, first in relation to fare collection and second in relation to the establishment of zone boundaries. The fare collection problem on congested lines in urban territory would be particularly difficult to solve.

PRESIDENT MCCARTER TESTIFIES

Thomas N. McCarter, president of the company, was then examined at length concerning various phases of the application. He explained that the relief desired was for emergency use only, and that the question of terminating the higher rates should be left to the commission for decision in the light of the then existing conditions.

Marshall Van Winkle, city counsel, questioned Mr. McCarter in detail regarding the organization and functions of the Electric Railway War Board and other utility committees in Washington, and asked whether the recent letters of President Wilson and Secretary McAdoo on the subject of needed utility relief had not been "promoted" by utility representatives. Mr. McCarter deprecated the insinuation and said that the letters were the patriotic expression of deliberate judgment based on accurate data.

Mr. Van Winkle stated that Jersey municipalities did not disagree with the letters but would not consent to the granting of relief to the Public Service Railway when it had refused to place its case before the "local" authorities. Mr. McCarter explained that formerly it would have been a waste of time to try to secure concerted action from the 146 communities served, and that now, with the recent Collingswood decision giving the State commission control over franchise rates, the only sensible emergency procedure was to apply to this board for relief.

Mr. McCarter said that the new line to the Port Newark shipyard is under construction. At first there was a slight misunderstanding, on the part of the Shipping Board in regard to this matter. The contract with the government was based upon the securing of a franchise with certain conditions, but upon application to Newark officials the latter wanted the company to proceed with construction without any guarantee that a franchise upon the stipulated terms would be forthcoming. Upon learning the full details of this, however, Admiral Bowles straightened matters out with the city officials; the desired franchise is in process of being granted, and the construction of the line has been begun. Mr. McCarter added that a contract has now been signed for the railway development for the Camden shipyard district.

Geneva Hearing Is Closed

The Public Service Commission for the Second District of New York on May 1 heard the application of the Geneva, Seneca Falls & Auburn Railroad Company, Inc., for permission to increase its rate of fare from 5 to 6 cents in the zone including Geneva and a part of Waterloo. This is one of the company's five fare zones. L. G. Haskins, secretary of the railway, testified that franchises in Geneva and Waterloo contain no fare restrictions. T. H. Werry, auditor, presented a series of statements relating to the affairs of the company from 1913 to 1917.

The company has never paid a dividend on its stock, said Mr. Werry, and it is difficult to pay interest on the bonds from the present earnings. The wages of the men were recently increased from 28 to 30 cents, and it is understood that the men intend to ask for 35 or 40 cents about July 1, when the present agreement expires. Just now, too, there is a lack of ballast, and the company has been ordered to repave one street in Geneva.

There was no opposition to the petition of the company, and Chairman Bill declared the hearing closed. Immediate action will probably be taken by the commission.

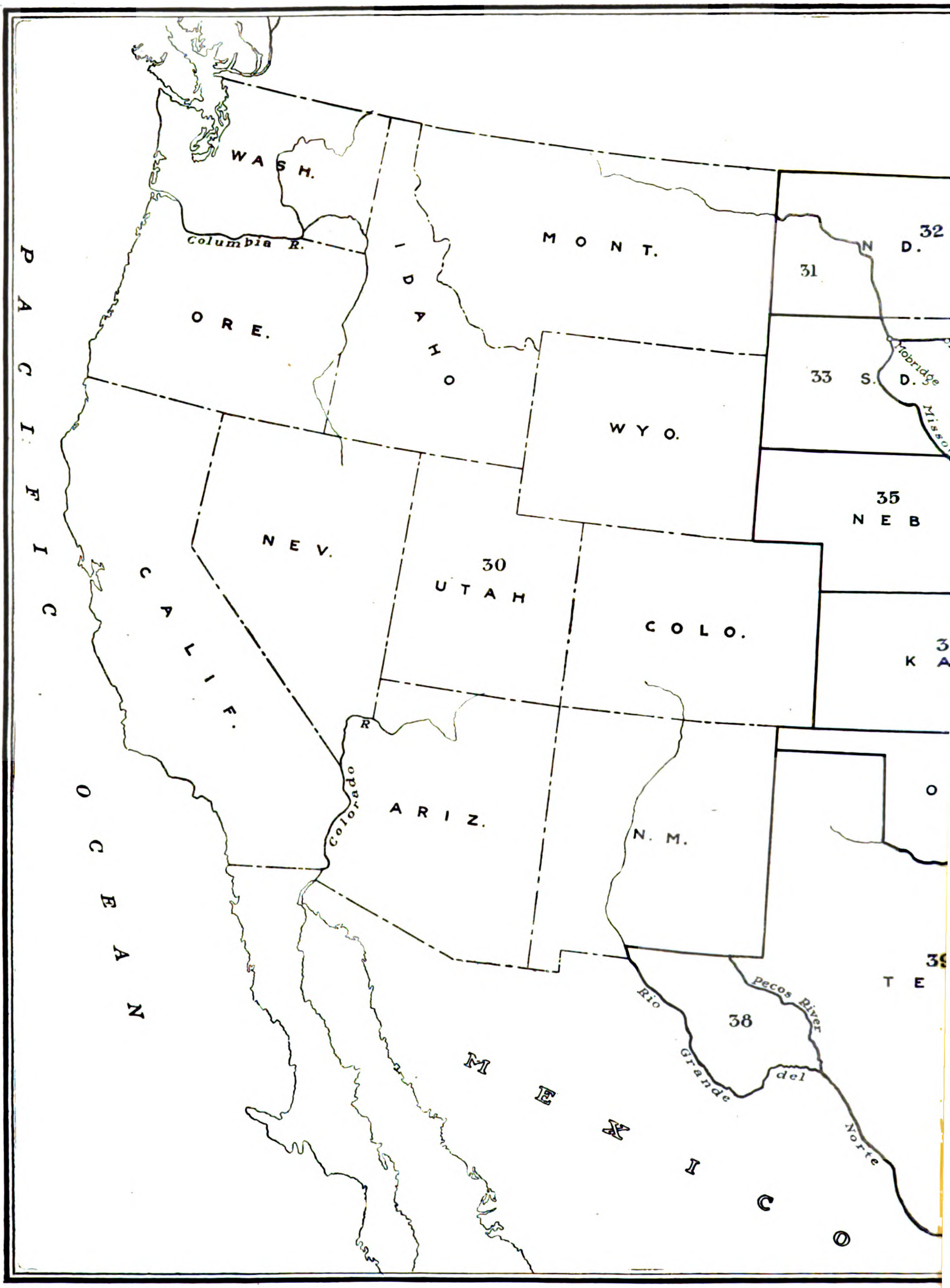
Six-Cent Fare Wanted for Hudson

The Public Service Commission for the Second District of New York on April 25 held a hearing on the question of the dismissal of the Albany Southern Railroad fare petition under the recent decision of the Court of Appeals. James E. Hewes, general manager, appeared for the company and Corporation Counsel Boothby represented Rensselaer.

Mr. Hewes announced that the company had abandoned its application as far as it related to Rensselaer. He said the company was operating in Rensselaer and Albany on the tracks of the United Traction Company under a contract. He argued, however, for a 6-cent fare in Hudson, stating that the company was not making an adequate return upon its investment there.

The company's books showed a deficit of $4,000. On the basis of a charge of one-half of the physical valuation of the company's property in Hudson, he said that there was a net deficit of $2,000. This, with a 2.6 per cent depreciation, made a deficit of $4,600.

Mr. Hewes said he did not anticipate that an increased fare would cause a falling off in the revenue, as the Hudson line was largely an accommodation line, the majority of the people there walking. There is only one small industry on the car lines. There was no appearance on the part of Hudson before the commission.


WASH.
Columbia R.
MONT.
N. D.
32
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ORE.
IDAHO
Mobridge
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S. D.
Missou
WYO.
PACIFIC OCEAN
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NEB
NEV.
30
UTAH
COLO.
CALIF.
3
KA
R
Colorado
ARIZ.
O
N. M.
39
TE
Rio Grande del Norte
Pecos River
38
MEXICO

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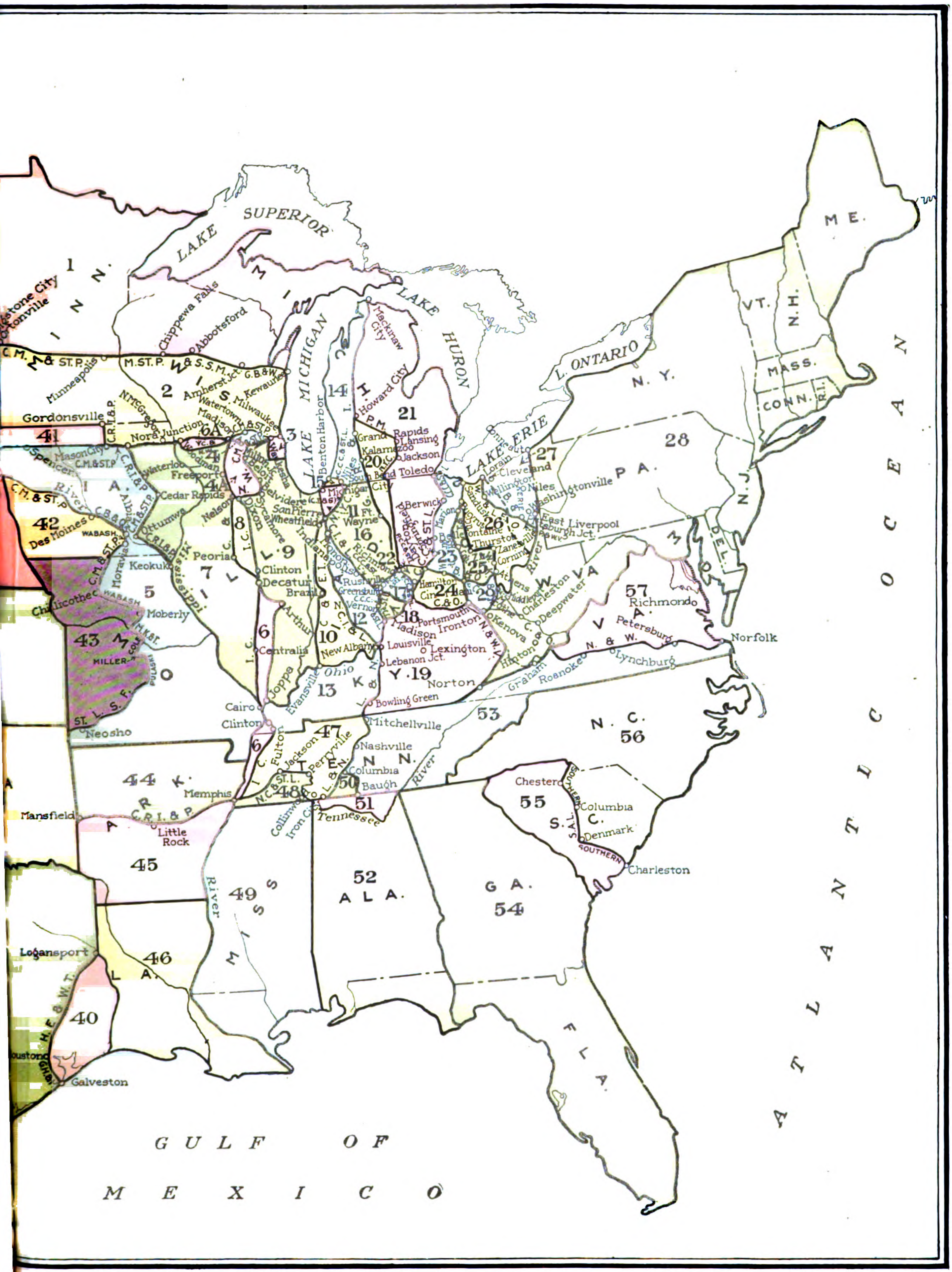
Map Showing Districts in Which


LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
L. ONTARIO
LAKE ERIE
GULF OF MEXICO
ATLANTIC OCEAN
MINN. 1
WIS. 2
MICH. 14
21
ILL. 9
IND. 16
OHIO
KY. 19
TENN.
ARK. 44
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LA. 46
40
MISS. 49
ALA. 52
GA. 54
FLA.
S.C. 55
N.C. 56
VA. 57
W. VA
PA. 28
N.Y.
N.J.
DEL.
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N.H.
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CONN.
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Stone City
Ortonville
Chippewa Falls
Abbotsford
Minneapolis
C.M.&ST.P.
M.ST.P.
S.S.M.
G.B.&W.
Amherst Jct.
Kewaunee
Waterloo
Milwaukee
Madison
Gordonsville
C.R.I.&P.
N.McGregor
Nora Junction
Y.C.R.
Mason City
Spencer
C.M.&ST.P.
Waterloo
Freeport
Cedar Rapids
C.B.&Q.
Des Moines
WABASH
Ottumwa
Albia
Moravia
Keokuk
Mississippi
Peoria
Clinton
Decatur
Brazil
Chillicothe
WABASH
Moberly
M.K.&T.
MILLER
ST.L.&S.F.
Neosho
Cairo
Clinton
Centralia
Arthur
Joppa
Evansville
Ohio
Rockford
Belvidere
Dixon
Sycamore
San Pierre
Wheatfield
Benton Harbor
Mackinaw City
Howard City
Grand Rapids
Lansing
Kalamazoo
Jackson
Bend
Toledo
Michigan City
Ft. Wayne
Berwick
Indianapolis
Richmond
Rushville
Greensburg
Vernon
New Albany
Louisville
Lexington
Lebanon Jct.
Madison
Portsmouth
Ironton
Hamilton
Cin.
C.&O.
Norton
Bowling Green
Kenova
Hinton
Charleston
Deepwater
Graham
Roanoke
Lynchburg
Richmond
Petersburg
N.&W.
Norfolk
Conneaut
Lorain
Cleveland
Wellington
Niles
Washingtonville
East Liverpool
Pittsburgh Jct.
Thurston
Zanesville
Corning
Athens
Bellefontaine
Marion
Mitchellville
Nashville
Columbia
Baugh
Jackson
Perryville
Fulton
Memphis
Collinwood
Iron City
Tennessee
River
Chester
Columbia
Denmark
SOUTHERN
S.A.L.
Charleston
Little Rock
C.R.I.&P.
Mansfield
Logansport
H.E.&W.T.
Houston
Galveston

From Various Sources Is Available

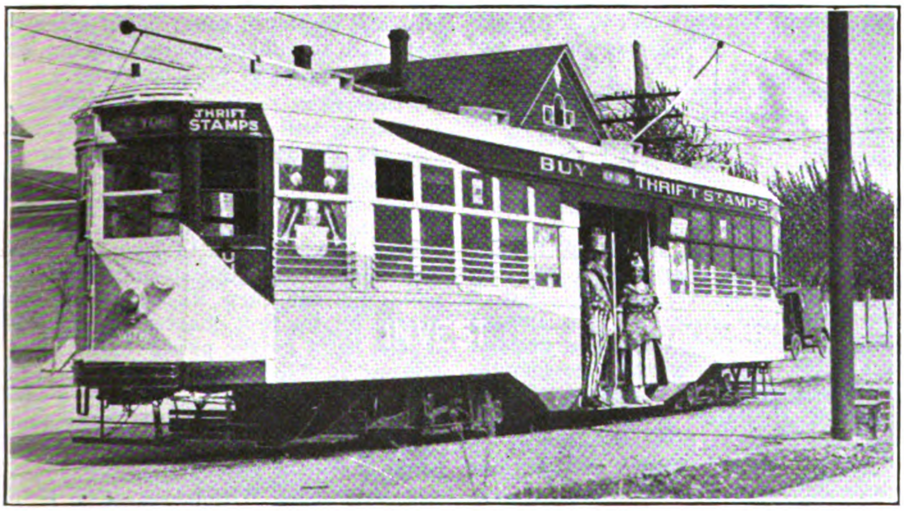
Supplement to Electric Railway Journal, May 18, 1918

Unique Car Crew in Unique Service

Ever since the start of the campaign by the government for the sale of thrift stamps the Manhattan & Queens Traction Corporation has been one of the leading boosters of the scheme among the electric railways. It would seem, however, that the company has about reached the ultimate in its work of selling the stamps by the introduction of a red, white and blue car whose motorman, Uncle Sam, and conductoress, Miss Columbia, sold $1,500 in thrift stamps in one day recently.

UNCLE SAM AND MISS COLUMBIA

The Manhattan & Queens Traction Corporation operates 22 miles of road between the Manhattan end of the Queensboro bridge at Fifty-ninth Street, New York, and Jamaica, L. I. The car on which Uncle Sam and Miss Columbia serve has naturally attracted an immense amount of attention, and the enterprise of the company has been commented upon favorably by the local public and by New York and out-of-town newspapers. The accompanying illustrations of the thrift car and its crew give an idea of the lengths to which the company has gone in its effort to help the government in the thrift-stamp campaign.



FULL VIEW OF THE CAR AND ITS CREW

Housing and Service Departments of E. F. C. Merged

Announcement was made on May 13 of the abolition of the housing department of the division of general service, and the passenger transportation service section as distinct units of the Emergency Fleet Corporation and their consolidation into one department to be known as the division of passenger transportation and housing.

A. Merritt Taylor has been named director of the new division of passenger transportation and housing. He has appointed J. Willison Smith as assistant director of housing and J. Rogers Flannery as associate director of housing, to act with him in connection with the housing problems. Garrett T. Seely, formerly assistant manager of passenger transportation, has been appointed assistant director of passenger transportation by Mr. Taylor, to act with him in handling the passenger transportation problems of the division.

The jurisdiction of the new division is as follows:

1. To determine upon and take such measures as may be necessary to relieve deficiencies in passenger transportation facilities serving shipyards and plants throughout the United States, which hold contracts with the Emergency Fleet Corporation.
2. To determine what housing developments are required to expedite ship construction for the Emergency Fleet Corporation, to designate the character thereof and to establish the same.
3. To secure, either by purchase, condemnation, requisition or otherwise, such land, property, franchises and facilities as may be required for those purposes.

Second Kansas City Hearing Held

Another hearing of the Kansas City (Mo.) Railways fare case on May 9, before the Public Service Commission, was accupied chiefly with the presentation of the city's opposition to the company's application. The purpose of the city was obviously to minimize the influence of figures presented by the company. The net effect, however, was to give the city officials very explicit information as to the many unexpected burdens which the company has to bear.

The city attorneys particularly asked P. J. Kealy, president of the company, in what way resources might be increased besides by a flat increase in fare. Colonel Kealy related the many studies made by the company on this subject. He mentioned the studies of zoning, for instance, and pointed out that with a 4-mile zone for a 5-cent fare only $90,000 would be realized by collecting an extra cent from those outside the zone. Even a 25-cent fare on owl cars, he said, would make no appreciable difference, since the revenue from some of the owl lines was only $2 a week each. As for a transfer charge, Kansas City is not laid out in such a way as to distribute the burden equitably on the public by this means. Colonel Kealy said that eventually electric railway operation must come to the zone system, so that each passenger will pay for the service he receives.

Colonel Kealy stated that the company had not estimated the amount of increase in fare necessary, but it is putting the evidence before the commission for decision. The question was asked as to whether the increased fare would continue if the war should end soon and conditions be restored to normal. He answered that the experience of the last few months had discouraged anybody from making predictions. He declared, however, that the company had to forego a fair return on the investment during the period of the war; but that, as the franchise provides, if better times should come, the stockholders would be entitled to receive the dividends foregone.

The company introduced a copy of resolutions adopted by several civic organizations. Some of the organizations made the resolutions stronger, but most adopted these conclusions:

"We recommend that such decisive action be taken as will permit an increase of the wage scale and the continuance of good service and leave it to the judgment of the Public Service Commission, to whom all facts will be presented, as to whether these ends can be accomplished by other than an increase in the revenue, and if not, we believe the revenue should be increased."

Briefs will be exchanged, and the next hearing, which may be the final one, will be held at Jefferson City on May 27.

Wants Fare Increase in Buffalo

Application has been made to the City Council of Buffalo, N. Y., by the International Railway for permission to increase fares on its lines within the city. The company fixes no tentative rate, but in an interview Henry W. Killeen, of Penney, Killeen & Nye, of counsel for the railway, says a 6-cent fare is absolutely essential.

The company operates under a franchise known as the Milburn agreement. This was made at the time the railway properties of the city were consolidated. Included in the agreement is the provision that a 5-cent fare must be charged with free transfers. In order to obtain permission to increase its rate of fare, the company must secure the consent of the City Council and the new rate must be ratified by the voters of Buffalo at a general or special election. The rate is also subject to review by the Public Service Commission.

The company started a publicity campaign in advance of the filing of the formal petition with the Council. This publicity held that the value of the nickel is now less than 50 per cent of what it was before the war and therefore the company is carrying passengers for about 2 cents.

The Mayor was elected a year ago on the platform of railway reform and has attacked the company on many occasions. In replying to these attacks, the railway closed one of its advertisements with this paragraph:

"And yet some men, whose motives seem to be revenge rather than civic betterment, have apparently learned nothing by reading of the conditions Lenine and Trotzky have brought in Petrograd."

Henry W. Killeen, of counsel for the company, says that unless the company is granted an increase in fare, it will be forced into the hands of a receiver.

Zones the Only Way Out

C. V. Wood, vice-president of the Milford, Attleboro & Woonsocket Street Railway, appeared before the Public Service Commission of Massachusetts at Boston on May 6 in support of a zone system of fares. He informed the commission that unless the company was permitted to increase its revenue it would be necessary to tear up the road and sell it for junk. The company needed $170,000 a year more revenue. Mr. Wood said that it would be necessary to charge a flat rate of 8½ cents if the company were to maintain the system of a single fare unit. It was believed that a zone system offered a better solution of the problem. F. H. Dewey, president of the company, said that the company was doing a fair freight business but no great amount of revenue was in sight from this service. Commissioner Eastman suggested that higher freight rates were to be expected on electric railways. He recommended that the company sell a park valued at $28,000 because the capital invested was yielding no return.

Transportation News Notes

Canadian Road Wants Increase.—The Moncton Tramways, Electricity & Gas Company, Moncton, N. B., has applied to the City Council for permission to increase the fares charged on the electric railway.

Increase for West Virginia Road.—The Union Traction Company, Sistersville, W. Va., has been granted authority by the Public Service Commission to increase its rates between Sistersville and New Martinsville from 20 cents to 25 cents each way.

Passenger Rates Increased.—The Public Utilities Commission of Ohio has approved an increase from 2 cents to 2½ cents a mile on the Cleveland & Chagrin Falls and the Cincinnati, Milford & Loveland Traction lines. The increases became effective as of May 1.

Amends Fare Plea.—The West Penn Traction Company, Pittsburgh, Pa., has filed a petition with the Public Service Commission for permission to amend the new tariffs at McKeesport, Pa., so that in addition to straight 5-cent fares, six tickets may be sold for 25 cents, without transfer privilege.

Omaha to Ask Six Cents.—The Omaha & Council Bluffs Street Railway, Omaha, Neb., has announced that it will apply to the Railroad Commission of Nebraska for permission to charge a 6-cent fare in Omaha. The 1-cent increase, if granted, will make the fare to Council Bluffs 11 cents instead of 10 cents.

Receiver Sees the Light.—C. A. Fagan, one of the receivers of the Pittsburgh (Pa.) Railways, favors a new rate of fares based upon the zone system. In a statement, Mr. Fagan pointed out the unfairness in the present fare system. He said it was absurd to charge the same fare for a ride to Soho as to Wilkinsburg. Fares in Pittsburgh are now 5½ and 6 cents.

Merchants Favor Increased Fare.—The Merchants' Association of New York announced on May 12 that it favored 6-cent fares on the subway lines of New York City. Its decision was based on the report of the committee on city traffic of the association, of which H. H. Porter is chairman, which asserted that the present fare was resulting in deficits greatly reducing the city's ability to borrow.

Fits the Service to the Fare.—The Southwestern Traction & Power Company, operating between New Iberia and Jeanerette, La., has filed with the Railroad Commission of that State a petition for authority to reduce its operations 50 per cent by having its cars leave each of these towns every two hours instead of every hour, as heretofore. The company pleads poor business and very high operating costs.

Inquiry Into Recent Accidents.—The Public Service Commission of the First District of New York announced on May 13 that it would begin on May 17 an investigation into the accidents that have recently occurred at various places in the city, and that special attention would be paid to the Union Railway lines, where one person was killed and several seriously injured a few days ago.

Skip Stops in Downtown Dallas.—The Dallas (Tex.) Railway on May 6 inaugurated the skip-stop system on all lines in the downtown business district and on Ervay Street and Colonial Avenue. If the plan is found to work satisfactorily, it will be extended to other lines. Signs have been placed at corners, and large display advertisements were published in the Dallas newspapers telling patrons how the plan would be carried out.

Hartford's Appeal Presented.—The city of Hartford, Conn., on May 7 filed with the Superior Court its appeal from the action of the Public Utilities Commission in denying the petition of the city for an order requiring the Connecticut Company to restore fares to 5 cents within the limits of Hartford and the towns immediately adjoining. The points made by the company are largely the same as those reviewed in the ELECTRIC RAILWAY JOURNAL for April 27, page 830.

Rules for Women Employees in Wisconsin.—A decision in the case brought by labor organizations to prevent the employment of women as drivers and conductors on street cars has been rendered by the Wisconsin Industrial Commission, ordering that no woman be employed on night runs and that under no circumstances shall their employment continue for more than eight hours a day. The runs on which women are employed must begin after 8 a.m. and terminate before 5 p.m., or within a period of nine hours.

From Five to Seven-Cent Zones.—A hearing will be held on May 21 before the Public Service Commission of Maine on the application of the Lewiston, Augusta & Waterville Street Railway for permission to increase its zone charges from 5 cents to 7 cents. This is an emergency application. The company did not earn its operating expenses for the first quarter of 1918. It is also beset by the prospect of higher interest on obligations maturing in 1918 and a new wage scale. Some time ago the property was re-zoned, ten 5-cent fares being substituted for seven 5-cent zones in one instance.

Fare Petition Withdrawn.—The Public Service Commission for the Second District of New York has closed the matter of the petition of the Elmira Water, Light & Railroad Company for permission to increase passenger fares in Elmira. Ross M. Lovell, attorney for the company, filed a letter with the commission withdrawing the petition and asking that the proceeding be discontinued. The petition asked authority to increase a 5-cent fare to 6 cents in cities and villages. No special hearing was held on the merits of the Elmira petition, but on April 18, after the decision of the Court of Appeals in the Rochester case, a hearing was held in relation to whether or not there is a franchise limitation in Elmira with respect to the rate of fare to be charged there by the company.

Fare Conferences in Albany.—At the conference on May 11 of representatives of the Chambers of Commerce or Boards of Trade of Albany, Rensselaer, Troy, Watervliet, Cohoes, Green Island and Waterford with officials of the United Traction Company negotiations were opened with a view to adjusting the differences that have arisen over the company's new schedule of intercity rates recently filed with the Public Service Commission. It was agreed temporarily to take up the question of 6-cent fares for all communities. In return for this, if the additional 1-cent fare can be instituted, H. B. Weatherwax, representing the United Traction Company, agreed to withdraw the tariffs filed recently imposing 10-cent and 15-cent fares on nearly all interurban trips.

Atlanta Committee Opposed to Rate Advances.—The committee of council members and citizens appointed by the City Council to investigate the petition of the Georgia Railway & Power Company, Atlanta, Ga., to the Railroad Commission for increased rates in all departments submitted its initial report to the Council on May 5. After reviewing the capitalization, corporate history and earnings of the company the committee says that the table of earnings which it presents "shows a healthy growth and one that should be wholly satisfactory to those who own and operate the power company." In conclusion it says that "should there be any change in present fares and charges, there should be reduction rather than increases." It recommends that the committee be continued and empowered to take steps to prevent any increases.

Skip Stop in Preparation at Charleston, S. C.—Preliminary to inaugurating the skip stop on all its lines, the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has painted its poles with broad white bands. These poles are spaced as recommended by the Fuel Administration—eight to the mile in the city and six in the suburbs. This means that the suburban practice is practically unchanged, while city stops are cut two or more to the mile. During the winter the company met the request to save fuel by curtailing service, six, eight, nine and ten-minute headways being increased to twelve. This meant five single-truck cars less in city service. The curtailment, however, probably cost the company more than it saved owing to the rapid increase of the riding population in consequence of war activities.

Personal Mention

A. J. Davies has been appointed general superintendent of the Kansas City-Western Railway, Kansas City, Kan., succeeding J. G. Herrin, who resigned recently. Mr. Herrin had been with the company twenty-five years. He is in ill health.

I. G. Walborn has resigned as electrical engineer of the Eastern Pennsylvania Railways, Pottsville, Pa., to go into the business of scientific farming on a large scale in partnership with his father at Orwigsburg, the ancient county seat of Schuylkill, now the center of a large agricultural district.

F. L. Butler has assumed the position of general superintendent of the Winnipeg (Man.) Electric Railway, succeeding Wilson Phillips, who remains with the company in an advisory capacity. Prior to going to Winnipeg Mr. Butler was general manager of the Chicago & West Towns Railway and the Suburban Railroad, Chicago.

F. W. Arthur has resigned from the Westinghouse Electric & Manufacturing Company, to become superintendent of sales of the Northern Ohio Traction & Light Company at Akron, Ohio. Mr. Arthur has been connected with the Westinghouse Company for seven years in the railway and power department of the Cincinnati office.

George A. Mills has been appointed electrical engineer of the Winnipeg (Man.) Electric Railway. For six years Mr. Mills has been electrical engineer for the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, and while in this capacity installed a system designed to take care of electrolysis. Prior to this he was electrical engineering instructor at the University of Pennsylvania.

Ralph W. E. Donges, president of the Board of Public Utility Commissioners of New Jersey, has been commissioned a lieutenant-colonel in the National Army. Governor Edge of New Jersey has requested Secretary of War Baker to permit the continuance of Mr. Donges' commissionership until pending important rate cases are decided. Lieutenant-Colonel Donges has been a commissioned officer in the New Jersey National Guard for the last seventeen years. He has been a member of the State board since 1913, when he was appointed by Woodrow Wilson, then Governor.

George W. Schmidt has been appointed chief engineer of the Northern Ohio Traction & Light Company's power plant at Akron. Mr. Schmidt began his career in the electrical industry in the mechanical department of the Union Electric Light & Power Company, St. Louis, where he remained for eight years. He was then appointed chief engineer of the power station of the company and served in that capacity for five and one-half years. Mr. Schmidt resigned from the company in St. Louis on March 1 to become connected with the Northern Ohio Traction & Light Company.

J. E. Hester, formerly general foreman of the car building, repair and painting department of the Union Traction Company of Indiana, Anderson, Ind., has been advanced to the position of acting master mechanic, succeeding M. F. Skouden, who has been appointed acting superintendent of motive power of the company. Mr. Hester entered electric railway work on Sept. 26, 1900, with the Union Traction Company in the carpenter repair department and has been in the service of the company continuously since that time except for two and one-half years he was with the Winona Interurban Railway at Winona Lake, Ind., in charge of the shop at Winona Lake. For the last six years Mr. Hester has been in charge of the woodworking and painting department of the Union Traction Company as general foreman.

W. C. Stockman, who has been acting superintendent of transportation of the Mobile Light & Railroad Company, Mobile, Ala., has been designated as permanent superintendent of transportation of the company. In this position he succeeds W. J. Sherwood, who resigned more than a year ago to become connected with the Motor Bus Company, Chicago, Ill. Mr. Stockman entered railroad work with the Louisville & Nashville Railroad. He went to work for the Mobile Street Railroad in 1892, while that line was still operated with horses, and remained with the company as conductor and later as motorman until 1901, when the Mobile Street Railroad was consolidated with the Mobile Light & Railroad Company. In 1902 Mr. Stockman was appointed inspector for the Mobile Light & Railroad Company, and in 1907 he was made chief inspector, which position he has held until the present time.

Obituary

Allan H. Royce, vice-president of the Toronto (Ont.) Suburban Railway, is dead. Mr. Royce was a member of the firm of Royce, Henderson & Boyd, barristers, Toronto, and was solicitor for the Toronto Suburban Railway for many years. He was elected secretary-treasurer of the Canadian Street Railway Association at the organization meeting in 1904 and retained the position until July 31, 1907.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Emergency Transportation Company, Oakland, Cal.**—Application for a charter has been made by the Emergency Transportation Company to operate street railways either with electricity or any other power, in Oakland, Alameda, Berkeley, Emeryville, San Leandro and Hayward. The incorporators are the following officers of the San Francisco-Oakland Terminal Railways: W. R. Alberger, vice-president and general manager; F. W. Frost, secretary and treasurer; B. W. Fernald, auditor; George H. Harris, general superintendent, and W. H. Smith, attorney.

***Colonial Traction Corporation, Williamsburg, Va.**—Incorporated to construct a line from Williamsburg to Yorktown, Newport News, etc., about 50 miles. Capital stock, $25,000. Officers: William S. Gribble, president, and Lawrence P. Gribble, secretary, both of Williamsburg.

Franchises

East St. Louis, Ill.—The East St. Louis & Suburban Railway has received a franchise from the City Council of East St. Louis to construct a line on Twentieth Street between Ridge Avenue and Henrietta Avenue.

Baltimore, Md.—The United Railways & Electric Company has received a franchise from the Anne Arundel County Commissioners to extend its Curtis Bay line through Fairfield and the surrounding community as far as Wagner's Point. Some of the county roads will be widened as part of the agreement.

Toronto, Ont.—The Toronto, Niagara & Western Railway, which proposes to construct an electric line between Toronto and the Canadian-Niagara frontier, via Hamilton, with a branch line along the Canadian shore of Lake Erie between Port Colborne and St. Catherines, Ont., has made application to the railway committee of the city of St. Catherines for permission to extend the time within which to begin construction. Abnormal cost of all railway construction supplies, shortage of labor due to the war, etc., are given as causes for the delay. The municipality has reported favorably on the application and the time has been extended but the date has not been fixed. [Jan. 22, '16.]

Chester, Pa.—The City Council of Chester at a special meeting recently called by Mayor McDowell, granted the Philadelphia Rapid Transit Company permission to make the changes asked for in its ordinance to facilitate the transportation of workmen to the munition and shipyard plants in Chester and Eddystone. The ordinance was passed as a war measure and will remain effective during the war and two years after peace is declared. The changes provide for double tracks for a distance in Fourth Street, single tracks in Fourth Street from Morton Avenue to Crosby Street, and in Crosby Street to Third Street, and a double curve at Third and Crosby Streets. The changes are in compliance with a letter received by the Mayor from A. Merritt Taylor, manager of transportation for the Emergency Fleet Corporation.

Charleston, S. C.—The City Council of Charleston has granted the Charleston & Summerville Interurban Railway, which proposes to construct a line between Charleston and Summerville, about 22 miles, a one year's extension of time on its franchise in which to make the necessary arrangements to begin construction. J. L. David, Charleston, president. [Nov. 4, '16.]

Track and Roadway

Alabama Interurban Corporation, Birmingham, Ala.—Work will be begun by the Alabama Interurban Corporation within the next sixty days on its proposed line from Birmingham to the Warrior River. The City Council of Bessemer recently granted the company a franchise over some of the principal streets, and at that time 90 per cent of the right-of-way and terminals at Warrior River had been secured. Thomas L. Cannon, Birmingham, president. [April 13, '18.]

Calgary (Alta.) Municipal Railway.—It is reported that the Calgary Municipal Railway has awarded a contract to the Birnie Lumber Company for the supply of 10,000 ties for replacement.

United Railroads of San Francisco, San Francisco, Cal.—The Railroad Commission of the State of California has granted permission to the United Railroads of San Francisco to use $170,900 of the moneys deposited in its depreciation fund to pay for the construction of the Army Street line and other improvements.

Pensacola (Fla.) Electric Company.—The Pensacola Electric Company has made application to the War Finance Board for financial assistance in extensive improvements which the company is planning relating to the Bayshore line, additions to the power plant and the purchase of new equipment in order to meet the needs of the army and navy and shipbuilding plants.

Detroit (Mich.) United Railway.—Active work was resumed recently by the Detroit United Railway on the construction of a double-track line on Linwood Avenue from Ferry Park Avenue to Joy Road. It is expected that the line will be ready for operation this summer.

Kansas City (Mo.) Railways.—The directors of the Kansas City Railways have approved the construction of a double-track extension from Prospect Avenue west to Troost Avenue, with provision for a single track on Twenty-seventh Street from Troost Avenue west to Main Street. This single track would be used in conjunction with a single track already laid on Twenty-fifth Street. Owing to war conditions, the times for building the line was left indefinite.

Public Service Railway, Newark, N. J.—The Board of Public Utility Commissioners has issued an order directing the Public Service Railway to make various repairs to property and equipment on the Union line and the Newark and Elizabeth line and directed that the service be otherwise improved. The board gave the company until Sept. 1 to make certain specified repairs to its tracks in North Broad Street, Broad Street, East Grand Street, Smith and East Jersey Street.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Improvements have been begun by the Trenton & Mercer County Traction Corporation on its lines in the West State Street section, as well as on the Princeton, Lawrenceville, Pennington, Hopewell and Yardville divisions.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District has under consideration the awarding of a contract to the Bethlehem Steel Bridge Corporation, the lowest bidder, for furnishing and erecting the steel for Section 3 of Route 49, being that portion of the Culver Rapid Transit Railroad between Avenue X and Coney Island. The commission on May 21 will receive bids for the construction of column foundations in connection with the above contract. The commission has awarded to Holbrook, Cabot & Rollins and G. W. McNulty, jointly, the lowest bidders, at $600,134, the contract for the installation of tracks on the Flatbush Avenue and Eastern Parkway subway line in Brooklyn, on the Nostrand Avenue branch of the same line and also on the Brighton Beach connection in Flatbush Avenue and St. Felix Street. The commission is also advertising for the receipt of bids for a supply of broken stone to be used as ballast on new rapid transit lines. This bid, will be received at the commission's new offices, 49 Lafayette Street, on May 21.

Corning & Painted Post Street Railway, Corning, N. Y.—An extension will be built by the Corning & Painted Post Street Railway to North Corning, provided the city will amend the franchise granted the company so as to permit the building and maintenance of the line on the same basis that the company built and now maintains and operates its main line, and providing the city will permit express packages and freight to be carried in and out of the city on trolley cars.

New York & Queens County Railway, New York, N. Y.—The Public Service Commission for the First District of New York approving an opinion by Commissioner Charles Buckley Hubbell, has issued an order permitting the New York & Queens County Railway to suspend for two years longer, from July 29, 1917, to July 29, 1919, the operation of cars across the Flushing Meadows between Summit Avenue and Jackson Avenue during the period required for filling in the meadows and changing the grade thereof. The commission granted a similar application on July 29, 1915, for a period of two years. Inasmuch as the filling in of the meadows was not completed within the two years specified in the previous order, an extension has been granted.

Tidewater Power Company, Wilmington, N. C.—Construction has been begun by the Tidewater Power Company on an extension about 1 mile long to the new shipyard plant.

Sapulpa (Okla.) Electric Interurban Company.—The Corporation Commission of Oklahoma has sustained the contention of the Sapulpa Electric Interurban Company of its right to take up 1 mile of its track in the city of Sapulpa to provide steel for an extension from Sapulpa to Tulsa. The company, finding it difficult to get new steel for the construction of the Tulsa line, some time ago started to take up a mile of its track, but was asked to delay until the matter could be considered by the Corporation Commission. The company maintained that a better purpose could be served by the steel in the Tulsa-Sapulpa interurban, than for local traffic, and the commission sustained this contention.

Brantford (Ont.) Municipal Railway.—The construction of an extension to the Terrace Hill district is being contemplated by the Brantford Municipal Railway.

Grand River Railway, Galt, Ont.—It is reported that the tracks of the Grand River Railway along the river in Hespeler will be relocated. Surveys are said to have been completed which will do away with a number of curves and give a practically straight route.

Nipissing Central Railway, North Cobalt, Ont.—Application has been made by the Nipissing Central Railway to the Dominion Parliament for a five-years' extension of time within which it may build a line from Latchford, Ont., to the Grand Trunk Pacific Railway near the Matagami River, Que.; from Latchford along the Montreal River, to the Grand Trunk Pacific Railway in Ontario; from Latchford southerly to Timagami station; an extension of the present line from Liskeard westerly to meet the last mentioned line; a line from Liskeard to Charlton; a line from the first mentioned line, starting at Wendego Lake, westerly to the Temiskaming & Northern Ontario Railway, and a branch line from the first mentioned line, starting in Casey Township to North Temiskaming, on the Des Quinze River.

Toronto, Ont.—A petition has been made to the Ontario Railway Board to suspend the order for the construction of the Pape Avenue extension by the Toronto Railway in order that the rails may be used in building the municipal line over the Bloor Street Viaduct, which is regarded as a more important work at the present time. The application was made jointly by Works Commissioner Harris and Assistant City Solicitor Fairty, acting for the city, and F. L. Hubbard acting for the Toronto Railway.

Cumberland Valley Railroad, Chambersburg, Pa.—Several trial trips have been made with a storage battery car on the lines of the Cumberland Valley Railroad between Mechanicsburg and Dillsburg.

Dallas (Tex.) Railway.—Work has been begun by the Dallas Railway on the construction of a line on Second Avenue. After the tracks have been laid on Second Avenue those on Exposition Avenue will be removed and the terminals at the entrance to Fair Park will be rearranged. When the Second Avenue line is opened for operation it will be combined with the present North Loop line, forming a crosstown service from the city limits on Second Avenue to Jefferson Avenue and Tyler Street in Oak Cliff. With the removal of the tracks on Exposition Avenue, Gaston Park will be made part of Fair Park, and the added property will be used for quartering the cadets and officers at Camp Dick during the State Fair next fall.

†Tacoma, Wash.—It is reported that the construction of an electric railway between Tacoma and Camp Lewis is being contemplated. Jay W. McCune, Traffic and Transportation Bureau, may give information.

Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—Work will be begun at once by the Pacific Electric Railway on the construction of a new station at San Pedro.

Lehigh Valley Transit Company, Allentown, Pa.—A contract has recently been awarded by the Lehigh Valley Transit Company to Robert S. Rathbun, Bethlehem, for the construction of a new one-story freight house, about 60 ft. x 75 ft., to be located in the South Side section of Bethlehem. It is estimated that the proposed new structure will cost about $10,000.

Power Houses and Substations

Pacific Electric Railway, Los Angeles, Cal.—A contract has recently been awarded by the Pacific Electric Railway to Houghton & Anderson, Los Angeles, for the construction of a brick substation, about 35 ft. x 45 ft., to be located in the Wilmington district.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—The Levy Court of Wilmington has granted the Wilmington & Philadelphia Traction Company, perpetual permission to erect and maintain poles and wires for electric light and power in New Castle. John F. Neary, attorney for the company, stated that the purpose is to maintain a high-tension line from the electric plant in the city to the Baldt steel plant at New Castle. He said the Wilmington City Electric Company had the authority, but did not have the necessary funds, and the Wilmington & Philadelphia Traction Company would provide the funds.

United Light & Railways Company, Grand Rapids, Mich.—Work is under way on the installation of a 22,500-kw. turbine at the Moline, Ill., power house of the United Light & Railways Company.

Manchester Traction, Light & Power Company, Manchester, N. H. — The Manchester Traction, Light & Power Company has completed its dam on the Piscataquog River at Gregg's Falls. Two generators of 1500 kw. each will be installed in the new power station. Electricity will be transmitted at 33,000 volts to the Kelley's Falls station. The main generating room of the power station, not yet completed, will be 85 ft. by 40 ft.; the transformer room will be 25 ft. by 74 ft., and will be equipped with three transformers, each having a rating of 1250 kva. A permit has been granted to the Manchester Traction, Light & Power Company for the purpose of erecting a boiler house near Mast Street.

Interborough Rapid Transit Company, New York, N. Y.—A new one-story transformer station is being built by the Interborough Rapid Transit Company at 154 West Sixteenth Street, to cost about $40,000.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—An addition will be built by the Puget Sound Traction, Light & Power Company to its power house at Fourteenth Street, South, to cost about $30,000.

Washington Water Power Company, Spokane, Wash.—Application has been filed by the Washington Water Power Company for permission to construct a reservoir and store unappropriated waters of the Baker River, to the amount of 30,000 acre-feet, to be used for power development. The cost of the proposed project is estimated at about $1,000,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Increasing Cost of Railway Operation and Equipment

Review of the Market from a Southeastern Standpoint—Advances in Cost of Material

Although the price of a few basic metals has dropped off slightly the general tendency is upwards, covering all commodities used in electric railway operation in the Southeast, as well as other sections of the country. Operating ratios are increasing with the continued and growing high price levels on materials, and the margins of net incomes are lessening each day, especially where no relief has been forthcoming through increased fares. Sheet brass, copper wire, aluminum and quicksilver prices for 1917 showed a decline over 1916, and 1918 quotations are holding close to the high marks of the past year. It is expected that the ever-soaring enhancement of cotton fabrics will be reflected in an expansion of insulated wire prices. Lightning arresters are up about 50 per cent over pre-war figures, a slight increase being recorded in the last six months. Hangers, ears, rail bonds and trolley wheels show little change for the last six months, closely following the basic metal market.

While air-brake equipment is up 75 to 100 per cent over normal, there has been no perceptible change lately to record. What can be said regarding air brakes holds true as well for motors, controllers and car cable. Very little second-hand apparatus is offered, but even transactions in this line are bringing unheard of figures. Quotations on rotaries remain firm, and no material variation has been observed since the 1916 advance, which was 40 to 50 per cent above normal. Transformers and associated equipment have enhanced somewhere in the neighborhood of 20 per cent in the last twelve months, and rumors are afloat that this class of apparatus is due for a further increase shortly. Since the war transformers have advanced 75 per cent and as much as 100 per cent in isolated cases. With regard to price changes armature coils can be put in the same class as transformers, with the exception that they have advanced only 10 per cent in the last year. Iron wire is up 33 per cent over early 1917 quotations.

A comparison of 1918 quotations with those of early 1917 indicates an average increase of 53 per cent on the following metals: foundry pig iron, sheet and steel bars, steel plates and shapes, spikes, cold-rolled shafting, rivets, common and refined bar iron, galvanized and black sheets and nails. It appears that the limit has not been reached in the prices of axles and forgings, even though they have advanced more than 300 per cent over pre-war quotations. Car wheels are comparatively steady. Cross ties, chestnut and pine poles continue to advance.

Pneumatic Door Control Growing in Favor

Adopted by Leading Railways—Ease of Operation for Women Conductors —Use on One-Man Cars

With the advent of women in ever-increasing numbers as conductors on electric cars, devices that contribute to ease of operation of cars are finding a wider market and readier sale. An illustration of this is furnished by air door engines, as they are described by one manufacturer; and pneumatic door and step control by another. Both of these mechanical improvements have been illustrated and given detailed treatment in the ELECTRIC RAILWAY JOURNAL. The engines or controls save in energy consumption, because stops are shortened through faster opening and closing of doors. Where women are employed on one-man cars the closing or opening of heavy car doors and the dropping or raising of weighty steps by mechanical means is being seriously considered.

Because one important Eastern road had placed 250 pneumatic engines on its subway cars, the employment of women guards has proved easy. The same company also has 100 surface cars so equipped and operated largely by women conductors. Simply by touching a push button the door engine, which can be adjusted for any speed of travel desired, is operated without the slightest physical effort. As further proof of their utility and popularity, these door controls or engines are being introduced on the leading traction systems all over the country.

In Washington, D. C., the new cars ordered are so equipped, and much of the old rolling stock is being rebuilt for the installation of the door control devices. Kansas City and companies in the South have recognized their worth and convenience and have placed orders for early delivery. And furthermore, the manufacturers declare shipments are ready whenever the car builders want them.

During a year there has been an advance in price of about 35 per cent due to natural conditions, but no further increase is anticipated unless scarcity of labor should impose conditions not now considered in the reckoning.

Supply of Wood Handles for Tools Short

Curtailment of Production With Government Requirements Causing Sharp Advances

A shortage of wood handles for railway picks, shovels, hammers, sledges, axes, hatchets and all kinds of tools in this line is very acute, and manufacturers and jobbers are unable to get adequate stocks. The government is in the market for all the available hickory timber, for use in aeroplane and other construction, and also for larger quantities of ash timber, such as used in making handles for tools and implements. Some manufacturers of picks, shovels and handle tools are said to be held back in production because of their inability to get wood handles.

Stocks are in a very broken condition. At the same time the heavy operating expense has compelled many small handle factories to suspend operations. The heavy snows of last winter prevented the handle concerns from getting out the usual supply of timber and from hauling much that was cut. The government is also buying heavily of shovels and spades, which is further restricting the supply for commercial use. It is doubtful if the situation will show any improvement this summer.

PRICE SITUATION

Prices are continually advancing. Pick, shovel, hammer and other hardwood tool handles are up again, while the shortage of mill shipments still continues. No particular item is affected, but all seem to be in about the same condition. A distributor handling a heavy business said he would be compelled to place an order for shovels at once, in view of the handle situation, if he wanted delivery by Oct. 15. Permits for carload shipments of different tool handles are given gingerly, and often after they are awarded the goods must be made.

The appended are jobbers' prices on hardwood handles: A. E. hammer handles, at $1 per dozen; black hammer handles, 16-in., $1 per dozen; 18-in., $1.15 per dozen; machine hammer handles—14-in., $1 per dozen; 18-in., $1.25 per dozen; machine handles—14-in., 60 cents per dozen; 16-in., 65 cents per dozen; sledge handles—$3 per dozen; 36-in., $3.50 per dozen; extra 30-in. sledge handles, $1.80 per dozen; extra railroad pick handles, $3.25 per dozen; No. 1, $2.60 per dozen; No. 2, $2 per dozen; D handle, shovel, are 35 per cent from standard list.

Traction Railway Credits Not Impaired

Manufacturers and Supply Firms Report No Weakness Evident and Settlements Fairly Prompt

No impairment of credit standing is reported in connection with the accounts of the traction railway companies. It was surmised that possibly a softening of conditions, due to reduced incomes, would have an effect in the buying capacity and credit rating of the electric roads. Diligent inquiry among the credit departments of leading manufacturers and sales agencies of equipment and accessories failed to reveal other than a very satisfactory state of affairs in the Eastern district.

Rail mills, which carry large accounts for traction properties, declare there is no change in the standardization of credits. No extra time is asked, nor are more notes negotiated by buyers. There is no great activity in rolling steel for rails, and none for stock accumulation. The market is therefore firm and comparatively short. Prices are f.o.b. mill at time of shipment and at the convenience of the shipper. Terms are 2 per cent ten days, but from twenty-five to thirty days are sometimes taken, with no objection on the part of the seller.

Where a miscellaneous account is in question settlements are made in thirty days, but occasionally the time is stretched to sixty and ninety days. A great many bills are cleared through the supply houses, but no complaints of delinquency are mentioned, other than that some companies, which are perfectly sound and safe, are naturally slow pay. It is their habit, though none of the credit men are inclined to have it emulated. Again, where thirty to sixty days is the rule, some debtors are letting it run to ninety and 120 days. These, however, are exceptions. It is generally admitted that the delays in the delivery of goods are responsible in a great many instances for slow or dilatory settlements. As was distinctly stated, no one could reasonably expect a buyer to pay for merchandise until it is received with the additional thirty days allowable from date of delivery for a chance to realize.

Firm Market on Railway Hardware

Orders Are Subject to Mill Acceptance and Shipping Convenience—Plants Are Running to Capacity

Electric railway shops, accustomed to buying material in suitable quantities for reserve stock, are inclined to purchase in a hand-to-mouth way now, according to sales managers of supply houses as well as manufacturers. Spikes, tie plates, tie rods, fish and angle plates, angle bars, rail bolts and nuts, with few exceptions, are quoted on the government price base, f.o.b. mill, orders subject to mill acceptance and shipment at its convenience. The usual practice, in order to obtain a favorable price, is to buy spikes in car lots, though quantities less than 200 kegs, with an advance of $1 a hundredweight, are by no means unknown. The market quotations are customarily made by the pound, minimum quantities named when specifications are supplied. Prices practically are stationary, with no recent change.

Manufacturers of nuts and bolts, as well as tie and fish plates, tie rods, angle plates and bars are now running their mills to full capacity and are turning over 100 per cent of their output to the government. This will likely last for sixty days or more, and, in the meantime, commercial consumers will have to get along as best they can. The general demand for some months has been very quiet, with stocks held by jobbers and dealers low. The government figures will be effective until June 30.

With railways always carrying sufficient supplies for current needs, the jobber and even the retailer is occasionally called upon for an emergency order. As a rule, however, jobbers do not find it profitable to carry much of a stock of the above-mentioned items. Traction roads for quite a period have wanted to buy as close as possible by going direct to the manufacturer. To this practice jobbing houses have raised no objection and consequently they are secondary factors in the business.

Deliveries range from two to three, six and eight months. One prominent house, which termed the present a seller's market, said on certain articles he would be obliged to place an order now so as to insure October delivery. The shipment is doubtful.

Rolling Stock

Lehigh Valley Transit Company, Allentown, Pa., has asked for specifications and prices on four new cars of the interurban type.

Nipissing Central Railway, North Cobalt, Ont., Canada, is contemplating buying two car bodies.

McComb & Magnolia Light & Railway Company, McComb, Miss., will purchase two passenger cars in the near future.

Hull Electric Company, Hull, Que., Canada, has ordered one double-truck steel sweeper, 46 ft. long over all, equipped with brooms and plows for double-end operation, from the Ottawa Car Manufacturing Company.

Galt River Railway, Galt, Ont., Can., had an oil stove explosion in one of its electric locomotives while in the yards of the Canadian Pacific Railroad at Galt, practically destroying it. The locomotive will be rebuilt.

Shore Line Electric Railway, Norwich, Conn., in conjunction with the Worcester (Mass.) Consolidated Street Railway, is reported as about to construct six trailers. They are to be operated between Worcester and New London, Conn.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., has placed a contract with the Cincinnati Car Company for sixteen double-truck cars, six with motors and ten to be trailers. Also ten smaller cars of thirty-five-passenger capacity.

Manila Electric Railroad & Light Corporation, Manila, P. I., mentioned in the ELECTRIC RAILWAY JOURNAL of May 4 as contemplating the purchase of fifteen new cars, will have them built in their own shops in Manila. The motors and other equipment will be purchased in the United States. The last cars built for the Manila property, controlled by the J. G. White Management Corporation of New York, were built by the J. G. Brill Company.

Boston (Mass.) Elevated Railway is asking for bids on 300 new cars, 200 motor cars of the general design of which are to be center-entrance, the latest units of this type in service on the road; and 100 of which are to be center-entrance trail cars, also of standard type for Boston operation. Specifications have been completed for bodies and will probably be ready soon for motors and electrical equipment. New trucks and air-brake with accessory apparatus, will be required for this rolling stock.

New York State Railways (Syracuse Lines), Syracuse, N. Y., having ordered twenty-five new cars from the J. G. Brill Company, furnishes the following specifications:

Number of cars ordered	25
Name of road	New York State Railways, Syracuse Lines
Builder of car body	J. G. Brill Co.
Type of car	Front-entrance, center-exit
Seating capacity	51
Weight (total)	35,000 lb.
Bolster centers, length	25 ft. 0 in.
Length over bumpers	47 ft. 7 in.
Length over vestibule	46 ft. 7 in.
Width over all	8 ft. 2 in.
Height, rail to trolley base	10 ft. 9⅝ in.
Body	Semi-steel
Interior trim	Natural cherry
Headlining	Agasote
Roof	arch
Air brakes	Westinghouse
Axles	Laclede Steel Co.
Bumpers	Brill
Car trimmings	Bronze
Conduits and junction boxes	Condulets
Control, type	Westinghouse H. L. D.
Couplers	Tomlinson Car & Air
Designation signs	Hunter
Door operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Fenders or wheelguards	Eclipse
Gears and pinions	Tool Steel
Hand brakes	National Brake Co.
Heaters	Peter Smith forced ventilation
Headlights	Crouse-Hinds
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors	Four Westinghouse 506A, inside hung
Paint, varnish or enamel	F. & C. Simplex system
Registers	International R-10
Sanders	Ohio Brass Air
Sash fixtures	Brill
Seats, style	Hale & Kilburn
Seating material	Cane
Step treads	Feralun
Trolley catchers or retrievers	Earll retrievers
Trolley base	Ohio Brass Co.
Trolley wheels or shoes	Star Brass Works
Trucks, type	Brill No. 67 F
Ventilators	Automatic Ventilator Co.
Wheels (type and size)	26-in. cast iron

Trade Notes

Larkin G. Mead, successor to Curran & Mead, New York, will remove his offices on June 1, 1918, from 55 Park Row to 110 West Fortieth Street.

The Electric Service Supplies Company has secured larger quarters in the Hudson Terminal Building, 50 Church Street, New York, N. Y., and is now occupying rooms 1771 and 1773.

Smith-Ward Brake Company, Brooklyn, N. Y., asks this paper to say that Herbert M. Weaver left its employ in August, 1915, and is not in any way connected with the company.

The Consolidated Car Heating Company has changed its offices in the Singer Building, New York City, from 2609 and 2610 to 1814 and 1815, where better quarters are secured.

C. F. Gailor, president and director of the Atlantic Welding Company, New York, since its incorporation in June, 1917, has resigned to accept a commission in the government service and will report in Washington immediately.

Brooklyn (N. Y.) Rapid Transit Company calls attention to the note appearing in the ELECTRIC RAILWAY JOURNAL of April 27 regarding an order for ventilators in connection with its recent purchase of fifty new center-entrance trail cars. The company says that it does not intend to use any type of automatic ventilators on these cars.

Bound Brook (N. J.) Oil-Less Bearing Company announce that after May 15, 1918, its Western office will be located at room 1723 Ford Building, Detroit, Mich. They were formerly located at 308 Moffat Building. This office is in charge of Harry J. Lindsley, Western sales manager.

Economy Electric Devices Company, Chicago, reports that it has received an order from the Galesburg & Kewanee Electric Railway, Kewanee, Ill., for Sangamo economy watt-hour meters for all of its cars. The Dubuque (Ia.) Electric Company has also ordered the economy meters for all of its active cars as the result of a service test.

D. C. & William B. Jackson, engineers, Boston and Chicago, announced that on account of two members of the firm having gone into the national service, and the third member expecting to do so as soon as practicable, they will close their offices and suspend business for the duration of the war as soon as the various pieces of work with which they are now occupied can be completed. They expect to resume business after the conclusion of the war.

E. E. Maher has been appointed by the Terry Steam Turbine Company, Hartford, Conn., manager for the Chicago district, with offices at 1328-29 McCormick Building, 322 South Michigan Avenue. John D. Stout has become manager of the New York office of the Terry company in charge of that district, with the exception of navy and marine installations which will now be handled by Mr. Herbert. Mr. Stout will now devote his entire time to navy and marine requirements.

New Advertising Literature

Buffalo Forge Company, Buffalo, N. Y.: An illustrated catalog describing the company's portable forges.

General Electric Company, Schenectady, N. Y.: Indexes to descriptive bulletins and sheets and also index of supply part bulletins.

Boone Scrymser Company, New York, N. Y.: Turbo machine oil as advertised in a circular being distributed by the company.

Link-Belt Company, Philadelphia, Pa.: Book No. 312 describing the Link-Belt silent chain drive for operating machine tools. The bulletin is profusely illustrated.

Mitchell-Rand Manufacturing Company, New York, N. Y.: One of the most comprehensive catalogs in this line recently distributed by the company entitled "Everything in Insulation." Not only are the many forms of insulation illustrated, but a detailed description is given of the treatment of the raw material, through the various process stages until the finished article is reached. Various tables of value to those interested in the meaning, purpose and application of these specialties are furnished, with carefully prepared chapters by an expert on insulating paints and varnishes, waxes and compounds. The cross-index gives additional value to this very complete publication, copies of which may be obtained free on application to the company.

NEW YORK METAL MARKET PRICES

	May 8	May 15
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26½	26¼ to 26½
Lead, cents per lb	6.62½	6.90
Nickel, cents per lb	50	50
Spelter, cents per lb	7 32½	7.37½
Tin, Straits, cents per lb	$1.00	$1.05
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

† Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 8	May 15
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6¼	6
Zinc, cents per lb	5½	5¼
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	*$34.00	*$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 8	May 15
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30.40 to 34¼	30.40 to 34¼
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	....	$60.00
T-rails, high (Shanghai), cents per lb	4¼	4¼
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	...	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80% to 82-3%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	79%	80%
Car window glass (double strength, all sizes AA quality), New York, discount, F. O. B. factory	80%	82-3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truckload lots), New York, per bbl.	$2.65	$3.20
Cement (carload lots), Chicago, per bbl.	$2.71	$3.26
Cement (carload lots), Seattle, per bbl.	$3.05	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.60	$1.62
White lead (100 lb. keg), New York, cents per lb	10	10
Turpentine (bbl. lots), New York, cents per gal	44½	42½

* Government price.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, May 25, 1918 *Number* 21

Real Purchasing Agents Save Money

A MAN'S job is gaged by his character at least as much as by his title. That is why a purchasing agent may be either an order and tracer clerk or a real buyer. His job calls for something more than watching the lead pencil market and refusing perfectos from salesmen. He has duties which tend to infringe the purchasing prerogatives of every department head and consequently he must be able to show cause every time and show it diplomatically.

If he is a buyer and not a clerk he can do wonders in reducing the cost of maintenance, for, like the manager, he is interested in making the dollar go farthest regardless of departmental jealousies. To illustrate: One purchasing agent noticed that the car maintenance department was getting an extraordinary increase in wheel life. He knew that trolley wire costs more than trolley wheels in the long run. Hence he persuaded the management that a very hard wheel was the costliest after all, no matter how fine a showing it gave to the car maintenance department.

As this purchasing agent has real power, he does not wait to buy wire until the line department asks for it, but buys when the market is low. Conversely, he holds scrap copper until the market is high. Last year he played this bear and bull game so well that the net expense for new wire was almost nil.

Needless to add that, as a genuine purchasing agent, he is keen to buy on the basis of tested quality every time, and he believes that electric railways will never buy soundly as a class until the purchasing agents as a class have an association of their own to work out this and many other problems peculiar to their work.

Hand to Mouth Purchase Policy Under Existing Market Conditions

THE wise purchasing agent, even in normal times, knows the value of advance purchases of stocks of those commodities for which there is a practically constant demand. It would seem that in the face of all the troubles now encountered in securing materials, there would be no need for calling up the subject at this time. Nevertheless, if we are to judge by a letter from a leading supply man which we quoted in our "Manufactures and the Markets" column in our issue for March 23, it will be found that there are still many purchasers who, for one reason or another, persist in a hand to mouth method of securing their supplies.

Whatever the reasons for such a policy, it appears in general to be a mistaken one, more especially in war times when labor and material shortage, freight and express delays and embargoes all tend to prevent prompt shipment and delivery. The old saw about foresight being better than hindsight quite aptly applies to this situation.

With some materials, such as girder rails, no amount of foresight in the placing of orders seems to have stimulated the arrival of the materials into stores. In fact, we know of girder rail orders placed almost two years ago which remain unfilled.

Nevertheless the great variety of materials needed by the railways are not yet subject to such prolonged delays, and our correspondent stated that if needs were anticipated and orders placed a reasonable period in advance, the materials would generally arrive in the storeroom in time to meet requirements. This would mean not only reduction in annoyance and time but often considerable monetary saving, because rush shipments generally require the manufacturer to offer exorbitant wages to workmen and to ship by express, both of which create price increases which the purchaser must pay.

We believe the manufacturers of electric railway materials are doing their utmost to co-operate with the railways in these strenuous times, and it is no more than just that the railways should do their part by endeavoring to anticipate their purchase requirements to the fullest possible extent.

Haul Freight and Do Your Bit

THE financial tide has turned adversely for many electric railway enterprises, and the street and interurban railway managers are now compelled to abandon practices not absolutely necessary and keep on the alert for opportunities which will aid in advancing the earning power of their lines. The development of plans for handling freight in less than carload lots presents possibilities for electric lines to preserve their position and strengthen their resources. It is essential that they take advantage of the present opportunity to handle this class of business in conjunction with steam roads, thus helping to relieve the present congested condition of the freight service and at the same time add to their own income.

Many interurban roads are anxious to handle freight and express on their lines, but they have not the equipment or facilities for meeting the present congested conditions, and large increases in rolling stock or freight terminals are out of the question. A system of making freight deliveries direct to the consignee has much to commend it. Such a system would do away with much of the necessity for increased terminal sheds and would decrease the labor of handling. The best service would undoubtedly be obtained if such deliveries were handled entirely by the electric roads. With proper coöperation, however, transfer companies could be of great assistance in relieving the congested conditions.

Electric railway systems cannot stand still, they must keep pace with the development and demands of the communities which they serve or they will be relegated to the scrap heap. The haulage of freight in less than carload lots is a work that can be conducted by most electric railways at much less cost and with greater speed than is possible by the use of motor trucks. Still in many cities definite routes are now being established for motor trucks to operate over and to provide the necessary service for shippers. This is a proposition that should receive careful consideration and thorough investigation, and it is a patriotic duty to our nation in a time when its future safety and development depend on transportation.

Will Automobile Competition Increase or Decrease?

IN THE heyday of its popularity, during the early nineties, the bicycle made big inroads into the receipts of electric railways of that time. So many people preferred to ride their wheels to work and home in the evening and took bicycle rides on holidays rather than trolley tours that the loss in patronage became a serious one for the railway owners. But the decrease in the popularity of the bicycle was almost as rapid as its rise. As a disturbing factor in electric railway affairs, it soon failed to have any material effect.

We do not anticipate so rapid a decline in the popularity of the automobile, the means of individual transportation which succeeded the bicycle. Nevertheless, present circumstances point to the advent of limiting conditions to its use.

The first of these is the condition brought about by the mere number of cars on the street. The most serious part of the congestion produced by them, however, is not from the cars in use, but those left by the owners next to the curb for hours at a time. An automobile on the street is wasteful enough of street area when it is moving. It is still more of an obstruction when "parked" by its owner while he is attending to business. Nevertheless, this is an evil with which many cities have to contend. We are glad to notice that our national capital, Washington, has just taken active steps to repress this nuisance. The direct purpose of the steps taken there is to reduce the interference by automobiles with the street cars. The latter, which are the means of transportation of the masses, have received priority of right-of-way.

The curtailment in the use of steel by the automobile manufacturers, recently ordered by the government, will cause a reduction for the present in number of cars manufactured, while the increasing demand for gasoline for war uses may cut down the consumption permitted by private cars. In such a case it is not at all unlikely that many persons will be driven again to use the cars just as they did when the bicycle fell from its high estate. An increase in the price of gasoline alone would probably not greatly decrease its consumption by pleasure cars. The cost of fuel is one of the smallest items of expense in the operation of an automobile, and if gasoline should go up even to double its present price the percentage increase in the total cost of automobile operation would be small. But the question is whether enough gasoline is being produced to supply our army and navy and yet permit the present enormous consumption by road vehicles. In such a case the government could well limit the use of both pleasure and commercial vehicles.

Women Conductors Can Give Satisfactory Service

SOON after the war broke out in August, 1914, many of the British tradesmen advertised that they would conduct "business as usual." They soon learned, and the country learned, that business could not be conducted as usual in war time. To combat the enemy successfully meant a tremendous strain upon the man power of the country, and women began to take up many of the duties formerly undertaken by men, including that of acting as conductors and even as drivers on electric cars. Now the use of women for this purpose is very common throughout Great Britain, Glasgow, for instance, with 862 cars having on June 1, 1917, 1514 women conductors and 203 women drivers. Women have also been employed extensively as conductors and drivers of electric cars in Italy and France with satisfactory results.

In this country up to the present women have been employed as conductors for surface cars, to any considerable extent, certainly, only in New York and Brooklyn, but in both of those cities they have been at work for a sufficient length of time that the practice can no longer be considered an experiment. It has been accepted by the public, and there has thus been opened to women a new line of work which is considerably more remunerative and no more arduous than many others in which they have been engaged in the past.

The first question which will naturally suggest itself in connection with this matter is whether the work is one which is suitable for women. On this point there are two recent reports, given in part elsewhere in this issue. While that by Mr. Squires is frankly critical, that by Dr. Bell of the New York State Industrial Commission explains that the work is less exacting and confining than that in many other occupations open to women. This fact is confirmed by the interviews contained in the State report, which is seemingly both thorough and constructive.

A second question is as to the effect on operating practice. Naturally, it is to complicate it somewhat. It means the providing at all carhouses of two sets of rest rooms instead of one and the duplication of other facilities, or, in other words, an expense which could be avoided with only one class of train employees.

Finally it would be well to consider the argument raised in the past in cities where applications have been made for permission to use women conductors, that if the companies offered wages high enough, they could get as many men as they needed. This may be true, but there are two answers to this. The first is that the companies cannot afford continually to raise wages, and the second is that if certain work can properly be performed by women, it should be done by them and the men released for work which only men can do. The testimony in New York as well as from abroad is that the work of a conductor can be performed by women without injury to their health or morals.

No Time for Municipal Counsel to Play to the Gallery

IT IS useless for municipal counsel to attempt to influence the judgment of regulating commissions by the introduction of prejudicial matter. As Harold L. Geisse, secretary Wisconsin Railroad Commission, recently said, "It is a method to be deplored, totally ineffective and unworthy of notice by opposing counsel."

From the commission's point of view, all of this is true. From the utility's point of view, the method is certainly deplorable, but it is not ineffective or unworthy of notice. To be sure, the intelligent part of the public, in following utility cases, is not moved by non-probative testimony brought out by shrewd city counsel. But that portion of the public which is controlled by its prejudices is profoundly stirred by mere innuendoes, unfulfilled promises of lurid disclosures and other tricks of the lawyer who tries to muddle the situation. These people should not be ignored, for some of their minds can be broadened by education. For the sake of this result, therefore, even intimations of untruths by municipal representatives should not be allowed to go unchallenged. No pitched battle with opposing counsel is either necessary or advisable; a dignified notice of misstatements or insinuations by a plain recital of facts is quite sufficient.

Sometimes, however, the commission itself is justified in raising a protest. This thought came to our mind as we recently sat through several weary hearings on the application of the Public Service Railway, Newark, N. J., for higher fares and listened to the municipal trial lawyer endeavor to create a prejudice against the company. We have no desire to attribute wrong motives to the municipal counsel, but some of his questions upon cross-examination of company officials speak for themselves.

These were his opening hints—"trailed by a company detective"; "more disclosures will follow." This was his puerile and silly question for the benefit of American Bolsheviki—will President McCarter give up some of his annual salary to meet the needed emergency revenue of $3,500,000? This was his appeal to prejudice against corporations—is not the fact that the company wants higher revenues in spite of municipal opposition a case of "the public be damned?" This was his most contemptible insinuation—were not the recent letters of President Wilson and Secretary McAdoo, urging fair play for utilities, "promoted" by a utility committee?

Such a lack of comprehension of and attention to the fundamental issues in the Public Service case is most deplorable. Nero fiddled while Rome was burning; Van Winkle daddles and slurs while the company faces an emergency. The railway does not deserve such treatment. With a phenomenal development in munitions plants, shipyards, government depots and cantonments through New Jersey, the railway's facilities are severely taxed, to say nothing of the burdens of higher operating costs. The company must have relief in order for it properly to perform its public function. Reasonable service for the public can only be had through reasonable prosperity for the utility.

If municipal attorneys cannot do more than merely play to the gallery of the non-thinking public, they should be sternly rebuked by the presiding commissioners. This has been done to some extent in the Public Service case, but not sufficiently. It would be well for all regulatory bodies to bear in mind Bacon's words: "There is due to the public a civil reprehension of advocates where there appeareth cunning counsel." Commissions have been organized not only to see that the public gets what it pays for and that the public pays for what it gets, but also, as Commissioner Whitney in New York recently said, to see that the policy pursued by commissions and *other public authorities* is such as to assure at all times the development and improvement of enterprises to meet the public need of utility service. Municipalities have a right to a fair hearing in rate cases, but that gives their counsel no license to use unfair methods of presentation, harmful to the general public. With commissions as with individuals, patience sometimes ceases to be a virtue.

Increase Mileage Production Per Car

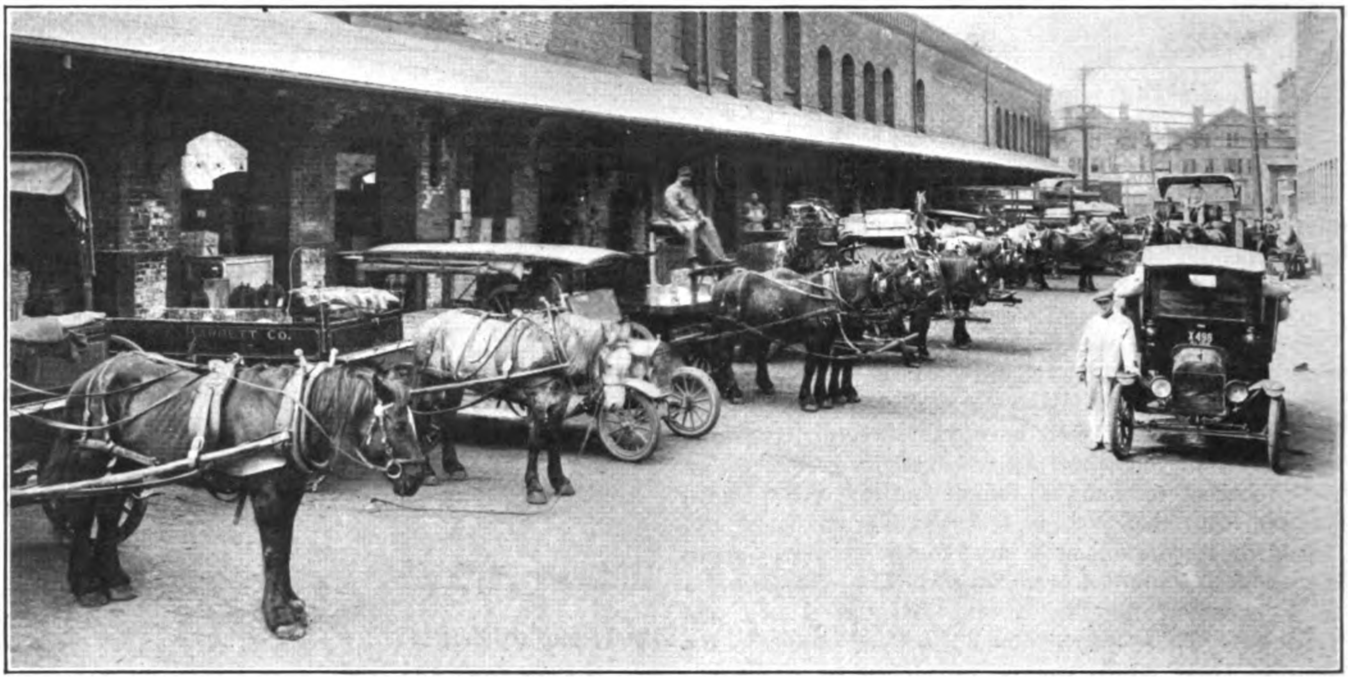
WHEN production engineers survey conditions in a machine shop they give much thought to the methods used to bring the material to the machine—for the machine represents a big investment and demands high-speed production if it is to pay. An efficient shop will not allow a costly machine to stand idle for lack of transport devices to be used for bringing the "feeding-in" material.

To do likewise with a car, which, after all, is a tool for producing car-miles, we must take advantage of every means to accelerate the feeding-in of the passengers handled in order that the car may be filled and emptied to return for a new charge as quickly as possible. The more people it can carry away during a given period, the more efficient it will be. The so-called small car with speed-up practices and devices will carry more people in an hour than the big car without them.

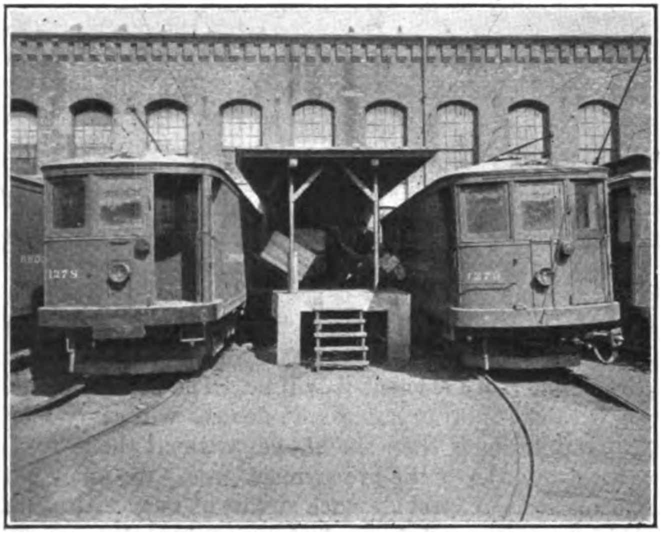
First in order is the prepayment area. We know how difficult it is to provide such areas in busy cities, but there are scores of large factories where the present terminals could be converted into prepayment stations at little cost. Perhaps, in some cases the factory would be willing to rent some frontage for the purpose of accommodating its employees as well as the railway. Many a present traffic snarl would be quickly disentangled by transferring to the ground the fare-collection interval which now cuts down the mileage output of the car.

Second is the loading platform in combination with the prepayment fare collection. This costs next to nothing, yet offers the advantage of saving about one-half of the time which a car requires to get away. Third is the possibility of pay-as-you-leave operation, particularly where single-end operation is used. Finally, we come to the use of car devices such as air-operated doors and steps, compact platform control with high rates of acceleration and braking, and motor-operated fare equipments—all of which contribute toward the goal of maximum mileage output.

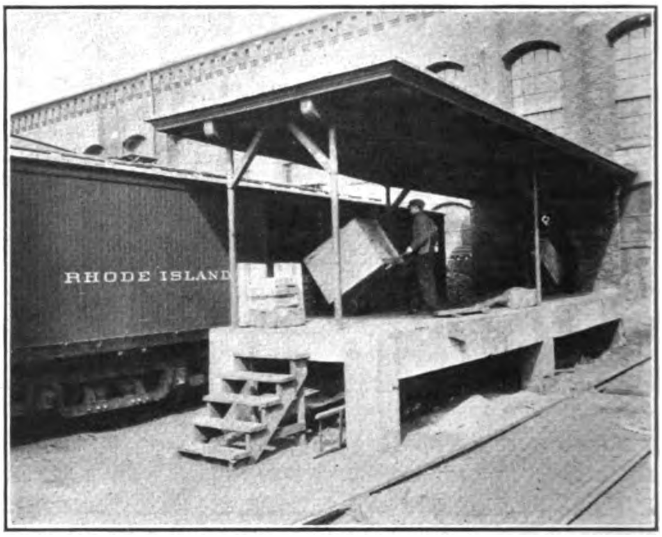
If electric railway men, therefore, will think of a car as a production engineer thinks of a machine tool, they will appreciate more than ever why it pays to spend an extra $1,000 on a $9,000 car if thereby the $9,000 investment can be made to give 10 to 20 per cent more output, which is miles and money.



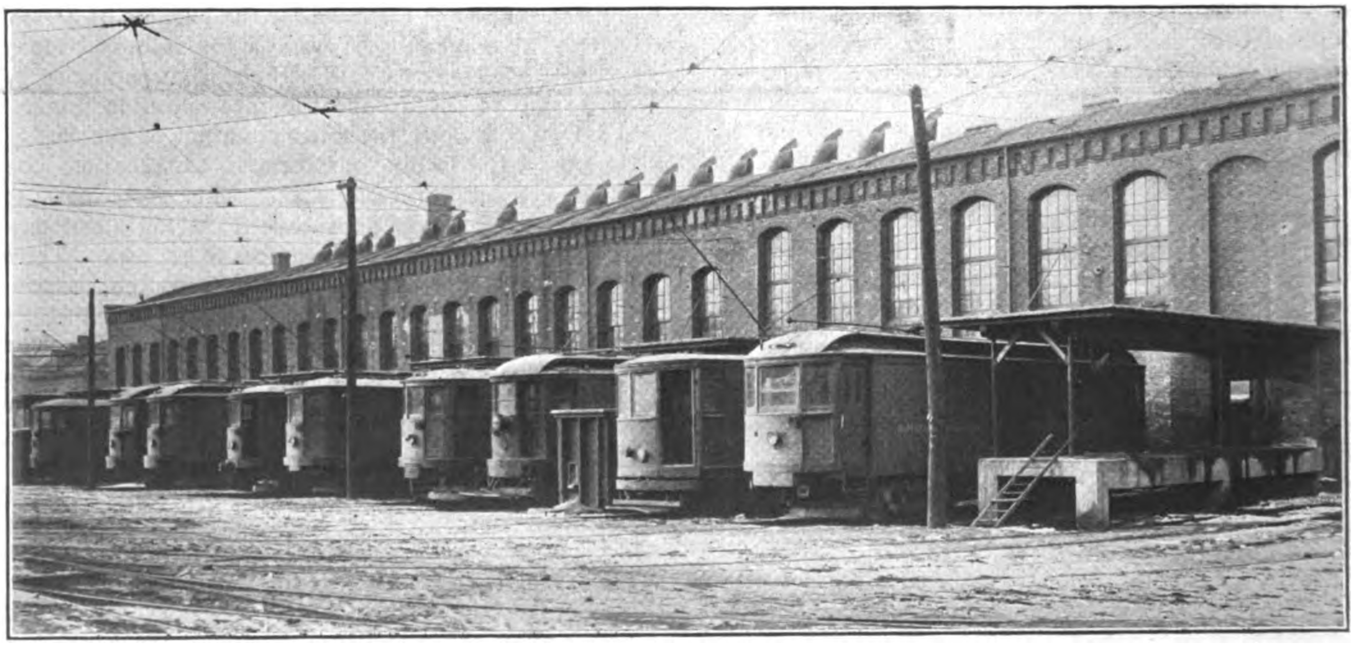
TEAM SIDE OF RHODE ISLAND COMPANY'S FREIGHT HOUSE AT PROVIDENCE



UNLOADING PACKAGE FREIGHT AT PROVIDENCE, R. I., FREIGHT STATION



CONCRETE LOADING PLATFORM, 30 FT. X 10 FT., AT EDDY STREET FREIGHT HOUSE, PROVIDENCE, R. I.



EXPRESS CARS IN LOADING AND UNLOADING BERTHS AT EDDY STREET FREIGHT HOUSE

Rhode Island Electric Freight Business Increases 185 Per Cent in Ten Years

In This Article Attention Is Especially Directed to the Details of Less-than-Carload Freight Handling at Providence Where Cars Are Loaded and Unloaded on Stub-End Tracks

SINCE the publication of the article on the freight handling facilities and methods of the Rhode Island Company, in the issue of the ELECTRIC RAILWAY JOURNAL for March 29, 1913, page 573, the freight department of this company has greatly expanded in income and facilities. Physically the most conspicuous development has been the remodeling of the old power house on Eddy Street into an excellent freight house. While, of course, if the building had been erected new it would not have been given quite the same proportions, nevertheless it is well located and has been admirably arranged for the purpose of handling a large package freight business with minimum interference of car movement.

At present from ninety to 100 loaded cars are handled in and out of the Providence freight station daily, at times of peak load taxing the capacity of the terminal. A number of photographs are reproduced herewith to show the appearance of the station on a typical day, but not at time of peak load. The freight house is a substantial brick building, with steel and tile arched roof, about 277 ft. x 75 ft. in outside dimensions. It is divided by a brick partition into two parts of the sizes shown in the diagram on page 1005, the larger section being for incoming freight. At the street end of the building are two tiers of offices, the principal ones being on the second floor. A portion of the street end of of the basement is also utilized. The principal feature of interest in the building is the row of short loading and unloading platforms projecting 30 ft. from the track side of the building. These average 10 ft. in width and are of very substantial concrete slab construction with heavy square concrete piers. They are protected from the weather by projecting roofs, supported on iron pipe columns so placed as to interfere as little as possible with the movement of trucks. The platforms are tapered so as to give the necessary clearance for the end platforms of the cars. There are ten of the platforms, so that twenty cars can be accommodated at one time.

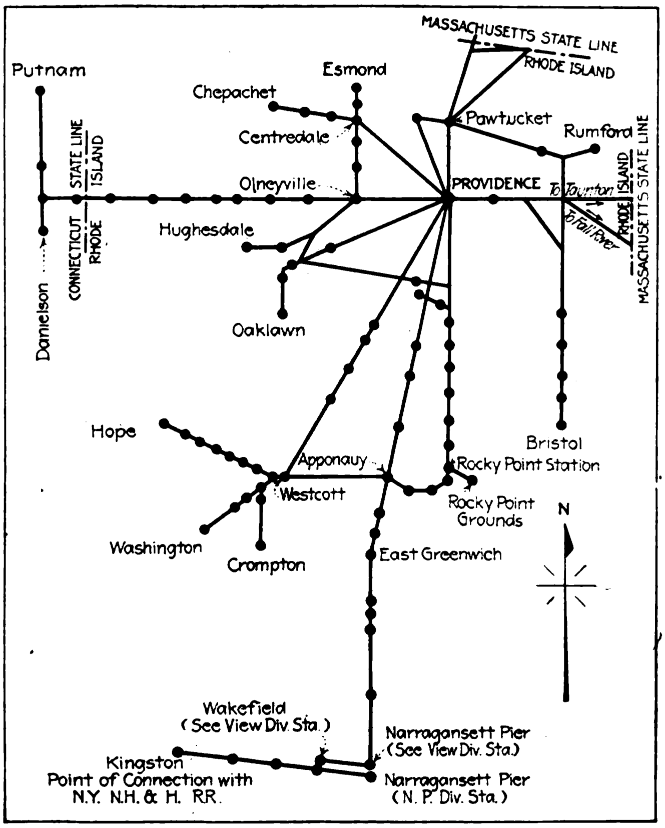

MASSACHUSETTS STATE LINE
RHODE ISLAND
Putnam
Esmond
Chepachet
Centredale
Olneyville
PROVIDENCE
Pawtucket
Rumford
To Taunton
To Fall River
RHODE ISLAND
MASSACHUSETTS STATE LINE
STATE LINE
ISLAND
CONNECTICUT
RHODE
Danielson
Hughesdale
Oaklawn
Hope
Apponauy
Westcott
Washington
Crompton
Bristol
Rocky Point Station
Rocky Point Grounds
East Greenwich
N
Wakefield (See View Div. Sta.)
Kingston
Point of Connection with N.Y. N.H. & H. RR.
Narragansett Pier (See View Div. Sta.)
Narragansett Pier (N. P. Div. Sta.)

DIAGRAM OF FREIGHT CENTERS ON RHODE ISLAND COMPANY SYSTEM (NOT TO SCALE)

The freight house is almost entirely surrounded with a paved area, arranged for the purpose of encouraging the driving of teams in at one side and out at the other. It is somewhat difficult to accomplish this as the tendency is to enter and leave on the team side of the building, where, unfortunately, the area is not as great as would be desirable. By a process of education it is hoped to get the teamsters into the habit of making the complete circuit of the building.

A rather complicated special-work layout was necessary in connection with the stub-end arrangement of tracks, and this layout requires a considerable yard area. Experience with the operation of the house during the past two years, however, has convinced the management that the expenditure for trackwork has been well justified by the results, as it is possible for cars to go in and out without interference. The question of area did not enter seriously here as the building in its present position on the site was inherited by the freight department and there was ample space on one side for the selected type of special-work layout. Since the Rhode Island Company went into the freight business nearly eighteen years ago there has been a consistent and uniform growth averaging about $22,000 per year. Freight service is furnished over 400 miles of track through eighty community centers. The distribution of these, not to scale, is shown in one of the figures reproduced in this article. The freight-car mileage made last year was 385,000, which is approaching the figure of 1000 car-miles per mile of track. The freight income is $870 per mile of track.

The department has now in service thirty-four regular motor express cars, three electric locomotives, six box trailers which are used for miscellaneous freight such

BILLING ROOM IN EDDY STREET FREIGHT HOUSE, PROVIDENCE, R. I.

as lumber, nineteen small gondola cars, three wood hopper cars, five gondola coal cars and three 30-ton wood hopper coal cars (used on the Sea View division). As the coal business has fallen off considerably due to embargoes the coal cars are now being used principally for handling ashes from the power plants to fills. All of the express cars are motor cars except that a few trailers are used in outlying regions. The Rhode Island Company handles New Haven M. C. B. equipment on per diem rates, collect, but owns no M. C. B. interchange equipment itself. The company also interchanges cars with other lines, which it can do being under the jurisdiction of the Interstate Commerce Commission. Regular freight service is given between Boston and Providence, the cars coming and going by night. Two of the motor cars are furnished with M. C. B. couplers so that they can pick up steam road equipment if necessary.

The billing of freight is done in the Eddy Street freight house at Providence, where a force of thirty-eight men and boys is employed. The main billing office is shown in one of the photographs, and the dimensions of all the rooms used by the billing department are given in one of the drawings. The billing work is in charge of a chief clerk and an assistant. In the billing office are one chief bill clerk, one rate clerk, nine billing clerks, one all-night billing clerk, one voucher clerk, one filing clerk, one expense account clerk and a messenger. In the over, short and damage room are four clerks for handling cases on local lines and two for foreign lines. In the accounting room are a chief accountant, seven clerks, and a ledger clerk. In the cashier's office there are two cashiers and three collectors.

The Egry system of billing is used for local lines and regular manifests are used on foreign lines. Both four and five-roll Egry machines are used. The four-roll machines furnish an original, a delivery voucher, a freight bill and a station way bill. Where an extra copy for the agent is desired, the fifth roll gives him a way bill.

The term "local lines" as used above applies where there are no agents to receive or deliver the freight. In the event that the deliveries are made by the con-

INCOMING FREIGHT HOUSE OF THE RHODE ISLAND COMPANY AT PROVIDENCE

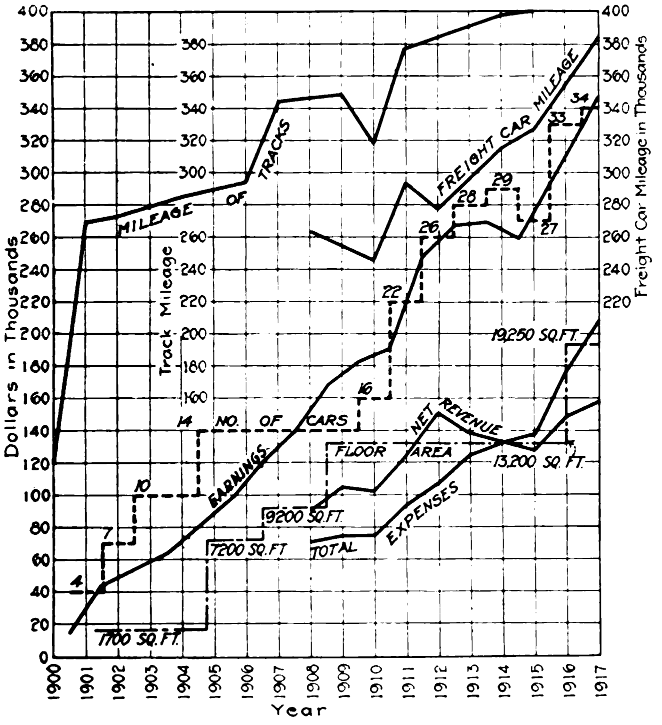


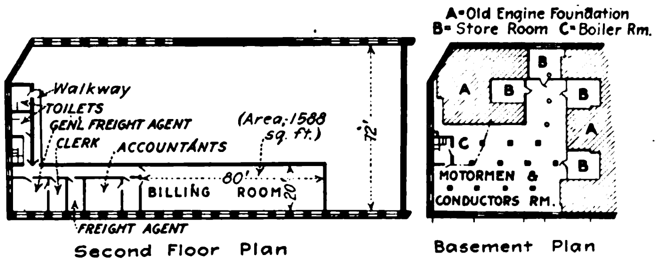
CHART OF FREIGHT DEPARTMENT OPERATING DATA, RHODE ISLAND COMPANY

ductor on the car along the line obviously this kind of service involves very careful checking to verify deliveries and to protect "shortages and overs." The Egry system provides the necessary safeguards. The term "foreign lines" applies where agents are located to receive and deliver the freight.

Records are preserved in the billing office for three years, and are then transferred to a less accessible point where they are stored for five years more.

The delivery records are kept in pasteboard boxes, and the car tallies, way bills and all other records except correspondence are filed in binders. In filing the tallies and other records a binding machine made by the McBee Binder Company, Athens, Ohio, is used. This permits the sheet to be bound permanently and inexpensively by a clerk entirely unfamiliar with bookbinding. The appearance of the bound records is very neat and they are readily accessible, as is seen in the photograph of the billing office.

A fair average month's business in the billing department on incoming freight runs about 14,000 pieces. The Egry billing on the local lines averages about 13,000 way bills per month. Twenty-four thousand pieces of manifest billing is an average month's work.


A-Old Engine Foundation
B- Store Room C-Boiler Rm.
Walkway
TOILETS
GEN'L FREIGHT AGENT
CLERK
ACCOUNTANTS
(Area, 1588 sq. ft.)
72'
80'
20'
BILLING ROOM
FREIGHT AGENT
Second Floor Plan
A
B
C
MOTORMEN & CONDUCTORS RM.
Basement Plan

SECOND FLOOR AND BASEMENT PLANS, EDDY STREET FREIGHT HOUSE

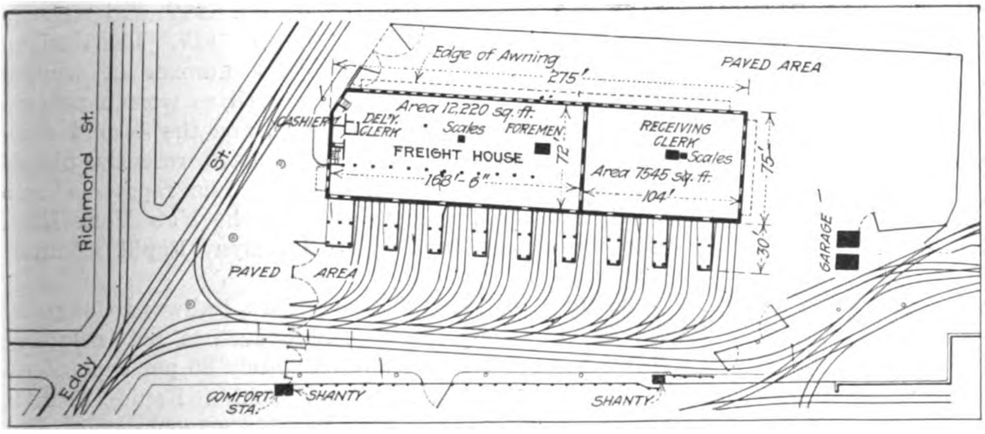
The billing office works in two shifts of nine hours each. The shifts are so arranged that one clerk reports at 2 p.m. and works until 11.30. The night clerk reports at 9.15 p.m. and is relieved by an early shift at 7.15 a.m. The office is open day and night except Sundays the year round, as is the freight house also.

FREIGHT DEPARTMENT IS ENTHUSIASTIC OVER ITS BUSINESS

A. E. Paddock, general freight agent the Rhode Island Company, is a firm believer in the future of the freight business for electric railways. He has had prepared the accompanying chart of data summarizing the growth of this department. He finds that the superior quality of service furnished by the electric lines is greatly appreciated by shippers. No time-table is published by the freight department, but the scheduled closing times for cars for different points are published each month in the *Street Railway Guide*, the official time-table booklet of the Rhode Island Company. All of the company's cars are "peddler" cars, picking up business along the line and hence furnishing a type of service that cannot be furnished in any other way.

Rush-Hour Shoppers Warned

At a recent meeting of the tramways committee of Cardiff, Wales, Arthur Ellis, general manager, asked the press to inform women intent on shopping and not engaged in war work that unless they could manage to do their buying in reasonable hours they would be excluded from the cars altogether. It might be necessary for women, said Mr. Ellis, to produce certificates to show that their business entitled them to ride in the cars. This was what it would come to if the cars were used for pleasure in busy hours. It was suggested that when their business was not urgent people should use the cars between 9.30 a. m. and 12.30 p. m., 3 p. m. to 4 p. m. and after 6.30 p. m. It was unanimously agreed that Mr. Ellis should have the power to curtail service whenever necessary, owing to the abnormal circumstances. Shoppers in America who travel during rush hours might well take warning.


Richmond St.
St.
Eddy
Edge of Awning
PAVED AREA
275'
Area 12,220 sq. ft.
CASHIER
DEL'Y CLERK
Scales
FOREMEN
FREIGHT HOUSE
168'-6"
72'
RECEIVING CLERK
Scales
Area 7545 sq. ft.
104'
75'
30'
GARAGE
PAVED AREA
COMFORT STA.
SHANTY
SHANTY

EDDY STREET FREIGHT HOUSE, RHODE ISLAND COMPANY, PROVIDENCE, R. I., AND SURROUNDING YARDS

Women Conductors in New York

Labor Bureau's Report on Women Conductors—State Medical Inspector Makes Thorough Examination and Finds Conditions Generally Satisfactory—Employees Interviewed and Say Work Is Preferable to That in Which They Were Formerly Engaged—Federal Report Less Favorable

TWO reports on the woman conductors in New York have recently been made public. One of these is by Benjamin M. Squires, and is published in the May number of the United States Bureau of Labor statistics. The other was submitted by Rosalie Bell, M. D., medical inspector of the New York State Industrial Commission, to Hon. James L. Gernon, first deputy commissioner. Owing to the length of the Squires report and the fact that it is available in printed form, only a brief abstract is made of the portion relating to surface car conductors. In addition several pages of the report were devoted to the employment of women as subway guards in Brooklyn, but the conditions mentioned do not vary greatly from those described under surface car operation and as readers of this paper are more concerned with the references to surface cars in the report, the portion on subway practice has not been digested.

For the same reasons in the reports of Dr. Bell the portion relative to the women subway guards have been omitted. Otherwise, the reports by Dr. Bell are printed complete, except that initials have been substituted for the names of the conductors mentioned and their addresses have been omitted, to avoid annoyance to them.

When abstracts of the Squires report appeared in the New York papers, representatives of several papers interviewed Mr. Hedley, vice-president New York Railways Company, in regard to the report.

Mr. Hedley said that the work was easier and much more congenial than many kinds of employment which women left to work for the railway company, that they received an even more rigid physical examination than the men before they were employed, that there was every convenience for their health and comfort at the different stations, that they were able to get off one, two or three days to rest if necessary, that their pay was the same as the men received with the exception of certain bonuses for long service and that there were no complaints from the women.

TABLE I.—TIME OF OCCURRENCE AND DURATION OF PERIODS IN THE DAY'S WORK OF WOMEN EMPLOYEES DURING A PERIOD OF SEVEN DAYS—NEW YORK RAILWAYS

Time of Occurrence of Waiting Period (Time Off Duty between Parts of Day's Work)	Number of Work Days, with a Waiting Period (Time Off Duty between Parts of Day's Work) of—									
	Under 1 Hr.	1 and Under 2 Hrs.	2 and Under 3 Hrs.	3 and Under 4 Hrs.	4 and Under 5 Hrs.	5 and Under 6 Hrs.	6 and Under 7 Hrs.	7 and Under 8 Hrs.	8 and Under 9 Hrs.	Total
7 a.m. and before 8 a.m.	1	...	1	...	1	..	..	..	..	3
8 a.m. and before 9 a.m.	2	12	18	38	25	..	1	8	7	111
9 a.m. and before 10 a.m.	19	43	73	56	19	3	15	29	4	261
10 a.m. and before 11 a.m.	2	22	30	6	2	6	6	3	..	77
11 a.m. and before 12 m.	4	43	44	7	1	1	1	2	..	103
12 m. and before 1 p.m.	12	84	120	26	10	1	..	..	..	253
1 p.m. and before 2 p.m.	7	102	75	24	2	..	..	..	..	210
2 p.m. and before 3 p.m.	23	90	188	37	8	..	..	..	..	346
3 p.m. and before 4 p.m.	14	196	165	44	3	..	..	..	..	422
4 p.m. and before 5 p.m.	25	155	86	8	1	..	..	..	..	275
5 p.m. and before 6 p.m.	18	50	7	4	1	..	..	..	..	80
6 p.m. and before 7 p.m.	6	25	6	...	1	..	..	..	..	38
7 p.m. and before 8 p.m.	5	10	2	...	..	..	..	..	..	17
8 p.m. and before 9 p.m.	2	3	2	...	..	..	..	..	..	7
9 p.m. and before 10 p.m.	1	1	3	...	3	..	..	..	..	8
10 p.m. and before 11 p.m.	1	1	5	2	..	..	..	..	..	9
11 p.m. and before 12 p.m.	...	22	16	...	..	..	..	..	..	38
12 p.m. and before 1 a.m.	5	13	...	...	..	..	..	..	..	18
1 a.m. and before 2 a.m.	2	1	1	...	..	..	..	..	..	4
2 a.m. and before 3 a.m.	...	...	1	2	..	..	..	..	..	3
Total	149	873	843	254	77	11	23	42	11	2,283

He also called attention to the conclusions of the inspector of the State Industrial Commission.

The papers also carried interviews with several women conductors on both properties in which they expressed satisfaction with the work.

The photograph on page 1007 shows the new summer uniform adopted by the New York Railways. It is of khaki, like the winter uniform of the same company, but of better quality, and a skirt reaching to about 10 in. from the ground has been substituted for the former bloomers, the coat is shorter and laced leggings are used instead of the former tape puttees. The cost of this summer uniform is: Skirt and coat, $8; cap, $1; leggings, $1.

At the present time the New York Railways has 467 women conductors in active service and thirty students.

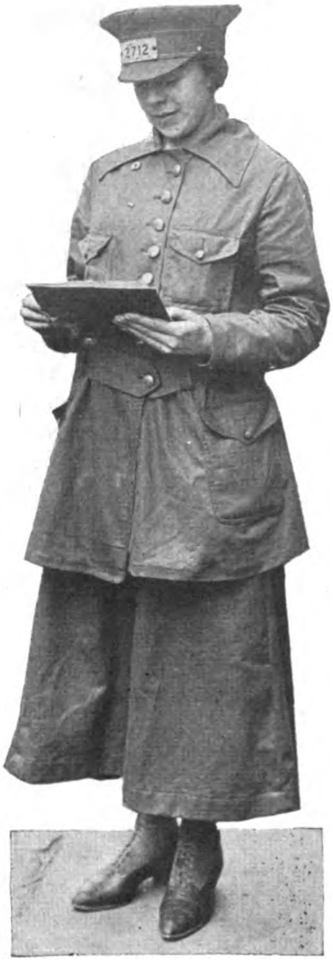
Report by Mr. Squires

A brief reference was made in the May 11 issue of this paper to the report by Benjamin M. Squires in the monthly review for May of the United States Bureau of Labor Statistics on street railway employees. The full text of the report, since available, shows that it occupies twenty-two pages of the review and contains a number of tables. It is devoted entirely to conditions in New York and Brooklyn where women are employed as electric railway conductors. The subject has been treated under four heads, though not so subdivided. These are: (1) statistical; (2) working hours and elapsed time; (3) period during day employed, and (4) sanitary and health conditions.

STATISTICAL AND OPERATING DATA

According to the report women have been employed as conductors in the operation of surface cars in New York and Brooklyn since December, 1917, and on subway cars in Brooklyn since October, 1917. The Hudson & Manhattan Railway employs a number of women guards on its subway trains as well as women porters and ticket agents at the stations, and the Second Avenue and Queens Surface Lines have recently placed women conductors on their cars. The report is confined, however, to the practice of the New York Railways Company and the Brooklyn Rapid Transit Company.

On Feb. 15, 1918, the New York Railways Company had in its employ 452 women conductors, not including thirty-five students, or approximately 30 per cent of all conductors employed. The Brooklyn Rapid Transit Company on the same date had 138 women conductors, not including forty-one students, on its surface cars,



Summer Uniform for Women Conductors New York Railways

and 297 women guards, not including women employed regularly in other occupations who work a portion of their time as guards. These were 5.6 and 21.7 per cent respectively of the total number of conductors and guards employed. In addition, on its subway-elevated stations, the Brooklyn company employed 929 women ticket agents out of a total of 1002 in this occupation, and fifty women porters out of a total of 180. The use of women ticket agents is not an innovation, however, and the porters are virtually cleaners about the stations, and in neither position does the employment of women present any unusual difficulties.

After explaining that under the practice of both companies choice of runs goes with seniority of service, the report says that on Feb. 15, 1918, practically all of the 138 women conductors on the surface lines of the Brooklyn Rapid Transit Company were extras. Of the 297 women employed as guards and conductors on the subway lines with the same company, forty were extras. Of the 452 women conductors employed by the New York Railways Company, 119 were extras. All of the male conductors employed by the New York Railways Company had regular runs. Several tables are given to show the hours worked by women on straight runs, swing runs of two periods and swing runs with three periods during the twenty-four, with the length of time worked and the time elapsed.

On the basis of one week, on the New York Railways, 13½ per cent of the total days worked by women conductors was completed in ten hours, and 62.9 per cent required twelve hours and over. On the Brooklyn Rapid Transit Company surface lines 16.1 per cent of the total days worked by women conductors required less than ten hours and 48.5 per cent required twelve hours and over. On the subway-elevated lines in Brooklyn, 36.5 per cent of the total days worked by women guards and conductors required less than ten hours within which to complete the day's work, and 50 per cent required twelve hours and over.

Table I, taken from the report, shows the duration and hour of occurrence of the waiting time of women employees during a period of seven days on the New York Railways Company. Similar tables were published for the Brooklyn Rapid Transit surface and subway-elevated lines.

Table II, also from the report, is a summary of the hours at which the runs began and ended on the New York Railways.

The author of the report thinks that those who advocate the employment of women as conductors have given scant consideration to irregularity of hours, to "within" time and to night work, or else they regard these as more than compensated by the comparative lightness of the work. The report considers the work not light, however, and that it involves considerable nervous strain as well as exposure to cold, damp and drafts, even on the best types of inclosed vestibule and center-door cars.

The report says "obviously a separate waiting and rest room must be provided for women employees. It must be considered too that since the strain upon women is greater than upon men in this work, opportunity for rest and relaxation must be provided in greater measure than for men. The need of adequate rest-room facilities for all women off duty becomes more apparent when it is taken into consideration that employees often live too far from the carhouses to make it practicable for them to go home between portions of the day's work. The immediate neighborhood of the carhouses is seldom inviting. Even if the waiting period comes at a convenient time or is of sufficient duration to permit women employees to shop or to go to places of amusement, it is

TABLE II.—NUMBER OF WORKDAYS OF WOMAN EMPLOYEES WHICH BEGAN AND ENDED AT EACH CLASSIFIED TIME DURING A PERIOD OF SEVEN DAYS—NEW YORK RAILWAYS

	Number with Ending Time—A.M.												Number with Ending Time—P.M.												
Beginning Time	12 and before 1	1 and before 2	2 and before 3	3 and before 4	4 and before 5	5 and before 6	6 and before 7	7 and before 8	8 and before 9	9 and before 10	10 and before 11	11 and before 12	12 and before 1	1 and before 2	2 and before 3	3 and before 4	4 and before 5	5 and before 6	6 and before 7	7 and before 8	8 and before 9	9 and before 10	10 and before 11	11 and before 12	Total
2 and before 3 a.m.	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
4 and before 5 a.m.	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	1	..	..	1	..	..	..	..	4
5 and before 6 a.m.	..	..	..	..	..	..	[1]2	1	3	3	..	2	..	..	1	1	5	33	36	98	3	..	..	1	189
6 and before 7 a.m.	..	..	..	..	..	..	..	..	12	11	6	7	..	2	2	6	12	27	214	217	89	4	..	..	609
7 and before 8 a.m.	2	1	..	..	..	..	..	..	..	1	1	..	2	..	1	2	1	3	30	88	40	13	..	1	186
8 and before 9 a.m.	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	1	1	8	18	2	..	..	33
9 and before 10 a.m.	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	1	7	..	3	..	2	15
10 and before 11 a.m.	9	1	..	..	..	1	..	..	..	..	..	1	2	..	1	..	..	3	3	6	2	1	5	16	51
11 and before 12 m.	59	24	5	1	..	..	..	..	..	..	..	..	..	1	..	2	2	1	3	3	2	2	8	24	137
12 m. and before 1 p.m.	147	173	43	3	..	..	..	..	..	..	..	..	..	..	3	8	1	4	5	8	7	9	6	33	450
1 and before 2 p.m.	51	128	38	3	..	..	..	..	..	..	..	..	..	..	..	2	2	6	2	5	5	5	2	14	263
2 and before 3 p.m.	8	19	2	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	4	1	1	3	1	3	44
3 and before 4 p.m.	4	5	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	3	1	1	1	24
4 and before 5 p.m.	4	7	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	2	..	1	..	19
5 and before 6 p.m.	2	5	..	..	..	5	3	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	18
6 and before 7 p.m.	2	2	2	..	..	8	5	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	3	26
7 and before 8 p.m.	1	5	..	..	..	5	12	5	6	2	..	..	..	..	..	..	..	..	..	..	..	..	1	1	38
8 and before 9 p.m.	..	..	..	..	..	..	1	1	6	6	..	..	..	..	..	..	..	..	..	..	..	..	..	1	15
9 and before 10 p.m.	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
12 and before 1 a.m.	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total	290	370	93	7	..	20	25	12	27	24	9	12	5	4	8	22	25	79	305	447	172	44	26	101	2,128

[1] Work ended the morning of the following day.

necessary for them to change to street dress and again to uniform or work dress" An inspection was made of the condition of the rest rooms in each depot and the facilities at some were criticised as inadequate. The report also speaks of the importance of maintaining near the car depots clean, wholesome lunch rooms as a means of maintaining the health and efficiency of the employees, especially the women employees.

OTHER CONDITIONS OF EMPLOYMENT

The uniform on the New York Railways is a regulation uniform consisting of an all-wool shirt, a coat, trousers, puttees and a cap of khaki. The company furnishes these at a cost of $5.75 to the employees. The women provide their own heavy coats and other apparel. Uniforms in Brooklyn consist of a dark skirt furnished by the employee, a cap and heavy coat, both dark blue in color, at a total cost to the employee of $16.10.

The age limits are twenty-one to forty-five, and a large percentage of the applicants are rejected. The same wages are paid to the women as to the men for the same work. The wages on the New York Railways and the surface lines of the Brooklyn Rapid Transit Company are 27 cents per hour for the first year. These wages increase on both lines to 30 cents for the second year and then by different gradations up to the sixteenth year, when the amount is 34 cents on the New York Railways and 35 cents on the surface lines of the Brooklyn Rapid Transit Company.

In discussing the attitude of the general public toward the practice the report says: "Public sentiment is rarely manifested except when inconvenience is threatened or occasioned. To those who use the street cars the introduction of women meant the operation of a greater number of cars and consequently better transit facilities. Attracted at first by the novelty of women conductors and inclined somewhat sentimentally toward the idea of women doing their 'bit' and releasing men for service, the general public seems now to have complacently accepted the situation with little thought of the consequences that may result and with less knowledge of the conditions under which women conductors work. A woman conductor, although still an object of interest, no longer excites any considerable comment."

The attitude of the Consumers' League of New York, as expressed by its representatives, is that there is no objection to women being employed in the operation of street cars but there should be protective legislation regulating the conditions under which women work. The Lockwood bill introduced into the Legislature at the recent session and indorsed by the Women's Trade Union League, New York State Child Labor Committee, and Consumers' League limits the work to six days or forty-eight hours in any week and to eight hours in any day unless for the purpose of making a shorter work day of some one day in the week, or before 7 o'clock in the morning or after 10 o'clock in the evening of any day.

The report concluded with the statement that from the facts brought out "it must be evident to every thinking person that it is practically impossible to make the conditions of employment even tolerably endurable to women employees." It also deprecates any policy of employing women to lower wages or to keep wages from rising to meet increases in the cost of living.

Reports by Medical Inspector of State Industrial Commission

REPORT ON BROOKLYN SURFACE LINES

Feb. 27, 1918.

MR. JAMES L. GERNON,
First Deputy Commissioner,
State Industrial Commission.

DEAR SIR:

In accordance with your request, I have made an investigation of the complaints made by the Central Federated Union of New York and the Central Labor Union of Brooklyn and Queens regarding the employment of women on the "elevated, trolley and subways."

The New York Railways (Theodore Shonts, president), operates numerous lines of surface cars in the Borough of Manhattan. It employs women as conductors.

The Brooklyn Rapid Transit (T. S. Williams, president), operates surface and elevated railways and subway; the latter extends from Coney Island, Sea Beach, Bay Ridge, Brooklyn, to Times Square, Manhattan.

The first investigation made was that of the Brooklyn Rapid Transit, which employs about 1621 women as follows:

Ticket agents (about)	1,000	(employed on elevated and subway stations)
Conductors	210	(employed on surface cars)
Guards	324	(employed on surface cars)
Car cleaners	41	(employed at subway stations)
Porters	46	(employed at subway stations)
	1,621	

Their employment office is located at 40 State Street under the management of Albert Maxwell, superintendent of employment. Male applicants apply for positions during the morning hours; female applicants from 2 p. m. to 5 p. m.

METHOD OF APPLYING FOR POSITION

All applicants are interviewed and casually inspected by Mr. Maxwell and his assistant, Mr. Hamilton.

If the applicant desires the position of conductor, she must be at least 21 years of age and measure 5 ft. 5 in. in height. Should the applicant fill these requirements, she is requested to write her name upon a blank card and present same to the physician and submit to an examination of her sight (distance and color), hearing, and answer numerous questions regarding her present and former state of health. If after the examination the applicant is recommended, she is required to fill out an application blank, is measured and weighed and the results are duly recorded upon the application blank. (Forms of these blanks are herewith attached.)

The applicant is then requested to sit for her photograph. Two forms are obtained—full face and profile. One of each is filed at the employment office, another at the station to which the conductor is detailed.

Later, she is given a badge and puncher for which she deposits $2, which is later refunded. She also obtains a cap and overcoat and is notified to appear at the School of Instruction, Fifty-eighth Street and Second Avenue, for instructions in her duties as conductor. (Guards are instructed at the subway station, Thirty-sixth Street and Ninth Avenue).

The school for instruction is located at Fifty-eighth

Street and Second Avenue, under the supervision of Mr. Winfield.

The instruction is theoretical and practical. A class room is fitted up with desks, blackboards, etc., and lectures are given to both men and women conductors on the methods of filling out day cards, recording the number of trips, transfers, etc. Examples in fundamental arithmetic are given to test the ability of the newly-appointed conductors.

A couple of days later the practical instruction is given. In the outer hall models of different types of cars are installed, and on these the conductors receive instructions relative to stopping car, opening and shutting doors of cars, signaling motorman, ringing up fares and transfers, etc.

The entire course requires about three days. When the conductors have given satisfaction in both departments, they are sent out on cars with experienced conductors for about four or five days. Then they return to the school, take an examination, which if passed successfully entitles them to a regular appointment. The salary begins from that date. The conductors are then detailed to one of the numerous depots.

The five car depots of the company at which women are employed are as follows: Fresh Pond, Twentieth Street and Ninth Avenue, Bergen Street and Troy Avenue, Flatbush, and Fifty-eighth Street and Second Avenue.

FRESH POND DEPOT

This depot is in charge of a depot master. The female conductors detailed to this depot number forty-seven fully qualified and fourteen partially qualified. They serve on the following lines: Gates Avenue, Myrtle Avenue, Union Avenue, Bushwick Avenue, Wyckoff Avenue, Richmond Hill, Williamsburg Bridge local and Metropolitan.

The rest room for the women is located in a separate building, about 30 ft. x 12 ft. It is ventilated by two windows, lighted by electricity and heated by a large base-burner stove. It contains twenty-eight metal lockers, and there are numerous hooks around the walls. It has wicker lounge, numerous chairs and a telephone connected with the office whereby the conductors are notified when to start out on their cars.

Along one side of the wall is a long table divided into about twelve compartments and lined with metal. This is called a change-making table and is used by the conductors when making up their accounts after each run.

The wash room is adjoining. Two bowls and a wash basin have been installed but are not yet ready for use. The women conductors are obliged to use temporarily the toilets on the elevated station near by. The rest room was clean, well heated and ventilated. Several conductors were at leisure and resting during their "swings."

Their uniform consists of a heavy dark blue coat, a blue woolen shirt and a cap and ordinary shoes.

I interviewed two of the conductors whose swings did not expire for several hours.

1. F. N., twenty-three years of age, formerly employed by Loose-Wiles Biscuit Company as labeller. Piece work averaged about $12 to $13 a week. Has been employed as conductor for about three weeks. She is tall, well developed, has a fine color and says the work is not difficult. She made her application in the manner described, received a week's training and was appointed. She has never worked ten consecutive hours.

2. M. R., about twenty-two years of age, formerly employed by the Remington Arms Company, Bridgeport, Conn. Piece work averaged $3.50 to $4 per day, but work was not steady. Has been here for several weeks. Her hours are from 8 p. m. to 10 a. m. with swings between. Does not work ten hours per day. She looks fairly well and says her health has improved.

TWENTIETH STREET AND NINTH AVENUE DEPOT

This depot is in charge of a depot master. The female conductors detailed to this depot consist of thirty fully qualified and six partially qualified.

They serve on the following lines: Sixteenth Avenue, Vanderbilt Avenue, Union Street, Flatbush and Seventh Avenue, Seventh Avenue, Smith Street and Fifteenth Street.

The rest room is in course of construction. Conductors occupy temporary quarters in another room which is clean and comfortable. The toilet facilities are adequate. I interviewed two conductors.

1. H. M., twenty-two years of age. Formerly employed as clerk in National Suit & Cloak Company and received $9 per week. Has been employed here for the past three weeks and claims to have gained 8 lb. She appears to be in excellent health.

2. Mrs. M. D., twenty-one years of age. Has a child seven months old. Before marriage worked in silk braid factory and made from $1.50 to $2 per day. Has worked here five weeks. At first the constant standing made her feet ache and swell, but those conditions have disappeared. At present she has a sore throat and has been treated by the association's physician, who has forbidden her to work for two days. I was informed that any employee who has been ill twenty-four hours must report to the association's physician, undergo an examination and not return to work until he permits it. Mrs. D. claims to have gained 5 lb. in the last five weeks. She appeared to be in good condition.

BERGEN STREET DEPOT

This depot is in charge of a depot master. The female conductors detailed to this depot consist of twenty-seven fully qualified and five partially qualified.

They serve on the following lines: Bergen Street, Summer Avenue, Tompkins Avenue, Lorimer Street, St. John's Place and Hoyt and Sackett Streets.

The rest room is located in a store on the opposite side of the street. It is about 30 ft. x 20 ft. x 10 ft., is ventilated by two windows, lighted by gas and heated by base-burner stove. It is furnished with lounge and numerous chairs. In the rear a portion is partitioned off and is used as a lunch room. It contains table and chairs and lockers. There is a matron in attendance, who at the time of my visit was serving lunch to several women conductors. The change-making table was in course of installment. I interviewed two conductors.

1. P. M., about twenty-two years of age, formerly employed as weaver in the American Rattan Company. Piece work averaged $12 to $12.50 per week. Employed here for about one month. She is accustomed to standing and does not mind it. She has not gained or lost weight, and appears to be in robust health.

2. S. B., about twenty-four years of age, formerly worked on a farm at Riverhead, L. I. Is a farmer's daughter. Has been employed two weeks and prefers this work to farm work. She is in robust health.

I also interviewed another young woman whose car left in a few minutes, so I was unable to obtain a full account of her work. She told me, however, that she preferred night work, as she did not go on duty until noon and that gave her a chance to sleep late in the morning.

The toilet here is located in the hall and at date of visit was out of order. The women conductors use the toilets in the main building on the opposite side of the street, intended for the office employees.

FLATBUSH DEPOT

This depot is in charge of depot master. The female conductors detailed to this department consist of thirty-four fully qualified and three partially qualified. They serve on the Nostrand Avenue, Flatbush Avenue, Ocean Avenue, Rogers Avenue and Avenue C lines.

The rest room is located upstairs. It is a large, airy room about 40 ft. x 30 ft. x 12 ft., lighted by three windows. It contained twenty-four lockers, a change-making table, a lounge and numerous chairs. The toilet room with two bowls and two wash basins is located across the hall, all clean and sanitary. I interviewed two conductors.

1. A. O., twenty-two years of age. Formerly employed as a domestic. Has been employed here since Jan. 1. She finds the work easy and prefers to work during the day from 6.38 a.m. to 7 p.m., with intervening "swings." Her run requires about one hour.

2. O. D., twenty-two years of age. Formerly employed as saleswoman in Wanamaker's, where she received $12 per week. She is accustomed to standing and enjoys her work. She was most enthusiastic and said all the women were kindly and considerately treated by the Brooklyn Rapid Transit people from the highest to the lowest.

This completes the inspection of the depots, and the conductors detailed to surface cars.

I interviewed many whose "swings" expired shortly, and who, therefore were unable to give me a detailed account of their work.

Many preferred to work from noon or early afternoon to midnight and later with intervening swings, as this allowed them to sleep late in the morning. Others preferred the early morning hours, which enabled them to have their evenings free Efforts have been made to detail a conductor as near her place of residence as possible. Some conductors preferred to serve on the "open-in-the-center" cars; others on the rear platform cars. In all types of cars, the muscular effort is slight.

When visiting the school of instruction, Fifty-eighth Street and Second Avenue, I tried each form of car myself. Personally I thought the "open-in-the-center" car the easiest, as all operations—opening and shutting doors, receiving fares and transfers, etc.—were performed by merely pushing a button.

In the rear platform cars, these same operations required pulling various cords. Leather handles, I noticed, have been attached to these cords, thus requiring a shorter reach for the conductor. This type of car is decidedly the most popular, as the women claim they obtain more exercise and are not obliged to stand constantly in the same space.

HEALTH OF WOMEN EMPLOYEES

The Brooklyn Rapid Transit Company has employed women as conductors, guards, car cleaners and porters since about Dec. 11, 1917. At the headquarters, I was informed that there have been but a few cases of illness among the female employees and no cases of pneumonia at all. The employees who have resigned have done so on account of the work interfering with their home duties and obligations or the objections raised by their relatives. Many who passed the different tests and were accepted failed to appear at the school of instruction and the matter was dropped. Ticket agents on duty at the elevated roads have been so employed for the last twenty years or more, so I did not make any investigations of their condition. Those at the subway stations are more recent. It is absolutely impossible for any person to state definitely whether or not the work is injurious to the "health and moral fiber" of women. Time alone will show. As far as I was able to observe, the women were in good physical condition, lively, interested and enthusiastic over their work.

Of course, only women in good physical condition are accepted by the physician. All the conductors are women whose former positions were less remunerative. Many were employed in factories and stores where constant standing was required without the fresh air they now enjoy as conductors.

It is but natural to conclude that, with the increasing salary, which permits better food and living quarters and freedom from financial worries, in addition to the fresh air, their physical condition will improve rather than deteriorate.

Through the courtesy of the examining physician of the Brooklyn Rapid Transit, I was permitted to select an applicant for the position of conductor who appeared in perfect physical condition and make a physical examination. The applicant will receive her appointment in a few days. I have permission to visit the station where she is detailed and make another examination in two weeks, to compare the results and thereby ascertain whether or not her health has improved or deteriorated.

As far as I could ascertain all applicants for position have been politely and courteously treated by the Brooklyn Rapid Transit Company.

Mr. Dempsey, vice-president of the company, very kindly gave Mr. Whitney and myself a letter requesting all employees to allow us to make any investigation necessary, also to answer any questions we might ask. He also requested me to inform him of any conditions which I considered undesirable. I complied with his request.

I make the following recommendations:

1. Regulate the hours of the employees that all may have one day of rest in seven.
2. Regulate the length of runs, making one hour and thirty minutes the maximum length of time between car depots or toilet facilities.
3. Complete the construction of the rest rooms and install a matron in each.
4. Provide heat in booths of ticket agents and boxes of coin agents.
5. Prohibit dry sweeping of subway.
6. Remove pools of water and repair plumbing at different subway stations.

Respectfully submitted,
(Signed) ROSALIE BELL, M. D., Medical Inspector.

REPORT ON NEW YORK RAILWAYS

March 4, 1918.

Hon. JAMES L. GERNON,
First Deputy Commissioner,
State Industrial Commission.

DEAR SIR:

In accordance with your request I have made an investigation of the complaints made by the Central Federated Union of New York and the Central Labor Union of Brooklyn and Queens regarding the employment of women on the elevated, trolley and subways.

The New York Railways (Theodore Shonts, president), operates numerous lines of surface cars in the Borough of Manhattan. Since Dec. 4, 1917, it has employed women as conductors. At the present time it has about 462 women conductors.

The company's employment office is located at Fiftieth Street and Seventh Avenue. Applications are received from 9 a. m. to 5 p. m., and all women applicants are interviewed by a woman who is in charge of the women's department of employment.

The applicant must be twenty-one years of age and 5 ft. 5 in. in height. She is required to fill out an application blank (form attached), and later undergoes a physical examination at the private office of the physician who makes the examination (form attached). Four physicians—three male and one female—are employed by the company to examine all applicants. Another physician with an office at headquarters examines employees who wish to enter the association. He also tenders them medical and surgical aid at their homes when necessary.

When applicants have successfully passed the physical examination, etc., and are accepted, they are detailed to the school of instruction also located at headquarters, Fiftieth Street and Seventh Avenue.

The instruction consists in lectures, etc., relative to filling out day cards, recording number of trips, fares, transfers, etc. This instruction is usually completed in one day, after which the applicants accompany an experienced conductor on their cars for several days, thereby receiving practical demonstrations and instructions. The entire course requires usually about five days, during which time they receive $2 per day from the company. When they give entire satisfaction, they receive an appointment and are detailed to one of the numerous car depots throughout Manhattan.

The uniform consists of a cotton khaki colored cap, blouse, bloomers and puttees, with ordinary shoes. Each conductor is provided with a badge, puncher and police whistle.

The eight car depots of the company are at: Fiftieth Street and Seventh Avenue; Fiftieth Street and Eighth Avenue; Fifty-fourth Street and Ninth Avenue; One Hundred and Forty-sixth Street and Lenox Avenue; Forty-second Street and North River; Twenty-third Street and North River; Fourteenth Street and Avenue B and 605 Grand Street.

FIFTIETH STREET AND SEVENTH AVENUE DEPOT

The number of female conductors detailed to this depot is 168. They serve on the following lines: Broadway and Columbus Avenue, Broadway and Amsterdam and Seventh Avenue.

The rest room is at Fiftieth Street and Seventh Avenue headquarters, and will accommodate about 174 conductors. It measures about 40 ft. x 20 ft., is ventilated by two windows, is heated by steam and lighted by electricity. It contains seventy-two lockers, two tables, ten chairs, three bowls and two wash basins. There are hot and cold water, liquid soap, paper towels and every convenience.

I interviewed four conductors:

1. Mrs. A. B., about twenty-five years of age. Husband has been drafted. Has child six years old. Worked in a factory before her marriage. Has been employed as conductor for one month. Has never worked more than ten hours per day. Seems to be in excellent health.

2. F. S. Formerly employed as assistant paymaster by a tobacco corporation. Received $17 per week. She says she prefers this work. Seems to be in good health.

3. B. U., about thirty-five years of age. Formerly a practical nurse. Gave up that work as she did not wish night work. At present she works during the day and is able to take a day off whenever she finds it necessary. She prefers a "hobble" car, which allows the conductor to sit all day. She has been employed since Dec. 11 and claims that her health has improved. She seems in good health and is extremely intelligent.

4. C. B., about twenty-five years of age. Born in Ireland. Formerly employed as lady's maid at $35 per month. Has worked as conductor since Dec. 11, 1917. She also prefers a "hobble" car, as this permits her to sit all day. She is very robust in appearance and seems to be in perfect health.

FIFTIETH STREET AND EIGHTH AVENUE

There are ninety-five female conductors detailed to this depot. They serve on the Ninth Avenue cars.

The rest room is large and square (about 30 ft. x 30 ft.), ventilated by one large and three small windows, heated by steam and lighted by electricity. It is furnished with three tables, numerous chairs and several benches. There are 120 lockers here, a telephone and adequate toilet facilities. I interviewed several conductors, as follows:

1. R. A., twenty-two years of age, of Swedish birth. Formerly employed as a governess and received $30 per month with room and board. Has been employed as a conductor for the last eight weeks. She is detailed to a platform car and cannot sit down very often. For the first few days she had a backache, but that gradually disappeared. Her feet have never troubled her. She is of robust appearance and possesses good health, though at times she is obliged to rest for a day or two. This is perfectly agreeable to her employers and for that reason she prefers this position to one in which she would be obliged to be constantly on duty. She begins her first run at 12.25 p.m. and works until 3.30 p.m., then swings 6.25 p.m. to 1.05 a.m. She does not object to working past midnight and never has had any trouble with passengers.

2. Mrs. B. S., twenty-seven years of age. Formerly employed as waitress, later as cashier in a bathing pavilion at Asbury Park. Has been married eight months. Has worked here about eight weeks. Hours from 7.45 a.m. to 7.33 p.m. with intervening swings. At first work made her ache all over, particularly her arms. This disappeared in about four or five days. Since that time she has not been affected and claims to be in excellent health.

3. Mrs. L. S., about thirty-eight years of age. Formerly employed as a trained nurse. She has three children, eldest nineteen years of age. Employed as conductor for the last six weeks. Has not been affected in any way.

FIFTY-FOURTH STREET AND NINTH AVENUE

Fifteen female conductors are detailed to this depot. They serve on the Ninth Avenue line.

The rest room is about 30 x 30 ft., ventilated by three windows, heated by steam, lighted by electricity, furnished with one long table, five settees and numerous chairs. There are three shower baths at this rest room. In the toilet rooms are the bowls, two wash basins, paper towels and every convenience. I interviewed several conductors:

1. Mrs. M. M., twenty-six years of age. Has one child six years of age. Formerly employed as a coat checker in Jack's restaurant. Received $10 per week. Has been employed as conductor for the last two weeks. Begins work at 11 a.m. and finishes at 1.05 a.m. with intervening swings. She has a very robust appearance and claims to be in good health.

2. Mrs. A. D., twenty-one years of age. Has never worked before. Has been employed for the last three days and claims to be in perfect health. She seems less than 5 ft. 4 in. in height, and I advised her to serve on a hobble car.

3. G. P. Formerly employed as cashier by the Edison Company and received $9 per week. Has been employed as conductor for the last eight weeks and serves on a Broadway and Amsterdam "hobble" car. The doors of this car are opened and closed by the pressing of a pedal. She informed me that the amount of force required was but slight—a mere touch is sufficient. After working a few days she had slight rheumatism in one arm, but this condition has disappeared. Her hours are from 12.55 p.m. to 4.15 p.m., then swings to 6.55 p.m. to 1.30 a.m. She does not object to night work.

ONE HUNDRED AND FORTY-SIXTH STREET AND LENOX AVENUE

Ten female conductors are detailed to this depot. They serve on the One Hundred and Forty-fifth Street and One Hundred and Twenty-fifth Street lines.

The rest room measures about 25 ft. x 20 ft. It is well lighted and ventilated, heated and furnished with three benches, a table and ten chairs. The toilet room has six bowls and three wash basins.

This is not intended as a regular rest room, but as a stopping place, at the end of different lines. No conductors were resting here, so I was unable to interview any.

FORTY-SECOND STREET AND NORTH RIVER

The female conductors detailed to this depot are fifty-five. They serve on the Thirty-fourth Street line. The rest room is about 25 ft. x 15 ft., ventilated by two windows, heated by steam and lighted by electricity. It is furnished with a table, ten chairs and eighteen lockers. There is a toilet but no wash basin. A telephone has been installed. I was unable to interview any of the conductors.

TWENTIETH STREET AND NORTH RIVER

The female conductors detailed to this depot are thirty-nine. They serve on the Twenty-third Street crosstown line. The rest room is about 15 ft. square, ventilated by two windows, heated by base-burner stove and furnished with a table, two settees and seven chairs. There are sixteen lockers and a telephone has been installed. I interviewed one conductor.

1. M. C., about thirty-five years of age. She has had various positions and experiences. First as a governess in England; later as proprietor of a tea room in Vancouver, B.C. She has been in New York one year and was employed previously as a passenger elevator operator in Greenhut's, but this work was very trying on account of the bad air she constantly breathed. She has been employed about one month as conductor and prefers it on account of the fresh air. She claims some of the passengers are insulting and she has been obliged to reprimand them. She prefers the closed car which enables her to sit down. At times she is obliged to take a day off. She claims her health has improved. This woman seemed extremely intelligent, refined, well educated and not of a very robust appearance, and rather unsuited to the work. She expects to return to England as soon as conditions there are more favorable.

FOURTEENTH STREET AND AVENUE B

Fifty-one female conductors are detailed to this depot. They serve on the Fourteenth Street Crosstown and Eighth Street lines. The rest room is on the top floor of the building, and measures about 40 ft. x 20 ft. It is ventilated by one window, heated by steam and furnished with a table, three settees and numerous chairs; twenty-four lockers and a telephone have been installed. There are three bowls and three wash basins. I interviewed two conductors.

1. Mrs. S. M., about thirty years of age. Has three children. Formerly employed as saleswoman in Woolworth's and received $7 per week. She has been employed as a conductor for the last month and does not find the work as hard as that of her former occupation. She has placed her children in a home and once a week, during a swing, she is able to visit them. She works from 6.17 a.m. to 9.16 a.m., then swings to 11.59 a.m. to 3.02 p.m., then swings to 5.11 p.m. to 7.50 p.m.

She is a rather fragile-looking woman, but claims to be in good health. Her feet were very tender and swollen at first, but at present do not bother her.

2. M. M., about twenty-two years of age, born in Italy. Formerly employed as a cashier in a theater and received $8 per week; later as a finisher on suits and made about $18 to $19 per week piece work. Has been employed as conductor for the last month. She works from 7.07 a.m. to 8.40 a.m., then swings to 11.42 a.m. to 1.52 p.m., then swings to 4.37 a.m. to 9.09 p.m. She has not become quite accustomed to the work and doubts whether or not she will continue it.

GRAND STREET

Twenty-nine female conductors are detailed to this depot. They serve on the following lines: Spring Street, Madison Street, Houston Street and Prince Street. The rest room is located on the top floor of the building, and is about 50 ft. x 20 ft. It is ventilated by five windows and a skylight, heated by a large base-burner stove and furnished with a long table, four settees, and eight chairs. Twenty lockers and a telephone have been installed. Two bowls and two wash sinks are located on the opposite side of the hall.

This is a very bright, cheerful room and in my opinion the most comfortable and attractive rest room. I interviewed two conductors.

1. C. S., twenty-two years of age. Formerly employed as waitress in St. Catherine's Hospital, Brooklyn, where she received $18 per month with room and board. When I asked her why she worked in Manhattan when she lived in Brooklyn, she informed me that she considered the uniform of Manhattan conductors more attractive than that of the Brooklyn Rapid Transit conductors. She serves as follows: Spring and Delancy Street from 12.18 a.m. to 3 p.m., then swings to 4.44 p.m. to 12.02 a.m. Bridge local, 7.17 a.m. to 12.58 p.m., then swings to 2.58 p.m. to 7.20 p.m. She seemed to be in good health.

2. F. K., twenty-two years of age. Formerly employed as saleswoman by Woolworth's. Received $7.75 per week. Later received $10 per week as saleswoman in a store. She serves on a Spring and Delancy Street car from 6.12 a.m. to 8.47 p.m., then swings to 11.45 a.m. to 3.30 p.m., then swings to 5.06 p.m. to 7.30 p.m. She claims to be in good health and not inconvenienced by the long hours.

This completes the investigation of the rest rooms and women conductors.

CONCLUSIONS

As well as I could judge, all employees were courteously and kindly treated and had no complaint to make.

The New York Railways Company seems to be doing a great deal for its employees. A number of rest rooms have been comfortably equipped and inspected and supervised by a woman inspector.

A well-equipped dispensary is maintained at Fiftieth Street and Seventh Avenue. Here a physician and trained nurse are in daily attendance. They treat all accidents and injuries among the employees. Illnesses of various kinds are treated by the association's physician in another office located on the floor above. Trained nurses visit the employees when necessary.

Arrangements have been made with several hospitals whereby employees of the New York Railways can receive treatment when necessary.

The women seem to be in good physical condition. Those who were handicapped by an occasional disability were able to take from one to four days off per month with the consent and approval of the company. Many were able to select the hours they preferred; also the type of car.

In reading over the histories of these women conductors, it will be observed that nearly all had been employed previously in some less remunerative work and were accustomed to constant standing.

All had been subjected to a complete physical examination.

I questioned the physician and nurse on duty the afternoon I inspected the school of instruction and dispensary. Both informed me that the women were in good condition, and the commonest complaint among them was that of twisted ankles, caused by wearing extremely high heels and jumping off the cars.

Some of the conductors are on duty from twelve to thirteen hours per day, although they work but ten hours or less, with intervening swings.

In my opinion, this is too long a stretch. In addition they work seven days per week. It is true that the Sunday schedule requires shorter hours and that they are permitted to take a day off whenever necessary.

At present all seem to be in good condition, but whether or not they will be able to remain on duty so many hours, day after day, without a weekly day of rest remains to be seen. Many of the women have been employed as conductors for the last three months. A few lay off on an average of one day per week.

I make the following recommendations:

1. Regulate the hours of employment that all may have one day of rest in seven.

2. Regulate the length of runs, making one hour and thirty minutes the maximum length of time between car depots or toilet facilities.

Respectfully submitted,

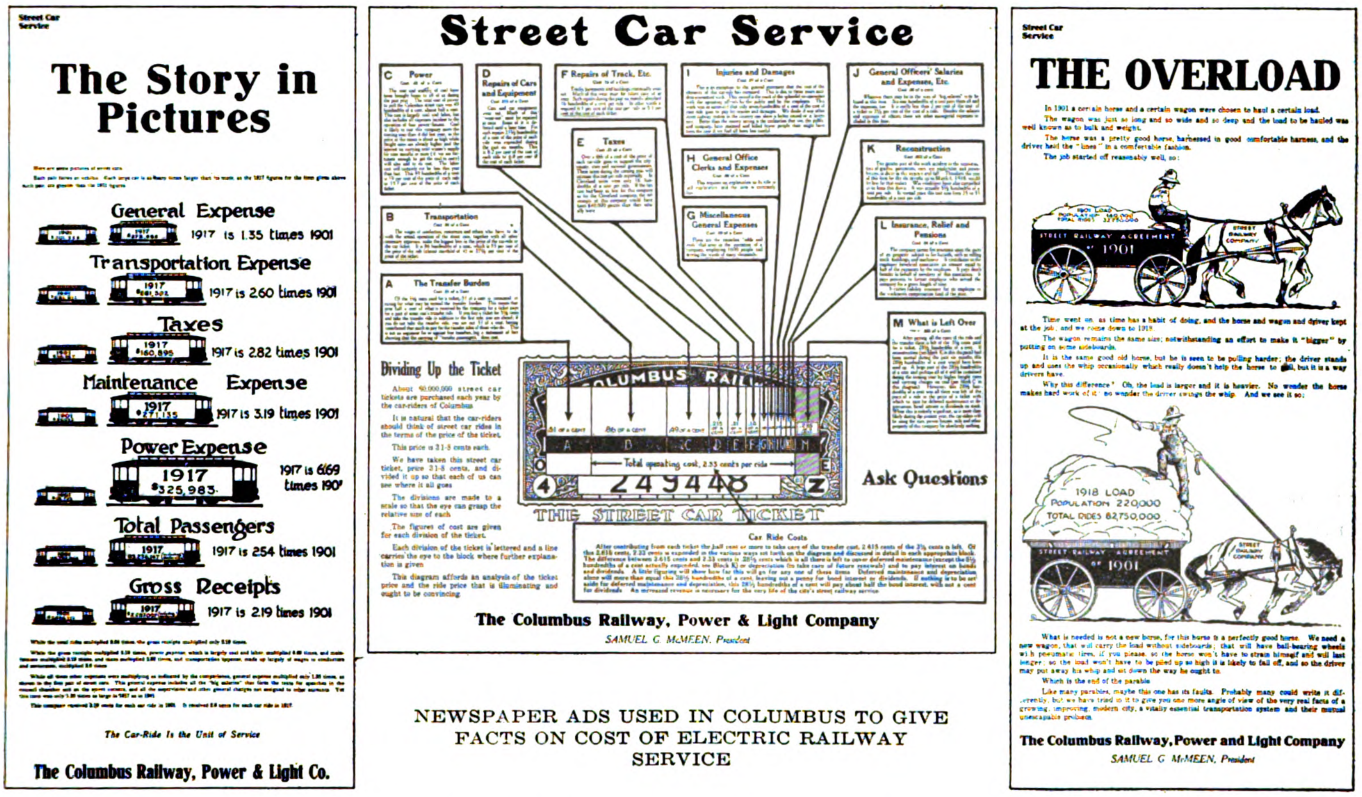
(Signed) ROSALIE BELL, M. D., Medical Inspector.

Telling the Public

Columbus Company in Newspaper Advertisements Is Presenting Facts About the Present Cost of Electric Railway Service

THE Columbus Railway, Power & Light Company, Columbus, Ohio, has been conducting a noteworthy advertising campaign to acquaint its patrons with the reasons for its application for an increased fare. Previous references to some of the advertisements were made in the ELECTRIC RAILWAY JOURNAL of March 9, page 480, and March 23, page 589. The accompanying illustration shows three additional advertisements that have been selected from among those used up to the present time.

The first advertisement, shown on the left, is the pictorial story of increased electric railway cost. The data show clearly how since 1901 the expenses have outrun the receipts. This advertisement, as well as the others, also emphasizes the idea that the car ride is the unit of service given by the company, and that the receipts therefor have decreased.



Street Car Service

The Story in Pictures

General Expense — 1917 is 1.35 times 1901

Transportation Expense — 1917 is 2.60 times 1901

Taxes — 1917 is 2.82 times 1901

Maintenance Expense — 1917 is 3.19 times 1901

Power Expense — 1917 is 6.69 times 1901

Total Passengers — 1917 is 2.54 times 1901

Gross Receipts — 1917 is 2.19 times 1901

The Car-Ride Is the Unit of Service

The Columbus Railway, Power & Light Co.

Street Car Service

C Power

D Repairs of Cars and Equipment

F Repairs of Track, Etc.

I Injuries and Damages

J General Officers' Salaries and Expenses, Etc.

E Taxes

H General Office Clerks and Expenses

K Reconstruction

B Transportation

G Miscellaneous General Expenses

L Insurance, Relief and Pensions

A The Transfer Burden

M What is Left Over

Dividing Up the Ticket

About 90,000,000 street car tickets are purchased each year by the car-riders of Columbus.

It is natural that the car-riders should think of street car rides in the terms of the price of the ticket.

This price is 31-8 cents each.

We have taken this street car ticket, price 31-8 cents, and divided it up so that each of us can see where it all goes.

The divisions are made to a scale so that the eye can grasp the relative size of each.

The figures of cost are given for each division of the ticket.

Each division of the ticket is lettered and a line carries the eye to the block where further explanation is given.

This diagram affords an analysis of the ticket price and the ride price that is illuminating and ought to be convincing.

Total operating cost, 2.33 cents per ride

THE STREET CAR TICKET

Ask Questions

Car Ride Costs

After contributing from each ticket the half cent or more to take care of the transfer cost, 2.615 cents of the 3⅛ cents is left. Of this 2.615 cents, 2.33 cents is expended in the various ways set forth on the diagram and discussed in detail in each appropriate block. The difference between 2.615 cents and 2.33 cents is .28½ cents which is all there is left to cover deferred maintenance (except the 8½ hundredths of a cent actually expended, see Block K) or depreciation (to take care of future renewals) and to pay interest on bonds and dividends. A little figuring will show how far this will go for any one of these items. Deferred maintenance and depreciation alone will more than equal this 28½ hundredths of a cent, leaving not a penny for bond interest or dividends. If nothing is to be set aside for deferred maintenance and depreciation, this 28½ hundredths of a cent will pay about half the bond interest, with not a cent for dividends. An increased revenue is necessary for the very life of the city's street railway service.

The Columbus Railway, Power & Light Company

SAMUEL G. McMEEN, President

Street Car Service

THE OVERLOAD

In 1901 a certain horse and a certain wagon were chosen to haul a certain load.

The wagon was just so long and so wide and so deep and the load to be hauled was well known as to bulk and weight.

The horse was a pretty good horse, harnessed in good comfortable harness, and the driver held the "lines" in a comfortable fashion.

The job started off reasonably well, so:

Time went on, as time has a habit of doing, and the horse and wagon and driver kept at the job, and we come down to 1918.

The wagon remains the same size; notwithstanding an effort to make it "bigger" by putting on some sideboards.

It is the same good old horse, but he is seen to be pulling harder; the driver stands up and uses the whip occasionally which really doesn't help the horse to pull, but it is a way drivers have.

Why this difference? Oh, the load is larger and it is heavier. No wonder the horse makes hard work of it; no wonder the driver swings the whip. And we see it so:

What is needed is not a new horse, for this horse is a perfectly good horse. We need a new wagon, that will carry the load without sideboards; that will have ball-bearing wheels with pneumatic tires, if you please, so the horse won't have to strain himself and will last longer; so the load won't have to be piled up so high it is likely to fall off, and so the driver may put away his whip and sit down the way he ought to.

Which is the end of the parable.

Like many parables, maybe this one has its faults. Probably many could write it differently, but we have tried in it to give you one more angle of view of the very real facts of a growing, improving, modern city, a vitally essential transportation system and their mutual unescapable problem.

The Columbus Railway, Power and Light Company

SAMUEL G. McMEEN, President

NEWSPAPER ADS USED IN COLUMBUS TO GIVE FACTS ON COST OF ELECTRIC RAILWAY SERVICE

The advertisement shown in the center gives in an illuminating way an analysis of where the 3⅛ cents paid for each ticket goes. Each element of cost is explained in detail in the proper block, and the text emphasizes the inability of the company to meet the demands of depreciation, bond interest and dividends. Deferred maintenance and depreciation, it is said, will alone more than equal the amount available for these items, leaving nothing for interest or dividends.

The third advertisement, on the right, tells the parable of "The Overload." This presents in an unusual way the difficulty of electric railway operation under an outworn operating agreement between a railway and the municipality served.

Six-Cent Fare Permitted in St. Louis

Missouri Commission Holds That Constitutional Consent Clause Does Not Bar It From Raising Franchise Rates to Provide Adequate Revenue — Suggests Ultimate Adoption of Zone System

CAR RIDERS in St. Louis, Mo., must pay a 6-cent fare after June 1. This is the happy finding of the Missouri Public Service Commission on the application of the United Railways for financial relief. A preliminary note in regard to the decision was published in the ELECTRIC RAILWAY JOURNAL of May 18.

The decision is a distinct victory for those who believe that municipal franchises do not constitute irrevocable contracts leaving States without power to regulate rates. In spite of a constitutional-consent clause in Missouri, the majority of the commissioners hold that it is their duty under the law to examine the facts and fix just and reasonable rates, notwithstanding franchise terms; and if the present rates are not sufficient to permit adequate service, then the public interest and welfare demand an increase of rates.

COMMISSION HAS CONTROL OVER FRANCHISE RATES

The commission had decided in a preliminary report on the petition of the company, as noted in the issue of March 9, page 477, that it has the power to change franchise rates. In view of the importance of the decision and the recent finding of the New York Court of Appeals in the Rochester case [E. R. J., April 13, page 696; April 27, page 811], however, the commission further examined the authorities. As a result it adheres to its former ruling and believes that its power cannot be seriously questioned. The decision as to jurisdiction was made under the following heads:

1. *Constitutional Clause Not a Grant of Power to City*

The opposition contended that Section XX, Article 12, of the State Constitution, by requiring municipal consent to railway construction and operation, prevents the State from altering the rates during the fifty-year franchise life. In the commission's opinion, however, the only harmonious construction is to hold that this article, when construed with other constitutional provisions regarding the police power and the control of the Assembly over rates, either does not delegate the power of the State to the city or, if it does, the city is empowered to fix or agree to rates only until the State elects to change them.

Continuing on this point the commission says in part:

"There is much merit in the contention that Section XX, Article 12, is not a grant of power to the city but is merely a limitation upon the power of the Legislature.

"Street Railroads; Chapter 155 R. S. Mo. 1889; Chapter 33, Article 5, R. S. Mo. 1909. State ex rel Kansas City vs. Ry. Co., 140 Mo. 539; Birmingham, etc. Ry. Co. vs. Ry. Co., 79 Ala. 465; Beekman vs. R. R., 153 N. Y. 144, 152; Farrell vs. Railroad Co., 61 Conn. 127; Citizens Street Ry. Co. vs. Africa, 100 Tenn. 27; City of Detroit vs. Ry. Co., 56 Fed. (Mich.) 867, 880; Chicago, etc. Ry. Co. vs. People 73 Ill. 514; People vs. Mutual Gas Light Co., 38 Mich. 154; People vs. Ry. Co., 92 Mich. 522.

"The lack of authority in the city to deprive the State of the power to regulate the rates also appears from the line of cases holding that the city cannot grant an exclusive franchise to an electric railway line upon its streets. This is the holding under both constitutional and statutory provisions, and shows that the city is not supreme in imposing conditions in its consent.

"St. Louis Transfer Ry. Co. vs. St. Louis Merchants Bridge Ry. Co., 111 Mo. 666; Grand Ave. Ry. Co. vs. Citizens Ry. Co., 148 Mo., l. c. 672; Birmingham, etc. Ry. Co. vs. Ry. Co., 79 Ala. 465; Parkhurst vs. Ry. Co., 23 Or. 471; Detroit Citizens Ry. Co. vs. City of Detroit, 110 Mich. 389, 171 U. S. 48. Booth on Street Railways (2nd Ed.), Sec. 29.

"The contention that Section XX, Article 12, is not a grant of power to the city to fix or regulate rates is also sustained by the following cases:

"State ex rel vs. Telephone Co., 189 Mo. 83; City of St. Louis vs. Bell Telephone Co., 96 Mo. 623; State vs. Pub. Serv. Comm., 270 Mo. 429; State Pub. Serv. Comm. ex rel vs. Railroad, 275 Ill. l. c. 570, P. U. R. 1917 B, 1046; Chicago vs. O'Connell 278 Ill. 591, 166 N. E. 210, P. U. R. 1917 E, 730; Woodburn vs. Pub. Serv. Comm., 161 Pac. 391, P. U. R. 1917 B, 967; Re Utah Light & Traction Co., P. U. R. 1918 B, l. c. 502."

2. *Rates Are Subject to State Regulation*

It may be, the commission remarks, that the city was empowered under Section XX, Article 12, or under its general power to contract, to impose or to fix rates by agreement with the company, but whatever its authority to enact the franchise ordinance the same was necessarily adopted subject to the provisions of the Constitution, reserving the rate-making power to the State and requiring the charter and ordinances of the city to conform always to the laws of the State. While the city had the right to refuse its consent, yet when this was given, it could not thereby deprive the State of its power to regulate the rates thereafter.

3. *Power to Regulate by Compulsion*

The fact that the city may have had authority as between itself and the company to make an agreement as to rates does not, to the commission's mind, mean that it had the right to contract away the police power of the State to fix rates by compulsion. This power had not been delegated or surrendered to the city. The rule is said to be well stated by the Oregon Supreme Court in Woodburn vs. Public Service Commission, 161 Pac. 391, P. U. R., 1917 B, l. c. 977.

"The right of the State to regulate rates by compulsion is a police power and must not be confused with the right of a city to exercise its contractual power to agree with a public service company upon the terms of a franchise. * * * The power to fix rates by compulsion is not granted to cities or towns; nor is the right of the Assembly to legislate upon that subject curbed by the State Constitution, because in its essence it is neither a municipal power nor an incident to a pure municipal power."

4. *Not an Impairment of Contract*

As to the assertion that an increase in franchise rates would be an impairment of contract, the commission holds that this is not so within the meaning of the Federal or State Constitution. (Woodburn vs. Public Service Commission, *supra.*) The State's act of regulation is not an impairment of contract but rather an exercise of a right provided in the contract.

5. New York Case Not Applicable

With reference to the recent Rochester decision in New York, the Missouri commission notes that the court expressly declined to pass upon the power of the legislature to alter franchise rates, in view of the lack of a provision in the regulatory law empowering the commission to raise franchise rates. The Missouri commission says:

"While we do not agree with the decision of the New York court, the decision is not in point in this case, as it cannot be doubted in view of the enactments and course of legislation in Missouri that it was the intention to confer, and the Legislature did confer upon this commission by the public service commission act of 1913, the power to regulate rates prescribed in franchises as well as other rates."

Having decided that it has power over franchise rates and having analyzed all the data, the commission discusses the question of relief. Pending a valuation of the property which the commission will make hereafter, through its own engineers, at as early a date as practicable, it is of the opinion that the investment, within the limits of the city of St. Louis, should be placed at $52,800,000. The average net annual return to which the company is entitled, after paying operating expenses and taxes and providing a reserve for replacements, including both minor and major obsolescence, is $3,168,000, or at the rate of 6 per cent.

COMPANY IS ENTITLED TO RELIEF

The commission estimates the operating revenue for 1918 at $12,731,792, which is about 3 per cent less than for 1917. The reduction is based partly upon a comparison of the revenue for January and February, 1918 (exclusive of the strike period), with the corresponding period of 1917, showing a decrease of 4.24 per cent for 1918; and upon a similar comparison for the first three months of the same years, showing a decrease of 2.83 per cent for 1918.

The commission believes that the reserves set up by the company are reasonable, to wit: Depreciation reserve, 10 per cent of gross revenue; injuries and damages reserve, 6 per cent of gross revenue, and insurance reserve, three-fourths of 1 per cent of gross revenue. The amounts credited to the depreciation reserve were $1,228,836 in 1913; $1,054,296 in 1914; $1,107,344 in 1915; $1,264,129 in 1916, and $1,312,555 in 1917. The total estimated amount to be reserved each year is $1,805,795. This exceeds the amount actually credited during any year cited. In the commission's opinion, the practice of the company does not make an excessive provision for depreciation.

The amount of $938,500 is estimated as the net income available for interest and dividends in 1918. This return is $2,229,500 less than the company is entitled to receive on the basis of the tentative valuation and is $1,584,730 less than the amount required to pay the interest on the funded debt.

It is apparent, the commission believes, that the company is entitled to temporary relief, and that the ultimate interest of the city likewise demands that such relief be granted. A reduction in service is not considered advisable at this time.

The commission remarks that the adoption of a zone system of rates, with a reduction in the fare for short rides to 3 cents or 4 cents, and an increase in the fare for long rides, approximately proportional to the distance traveled, would offer the most equitable solution, although it would entail some readjustment of real estate values and would undoubtedly be opposed at present by a large portion of the people of the city. Moreover, it would probably require the reconstruction of the cars at considerable expense, so as to permit the use of the "pay as you leave" system of collecting fares in place of the present "pay as you enter" system.

ZONE SYSTEM SHOULD BE CAREFULLY CONSIDERED

The company is adverse to the adoption of the zone system at this time, and, under all the circumstances, the commission concludes, for the present at least, to retain the system of uniform rates for all distances within the city limits, though it would urge upon both the city and the company a careful consideration of the zone system, with a view to its ultimate adoption as soon as the public can be brought to a realization of its advantages.

The commission looks upon a transfer charge as very undesirable and working a hardship upon a considerable portion of the traveling public. Increasing the fare for adults to 6 cents within the city and retaining the 2½ cents fare for children, however, will provide an estimated increase in revenue of $2,026,079, which is approximately $200,000 less than the required increase. The commission therefore concludes that such fares shall be allowed. The company will be required to issue coupon books, without reduction of rate.

The commission will retain control over the case and will so change the fare from time to time, by a reduction either in the basic rate or in the price of coupon books, as to insure a net average return as allowed, and no more. The commission adds, in concluding:

"If the company will agree to set aside any excess earnings, above the net return herein allowed, for interest and dividends, in a fund to be used as a reserve or to be expended for extensions, improvements and betterments with the consent of the commission, without capitalizing same as against the city and with due regard to the principle that such excess earnings shall primarily accrue to the public's benefit, it will not be necessary to change the rates as often as might otherwise be deemed advisable, as the city would receive the benefit of such excess earnings as might accrue. The commission, therefore, would entertain a proposition from the company in line with the above suggestion.

"The company has expressed a willingness to grant an increase of 10 cents per hour in the wages of motormen and conductors and a corresponding increase in the wages of all other employees whose salaries do not exceed $200 per month. The commission has based its estimate of operating expenses on such an increase in wages. The commission, however, does not hereby fix and determine this increase in wages, believing that the wages should be determined by arbitration."

Annual Brown Book Issued

Central Electric Railway Association and Allied Bodies Publish Their Official List for 1918

BROWN BOOK No. 8 of the Central Electric Railway Association, Central Electric Traffic Association and Central Electric Accountants' Association was issued from Indianapolis on May 15. It contains a list of officers, committees and members of the different associations, with their annual reports and other matter of interest relating to them. A list of the chairmen of the different committees follows:

CENTRAL ELECTRIC RAILWAY ASSOCIATION

Auditing Committee—Walter Shroyer, Anderson, Ind.
Annual Transportation—H. A. Nicholl, Anderson, Ind.
Bureau of Standards—Adolph Schlesinger, Anderson, Ind.
Constitution and By-Laws—A. W. Brady, Anderson, Ind.
Finance Committee—F. D. Carpenter, Lima, Ohio.
Hotel and Arrangement—S. D. Hutchins, Westinghouse Traction Brake Company.
Joint Interline Folder—E. B. Peck, Indianapolis, Ind.
Membership—A. C. Blinn, Akron, Ohio.
Military Efficiency and Defense—A. W. Brady, Anderson, Ind.
Program—E. B. Peck, Indianapolis, Ind.
Publicity—E. R. Kelsay, Toledo, Ohio.
Resolutions—A. W. Brady, Anderson, Ind.
Rules Governing Interchange of Equipment—H. A. Nicholl, Anderson, Ind.
Standardization—H. H. Ross, Toledo, Ohio.
Uniform Charges for Repairs to Interchanged Equipment—H. G. Gilpin, Springfield, Ohio.
Supply Men—S. D. Hutchins, Westinghouse Traction Brake Company.
Transportation—G. K. Jeffries, Indianapolis, Ind.
Track and Roadway—T. R. H. Daniels, Indianapolis, Ind.

CENTRAL ELECTRIC TRAFFIC ASSOCIATION

Auditing—Walter Shroyer, Anderson, Ind.
Booster—F. D. Norviel, Anderson, Ind.
Conference—F. D. Norviel, Anderson, Ind.
Conference with Central Freight Association and Central Passenger Association—J. H. Pound, Benton Harbor, Mich.
Constitution and By-Laws—C. J. Laney, Akron, Ohio.
Freight Rates—F. D. Norviel, Anderson, Ind.
Interchangeable Penny Coupon Ticket—W. S. Whitney, Springfield, Ohio.
Interline Baggage—O. H. Murlin, Dayton, Ohio.
Joint Passenger Tariffs—W. S. Whitney, Springfield, Ohio.
Joint Freight Tariffs—J. H. Pound, Benton Harbor, Mich.
Military Traffic—F. D. Norviel, Anderson, Ind.
Official Classification—W. S. Whitney, Springfield, Ohio.
Joint Exception Tariff—C. O. Sullivan, Lima, Ohio.
Joint Weight and Inspection Bureau—J. H. Crall, Indianapolis, Ind.
Official Interurban Map—G. M. Patterson, Fort Wayne, Ind.
Official Interurban Guide—C. O. Sullivan, Lima, Ohio.
Rules Governing Settlement of Freight Claims—F. D. Norviel, Anderson, Ind.
Storage and Demurrage—C. O. Sullivan, Lima Ohio.

CENTRAL ELECTRIC RAILWAY ACCOUNTANTS' ASSOCIATION

Clearing House—E. L. Kasemeier, Springfield, Ohio.
Compiling—L. T. Hixson, Indianapolis, Ind.
Freight and Express Accounts—Walter Shroyer, Anderson, Ind.
Light and Power—A. E. Dedrick, Youngstown, Ohio.

In the Heart of the Allegheny Mountains

FAR up in the Allegheny Mountains at Bluefield, W. Va., at the eastern terminus of the Norfolk & Western electrification, is a small trolley line operated by the Appalachian Power Company. Although the railway end of this company's business is only 4 to 5 per cent of its total gross, it operates the property on the principle of selling transportation. Bluefield itself has some 18,000 people and Graham, Va., with which connection is made, has only 2500. Nevertheless, the railway carries 6000 passengers a day in five cars. At no time are more than eight cars in service.

The longest straightway ride is 3 miles, but it is possible to ride 5 miles on a transfer. Because of the mountainous character of the section, the track is practically of shoestring character since it follows the valley.

When the present interests took hold, about five years ago, the service was poor and unappreciated. Old single-truck cars were used, and these were operated only at intervals of twenty minutes. These cars were replaced with double-truck cars, to which two new steel single-truck cars were added last year, and the headway was cut to ten minutes. This produced at once an increase of 25 to 30 per cent in gross income. Since then travel has grown at the rate of 10 per cent a year, or practically in parallel with the increase in population. There are no jitneys but quite a number of private automobiles which draw some business from the railway through the hospitality of their owners. These are expected to diminish gradually in view of government restrictions on output of machines, etc. Up to Feb. 1, 1918, franchise stipulations compelled the company to sell workmen's tickets at the rate of fifty for $1.50 and tickets good at any time at the rate of six for 25 cents. On presentation of its case, the West Virginia Public Service Commission permitted the company to change to a straight 5-cent fare. There was no protest. This change has caused a drop of 10 per cent in travel but an increase of 8 per cent in gross. Most of the traffic comes from railroad employees, clerks and merchants. Even the latter would travel on the 3-cent tickets.

The labor problem in this high-wage, coal-mining center is just as hard for this company with its small number of railway men as for many a big system. About half the men, says Herbert Markle, general manager, stick to their jobs, while the rest are floaters. Within the past year wages have been raised twice—a 5 per cent increase in wages and then a 10 per cent war bonus—making the average wage about 30 cents an hour.

Just as soon as the proper track labor can be obtained, a passing track will be put down in the heart of Bluefield to permit the effective operation of one-man cars. The present rolling stock is vestibuled, but no air brakes are installed. One-man operation is recognized by the management as the only way of continuing to give good service with some return on the investment.

LETTERS TO THE EDITORS

Limitations in Track Spiral Standardization

BROOKLYN RAPID TRANSIT COMPANY
BROOKLYN, N. Y., May 21, 1918

To the Editors:

Relative to the article by E. M. T. Ryder describing a proposed uniform system of spirals and the editorial thereon appearing in the issue of April 6, 1918, I wish to submit the following comments:

The proposed spirals, being based on the use of 5-ft. chords subtended by the center line of successive variable radii and consequently requiring all engineering data to be based on the center line of curve, are directly opposed to the established street railway practice of referring all engineering data to the inner gage line of curves. For this reason, instead of simplifying the methods of computation, the proposed spirals would only add to the labor of computing.

As a result of the rather long chords proposed, the ends of the spirals would be projected beyond the first frog into the curved crossing in double track lines, which, as will be understood by special work draftsmen, complicates computations considerably; compound curves should be eliminated from frogs whenever possible. Due to the essential design of frogs the alignment of curves is broken at every intersection and the resultant shock would be accentuated if there were compound curves in them.

When used in connection with tongue switches, most spirals become spirals in name only since a considerable proportion will be taken up by the arc of the switch radius used. In the case of a 100-ft. radius switch this will amount to about 7 deg. 30 min., and if the spiral is not used through the first frog, only two or possibly three radii of the spiral remain. The importance of spirals in special work proper has been very much exaggerated. They are more needed and are more useful in connection with the plain ends of branch-offs or plain curves.

There is practically no need for deflection angles when special work is laid out, since with the rather short middle radii used in street railway work special work is manufactured to template, and the information which is given on the drawing of the manufacturers is sufficient.

As to economies to be effected by the addition of another spiral to the miscellaneous assortment now in use, neither first cost nor subsequent maintenance would be affected, and I fully agree with A. E. Harvey and the others who have so clearly explained this phase of the question in previous letters to you.

Why not revise the design of A.E.R.E.A. standard guard rail to allow the use of 12-ft. lengths upon which practically all street railway spirals are based?

M. BERNARD, Assistant Engineer.

THE CONNECTICUT COMPANY
NEW HAVEN, CONN., May 21, 1918.

To The Editors:

I have read with interest the discussion on track spirals which has been published in your paper and consider that Mr. Harvey's letter covers the case fully and that no material advantage would be gained by attempting to standardize along the lines suggested. Mr. Ryder's article shows that there is practically no difference in the actual alignment of track, no matter which of the various spirals are used. Moreover, it would be many years before this standardization could be utilized, since the greater part of special work renewals would require that the repair pieces conform to the original layouts.

I understand that one steel company alone has templates for approximately 300 different spirals now, and if a new set of spirals were adopted as standard, it would mean an additional set of templates for each of the spirals adopted as standard, thus adding that much to the present number held by this one company.

Another feature not mentioned by Mr. Ryder, nor so far as I have seen by any of your correspondents, is the fact that while Mr. Ryder's spirals are figured to center line, two of the three larger steel companies figure their spirals to inside gage line, the purpose being to allow the use of their spirals for railways having a track gage greater, or less, than the standard gage, and there are several such railways in the United States. To make Mr. Ryder's spirals standard, therefore, they should be figured for the inside gage line, or it will be necessary to have additional standard spirals for companies not using standard gage.

Mr. Ryder's statement that the proposed spirals can be laid out on the ground by transit, if desired, is not inherent in these particular spirals, since all spirals can be laid out in the same way, and while it may be true that all spirals have not been tabulated with the view of staking them, they can be easily figured and tabulated so that the proposed standards will not have any advantage over those now in use in this respect.

Personally I would hesitate to recommend the adoption of these standards for use on our lines, as I cannot see where the company would be a gainer, since we have our data so worked up that it is a simple matter to determine car clearances in making layouts.

If present business conditions are to result in a curtailment of orders, this does not seem a good time to attempt a standardization which entails the cost of new templates for all steel companies. Moreover, as I assume that most of the curtailments will be in the renewal of entire layouts, such orders as do go through would be for parts of layouts and would of necessity require the use of the existing curvatures of the pieces to be renewed. There is so little difference between present spirals and the one proposed as standard, that it would be a step toward co-operation and economy for the railway companies to use exclusively the spirals of the three larger steel companies. This would make use of material and computations already existing, reduce the troubles and vexations mentioned by Mr. Angerer, and give results practically as close as with one standard.

W. R. DUNHAM, JR.,
Engineer Maintenance of Way.

AMERICAN ASSOCIATION NEWS

War Board Issues Bulletins

DURING the last week four bulletins have been issued by the American Electric Railway War Board. No. 16 transmits the bulletin issued by the Highways Transport Committee of the Council of National Defense on the establishment of return loads bureaus. No. 17 gives the text of the federal act approved by the President on April 20 in which electric railways are enumerated among other "war utilities" whose willful injury or destruction is punishable according to the terms enumerated in the act. No. 18 gives the text of the federal act approved on April 22 in which the President and his designated agents are empowered to take over street and interurban railroads for the transportation of shipyard and plant employees, and No. 19 is a copy of the rules issued by the National War Labor Board giving the procedure for taking up industrial disputes with that board.

Manila Company Section Holds April Meeting

THE chief feature at the meeting on April 2 of the Manila Company section was a talk by James C. Rockwell, general manager of the company, who had recently returned from the United States after a six months' vacation trip. He described the principal events of his tour, the evidences of war conditions which he had noticed and particularly the use of women conductors and guards in New York and Brooklyn. He said that the work of these women appeared to him to be excellent and the service rendered by them quite as good as that by men. In fact, he believed that it was rather better, as they had a quiet dignity about them which is too often lacking in men similarly engaged. Mr. Rockwell was introduced by Vice-President Duffy, who told of an interview which he had had with Hon. P. S. Reinsch, United States Minister to China, on the possibilities for development along commercial lines of the Philippine Islands.

"Snow-Fighting Night" at Milwaukee

AT THE APRIL meeting of company section No. 1 the entire evening was devoted to talks and discussions on snow fighting and snow-fighting equipment. R. R. Lukens, superintendent of way and structures, operating; H. A. Mullett, superintendent of rolling stock; R. H. Pinkley, superintendent of way and structures, engineering; G. M. Kuemmerlein, superintendent of transportation, and A. J. Killa, transportation department, took up the subject from the standpoints of their several departments. Supervisors Henningfeld, Wunderlich, Hackbarth, White, Throop and Hungsinger also gave interesting talks on their experiences in big snowstorms.

Mr. Lukens made a comparison between the snowstorms of 1881 and of last winter. He dwelt particularly upon the damage caused by thawing following the five severe storms of January and February. Mr. Mullett emphasized the importance of the part played by track sweepers in keeping the arteries of traffic open and described the types of sweepers in use at Milwaukee. Mr. Pinkley spoke of the formation of ice and snow and showed some slides from pictures made during recent snowstorms and also some illustrating the types of plows used. Mr. Kuemmerlein considered the delays caused by the compelling of teams and other vehicles to use the car tracks as one of the most serious problems in connection with snow handling. He told how the lines had been kept open in storms and also how expensive this work is. Mr. Killa outlined the local snow-fighting procedure and mentioned the fact that during last winter's storms some men operated sweepers as long as thirty-six hours continuously.

War Activities Reviewed at Capital Traction Meeting

AT THE FINAL meeting of the 1917-1918 season, held on May 9, by the Capital Traction Company section, No. 8, George E. Hamilton, president of the company, addressed the members and summarized the activities of the company's organization in Liberty Loan campaigns, Red Cross activities and the sale of thrift stamps. It was stated that in the two last Liberty Loan drives 505 individual subscriptions had been made from the ranks of the company for a total of $73,050, and that, including the company's investment of its reserve funds, in all three loans a total of $403,000 had been subscribed, exclusive of the individual subscriptions to the first loan of which no record was made. Red Cross memberships to the number of 375 were obtained in the campaign last December, and approximately $3,500 worth of thrift stamps sold. Eighty-nine men from the ranks of the company have entered the army or navy. After referring to what had been done Mr. Hamilton stated that although much had been accomplished, there was still a great deal to do, and he urged every member of the section to become a missionary to see that everyone understood the crisis the country is facing and put his full energies to the task in hand to the end that a successful termination may be reached in the quickest possible time.

The meeting was made the occasion of a celebration in honor of William E. Graham, foreman of the paint shop of the company, who is rounding out fifty years in the service of the company. Mr. Graham entered the employ of the Washington & Georgetown Railroad on June 18, 1868, about five years after the organization of that company which was the first street railway in the city of Washington. Mr. Hamilton paid a glowing tribute to Mr. Graham and presented him, on behalf of the company, with a check for $250, and on behalf of his fellow workers Mr. Graham was presented with a chest of silver bearing a suitable inscription.

The section had as its guests about twelve British sailors now in this country, and several of them contributed to the entertainment with songs. British official motion picture films, taken during the retreat of the Germans at the battle of Arras, were shown and gave those present a vivid picture of what modern war means. President Elon von Culin presided, and 165 members and guests were present.

The next meeting of the Capital Traction Commpany section will be held on Oct. 10, 1918.

Brake Slack Adjusters Assist in Producing Needed Economy

Automatic Adjustment of Brakes Reduces Maintenance Costs and Produces Safer Operation

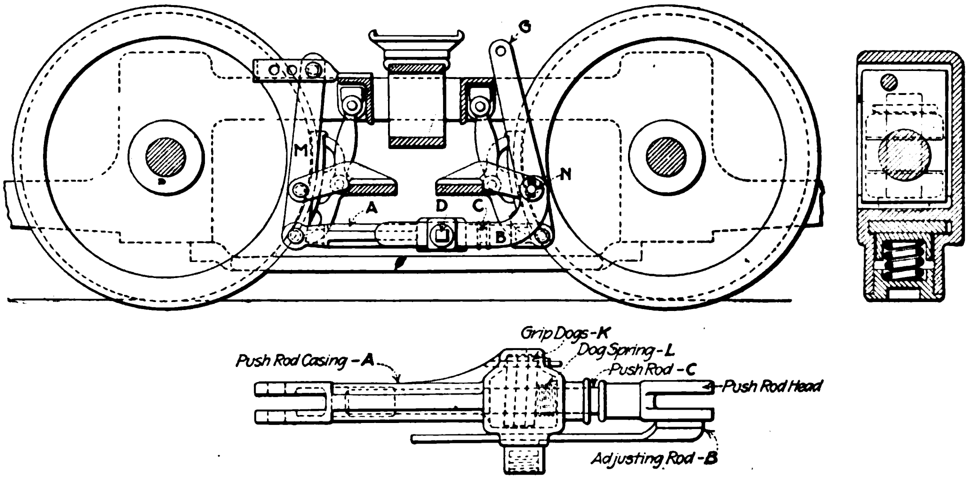
After a series of trials and careful investigation, the Brooklyn Rapid Transit System recently ordered 220 sets of Gould type slack adjusters for use under cars equipped with Peckham 14-D5 trucks. Air-brake engineers have recognized for a long time the desirability of using some kind of slack adjuster as a means for obtaining maximum reliability and efficiency of the braking system by providing uniform piston travel. The Gould slack adjuster is operated by either hand or air brake application and has resulted from many years of development and experimentation. During this time many details of construction have been tried out and discarded as being unsuitable for the severe conditions of surface car operation. The present type of adjuster is designed to take the place of the bottom brake rod connection between the live and dead levers attached to the brake beam. This location has been chosen as it has been proved that any slack resulting from brakeshoe, fulcrum or pin wear can be more effectively and more quickly taken up at this point.

The operation of the Gould type adjuster will be best understood by referring to the accompanying illustration which shows the adjuster as applied to the trucks of an electric car. In applying the brake the live lever *G* moves to the right, forcing the brakeshoes on this side against the wheels. At the same time the bottom rod *C* and the casing *A* of the slack adjuster are moved toward the left. The push-rod casing *A* is attached to the lower end of the dead lever *M* and its movement brings the brakeshoes on the left side tight up against the wheels. Should wear occur in the brakeshoes or wheels, the adjusting rod *B* attached to the brake-beam fulcrum of the live lever moves to the right to the extent of the lost motion in the slot at *N*. If the brakeshoe clearance exceeds this amount, the adjusting rod *B* which is held by a friction spring and shoe, is moved to the right. This friction will then be overcome and the push-rod casing *A* will move to the left to the extent that this movement exceeds the normal brakeshoe clearance provided in the slot *N*.

When the brakes are released, the action of the release spring, not shown, and the weight of the brake beam cause the shoes to fall away from the wheels. The lost motion in the connection at *N* is taken up, which provides the necessary brakeshoe clearance. The brake beam and shoes are now held in suspension by the friction of the adjusting rod *B*, and any further movement of the live lever caused by the force of the release spring will cause the push rod *C* to move to the right through the dogs *K*, which are held in the locked position by the spring *L*. These dogs permit movement of the push rod through them to the right, but grip the rod firmly and prevent movement toward the left. The push rod is thus drawn through the grip dogs the same amount that the excess travel in the brake rigging caused the friction clamp to slide on the adjusting rod as the brakes were applied and on the next application of the brakes normal movement of the live lever will prevail until such a time as the pins, shoes and wheels commence to wear, when the action will be again repeated automatically.

The holes through the grip dogs are slightly larger than the push rod so the rod passes freely through them when they are at right angles to it, but it is locked firmly against movement in the opposite direction due to the lever action of the dogs. Both the push rod and the dogs are made of high-grade steel so the wear is scarcely discernible after years of service. The spring *L* serves to hold the dogs in the locked position and prevents rattling of parts.

To release the slack adjusters it is necessary to insert a bolt or chisel behind the dogs and move them to the right as far as they will go. The operator can then move the brake beams and shoes away from the wheels by placing a bar behind the beam and new shoes can be readily inserted. After the shoes have been replaced a single application of the brakes takes up all excessive slack and provides the correct adjustment automatically. The car is then ready for operation.



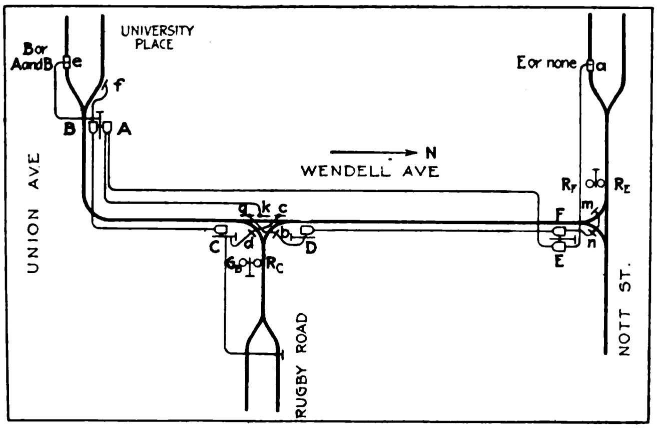
DETAILS OF THE GOULD TYPE SLACK ADJUSTER AS APPLIED TO AN ELECTRIC CAR TRUCK

A type of Gould slack adjuster for use on locomotive tenders, freight cars and passenger cars has a release spring as part of the adjuster, and an unlocking lever is provided for unlocking the grip dogs. The pressing in of this lever forces the dogs to an upright position and permits the push rod to slide easily and give the space necessary to replace the shoes. No tools are required.

The following are some of the advantages claimed for this type of slack adjuster: (1) Water, snow, ice and rust do not interfere with its operation. (2) Slack adjustment and replacement of worn shoes can be made quickly and without necessity of placing cars over a pit. (3) Costs are reduced by obtaining more mileage from shoes and the wheels, and by requiring less time for making brake adjustments and replacements. (4) Economy is obtained in operation of the cars by using less air and power and by reducing the number of accidents. (5) Comfort to the traveling public is increased by providing smoother, safer and more rapid operation. (6) The human element is eliminated by having automatic adjustment of brakes, and a cheaper class of labor can be used for making brake adjustments. (7) These adjusters can be substituted for the turnbuckles in the brake rigging and they automatically do the work of the turnbuckle.

Automatic Signals on the Schenectady Railway

THE Schenectady Railway has recently completed an installation of automatic signals on its single track on Union and Wendell Avenues; from University Place to Nott Street. The signals are Nachod automatic known as Type MD, having normal closed hold-clear circuits giving indications by lights and disks. They are operated and lighted from the trolley power and the entire signal relay, both magnets and switch contacts, is immersed in oil. The trolley contactor is of the flexible wiping type without moving parts.



SIGNAL LAYOUT FOR SCHENECTADY RAILWAY

The accompanying diagram shows the signal locations and their connections. The object of the layout is to block opposing movements respectively through a long block, *AE*, and also through a short block, *AC*, which is included within the long block, to permit following movements through each of these blocks, to permit opposing movements between the long and the short routes as far as the limits *C*, of the common track, and to prevent meeting on the long route except at the ends *A* and *E* of the long block. The special features of the layout are that contactor *e* when traversed with power will set two blocks of signals, and without power but one block. When traversed with power, contactor *a* will set one block, and without power will not affect the signals. The preliminary contactor located at the double track on Rugby Road will set the opposing signal *B* at stop as soon as the car starts to leave the double track and before it gets to the main single track block *CB*, but this block will also be completely controlled by contactor *d* or *c*.

The signals were furnished by the Nachod Signal Company, Inc., Louisville, Ky., and were installed by the railway company under the supervision of the signal company.

High Carbon Dioxide Percentage Indicates Good Boiler Room Operation

THE accompanying chart gives a ready means of determining the relation of percentage of carbon dioxide (CO_2) and operating economy. The chart connects percentage of CO_2, total annual cost of coal and total annual heat loss up the chimney. When a straight edge, represented by a broken line in the diagram, is laid across the chart through points selected on two of the lines, the corresponding value of the other quantity can be found by the intersection of the straight edge and the third line. For example, if $20,000 is spent per year for coal burned in the furnace whose average CO_2 registers 9.3 per cent then the approximate yearly loss is $5,000.

The object of this chart is to show that a high percentage of CO_2 is most desirable. To be sure even where the CO_2 is as high as 21 per cent, the theoretical maximum, there is a loss because in the average power plant the flue gases leaving the boiler have a temperature of 500 deg. or 600 deg. Fahr.

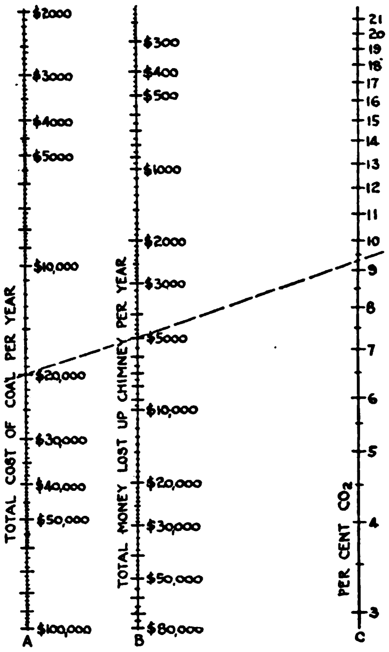


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CHART SHOWING RELATION OF CO_2 IN FLUE GASES AND ANNUAL CHIMNEY LOSS IN POWER PLANT

This chart is based on a flue-gas temperature of 600 deg. Fahr. and an outside air temperature of 60 deg. Fahr. Where the flue-gas temperature is higher or the outside air temperature is lower the money loss will be correspondingly increased. On the other hand, with a higher outside air temperature and a lower flue-gas temperature, the money loss is proportionately decreased. It has been assumed that the coal used has a heat value of 14,500 B.t.u. per pound of combustible. The chart was prepared by the Uehling Instrument Company, New York City.

Tie Tampers Help Solve Labor Problem

G. W. VAUGHAN, engineer maintenance of way, New York Central Railroad, presented a paper on tie tampers before the New York Railroad Club at its meeting on May 17. The Imperial tie tampers, as used by the New York Central Railroad, were described. Due to the present shortage of labor a foreman together with two men and a tamping outfit have been doing the work previously done by a gang of ten men. The outfit is left out on the line and is shifted by a work train crew each morning or night.

Comparison of costs for tamping by hand and with machines were given. These showed a substantial saving in favor of machine tamping.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Mayor of Toledo Questioned

Interrogated in Connection With the Injunction Preventing the City from Interfering With Fare Raise

Testifying in the Federal District Court at Toledo, Ohio, on May 17, Mayor Cornell Schreiber of that city disclaimed all responsibility for the so-called "Street Railway Commission" and said that he had not read its report, filed with him some time ago, except to glance at an occasional statement. Judge J. M. Killits agreed with him that the commission is not an official municipal body and that the Mayor is under no obligations to father its plan.

Mayor Disclaims Knowledge

This was brought out in a hearing on the injunction suit recently filed to restrain the city from interfering with the rate of fare charged by the Toledo Railways & Light Company, in which a temporary order was granted in favor of the company. Attorneys had attempted to have the Mayor identify a copy of the commission's report, but he insisted that he knew nothing about its contents and refused to comply with the request. The court upheld him.

Mayor Schreiber was also sustained in his refusal to answer questions as to what he had done toward solving the local railway dispute, as this matter is in the hands of the City Council. He had made no arrangements to keep the cars in operation and had prepared no papers looking to a receivership, had labor trouble occurred.

Testimony About Company Records

John J. Higgins, commissioner of city accounts, gave some interesting information in regard to the company's records. Taking into consideration the decrease in the number of passengers for December, 1917, and January and February, 1918, as compared with the same period a year before, amounting to 8.2 per cent, and estimating the gross operating revenue on the decreased number of passengers the coming year at a rate of fare of eleven tickets for 50 cents and cash fare of 5 cents, this revenue would be within $2,000 of the gross operating revenue for the entire calendar year of 1917. On this basis, he said, any increased wages paid the men would be a reduction of the company's return on its investment. The rate of eleven tickets for 50 cents and 5 cents cash fare would not provide the company with any additional money.

Mayor Schreiber, who had said that this was the only increase in the rate of fare he would approve, and Director of Law Emery argued that the earnings of the power department should be figured with the total earnings. The company objected to this on the ground that it was a separate department.

Judge Killits intimated that there should be some consideration of the possible return on the investment, but Mayor Schreiber said that his idea was that an increase should be made only for the purpose of paying the men higher wages. He believed it could be shown the company now paid more than 6 per cent on the investment.

Judge Rebukes the Mayor

At the session on the previous day Mayor Schreiber said the company had been paying interest on $15,000,000 bonds, while it was on the tax duplicate for $11,000,000. Judge Killits informed him that this was an ill-advised statement—an appeal that was causing all the delay in arriving at a settlement of the railway controversy.

The court made it plain that there was no desire on his part to fix a rate of fare, but that he felt perfectly capable of doing so if such a step became necessary. That was a function that should be performed by Council, but apparently this body had not seen fit to take the matter into consideration.

In speaking of the attitude of the employees, Mayor Schreiber said that they were under contract and for that reason he did not think they were entitled to as great an increase in wages as they had asked. He did believe, however, that some plan should be formulated to give living wages.

He believed the business of the company would be increased by the influx of people to work in the war industries and that at the end of the year the records would show a different story from the one shown at the hearing.

Government Takes S. P. Electric Lines

The Federal Railroad Administration on May 10 decided that the electric lines of the Southern Pacific Company in Alameda County, California, are a part and parcel of the Southern Pacific System and as such are under federal control. A telegram to the Railroad Commission from counsel to Director General McAdoo read:

"Our investigation shows that the electric lines at San Francisco, Oakland, Berkeley and Alameda are part and parcel of the Southern Pacific System and as such are under federal control."

It is expected that this action of the government will result in the dismissal by the Railroad Commission of the application of the company for increased fares for these lines on account of lack of jurisdiction under the new order.

Report on Canadian Road

Plans to Abandon Part of London & Lake Erie and Equip Rest With 1500 Volts Direct Current

The City Council of London, Ont., has received from Sir Adam Beck, chairman of the Hydroelectric Power Commission of Ontario, a valuation and report on the London & Lake Erie Railway, operating a 28-mile route between London and Port Stanley.

The company has been in financial difficulties since the city of London took over from the private lessees, and electrified its own railroad, between London and Port Stanley in 1915. The city road had been a failure under fifty years of steam operation, while the electric had prospered in recent years.

Offer to Sell Road

G. B. Wood, Toronto, president of the traction company, last summer called a meeting of representatives of the municipalities his line traverses and stated that the company could no longer hold out in competition with the London & Port Stanley Railroad, which had been rehabilitated at a cost of more than $1,000,000, and which gave a high-speed service over a shorter route. The negotiations brought no result and London was recently offered the traction line by its owners, who asked $450,000, an amount representing one-half the bonded indebtedness of the company. Later Sir Adam, at whose suggestion the London & Port Stanley Railroad was electrified, was asked to have his engineers report on the value of the line, and on a scheme to operate it in conjunction with the London & Port Stanley Railroad.

Sir Adam now reports that the physical value of the company including lands, buildings, materials, equipment, etc., was $262,164 on April 30.

Abandonment Plan Outlined

His engineers worked out a scheme to abandon, scrap and sell the right-of-way for a stretch of approximately 9 miles from a point north of St. Thomas through that city to Port Stanley. The two railways closely parallel each other between St. Thomas and Port Stanley. He would sell the company's power rolling stock, and with the proceeds extend the line to connect with the London & Port Stanley Railroad north of St. Thomas, and he would also connect the London terminals of the two railways. He would refit the road to operate on 1500-volt direct current as does the London & Port Stanley Railroad and would purchase new cars.

The report is to be considered by the City Council soon. The company has not commented on Sir Adam's report.

War Labor Board Announces Rules

Local Cases Heard by Sub-Committees—Board Itself to Grant Hearings Only When These Fail to Settle the Controversy

After thorough consideration of the problems to be met in the operation of the National War Labor Board's machinery for the adjudication of industrial controversies, the board on May 14 agreed upon a plan of procedure and method to be followed in all cases. This plan provides for the appointment of sub-committees composed of two members to act for the board in every local controversy, and the appointment of permanent local committees in cities and districts to act in cases therein arising, and also comprehends a method of investigating industrial disputes by trained field agents sent into territories by the board from Washington. It lays down the method to be followed by persons desiring to bring a condition to the attention of the board.

HEARING BY THE BOARD ITSELF

Under the form of procedure established, the board itself will sit in hearing upon cases only when its sections, or sub-committees, or local committees find it impossible to settle a controversy. In such cases the board will sit as a board of arbitration, decide the controversy, and make an award.

In compliance with the direction of the President's proclamation of April 8, the board will hear appeals in the following cases:

1. Where the principles established by him in such proclamation have been violated.
2. Where an award made by a board has not been put into effect, or where the employees have refused to accept or abide by such award.
3. To determine questions of jurisdiction as between government boards.

FULL TEXT OF THE DECISION

The full text of the decision of May 14 follows:

1. Any person desiring to bring before the National War Labor Board an issue between employer and employees, of which the board has cognizance, shall deliver to the secretary of the board a written statement, signed by him, with his proper post-office address at his home and in Washington. The statement shall contain a brief description of the grievance and the names of the persons or corporations against whom he complains, with their post-office address.
2. Where an employer and employees both desire to submit a controversy to the board, they shall sign a short joint statement of the issue between them, with their respective post-office addresses, and request the action of the board. They shall deliver this signed statement to the secretary of the board.
3. Controversies in which the Secretary of Labor invokes the action of the board, together with the documents transmitted by him, shall be delivered to the secretary of the board.
4. Such complaints, submissions, and references by the Secretary of Labor shall be received by the secretary of the board and filed in his office, and indorsed with the date of filing.
5. The secretary of the board shall keep one docket for the filing of all complaints, submissions, and references, and shall number them on the docket in the order in which they are received and filed. Thereafter the cases shall be referred to by such number.
6. Where the complaint or submission filed shall show clearly that another board than this has primary jurisdiction therein, the secretary is authorized to direct the proper reference, and to advise the party or parties initiating the proceeding of such reference. At the next session of the board the secretary shall advise the board of his disposition thereof.
7. The secretary of the board shall digest all cases presented and bring them to the prompt attention of the board for its action.

ORGANIZATION OF THE BOARD

1. Two members of the board, one from the employers' side and one from the employees' side, shall be appointed to act for the board in respect to every local controversy, the members to be named by the joint chairmen at the instance of the respective groups of the board. These members shall be called a section of the board, and shall hear and adjust cases assigned to them. If they cannot effect any adjustment, they shall summarize and analyze the facts and present the same to the board with their recommendations.
2. The secretary shall select trained and experienced men of neutral attitude to act as examiners, to accompany the sections, and to assist them in the discharge of their duty by investigation, digest of evidence, and in other proper ways.
3. The national board may appoint permanent local committees in any city or district to act in cases therein arising. In the selection of such local committees, recommendations will be received by the national board from associations of employers and from the central labor body of the city or district and other properly interested groups. Sections of the board are authorized to appoint temporary local committees where permanent local committees have not been appointed by the board.
4. Two special field representatives may be selected by the secretary from names submitted by the joint chairmen to make a joint investigation of any complaint for the purpose of ascertaining the complete facts without the intervention of sections.

ARBITRATION

1. When the board, after due effort of its own, through sections, local committees, or otherwise, finds it impossible to settle a controversy, the board shall then sit as a board of arbitration, decide the controversy, and make an award, if it can reach a unanimous conclusion. If it cannot do this, then it shall select an umpire, as provided, who shall sit with the board, review the issues, and render his award.

Appeals will not be heard by the National War Labor Board from the decisions of regularly constituted boards of appeal, nor from any other board to revise findings of fact.

M. O. Inquiry About June 1

The groundwork of the investigation of the question of municipal ownership in New York State, to be made by the legislative commission headed by Senator George F. Argetsinger of Monroe, virtually has been completed and it is expected that the commission will commence its real work about June 1.

In an effort to facilitate this inquiry Senator Elon R. Brown has completed an analysis of the financial condition of the cities which will be the basis of the investigation. This analysis was made after a careful study of the real estate values, assessment and debt incurring capacity of the municipalities and is designed to establish the reasonableness of the contention that the financial burden that would be cast upon cities taking over public utilities would lead to bankruptcy.

After Mayor Hylan of New York City had made his appearance before the Legislature and advocated the enactment of the Wagner-Donohue municipal ownership bill, Senator Brown persuaded the Senate to defer action upon the measure and caused the appointment of a legislative commission which will look into the whole problem and report to the next Legislature.

Chicago Men Want Increase

Members of the trainmen's unions of the Chicago Surface Lines and the Elevated Railways took action recently looking toward an increase in wages of 15 cents an hour over the present scale. Resolutions to this effect were indorsed at a meeting of the employees on May 16. It was decided to make the request first to the company officials, and failing in relief there to take up the matter with the Mayor and City Council and if necessary with the United States War Labor Board.

The wage scale for conductors and motormen of the surface lines now ranges from 30 to 39 cents an hour, the maximum being reached after four years. The new scale would give a maximum of 54 cents an hour. On the elevated lines the conductors have been getting 34 cents, and the motormen from 35 to 41 cents. Both contracts were made last June and were intended to continue in effect for three years. Officials of the unions contend that the agreement should be disregarded by both sides and a new wage scale arranged more in accord with the increased cost of living.

Boston Relief Bill Signed

Upon Acceptance by Stockholders the Property Will Pass Under the Control of Public Trustees

The bill placing the control of the Boston (Mass.) Elevated Railway in the hands of a board of five public trustees, to be appointed by the Governor, was passed by the State Senate on May 21 and signed by Governor McCall on May 22. Under the terms of this act the trustees for ten years will have power to regulate service and maintain a flexible fare system without any supervision from State regulatory bodies.

It is provided that the company shall raise $3,000,000 by the sale of preferred stock, $1,000,000 of the proceeds to be used as a reserve fund for fare regulation. The State will have the option of buying the property at any time by assuming the liabilities and reimbursing stockholders for the amount paid in. The property can be returned from public to private management at the end of the ten-year period, or thereafter upon two years' notice by legislation.

The act is to become effective upon its acceptance by the holders of not less than a majority of all the stock of the Boston Elevated Railway and of the leased West End Street Railway, and also upon the filing of a certificate that the entire $3,000,000 above mentioned has been subscribed for and at least 30 per cent paid in cash by each subscriber, and that no dividends have been declared or paid upon common stock since the passage of the act.

The principal terms of the measure and the discussion that followed consideration of the bill were reviewed in the ELECTRIC RAILWAY JOURNAL for April 20, page 778, and May 11, page 928.

City Wins Bridge Suit

The city of Seattle has won its suit against the Puget Sound Traction, Light & Power Company to collect $60,917 as the company's share of the cost of constructing the Freemont Avenue bridge. The suit was heard before Judge Calvin S. Hall, in the King County Superior Court at Seattle. The jury also returned a special finding that the company was not entitled to damages for the removal of the Stone Way bridge.

In July last the traction company filed a counter claim for $210,000, alleging this to be the amount of damages sustained by the company as the result of the removal of the Stone Way bridge. The jury disallowed this claim and upheld the city in all of its contentions. The Stone Way bridge was ordered out by the United States Engineer's office and was demolished after the Fremont bridge was completed and ready for traffic.

As a result of the verdict, the company must pay the city of Seattle not only $60,917, but interest on that amount from June 15, 1917, and $333 a month as the company's share of the cost of maintaining and operating the bridge. A price of 1 cent a kilowatt-hour was allowed the city for current used on the bridge by the company in operating its cars since June 15, 1917.

Increase in Pay in Salt Lake

The board of arbitration appointed to consider the question of wages for the employees of the Utah Light & Traction Company, Salt Lake City, Utah, has reported its findings. The award will amount to about $89,000 additional a year in the wages of trainmen, carhouse men and those in the engineering departments. The new scale for trainmen dating from May 1 is 34 cents an hour for the first year; 39 cents an hour the second year, and 42 cents an hour thereafter. The scale which has been in force called for 28 cents an hour the first year, 34 cents an hour the second year and 37 cents an hour thereafter. In its finding the board said:

"We have arrived at our conclusions as to the scale of wages entirely upon the basis of what we deem fair and just to them and not at all upon the ability of the company to pay these wages.

"The increase in wages allowed by us, amounting to about $89,000 per annum, is merely added to a deficit now existing, and which must continue to mount up, resulting in complete insolvency unless relief shall be obtained. We direct attention to this fact in order to explain the suggestion that the company make immediate application to the Public Utilities Commission for the relief to which it is entitled.

"We venture to urge upon the Public Utilities Commission such action as will give prompt and speedy relief to the company through the exercise of any and every economy of operation which can be devised, and if such economies prove inadequate, as we believe they will, to furnish the money needed to pay the increased wages which we recommend, then that such further relief be granted as may be necessary through an increase of rates."

Governor Vetoes City Bus Bill

Governor Whitman of New York has vetoed the Rowe bill permitting Buffalo to establish municipally owned and operated jitney bus lines. The Governor said:

"This bill is disapproved for the reasons set forth in the report of the Public Service Commission for the Second District, to whom the bill was referred, which report is as follows:

" 'The matter has been considered by the commission and it is our impression that the amendment seems to be so detailed and complete as to raise the question whether it does not abrogate the jurisdiction of this commission under sections 25 and 26 of the transportation corporations law as amended by chapter 667, laws of 1915. We think it would be mischievous to authorize cities to license bus lines which would not be required to procure certificates of convenience and necessity from the commission. The reasons are obvious.' "

Strike in Philadelphia

Attempt to Embarrass the Philadelphia Rapid Transit Fails Miserably as an Objective to Union Domination

The very small disloyal element among the employees of the Philadelphia (Pa.) Rapid Transit Company called a strike on May 16. That this element existed was well known to the management. In fact, the company referred to professional trouble makers in the statement which it made acknowledging the petition of the employees asking for an increased wage and requesting the company to petition Councils for an increase in fare to make the wage advance possible.

ONLY 700 MEN OUT

Only about sixteen of the eighty lines in the city were affected by the strike and none of these suffered seriously. Representatives of the men who went out claimed that 3400 men had quit. The police estimated the number of men on strike at about 1000. The company said that only 700 men were involved.

The leaders of the men who are on strike describe the movement as a self-imposed lock-out because the company refused to allow the men to wear union buttons and they decided not to work without them.

The whole affair appears to be an attempt to make capital out of the present extraordinary industrial and labor condition and seriously to embarrass the company at a time which appeared to the malcontents to be most propitious. Even the figures of the men who went out as to their own number bear witness to the need of their cause being bolstered up from sources outside.

The controversy has been reported upon to the Department of Labor by E. E. Greenwalt, commissioner of conciliation. He said that he had exhausted every effort to persuade the company to agree to some form of compromise with the men.

NO COMPROMISE

That there would be no compromise of any kind was indicated by the determination of the company, as announced previously, to continue the existing co-operative plan as at present administered until two-thirds of the men ask for a change. The co-operative plan has been in use for seven years and its scope and workings have been explained in detail to the public authorities. The outstanding feature of this plan is that the trainmen are represented at all times by a committee of their own choosing that can take up with the management all matters requiring discussion or adjustment.

Iowa Meeting Postponed

The meeting of the Iowa Electric Railway Association, set to be held in Des Moines on May 23, has been postponed to May 31. A meeting of the Iowa section of the N. E. L. A. was set for the same time.

News Notes

More Transit Lines to Open.—The Public Service Commission for the First District of New York has announced that it had fixed June 15 as the date for the opening of the new Lexington and Seventh Avenue lines of the dual subway system in New York City.

Southern Road Increases Wages.—Increases in pay of from 2 to 5 cents an hour for motormen and conductors of the Southern Public Utilities Company, which operates in Greenville, Anderson, Winston-Salem and numerous other cities in the Carolinas, was announced on May 8. The increase, effective from May 1, will depend on length of service.

National Research Council to Be Made Permanent.—In an order issued on May 11 President Wilson has made the National Research Council a permanent body. This council was organized in 1916 at the request of the President by the National Academy of Sciences to organize research and secure co-operation of military and civilian agencies in the solution of military problems.

Men and Company in Conference in St. Louis.—A general agreement between the United Railways, St. Louis, Mo., and its employees is expected without delay, it was announced on May 15 following a conference in the office of Bruce Cameron, superintendent of transportation, who is acting for Richard McCulloch, president and general manager, during his absence from the city.

Increase in Wages in Reading.—The Reading Transit & Light Company, Reading, Pa., has increased the wages of its 600 motormen and conductors in Reading, Norristown and Lebanon 1 cent an hour, to take effect on June 1. This is the second increase in four months and the sixth since April, 1916. The wages will range from 28 to 31 cents an hour, depending upon length of service.

Twin City Wage Increase.—For the second time within eight months the Twin City Rapid Transit Company, Minneapolis, Minn., on May 16, announced increases in the wages of its employees. The increases, effective on June 1, mean that each motorman and conductor will get from $7 to $10 a month more than he is now receiving. The increase will add $250,000 a year to the company for platform wages.

Statisticians and Accountants Needed.—The United States Civil Service Commission announces that the bureau of ordnance of the War Department is in urgent need of statistical experts at $1,800 to $4,500 a year; statisticians at $1,800 a year, and clerks qualified in statistics, clerks qualified in accounting, and clerks qualified in business administration at $1,000 to $1,800 a year. These examinations are open to both men and women, except the examination for statistical expert, which is open only to men.

Government Employment Agency Opens.—Within a few days the largest employment agency in America operated jointly by the federal and state governments will open for business at 116 North Dearborn Street, Chicago, Ill. Its purpose will be to serve free every employer needing help and every employee seeking work. Recently the United States Employment Service took over the handling of all railroad labor for the Western territory, which includes the district west of Pittsburgh and Buffalo.

Referendum Asked on Franchise Settlement Terms.—A petition bearing 7911 names, asking for a referendum on the United Railways' settlement bill enacted by the Aldermen of St. Louis, Mo., a month ago has been filed with the Election Board by the Citizens' Referendum League. The new charter provides that if a petition of 2 per cent of the registered vote at the last mayoralty election is filed within thirty days after the approval of an ordinance, it shall be suspended for forty days to permit the filing of supplementary proceedings.

M. G. Chace Rhode Island Fuel Administrator.—United States Fuel Administrator Garfield has announced the appointment, with the approval of the President, of Malcolm G. Chace, Boston and Providence, as fuel administrator for Rhode Island, vice George H. Holmes, who resigned for business reasons. Mr. Chace is a son of the chancellor of Brown University. He is a resident of Boston, but his business firm, Chace & Harriman, engaged in the promotion and conduct of public utilities, has its headquarters at Providence, R. I.

Wage Board to Meet in Chicago.—Hearings in the wage controversies between the electric railway operatives of Detroit, Mich., and Cleveland, Ohio, and the respective employing companies, which were scheduled to be held in the two cities on May 27 and 28, will instead be held in Chicago on May 27, according to a rearrangement of the board's schedule. These particular controversies are in charge of William H. Taft and Frank P. Walsh, joint chairmen of the board, acting as a section of the body. The entire membership of the board will meet in Chicago, however, for the consideration of, and action upon, such business as will have been presented.

E. F. C. Transportation Division in Philadelphia.—The Emergency Fleet Corporation will start moving to Philadelphia, Pa., on June 1. It is expected that within four days all the divisions will have been moved. The Passenger Transportation & Housing Division will precede all others to Philadelphia. This division will move on May 25. This was decided upon in order that the division may assist in the locating of the personnel of the corporation in suitable quarters in Philadelphia. Employees of the Passenger Transportation & Housing Division have been notified that they will be governed accordingly. This is the division of which A. Merritt Taylor is director.

New Officers of Pacific Claim Agents.—The Pacific Claim Agents' Association held its annual convention in Portland, Ore., during the week of May 6. The 1919 convention will be held in Oakland, Cal. The following officers were elected for the ensuing year: H. G. Winsor, Tacoma Railway & Power Company, Tacoma, Wash., president; W. H. Moore, San Diego (Cal.) Electric Railway, first vice-president; J. S. Mills, San Francisco-Oakland Terminal Railways, second vice-president; C. A. Blackburn, Butte (Mont.) Electric Railway, third vice-president; B. F. Boynton, Portland Railway, Light & Power Company, Portland, Ore., secretary-treasurer; S. A. Bishop, Los Angeles; J. H. Handlon, San Francisco; A. M. Lee, Seattle; F. J. Lonergan, Portland; Thomas G. Ashton, Spokane, and J. T. Rupli, Seattle. members executive committee.

Substation and Carhouse Badly Damaged.—The plant at Thirty-first Street and Lincoln Avenue, Ogden, containing equipment of both the Bamberger Electric Railroad and the Utah Light & Power Company, was damaged by fire recently to the extent of $500,000, unofficial estimate. A considerable amount of rolling stock, said to include eighteen cars and two locomotives, was also reported to have been damaged. The company has made no definite plans for reconstructing the plant, except to repair the substation. A brick wall will be built on the west side of this station, which formerly was divided from the carhouse by a frame wall. The reconstruction of the carhouse and sheds and the installation of equipment for repairing, painting and the general upkeep of the rolling stock of the company will cost approximately $100,000.

New Providence Wage in Effect.—The new scale of wages accepted by the employees of the Rhode Island Company, Providence, R. I., went into effect on May 18. Under the wage increase, the track men get 35 cents an hour; shop men, pit men, washers and cleaners, 31 to 38 cents an hour; freight house men 27 to 28 cents an hour; breakersdown, 30 cents an hour; freight employees, receiving and delivery clerks 28 cents an hour; line department men, 32.5 to 36.7 cents an hour; power department men, 21.8 to 36 cents an hour; all other clerks, excepting general office clerks, $1.40 more a week, making the pay $17.90 to $19.40; transportation men, excepting platform men, starters, inspectors and information men, 2 cents an hour more. The new schedule for motormen and conductors under the 2-cent raise will be per hour as follows: First six months, 30 cents; second six months, 32 cents; second year, 33 cents; third year, 34 cents; thereafter, 36 cents. On June 1 another cent an hour will be added to the above rate.

Financial and Corporate

Business and Costs Both Up

Detroit United Railway in 1917 Suffered Loss of Almost 25 Per Cent Net Income

Although the gross operating earnings of the Detroit (Mich.) United Railway for the calendar year 1917 gained $1,391,270 or 8.6 per cent, this amount was more than offset by the rise of $2,043,988 or 18.2 per cent in operating expenses. As a result the net earnings from operation fell $652,718 or 13.5 per cent. Other income and deductions from income showed increases, and the net income exhibited a dropping off of $705,262 or 24.4 per cent.

TABLE I—PASSENGER AND MILEAGE STATISTICS

	1917	1916
Revenue passengers	356,208,429	335,599,802
Transfer passengers	119,962,125	119,899,335
Employee passengers	8,557,264	8,670,561
Total passengers	484,727,818	464,169 698
Receipts revenue pass'r	$0 0459	$0.0450
Receipts per passenger	$0.0337	$0.0325
Car mileage	58,957,941	54,008,437
Earnings per car-mile	$0.2956	$0.2970
Expenses per car-mile	$0.2249	$0.2077
Net earnings per car-mile	$0.0707	$0.0893

The same amount was credited to the depreciation reserve as in 1916, $800,000, but in the last year the dividends were increased from $843,750 to $1,118,750, and $150,000 was credited to a reserve for taxes. The dividend payment in 1917 equaled 4.89 per cent on the capital stock and undivided surplus. The balance transferred to surplus in 1917 was only $106,780 as compared to $1,237,042 in the year preceding.

The foregoing figures summarize the business of the Detroit United Railway, the Rapid Railway System, the Sandwich, Windsor & Amherstburg Railway, the Detroit, Monroe & Toledo Short Line Railway and the Detroit, Jackson & Chicago Railway. The full figures are given in the accompanying comparative statement in Table II.

During 1917 the company and its subsidiaries expended $2,999,220 for additions to property. On Jan. 1, 1917, the depreciation reserve stood credited with $4,295,627. The balance at the end of 1917 was $5,114,827.

Passenger and mileage statistics of the system for the last two years are shown in Table I.

TABLE II—COMPARATIVE INCOME STATEMENT OF DETROIT (MICH.) UNITED RAILWAY FOR 1916 AND 1917

	1917		1916	
Gross earnings from operation:	Amount	Per Cent	Amount	Per Cent
Passenger	$16,370,239	93.9	$15,069,980	93.9
Express	1,000,869	5.7	907,771	5.7
Mail	11,748	0.1	11,828	0.1
Special car	45,083	0.3	47,088	0.3
Total	$17,427,939	100 0	$16,036,669	100.0
Operating expenses	13,259,790	76.1	11,215,802	69.9
Net earnings from operation	$4,168,149	23.9	$4,820,867	30.1
Other income	411,737	2.4	351,334	2.1
Gross income	$4,579,886	26.3	$5,172,201	32.2
Interest on funded and floating debts and taxes	2,404,355	13 8	2,291,409	14.3
Net income	$2,175,530	12.5	$2,880,792	17.9
Amount credited to depreciation reserve	$800,000	4.6	$800,000	4.9
Amount credited to reserve for taxes	150,000	0.9	....	....
Dividends paid	1,118,750	6.4	843,750	5.3
Total	$2,068,750	11.9	$1,643,750	10.2
Balance transferred to surplus	$106,780	0.6	$1,237,042	7.7

War Finance Board Sworn In

The War Finance Corporation, created by Congress to finance war industries and limit and control investment of capital during the war, was brought officially into existence on May 17 by the swearing in of the directors and officers in the office of the Secretary of the Treasury. The corporation has for its chairman of the board of directors Secretary McAdoo; as vice-chairman and general manager, W. P. G. Harding, governor of the Federal Reserve Board, with Sherman Allen, formerly assistant secretary of the treasury and now assistant secretary of the Federal Reserve Board, as treasurer and secretary pro tem.

The board of directors, in addition to Messrs. McAdoo and Harding, consists of Clifford M. Leonard, Eugene Meyer, Jr., and Angus W. McLean. The members of the Capital Issues Committee, which is to regulate investment of capital during the war, consists of Charles S. Hamlin, designated as chairman by President Wilson; John Skelton Williams, Controller of the Currency; Frederick A. Delano of the Federal Reserve Board; James B. Brown, John S. Drum, Henry C. Flower, and Frederick H. Goff.

The Capital Issues Committee of the Federal Reserve Board, which went out of existence on May 17 with the organization of the War Finance Corporation, issued on May 22 a final report of its activities during the four months of its organization. The committee passed on applications for the investment of capital to the amount of $478,458,386, and of this amount for new enterprises it permitted the investment of $154,102,224. For refunding purposes the committee approved the investment of $258,664,496.

Of applications considered 192 were from municipalities, sixty-two from public utilities corporations, and 108 from industrial concerns. Of these the committee gave its approval to 140 municipal, sixty public utility, and seventy-seven industrial corporations. Thirty-four municipal applications were disapproved and eighteen curtailed, twenty-four industrial applications were disapproved and five curtailed. By securing postponement for the period of the war, the committee saved from investment $19,865,000.

OPERATIONS OF CAPITAL ISSUES COMMITTEE FOR FOUR MONTHS TO MAY 17

	Municipal	Public Utility	Industrial
Number considered	192	62	108
Number approved	140	60	77
Number disapproved	34	2	24
Number curtailed	18	0	5
Amount considered	$86,878,512	$172,069,605	$219,510,269
Amount disapproved	19,791,665	6,000,000	39,900,000
Aggregate approved	69,086,847	166,069,605	179,610,269
Less refunding	21,392,312	125,860,284	111,411,900
Aggregate new issues	45,694,534	40,209,321	68,198,369
New issues last year same period	108,952,865	107,504,075	287,754,684
Analysis of new issues approved:			
Amount original applications	65,486,199	46,209,321	108,098,369
Amount approved	45,694,534	40,209,321	68,198,369
Curtailment effected	19,791,665	6,000,000	39,900,000
Analysis of applications informally discouraged:			
Number	8	3	6
Amount	$8,915,000	$7,360,000	$3,596,000

B. R. T. Finance Hearing May 28

The war Finance Corporation has set May 28 as the date for the hearing in Washington on the application of the Brooklyn (N. Y.) Rapid Transit Company for aid in meeting the $57,735,000 of 5 per cent gold notes which mature on July 1. This fact was announced to the stockholders of the company at a special meeting on May 23 by Col. Timothy S. Williams after unanimous approval of the creation of a $150,000,000 mortgage had been granted. President Williams said:

"I was in Washington on May 22 for my first conference with the members of the War Finance Corporation, which can aid your company in financing its maturity note issue. As you know, the board of directors has had the matter up with local banking officials and with government authorities, but nothing could be accomplished."

New York Net Falls

Metropolitan Lines for Last Quarter of 1917 Show Increases in Cost of Service

With an increase of 4,575,453 revenue car-miles, the electric railways in New York City during the last quarter of 1917 secured a gain of $1,559,629 in railway operating revenues at the cost of a rise of $1,348,520 in operating expenses, as compared to the same period of 1916. After the payment of taxes and contractual and other compulsory deductions from income, the net corporate income showed a loss of $412,298. The Manhattan and Bronx surface lines showed increases in net, but the Queens surface lines and the rapid transit roads reported decreases. Details are published in the accompanying statement. Under the borough totals for surface railways, only a few of the most important lines are included.

FINANCIAL SHOWING OF NEW YORK CITY LINES, OCTOBER-DECEMBER, 1917

Company	Revenue Car-Miles Total	Revenue Car-Miles Increase	Railway Operating Revenues * Amount	Railway Operating Revenues * Increase	Operating Expenses * Amount	Operating Expenses * Increase	Railway Taxes	Net Corporate Income Amount	Net Corporate Income Increase
Hudson & Manhattan Railroad	$2,136,830	$61,301	$1,203,290	$83,979	$532,585	$84,851	$85,160	††$205,826	†$38,876
Interborough { Subway Division	19,359,369	1,194,307	5,948,125	225,779	2,328,824	309,892	569,075	1,724,546	†1,154,568
Interborough { Elevated Division	19,312,427	1,257,847	4,811,081	†99,509	2,519,518	375,228	475,263		
Brooklyn Rapid Transit System	24,087,084	†186,749	7,395,582	88,792	4,714,020	270,256	437,839	378,700	†75,611
Manhattan Surface Roads	10,884,528	1,275,524	5,013,175	979,699	3,451,875	282,702	388,203	†100,934	662,965
New York Railways	6,854,378	343,008	3,020,813	457,004	2,089,220	192,042	238,534	5,795	238,302
Third Avenue (including Kingsbridge)	1,522,941	392,709	1,018,195	267,016	596,551	41,123	75,476	25,290	222,609
Bronx Surface Roads	4,452,021	1,111,753	1,240,427	412,510	969,307	†22,764	91,767	†100,797	394,800
Union (including Bronx Traction)	2,365,156	341,062	674,501	148,497	517,480	†54,099	56,494	†16,528	185,091
Queens Surface (excluding Brooklyn Rapid Transit)	2,371,550	†81,954	511,695	†108,393	576,727	18,848	28,881	†245,204	†131,29
Grand total	$83,447,529	$4,575,453	$26,349,623	$1,559,629	$15,331,299	$1,348,520	$2,095,863	$1,802,810	†$412,298

* No deductions for intercompany transactions. † Deficit, or decrease from corresponding period of 1916. †† Balance applicable to adjustment income bonds.

Portland Earnings Increase

Six-Cent Fare in Oregon City Results in Increase in Receipts and Reduction in Expenses

According to a report submitted to the city council of Portland, Ore., by Edward M. Cousins, public utility expert, the average earnings of the Portland Railway, Light & Power Company for six years ending Dec. 31, 1917, were $919,548 a quarter. In the last six years (twenty-four quarters) the earnings have exceeded $1,000,000 only six times, one of which periods was for the last quarter of 1917. The earnings have never before reached or approached within $100,000 the revenue for the first quarter of 1918, reported now as $1,125,679. Operating expenses show a decrease of $67,126 under the previous quarter. Mr. Cousins says:

"The number of passengers handled during the quarter ended March 31, 1918, decreased 480,451. The latter figure indicates the company is sacrificing business for high rates. There has been a heavy increase in volume of floating traffic in the city due to intensive commercial activity, estimated at at least 25 per cent over the preceding quarter, which should have been reflected in the traffic density.

"It will be recalled that the 6-cent fare took effect on Jan. 15, since which time, as a matter of common knowledge, a large number of car riders under normal conditions have, for actual or imaginary reasons (ranging from dislike of the cent change and the principle of the thing, to need of physical exercise and preference for a neighbor's motor car) ceased to contribute their normal patronage.

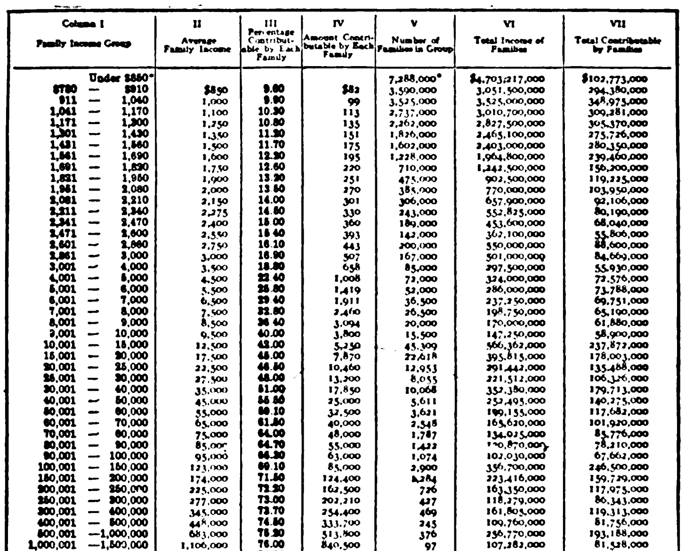
"One of the fundamental rate elements is density of traffic and, as is well known, traffic movement is highly sensitive to rate adjustment, especially human traffic which might well be dubbed 'fickle,' so that for a multitude of reasons best known to the individuals composing the traffic, the density might easily shrink 25 per cent. At a 6-cent rate 17,022,273 passengers would yield a revenue of $1,021,336. A 25 per cent increase at a 5-cent rate would yield $1,063,892.

"I am satisfied 7,000,000 passengers a month would now be riding on street cars in Portland at a 5-cent fare."

Do Your Duty—and More!

What is one's share of the cost of the war? The Bankers Trust Company, New York, N. Y., has answered this question in a recent pamphlet containing the accompanying table. This table gives a logical basis for determining how much each one should contribute from his income, in the payment of taxes and in the purchase of bonds, so as to bear his equitable share of the cost of the second year of the war.

The distribution of incomes of $3,000 and over is based on 1916 income tax returns, and of those below $3,000 on carefully made estimates. The point particularly to be noticed in a study of the table is the essentiality of every one's doing his share. While a few rich families have large incomes, 75 per cent of the family income is received by those with incomes less than $2,500.



Column I Family Income Group	II Average Family Income	III Percentage Contributable by Each Family	IV Amount Contributable by Each Family	V Number of Families in Group	VI Total Income of Families	VII Total Contributable by Families
Under $850*				7,288,000*	$4,703,217,000	$102,773,000
$780 — $910	$850	9.60	$82	3,590,000	3,051,500,000	294,380,000
911 — 1,040	1,000	9.90	99	3,525,000	3,525,000,000	348,975,000
1,041 — 1,170	1,100	10.30	113	2,737,000	3,010,700,000	309,281,000
1,171 — 1,300	1,250	10.80	135	2,262,000	2,827,500,000	305,370,000
1,301 — 1,430	1,350	11.20	151	1,826,000	2,465,100,000	275,726,000
1,431 — 1,560	1,500	11.70	175	1,602,000	2,403,000,000	280,350,000
1,561 — 1,690	1,600	12.20	195	1,228,000	1,964,800,000	239,460,000
1,691 — 1,820	1,750	12.60	220	710,000	1,242,500,000	156,200,000
1,821 — 1,950	1,900	13.20	251	475,000	902,500,000	119,225,000
1,951 — 2,080	2,000	13.50	270	385,000	770,000,000	103,950,000
2,081 — 2,210	2,150	14.00	301	306,000	657,900,000	92,106,000
2,211 — 2,340	2,275	14.50	330	243,000	552,825,000	80,190,000
2,341 — 2,470	2,400	15.00	360	189,000	453,600,000	68,040,000
2,471 — 2,600	2,550	15.40	393	142,000	362,100,000	55,806,000
2,601 — 2,860	2,750	16.10	443	200,000	550,000,000	88,600,000
2,861 — 3,000	3,000	16.90	507	167,000	501,000,000	84,669,000
3,001 — 4,000	3,500	18.80	658	85,000	297,500,000	55,930,000
4,001 — 5,000	4,500	22.40	1,008	72,000	324,000,000	72,576,000
5,001 — 6,000	5,500	25.80	1,419	52,000	286,000,000	73,788,000
6,001 — 7,000	6,500	29.40	1,911	36,500	237,250,000	69,751,000
7,001 — 8,000	7,500	32.80	2,460	26,500	198,750,000	65,190,000
8,001 — 9,000	8,500	36.40	3,094	20,000	170,000,000	61,880,000
9,001 — 10,000	9,500	40.00	3,800	15,500	147,250,000	58,900,000
10,001 — 15,000	12,500	42.00	5,250	45,309	566,362,000	237,872,000
15,001 — 20,000	17,500	45.00	7,870	22,618	395,815,000	178,003,000
20,001 — 25,000	22,500	46.50	10,460	12,953	291,442,000	135,488,000
25,001 — 30,000	27,500	48.00	13,200	8,055	221,512,000	106,326,000
30,001 — 40,000	35,000	51.00	17,850	10,068	352,380,000	179,713,000
40,001 — 50,000	45,000	55.50	25,000	5,611	252,495,000	140,275,000
50,001 — 60,000	55,000	59.10	32,500	3,621	199,155,000	117,682,000
60,001 — 70,000	65,000	61.50	40,000	2,548	165,620,000	101,920,000
70,001 — 80,000	75,000	64.00	48,000	1,787	134,025,000	85,776,000
80,001 — 90,000	85,000	64.70	55,000	1,422	120,870,000	78,210,000
90,001 — 100,000	95,000	66.30	63,000	1,074	102,030,000	67,662,000
100,001 — 150,000	123,000	69.10	85,000	2,900	356,700,000	246,500,000
150,001 — 200,000	174,000	71.50	124,400	1,284	223,416,000	159,729,000
200,001 — 250,000	225,000	72.20	162,500	726	163,350,000	117,975,000
250,001 — 300,000	277,000	73.00	202,210	427	118,279,000	86,343,000
300,001 — 400,000	345,000	73.70	254,400	469	161,805,000	119,313,000
400,001 — 500,000	448,000	74.50	333,700	245	109,760,000	81,756,000
500,001 —1,000,000	683,000	75.20	513,800	376	256,770,000	193,188,000
1,000,001 —1,500,000	1,106,000	76.00	840,500	97	107,282,000	81,528,000
1,500,001 —2,000,000	1,701,000	76.70	1,305,500	42	71,442,000	54,831,000
2,000,001 —3,000,000	2,459,000	77.50	1,905,700	34	83,606,000	64,793,000
3,000,001 —4,000,000	3,459,000	78.20	2,706,600	14	48,426,000	37,892,000
4,000,001 —5,000,000	4,514,000	79.00	3,566,000	9	40,626,000	32,004,000
5,000,001 and over	10,284,000	79.70	8,201,500	10	102,840,000	82,015,000
Reported non-taxable incomes not apportioned in reports—50% estimated contributable					2,000,000,000	1,000,000,000
FAMILY GROUPS and individuals—their estimated total incomes and ability to contribute				27,304,199	$38,250,000,000	$7,250,000,000
CORPORATIONS and other business enterprises—their estimated total incomes and ability to contribute after dividend distributions					11,750,000,000	2,750,000,000
Total estimated National Income and amount realizable therefrom					$50,000,000,000	$10,000,000,000
BANKS—the share of the burden which they probably must carry. This is not the estimated peak load, but a conservative estimate of the average minimum burden						3,500,000,000
Estimated receipts from direct taxation and bond sales						$13,500,000,000
Estimated receipts from indirect taxes, such as customs, excise taxes, stamp taxes, including sundry receipts						1,500,000,000
COST of Second Year of the War estimated						$15,000,000,000

*This group is largely composed of individuals

HOW TO USE THE TABLE. Find your income in Column I. Multiply this by the "percentage contributable,"—Column III. The result is the total amount which you should contribute during a year. Deduct the amount which you pay in taxes—the remainder is the amount of Liberty Bonds which you should buy from income during a year.

Illustration	$5,000 income	Less tax, say $80	$10,000 income	Less tax, say $675
	$5,000 x 22.4% = $1 120	Bonds to be bought $1,040	$10,000 x 40% = $4,000	Bonds to be bought $3,325

EACH INDIVIDUAL'S SHARE OF WAR BURDEN

Financial News Notes

Chicago & Interurban Earnings.—The operating revenues of the Chicago & Interurban Traction Company, Chicago, Ill., for the year ended Dec. 31, 1917, amounted to $338,157 as compared to $333,602 the year before. The operating expenses at $212,370 and the interest and taxes at $94,769, however, showed slight increases, so that the net income decreased from $55,565 in 1916 to $31,018 in 1917.

Electric Bond & Share Returns.—The gross income of the Electric Bond & Share Company, New York, N. Y., for the calendar year 1917 totaled $3,140,020, and the net income $2,066,389. The accumulated income, after the payment of $487,710 in preferred dividends and $644,888 in common dividends, was $3,506,204 at the end of the year. The surplus and undivided profit at this time amounted to $4,393,665.

Wants to Fund $182,500 of Notes.—The Springfield Railway & Light Company, which controls the Springfield Consolidated Railway, has asked authority from the Illinois Public Utilities Commission to issue two lots of 5 per cent gold bonds, one for $75,500 and the other for $107,000. The total amount of $182,500 is needed to pay notes issued by the company since Dec. 31, 1913, representing improvements of a permanent nature.

Boise Line Overcomes Deficit.—According to the 1917 report of the controlling companies, the Idaho Power Company and in turn the National Securities Corporation, the gross operating earnings of the Boise Valley Traction Company in 1917 totaled $334,844 as compared to $291,404 in 1916. The operating expenses, including taxes, rose from $215,365 to $234,474. The decrease in other income was offset by the decrease in fixed charges, and the balance for 1917 was a net income of $12,637 as compared to a deficit of $9,804 the year preceding.

Sale Under Foreclosure Ordered.—Supreme Court Justice Greenbaum has appointed Lyttleton Fox referee to sell the franchise and other property of the electric railway running from the East Twenty-third Street ferry to the Christopher Street ferry, which has been owned by the Central Crosstown Railroad, New York City. The sale was ordered in the suit by the Guaranty Trust Company, New York, N. Y., to foreclose on a $3,000,000 mortgage made in 1902 as security for a bond issue. The sum due on the mortgage is $3,545,434. The date of the sale will be fixed by the referee.

Lehigh Preferred Dividend Passed.—The directors of the Lehigh Valley Transit Company, Allentown, Pa., at their meeting on May 16 failed to take action with respect to declaration of the quarterly preferred dividend of 1¼ per cent usually paid early in May. Only 17 per cent of the preferred stock is held outside the Lehigh Power Securities Company treasury. All holders at the time of the recent merger were given opportunity to sell their stock for cash or exchange for securities in the new company. The total issue of Lehigh Valley Transit Company preferred stock is $4,979,687.

Carolina Power & Light Gains 16 Per Cent.—The gross operating earnings of the Carolina Power & Light Company, Raleigh, N. C., and its subsidiaries for the year ended Dec. 31, 1917, totaled $1,826,303 as compared to $1,474,948 in the year preceding. The operating expenses, including taxes, rose from $694,921 to $927,407, and the net income available for dividends in 1917 was $484,972 and in 1916 $351,755. The total number of passengers carried in Raleigh increased from 2,212,162 in 1916 to 2,411,319 in 1917, and those in Asheville increased from 5,165,627 to 5,566,567 in the same period.

Briefs Filed in Seattle Valuation.—Figures of $30,301,404 by the company and $23,179,692 by the city were contained in briefs filed with the State Public Service Commission of Washington and Idaho in the Washington Water Power Company valuation case by Attorney Frank T. Post for the company and Corporation Counsel J. M. Geraghty for the city. The valuation of the power company's property is being made prior to the determination of a basis for future rates. Hearings before the joint commissions were commenced last February and concluded in April. The case was referred to in the ELECTRIC RAILWAY JOURNAL of May 18, page 985.

Another "Dan Patch" Installment Paid.—Representatives of the Dan Patch Patrons' Association have paid C. T. Jaffray, chairman of the committee representing the holders of the bonds of the Minneapolis, Rochester & Dubuque Electric Traction Company (the Dan Patch Air Line), $25,000, the second payment on the electric road. The next payment will be made on July 11. A payment of $10,000 on April 12 resulted in the dismantling order of the Federal Court being held in abeyance. Members of the protective association will pay $225,000 for the part of the road for which they are under contract and will gain title to the property when the payments are completed.

Higher Power Earnings for Kansas Railway.—The Missouri Public Service Commission has granted, in the arbitration requested by the Kansas City Railways and the Kansas City Light & Power Company, an increase in the rate paid by the light company for current from the railway. The rate was formerly 1 cent per kilowatt-hour, but the new rates are $15 per kilowatt of maximum demand and 1.14 cents per kilowatt-hour. This will mean an increase of nearly $500,000 a year in the sum received by the railway. In addition, the commission suggests the payment of $107,481 to the railway to cover the balance up to Jan. 1, 1918, for unadjusted differences in payment for current since the companies were reorganized. The stated sum is the amount to be paid after deducting about $72,000 which the railway owes the light company for fuel oil. The light company is now asking the Public Service Commission for a readjustment of its rates charged to the consumer.

Electric Railway Monthly Earnings

††ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1 m., Apr. '18	$14,284	$10,544	$3,740	$473	$3,267
1 m., Apr. '17	27,158	23,619	3,539	650	2,889

CITIES SERVICE COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1 m., Apr. '18	$1,885,750	$37,254	$1,848,496	$212	$1,848,284
1 m., Apr. '17	1,609,012	30,887	1,578,125	225	1,577,900
12 m., Apr. '18	20,127,716	380,001	19,747,715	2,635	19,745,080
12 m., Apr. '17	14,361,932	278,810	14,083,122	86,511	13,996,611

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$245,270	*$179,104	$66,166	$73,881	†$7,715
1m., Mar., '17	236,387	*166,137	70,250	66,629	3,621
12m., Mar., '18	3,077,458	*2,139,882	937,576	836,718	100,858
12m., Mar., '17	2,938,421	*1,869,863	1,068,558	810,460	258,098

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$328,221	*$250,282	$77,939	$67,281	$10,658
1m., Mar., '17	287,052	*183,819	103,233	64,662	38,571
12m., Mar., '18	3,783,627	*2,668,891	1,114,736	792,345	322,391
12m., Mar., '17	3,186,789	*1,955,131	1,231,658	760,429	471,229

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$64,766	*$61,072	$3,694	$19,126	†$15,432
1m., Mar., '17	67,227	*53,586	13,641	15,679	†2,038
12m., Mar., '18	868,790	*721,720	147,070	191,057	†43,987
12m., Mar., '17	828,722	*587,706	241,016	186,001	55,015

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$481,786	*$347,598	$134,188	$98,128	‡$46,699
1m., Mar., '17	376,822	*245,765	131,057	78,347	‡53,842
12m., Mar., '18	5,202,284	*3,617,494	1,584,790	1,055,564	‡623,535
12m., Mar., '17	4,143,045	*2,514,630	1,628,415	868,735	‡778,566

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
12 m., Mar. '18	$6,559,130	$4,191,939	$2,367,191	$1,013,507	$1,353,684
12 m., Mar. '17	5,543,778	3,043,414	2,500,364	914,551	1,585,813

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* Includes taxes. † Deficit. ‡ Includes non-operating income.

†† On May 1, 1917, the Atlantic Shore Railway was divided East and West of York Beach, Me., the Western end passing to the operating control of the Portsmouth, Dover & York Street Railway. Figures for the first four months of 1917 are for the entire system. Beginning with May 1 figures for the Atlantic Shore Railway as at present constituted are given.

Traffic and Transportation

Fares Up from Six to Seven Cents

Hartford & Springfield Street Railway Advances Zone Fares Another Cent, with Fifteen Rides for $1

The Hartford & Springfield Street Railway, Warehouse Point, Conn., announced an increase in fare from 6 cents to 7 cents in the zones operated by the company in Connecticut, effective on May 20.

At a public meeting in Thompsonville on May 13, George S. West, treasurer of the road, discussed the necessity for the increase. He stated that the company was not earning its interest charges at present and that no dividends had been paid on the common stock since the first year of operation. Unless net earnings could be materially increased a receivership was likely, with the probability of the road being sold for junk at a price which it is estimated will return 50 or 60 per cent of the investment to the owners. From 1901 to 1908 only about 6 per cent was paid on the preferred stock; from 1908 to 1912 less than 3 per cent, and since 1912 nothing has been paid.

The company operates about 48 miles of track. In 1917 an inventory by Sloan, Huddle, Feustel & Freeman, Boston, showed a total value of $1,290,125, based on the prices of normal times. The road is bonded for only $20,000 per mile, and its capitalization includes $285,000 of preferred stock and $500,000 of common. Mr. West said that the cost of material had increased 140 per cent within a comparatively short period; that wages were lower than on most other roads, and that these will probably be increased after June 1, when the existing agreement with the men expires. A high tribute was paid by the speaker to the loyalty of the employees, who have faithfully remained at their posts in the face of the rising cost of living and of superior opportunities elsewhere. The total cost of fuel for the year ended April 30, 1918, was $43,702, compared with $24,423 the previous year. Operating results for the 1917-1918 fiscal year were: Gross earnings, $240,608; operating expenses and taxes, $210,912; net earnings, $29,696; interest, $45,950. The total deficit was $26,085.

The company has arranged to sell books of tickets at the rate of fifteen rides for $1.

"Key System News" Popular

The San Francisco-Oakland Terminal Railways, Oakland, Cal., at present is distributing approximately 80,000 of each issue of *Key System News*. Of this number more than 35,000 are distributed through the mails to a list compiled from the telephone book, lists of club members, both gentlemen's and ladies' clubs, city directories, fraternal organizations, etc., and by personal canvass of the homes of working people whose names do not appear in the telephone directory. The paper is mailed direct to residences and not to offices.

In addition to those sent by mail, the company also carries supplies of copies in two tin boxes, one at each end of the cars. In that manner it disposes of about 40,000 copies. *Key System News* is regarded as having been of great help in educating the people of the communities that are served by the railway to a better idea of the business of the company and to the problems of increasing costs for labor and material.

London Fare Increase Refused

The request of the London (Ont.) Street Railway for a fare increase has been rejected by the City Council by the adoption of the recommendation of the finance committee and board of control "that no action be taken on the request . . . at present."

Meanwhile the employees have refused anything less than the 30 per cent wage increase which they demanded. As a result the question has gone to a board of concilation, appointed under the industrial disputes act.

The company put forward a proposal that the city should have a measure of control and also jurisdiction over the expenditure of all earnings in excess of 6 per cent on its stock issue. Figures were presented showing that there was an actual deficit last year of $24,827, with capital obligations fully met. The company's franchise expires in 1925. The dividend on stock actually was paid in the first half of the year, but was passed in the second half.

Mayor Somerville suggested that the company arrange to discontinue temporarily its annual redemption of $35,000 of bonds, paying interest meanwhile on a sort of patched up moratorium.

Last year 7,976,239 people were carried on seven-for-25-cent tickets, 1,553,099 on limited nine-for-25-cent tickets, 268,574 on two-for-5-cent child's tickets and 1,091,836 on 5-cent cash fares. The average fare per passenger was 3.63 cents.

The company has not yet availed itself of its right of appeal to the Ontario Railway & Municipal Board. It is practically certain that the question will be reopened later in the year, when the new wages are in operation.

The company carried on a vigorous advertising campaign, and it is believed that an effective groundwork has been laid for future action.

Trenton Fare and Service Cases

Former Will Be Begun on June 3 Following Conclusion of Inquiry Into Service and Equipment

The Board of Public Utility Commissioners of New Jersey decided on May 14 to start the hearing on June 3 on the application of the Trenton & Mercer County Traction Corporation for 6-cent fares.

At present hearings are being held before the commission on complaint of the City Commission, in which poor service is alleged. After the cross-examination in the pending service improvement is completed the hearing will be resumed on May 28, and this will allow the Utility Commission time to prepare for the rate hearing.

H. C. Eddy, senior inspector of traffic for the Utility Commission, testified that he did not think one-man cars would be advisable for Trenton. He produced cards taken from three-day readings during the rush hours showing that not enough cars were in service to handle the crowds. He thought that the riding habit in Trenton was not as strong as in other cities. Mr. Eddy said the company needed a dispatching system to improve its service.

Many recommendations for improvement to its lines were made at the hearing of the Trenton & Mercer County Traction Corporation before the commissioners on May 15. F. J. Daly, an inspector for the board, who made a complete survey of Trenton, was assisted by five trained traffic observers. Mr. Daly said the company did not provide ample service during the rush hours, especially to the men and women employed in the factories. He said that two of the faults were the failure to maintain schedules and the operation of single-truck cars.

That the carhouses of the corporation should be removed from their present location to some site more central in order to be more accessible for the cars and get them promptly in service was one of the recommendations of Chief Inspector Eddy of the commission. Mr. Eddy presented a detailed statement of defects in cars and tracks on the Trenton road. He said the fire protection at the carhouses is not adequate and he recommended an automatic sprinkling system over all the structures. He also suggested a reorganization as far as the corporate existence and the operating department were concerned. He thought that all the single-truck cars should be replaced with double-truck cars.

The hearing was before Commissioners Donges and March. George L. Record, special counsel, and Charles E. Bird, city counsel, represented Trenton. Former Prosecutor Martin P. Devlin appeared for the labor interests, and Frank S. Katzenbach, Jr., and Joseph E. Hunt, together with Rankin Johnson, president of the traction company, were present on behalf of the company.

Pittsburgh to Zone

Receivers Realize Inadequacy of Recently Increased Flat Fare to Meet the Present Conditions

The receivers of the Pittsburgh (Pa.) Railways after an examination of the revenues, expenditures and financial needs of the company, have come to the conclusion that it is absolutely imperative that the revenues be increased in order that proper service may be maintained and that adequate provision be made for the immediate future.

A statement by the receivers says:

"Our examination indicates that a fare of from 7 to 8 cents will be necessary to take care of the things that must be done to render the service that should be rendered, but we hope that we will be able to find a way to establish an area in the downtown section where a lower rate than this will be sufficient. As soon as we arrive at a definite conclusion with regard to the actual necessities and to our plans to overcome those difficulties we will make public the details."

In discussing the announcement, Attorney Charles A. Fagan, one of the receivers, said he did not believe there would be any widespread opposition to the proposed plan once it was fully understood and the equitable treatment it would afford the people was appreciated. He is quoted as follows:

"I do not think the proposed plan will be considered unjust or burdensome when all the points are announced and its workings are understood. That announcement, I may say, will come very soon; the matter is virtually decided upon now.

"The zone plan, or the paying by the passenger for the ride according to the distance traveled, is the only logical method. There is no reason why one person should pay as much for riding a short distance as another does for riding several miles. There will be a lowering of the present rate of fares in many instances. Some of those who travel will go back to the old 5-cent fare. I think the public will come to see that the plan is the right one and should have been effective long ago."

Fare Increase for Atlantic City Road

The State Board of Public Utility Commissioners of New Jersey has allowed an increase in fares for the Atlantic City & Shore Railroad. Two cents has been added to the rate between Atlantic City and Pleasantville. Other zones in which the company operates are affected at the rate of 1 cent for each fare collected. The company will continue to sell strip tickets at six for 60 cents. This the board says will result in a 5-cent fare for patrons. It is further stated by the board that the increase appears to be a reasonable means of securing added revenue for the company, and that it is estimated the raise in fares, will result in an increase of $20,058 for the company.

A hearing on the application for the increase was held on May 13. No opposition was registered. The board was of the opinion that if the operation of the road was to be continued, additional revenue must be afforded and that it did not seem to be unreasonable to expect that the division could yield such revenue. The increase is to take effect at once.

I. T. S. Increases Allowed

In an order effective from May 1, the Public Service Commission of Illinois has granted almost in its entirety the petition of the Illinois Traction System, Peoria, for emergency relief for electric light and gas plants in fourteen Illinois cities where it operates.

The commission also allows 6-cent fares in Cairo and Jacksonville and the elimination of tickets and straight 5-cent fares in Bloomington, Decatur, Danville, Champaign, Urbana, Galesburg and Quincy. Increases in rates for gas ranging from 10 to 25 cents a thousand are allowed in Decatur, Danville, Champaign, Urbana, Galesburg and Jacksonville. Electric rate increases of approximately 1 cent a kilowatt-hour are allowed in Bloomington, Galesburg, Normal, Decatur, Danville and Jacksonville, while smaller increases are allowed in Cairo and cities in which the Madison County Light & Power Company operates.

The order in brief says that this is an emergency case and that it is the duty of the commission in each instance to determine what may be reasonable rates for the public and the utility alike. The new rates are not to remain in effect beyond six months after the termination of the war and may be rescinded before that time. If the commission decrees, the old rates automatically become effective. The companies are to file reports of earnings and expenses every six months.

Boston Will Eliminate 1152 Stops

The Boston (Mass.) Elevated Railway is planning to eliminate 1152 stopping places on its surface lines for the purpose of saving coal as recently recommended by James J. Storrow, New England Fuel Administrator. There are 2881 stopping places on the surface lines less than 500 ft. apart, and 1200 of these are less than 400 ft. apart. Forty per cent of these, or 1152, can be withdrawn and it is estimated that this will save 27,000 tons of coal in one year, or about enough fuel to operate the road for twenty-seven days in the winter. Bulletins emphasizing the above facts have been posted in the various subway stations, carhouses, etc., on the system. They are signed by Edward Dana, transportation manager. These bulletins also urge the co-operation of the public as follows:

"Twenty-seven thousand tons of coal saved during the coming year will operate the road for approximately twenty-seven days next winter, when it may be impossible to get coal.

"As a war obligation the co-operation of patrons is solicited."

Rigid Parking Rules

At Some Corners in Washington Autos Not Permitted to Cross Tracks Except at Night

The district commissioners of the District of Columbia, supplemented by the police department, have just announced a series of new traffic rules which will go into effect on June 1. Their purpose is still further to help car movement which has already been assisted by the skip-stop, staggered-hour program, introduced in Washington by the commission. The section bounded by I Street, Pennsylvania Avenue, Seventh Street and Seventeenth Street is defined as the congested section, and most of the new regulations apply to it.

NO LEFT-HAND TURNS

The two most radical changes forbid left-hand turns at Fifteenth Street, New York and Pennsylvania Avenues and Fourteenth Street and New York Avenue and establish a number of one-way streets. At Fifteenth Street and New York Avenue vehicles are forbidden to cross the car tracks at all. Where there is a street loading platform or safety zone, no vehicle may stand between the platform or zone at the curb except long enough to take on or let off passengers. On several streets no parking of automobiles or other vehicles is permitted; on other streets parking is allowed for a limited time only.

Reduction in Fare Refused

The State Board of Public Utilities Commissioners of New Jersey has dismissed the petition of the city of Hoboken, filed on March 26, 1913, asking that the fare of the Public Service Railway there be reduced from 5 cents to 3 cents. The original petition applied to the Washington Street and the Willow Street lines, but on Oct. 1, 1915, an amended petition was filed making the petition applicable also to other lines in the city.

The petition alleged that the 5-cent rate of fare was unjust and unreasonable and that a 3-cent rate would be just and reasonable. After declaring that the city of Hoboken failed to sustain its allegations, the report of the Board of Public Utility Commissioners says:

"A satisfactory conclusion, even after a complete anaylsis of the testimony is impossible because of the confused state in which it was presented. Much of the testimony offered by various witnesses was subsequently withdrawn because of inaccuracy. Many of the elements necessary to a proper appraisal were disregarded and it would seem that no genuine attempt had been made by any of the witnesses to ascertain any proper allocation of the passengers, revenue therefrom, or operating expenses to the city of Hoboken which would justify the board in making any determination as to the merits of the application."

Charlotteville's Fare Increase Carried Unanimously

The Value of Good Public Relations in a Pinch Is Demonstrated Again in Virginia's University City

In securing the right to charge a straight 5-cent fare and a straight 3-cent children's fare in place of the six-for-a-quarter and two-for-five tickets, noted briefly in the ELECTRIC RAILWAY JOURNAL for April 27, page 831, the Charlottesville & Albemarle Railway, Charlottesville, Va., did not have to depart from its unique position as "an electric railway without an attorney." The local franchise did not embody any restrictions on rates of fare other than that the maximum within the city limits must not exceed 5 cents and without the city limits, 10 cents. The grant did require, however, that if any change was desired formal advertisement must be carried four times and that application for a hearing must be made before the State Corporation Commission with submission of valuation figures and other evidence of conditions.

FORMAL AND INFORMAL NOTICES

In compliance with the law, the railway, which was described in this paper for Sept. 22, 1917, inserted the usual formal notice on April 1, 4, 8 and 11.

Please Note

On account of the great increase in the cost of labor, rails, copper wire, in fact everything used in the operation of a street railway, we shall be compelled to discontinue on March 1st, 1918, the sale of six tickets for a quarter, having a straight five-cent fare; while for children between five and thirteen years of age tickets will be sold at the different stores, and at the Company's Office, at three cents each.

We regret very much the necessity for this action, but it is in order to maintain the service and help pay expenses. Tickets will be on sale until March 1st.

C. & A. RY. CO.

NOTICE OF INCREASE

The informal notice, however, appeared during the last few days of February both as a newspaper advertisement and a car poster. This notice, reproduced herewith, begins with a "Please Note," and the general tone is one of regret that an increase is necessary to maintain the quality of the service. To give the public a breathing spell, the company announced that tickets could still be bought at the old rates up to March 1. This brought a veritable avalanche of ticket sales, fully $2,000 of tickets being sold within ten days on a property whose total railway income during the entire year 1917 was only $42,605.

In the meantime, formal hearing before the State Corporation Commission had to be delayed until April 15. Pending this hearing, the company stopped selling tickets on the cars after March 1. Of course, it was still possible for a person to buy tickets at the old price by going to the office of the company, but very few took advantage of this opportunity.

At the hearing before the commission, the company was represented only by John L. Livers, its vice-president and general manager. The application was granted without any opposition, either from the Charlottesville Council or the Chamber of Commerce. Everybody felt the company was entitled to any increase that it needed to maintain its high standard of service.

Perhaps this quotation from an editorial entitled "A Fair Rate," in the Charlottesville *Daily Progress* is as good a picture as any of the public frame of mind:

"Charlottesville can boast the best street railway service of any city of equal size in this country. It has attracted favorable comment from many strangers who are surprised to find such a modern and splendidly equipped street railway in a city no larger than Charlottesville. To continue to maintain this up-to-date system, the company finds it imperative to discontinue the sale of six tickets for 25 cents."

The editorial then listed a large number of places that had gone to 6 and 7-cent fares whereas Charlottesville was simply going to the 5-cent fare.

Mr. Livers figures that the 5-cent full fare and 3-cent half-fare will add about $3,550 to the annual revenue, assuming that the travel for 1918 equals that of 1917 when the receipts were $42,605. It will not be easy to keep this volume of traffic because the war has cut down the attendance at the University of Virginia from 1200 to 600 students. At the same time, the company is certain that not a fare will be lost because of the increase. The discontinuance of tickets will also save several hundred dollars in printing and accounting charges, besides simplifying the work and eliminating temptation for the car operators.

Municipal Railway Feels the Pinch

The proposed amendment to the charter of the city of Edmonton, Alta., authorizing it to collect fares on the Edmonton Municipal Street Railway on the straight zone principle, was not authorized by the Alberta Legislature but the following section was adopted:

"Notwithstanding anything to the contrary whatsoever, the city is hereby declared to have and it shall have the power and authority to charge such tolls and fares on its tramway lines as shall from time to time be fixed by its Council, provided that such fares are uniform throughout the city."

Acting on the new powers, the city's street railway committee made the following recommendations:

"Transfers to be issued only between 6 and 9 a. m. and 5 and 8 p. m. A 10-cent fare between 11.15 p.m. and the time when cars cease running at night. Six tickets for 25 cents, good between 5 and 8 a.m. School children, ten tickets for 25 cents. Street railway to be supplied with electric energy at cost. Otherwise the 5-cent fare to remain in force as before."

An alternative proposal was submitted by Alderman Martin. He suggested the following:

Children 2½ cents, but such tickets not to be used between 9.30 and 11.15 a.m., and after 5 p.m. Labor tickets 4 1/6 cents, or six for 25 cents. Ordinary tickets, 6¼ cents—that is, four for 25 cents, or cash fares 7 cents. Ten-cent fares after 11.15 p.m.

Further discussion of the matter was adjourned until the new legislation becomes operative.

Report on Transportation in Washington

The report of the Public Utilities Commission of the District of Columbia to the Senate on March 9 relative to transportation conditions in Washington has just been published as document 197 of the Sixty-fifth Congress, Second Session, Senate. It contains sections 1 to 5 of the report made by John A. Beeler, the commission's expert, on congestion in the throat of the Capital Traction System, stopping places, entrance to Washington, of the W., B. & A. interurban cars, staggered hours of business and congestion on the downtown business district lines of the Washington Railway & Electric Company. The commission says in its report that it is still studying the question of rerouting and believes that it has full power, under the public utilities act, to take all necessary steps to carry out such improvements.

Salt Lake Fare Decision Upheld

By a decision of the Supreme Court of Utah Salt Lake City loses its fight for the 4-cent fare on the lines of the Utah Light & Traction Company.

The Public Utilities Commission ruled some time ago that the company's application for the elimination of the commutation books, giving fifty fares for $2, be granted. As a result the selling of the tickets at the 4-cent rate was discontinued on Dec. 31 last, and the company declined to accept any of the tickets after Feb. 1. Appeal from the commission's decision was taken by Salt Lake City.

The decision of the Supreme Court says that the order of the commission increasing the fares, presented three questions:

1. Did the passing of the franchise ordinances fixing the fares and their acceptance by the defendant constitute a contract between Salt Lake City and the defendant and between Murray City and the defendant?

2. If the franchise ordinance constituted contracts, was it within the power of the Legislature to authorize the commission to change the fares?

3. Does the constitutional provision by which the city authorities are given the exclusive right to permit or to refuse permission to electric railway companies to construct and operate within the cities of the State, prevent the State through its Legislature, from exercising its sovereign perogative to regulate and change the fares fixed in the franchise ordinances?

The first and second questions are answered in the affirmative by the Supreme Court. The third is answered in the negative. The court holds that so far as the question of the powers of the Utilities Commission are judicial, the utilities act has conferred power upon the Supreme Court; but in so far as the acts of the commission are properly administrative, or in their nature legislative, the power has been "wisely and properly" withheld from the court.

The decision of the Public Utilities Commission in this case was reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 16, page 34.

Cleveland Body Will Investigate

The public utilities committee of the Chamber of Commerce of Cleveland, Ohio, is preparing to investigate the electric railway situation in order to ascertain whether the 6 per cent dividends, pledged by the Tayler grant to the Cleveland Railway, can be maintained and at the same time adequate service be furnished. This was decided at a meeting held on May 13. The work will be commenced just as soon as the personnel of a committee can be decided. Mayor Harry L. Davis, Street Railway Commissioner Sanders and members of the Council committee on street railways will be invited to participate.

Attorney H. J. Crawford, representing the company, said that Council must either allow the maximum fare provided by the franchise to be exceeded, or the service will have to be reduced. A clause in the grant provides for a reduction of service, if at any time the income is insufficient to pay the expenses of operation and, also, yield a return of 6 per cent on the investment, as represented by the outstanding stock.

Mr. Crawford said that the safeguards about owners of the stock are so strong that whenever the dividend rate is impaired the city will lose control of the operation of the road and the authority of the Street Railway Commissioner will be nullified temporarily. However, before the city would lose this control, arbitrators would have to ascertain that the service demands were too great to enable the company to meet its requirements at the maximum rate of fare and fix the method in which the company was to recoup its losses.

J. J. Stanley, president of the Cleveland Railway, expressed the hope that it would not be necessary to reduce the service. It is barely sufficient now to take care of the transportation needs of the city.

Within the past year the rate of fare has been increased four times.

Philadelphia Rapid Transit Wants Six-Cent Fare

Additional Revenue Imperative in Philadelphia if Ability to Serve Public Is to Continue Unimpaired

Mayor Smith of Philadelphia, Pa., on May 16 submitted to Councils a communication from the Philadelphia Rapid Transit Company, asking for an increase in fares from 5 cents to 6 cents.

The bill has in turn been referred to Councils' committee on finance and to the street railway committee. The measure provides that in case the transit lease now before the Public Service Commission is approved, the base fare shall be 6 cents, and the fare thereafter shall be subject to adjustment according to the terms of the lease. If the lease is not approved, the measure provides, the 6-cent fare shall be subject to revision and adjustment at the expiration of one year after the close of the war.

Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, in a letter to Mayor Smith and Councils, said in part:

INCREASE A WAR MEASURE

"Apart from all other considerations, and purely as a war measure, the company, therefore, at the instance of its men and in order to be in a position to render more efficient service, asks you to assent under the 1907 contract to an increase in the base fare from 5 cents to 6 cents. It is estimated that this increase, after allowing for a slight falling off in riding, will add $3,500,000 to $4,000,000 to the revenues of the coming year, all of which will be expended in the payment of the increased wages and in the purchase of new cars, and other facilities and the improvement of service to the public. The company will immediately, upon assent being granted, place orders for 100 additional cars, and believes that it can get the necessary priority orders to have them delivered within a period of six months, so that if ordered promptly they will be available for the next winter.

"The company pledges that no part of the increased revenue derived from the increase of fare asked for shall be used to pay dividends to the stockholders of the company beyond the 5 per cent now established.

"The financial results for the year ended June 30, 1918 (two months estimated), will be as follows:

Gross earnings	$30,343,000
Operation and taxes	18,337,000
Fixed charges and dividends	11,253,000
Surplus	753,000

"An estimate of the results for the year beginning July 1, 1918, assuming a 4 per cent increase in gross earnings, an added payroll charge of $1,750,000 on account of a 5 per cent increase in wage and with allowance for increase in the cost of materials and other expenses, follows:

Gross earnings	$31,560,000
Operation and taxes	21,761,000
Fixed charges and dividends	11,350,000
Deficit	1,551,000

"Applying this estimate of earnings for the fiscal year beginning July 1, 1918, to the estimated working cash balance on hand June 30, 1918, and having regard to the fact that all capital expenditures, including refunding, must be met out of current cash, as it is impossible to issue any new securities during the war period, the financial condition of the company as at June 30, 1919, would be as follows, no allowance being made for increase in fare:

Estimated cash working balance June 30, 1918	$1,900,000
Year to June 30, 1919, deficit from operations	1,551,000
	$3,490,000
Capital requirements	1,800,000
Estimated cash deficit June 30, 1919	$1.451,000

"If the fare increase asked for should become effective, say, July 1, the estimated increase in gross revenues for the coming year would be $3,500,000, from which should be deducted the above estimated cash deficit of $1,451,000, leaving $2,049,000 cash available for the purchase of 100 new cars and the improved service facilities promised. If the result of the fare increase should be more favorable than the estimates, the additional revenues would also be applied to the extension and betterment of the service."

Dallas Jitneys Lose

Jitney drivers of Dallas, Tex., lost again in the recent city election in which they sought by initiative to validate the initiated ordinance adopted by the voters at a general election more than one year ago and later held invalid by the courts. The jitney drivers by an initiative petition at the recent city election sought to make certain changes in this measure which would have removed the objections raised to it and would have made the measure conform to the court's interpretation of the constitutional limitations on these points. The initiated measure was overwhelmingly defeated.

With the results of the recent election announced, A. S. Hardwicke, city attorney, has issued a statement outlining in full the city's attitude toward the jitneys in Dallas. Mr. Hardwicke reviewed the fight between the city and the jitney drivers from the beginning, showing how the city first enacted a simple regulatory ordinance, the provisions of which were not onerous, but that the jitney drivers objected to any form of regulation and went to the courts and secured an injunction nullifying the action of the city. This case has been appealed by the city and is now before the State Supreme Court.

With the situation thus disposed of for the time being, at least, city authorities have issued instructions to the police department to enforce the jitney regulations to the letter. This enforcement has practically put the jitneys out of business in Dallas.

Transportation News Notes

Metal Tokens for St. Louis.—Metal tickets will be used by the United Railways, St. Louis, Mo., when the new 6-cent rate is applied on June 1.

Six-Cent Fare in Chester.—Notice was given on May 15 by the Southern Pennsylvania Traction Company, Chester, Pa., that a new tariff for fares would go into effect on June 14. The increase is from 5 cents to 6 cents.

Increase for West Virginia Line.—The Newell Bridge & Railway Company, Newell, W. Va., has been authorized to increase its fare on the Newell-East Liverpool line from 5 cents to 10 cents, effective at once.

Skip Stop Suggested for Twin Cities.—The skip-stop plan of operation for the Twin City Rapid Transit Company has been suggested to the Councils of Minneapolis and St. Paul, Minn., and will receive attention at once, it is expected.

Maine Road Files Increase.—The Calais (Me.) Street Railway on May 18 filed a new schedule of fares with the Public Utilities Commission of Maine proposing an increase in fares from 5 cents to 6 cents, effective on June 10.

Commission Refuses Fare Increase to Interurban.—The Public Utilities Commission of Colorado has refused the application of the Denver & Interurban Railroad for permission to increase the fare between Denver and Boulder from 75 cents to 90 cents for the 28½-mile trip.

Springfield Wants Six-Cent Fare.—The Springfield (Ill.) Consolidated Railway has filed a petition with the State Public Utilities Commission asking for authority to increase its rates from 5 cents to 6 cents, and to discontinue selling tickets for reduced prices, as at present.

Omaha Would Charge Six Cents.—The Omaha & Council Bluffs Street Railway has filed a petition with the State Railway Commission of Nebraska for permission to increase its fares in Omaha from 5 cents to 6 cents. The purpose of the company to do this was noted briefly in the ELECTRIC RAILWAY JOURNAL of May 18.

Will Go to Seven Cents.—It is reported that the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, will file with the Public Service Commission of Pennsylvania a new tariff increasing car fares to 7 cents or six tickets for 40 cents in the Sharon-Farrell district, which includes Wheatland, Farrell, Sharon and Sharpsville.

Cincinnati Must Be Shown.—W. C. Culkins, street railroad director of Cincinnati, Ohio, is quoted as saying that an increase in the rate of fare will be considered only after all other remedies for improving the financial situation of the Cincinnati Traction Company have been exhausted. He considers that the burden of proof rests with the company.

Elevated Skip Stops.—Patrons of the Ravenswood branch of the Northwestern Elevated Railroad, Chicago, Ill., were recently notified that to shorten the running time between their stations and the downtown loop, commencing May 13 and until further notice a skip-stop train schedule would be put into operation on the Ravenswood branch during the morning rush hours.

Would Compel Company to Pave.—Judge King Dykeman, in the King County Superior Court, Seattle, Wash., recently signed the order for peremptory writ compelling the Puget Sound Traction, Light & Power Company to proceed with the paving in the Queen Anne District, as obligated in its franchise. It is understood the company will file a supersedeas bond pending appeal.

Twin City to Ask Six-Cent Fare.—Horace Lowry, president of the Twin City Rapid Transit Company, Minneapolis, Minn., speaking on May 17 before the St. Anthony Commercial Club, said the company is preparing a request to the City Council for permission to put in a 6-cent fare. According to Mr. Lowry the company is facing higher fare, curtailment of service or bankruptcy. The proposed move is a war measure.

Final Schedule Order Issued.—The Public Service Commission for the First District of New York has adopted a final order directing the Brooklyn Heights Railroad and other companies of the Brooklyn Rapid Transit System operating surface car lines, to file operating schedules with the commission and to post in the cars placards giving the "headway" and service called for in the schedule. These schedules must show the route, the car run numbers, the terminals and car depots.

P. A. Y. E. Extended in Spokane.—On May 5 the Spokane (Wash.) Traction Company inaugurated the system of pay-as-you-enter on all of its cars. This plan of operation has been in use on the Washington Water Power Company cars for a couple of years. The Spokane Traction Company is planning to change its gates both of which are at the rear end of the car opening out on the right side and operated by the motorman. When the change is made it will be possible for the conductor to operate the gates.

Blue Hill Street Railway Seeks Fare Increase.—The Blue Hill Street Railway, one of the original Stone & Webster properties south of Boston, Mass., has filed a schedule of increased fares with the Public Service Commission of Massachusetts. The road at present is operated in three zones of 5-cent fares each and in one 6-cent zone. It is proposed to increase the fare to 6 cents in each of the former 5-cent zones and to 7 cents in the former 6-cent zone. A public hearing will be assigned by the board at a later date.

Seattle Suburban Line Feels Pinch.—Thomas F. Murphine, city utilities commissioner of Seattle, Wash., has agreed to the request of a delegation from the Rainier Valley Business Men's Club to investigate the Seattle & Rainier Valley Railway. The club committee presented no definite plan or recommendation. It asked that the city extend some relief to the road. The elimination of transfers, the sale of block tickets and a 6-cent fare have all been advanced as relief measures, although the 6-cent fare seems hardly possible in view of the recent court ruling.

Dayton Has a Traffic Problem.—A. L. Drum, transportation engineer of the United States Shipping Board, addressed electric railway officials and members of the City Commission at Dayton, Ohio, on May 8 in an effort to offer suggestions that will aid in the solution of the transportation problem in that city. Mr. Drum suggested that factories stagger the hours for opening and closing and that cars be rerouted. The matter is now before the Commissioners and J. E. Barlow, city manager, and an effort will be made to work out a practical plan.

Voters to Pass on Fare Increase.—A resolution has been passed by the City Commission of Sioux Falls, S. D., to submit the question of a 6-cent fare for the Sioux Falls Traction System to the voters and a special election has been called for May 28. Several weeks ago a committee of members of the local commercial club and other citizens was appointed to investigate the affairs of the company. On May 11 that body filed a report in which it recommended a 6-cent fare. Among other things the committee learned that the railway has paid no dividend on its stock since 1907 and that for the last three years the expenditures of the company have exceeded the receipts.

Increase for Trenton Suburban Line.—An increase from 5 cents to 6 cents on each fare and the withdrawal of commutation tickets at twelve for $1 was allowed on May 17 to the New Jersey & Pennsylvania Traction Company on its lines in four fare zones between Trenton and Princeton by the State Board of Public Utility Commissioners. The board says the increase is for the purpose of meeting a deficiency in operating revenue and to provide for the bond interest and not for the purpose of declaring dividends, and that the addition of 1 cent to each fare and the withdrawal of tickets will net the company 6 per cent on the physical value of the property.

Charleston Refuses Fare Request.—By a vote of nine to eight the City Council of Charleston, S. C., on May 14 rejected the petition of the Charleston Consolidated Railway & Lighting Company asking for an increase in fare from 5 cents to 6 cents. When the matter was officially reported to the Aldermen, Chairman Lawrence M. Pinckney, of the joint committee on ways and means, streets and railroads, first read the majority report, which favored an increase, and then the minority report, signed by five members, which opposed the granting of the petition. Alderman Pinckney moved that the minority report be considered as a substitute for the majority report after Alderman Robertson had moved for adoption of the majority report.

A Red Cross Car.—W. W. Lowe, manager of the Manhattan & Queens Traction Corporation, New York, N. Y., is preparing a car for the Red Cross campaign. The exterior and interior will be entirely in white enamel, with large red crosses prominently displayed. In this case the motorman will wear the costume of a surgeon, while the conductoress will represent a Red Cross nurse. Mr. Lowe is contemplating offering an annual pass over the railway to the passenger making the largest subscription. The car of this company which has been enlisted in the Thrift Stamp campaign was described and illustrated in the ELECTRIC RAILWAY JOURNAL of May 18, page 991.

Wants Straight Five-Cent Fare.—The Des Moines (Ia.) City Railway has started a newspaper advertising campaign as a forerunner of its plan to put fares in Des Moines on a straight 5-cent basis. Several times recently all the papers in the city have carried half page advertisements which give a very concise financial statement of the company's revenues and expenses during the first three months of 1918. Particular attention was called to the fact that the expenses during this period exceeded the income by more than $4,000. There is likelihood now that the City Railway will ask the Council to suspend the six-for-a-quarter ticket clause of the franchise during the period of the war. Officials of the company are of the opinion that the city can take this action without a vote of the people which would be necessary if an unqualified 5-cent fare were sought.

A Runaway.—A curious runaway occurred recently on an electric railway in one of the Central States. The primary cause was that the trolley jumped off on a small pay-as-you-enter car which, at the time, was on the out trip near the edge of the city. The motorman-conductor got off to put the trolley back. When the trolley struck the wire, the car started down the track for the country. The motorman was too surprised to hang to the trolley rope. He had left his controller on the first contact. Since the car was on a 12-mile interurban track and would soon meet a big interurban car, the motorman hurried to the dispatch phone and explained the situation. Power was cut off at once. The motorman walked 4 miles to get his car and then a mile to a station phone to call for power again. His carelessness had tied up the interurban and freight service of a busy railroad line for two hours.

Legal Notes

ILLINOIS.—*Interurban Motorman While on City Tracks Is Employee of Interurban Company Under Workman's Compensation Act.*

Under the workmen's compensation act, a motorman employed by an interurban railway company and wearing its uniform, who was paid by the hour and operated its cars to the city limits of Chicago and then operated them within the city limits under an agreement between the interurban company and a city railway company, whereby that company paid his wages while operating within the city, was the employee of the interurban company while operating cars within the city. (Chicago & Interurban Traction Co. *vs.* Industrial Board of Illinois et al., 118 Northeastern Rep., 464.)

ILLINOIS. — *Assessment of Railway Buildings for Municipal Benefits.*

Where the real estate on which an electric railway terminal is located is assessed for improvements and the use of such terminal for railway purposes is permanent, the property should not be assessed on the theory that the company might sell it for a manufacturing plant and move its terminal to some other place. (City of Chicago *vs.* Chicago Railways, 118 Northeastern Rep., 728.)

MASSACHUSETTS. — *Release by Injured Passenger Does Not Affect Executor's Right of Action.*

Where an injured passenger gave a street railway a release from any and all claims, demands, actions and causes of action of every name and nature that she had or might have against the company as a result of her injuries, the release to be binding on her, her heirs, executors, administrators and assigns, such release did not bar recovery in the executor's action for wrongful death of the passenger caused by her injuries, since, in case of recovery for wrongful death, the executor or administrator receives the penalty for death in a different capacity from that in which he would receive damages for conscious suffering. (Wall *vs.* Massachusetts Northeastern Railway, 118 Northeastern Rep., 864.)

NEW JERSEY.—*Person Crossing Track Must Exercise Continual Vigilance.*

The plaintiff before crossing the track of a street railway looked first to the south and then to the north, and continued looking to the north until a car coming from the south came into the range of observation, but he did not look again to the south before attempting to cross. He was struck and injured by the car which was moving from 5 to 8 m.p.h. It was held to be a court question and not a jury question, that the plaintiff was guilty of contributory negligence and that it was error for the trial court not to have granted a motion to nonsuit the plaintiff or direct a verdict for the defendant. (Hubbard *vs.* Atlantic Coast Electric Railway, 102 Atlantic Rep., 632.)

NEW JERSEY. — *Proper Service with Maintained Property More Important than Contracts with Municipalities.*

Where a street railway was being run at a loss, even without allowing for depreciation, the public utility commissioners should have granted a request to raise the fare from 5 to 6 cents, although there were local contracts with municipalities through which the road ran, such contracts being inferior to the duty of the street railway to keep and maintain its property and equipment and to furnish safe, adequate, and proper service as required by act April 21, 1911 (P. L. page 379) sec. 17 (b). (Northampton, Easton & Washington Trac. Co. *vs.* Board of Public Utility Commissioners of New Jersey, 102 Atlantic Rep. 930.)

NEW YORK. — *Apportionment by Commission of Cost of an Improvement Which Required Joint Action of More than One Utility.*

The public service commission law (Consol. Laws, chap. 48) sec. 50, provides that if the commission has determined to order improvements which require joint action by more than one railroad company, it shall notify them that it shall be made at their joint cost, and if, in thirty days, they shall fail to file an agreement for division or apportionment thereof, it shall have authority, on hearing, to fix the proportion of the cost or expense to be borne by each. Held, that the commission need not impose a part of the cost on each, but, if fairness requires it, may order all the cost to be paid by one. (People ex rel. International Railway of City of Buffalo *vs.* Public Service Commission, Second District, (Erie Railroad et al., interveners), 168 New York Sup., 322.)

NEW YORK.—*Person Waiting to Board Car Injured by Car Coming from Opposite Direction.*

Where a car on a single track approached plaintiff, standing under a bright light in the roadway in the usual place to board a car bound the other way, and, when the motorman saw plaintiff turn and diagonally approach the track, he sounded his gong, put on the air brake and reversed the current, but plaintiff's umbrella caught against the side of the car, turning her around and causing her to fall, the street railway was not liable, plaintiff having been to blame for letting her umbrella catch against the car by holding it low to cover her hat and having been preoccupied in looking the other way. (Campbell *vs.* Richmond Light & Railroad, 168 New York Sup., 814.)

TEXAS.—*Misconduct of Jury in Arriving at Verdict.*

In an action for personal injuries, it was flagrant misconduct for the jury in assessing damages to consider the fact that the plaintiff's attorneys would receive 50 per cent of the recovery, and to double their verdict on that account, and to consider items for hospital, medicine and physicians not submitted to it. (San Antonio Traction Co. *vs.* Mendez, 199 Southwestern Rep., 691.)

New Publications

Statistics of Railways for 1906-1916

Bureau of Railway Economics, Washington, D. C. Consecutive No. 120. Miscellaneous Series No. 30. Fifty-eight pages. Paper.

This annual bulletin brings together in convenient form the official statistics of railway operation, based upon official data of the Interstate Commerce Commission, from 1906 to 1916, the latest year for which such data are available. The statistics of net operating income have been compiled to correspond as nearly as possible with the definition of the "standard return" guaranteed by the federal government to the railroads under national control.

Effect of Workmen's Compensation Laws Is Diminishing the Necessity of Industrial Employment of Women and Children

By Mary K. Conyngton. United States Department of Labor, Bureau of Labor Statistics. Bulletin No. 217. Workmen's Insurance and Compensation Series No. 11. Superintendent of Documents, Government Printing Office, Washington, D. C. Paper, 15 cents.

The investigations described in this book were undertaken to throw some light on the question of how workmen's compensation laws compare with employers' liability laws from the point of view of women and children in the families of injured employees. A study was made of the results under the elective compensation system of Connecticut, the compulsory insurance system of Ohio and the employers' liability law of Pennsylvania, which up to Jan. 1, 1916, had no compensation law.

In the author's opinion, the situation may be summed up by saying that in the compensation states the families of victims of industrial fatalities knew with reasonable certainty what they might expect, received it with reasonable promptness and found it, in general, sufficient to keep them from extreme hardship. In the liability state visited, however, the families of decedents were entirely uncertain as to what they would have or when they would get it, and a large proportion were quite certain that they would not receive anything. The author considers the former system preferable.

Personal Mention

Percy Allen Rose has resigned as solicitor of the Johnstown (Pa.) Traction Company.

J. F. Canfield has been appointed auditor of the Ottumwa Railway & Light Company, Ottumwa, Iowa, succeeding C. Brazel.

J. O. Marcum, claim agent of the Ohio Valley Electric Railway, Huntington, W. Va., has been made superintendent of transportation of the company to succeed W. C. Baker.

John W. Williamson, general freight agent of the Ohio Valley Electric Railway, Huntington, W. Va., has been made assistant superintendent of transportation of the company.

W. R. Power has been made general manager of the Ohio Valley Electric Railway, Huntington, W. Va., to succeed H. S. Newton, now manager of railways of the Monongahela Valley Traction Company.

T. D. Rauch has been placed in charge of the new complaint department which has been instituted recently by the Little Rock Railway & Electric Company, Little Rock, Ark., for the purpose of centralizing the settling of complaints.

M. Miers has resigned as master mechanic for the Joplin & Pittsburg Railway at Pittsburg, Kan., and accepted a similar position with the Michigan United Railway at Kalamazoo, Mich. Mr. Miers was with the Michigan United Railway previous to his appointment at Pittsburg.

F. T. Morrissey has resigned as manager of the Eldorado Illinois group of properties of the Southern Illinois Utility Company to become electrical engineer for the Indiana Railways & Light Company, Kokomo, Ind., filling the place made vacant by the resignation of George H. Losey.

Fay Griffith, who has been superintendent of the lighting department of the Little Rock Railway & Electric Company, Little Rock, Ark., has been promoted to the position of superintendent of light and power and has taken over both the meter and line departments of the company.

Walter J. Cummings has been made chairman of the board of directors of the Chicago & West Towns Railway, Chicago, Ill., succeeding his brother, John J. Cummings, who died on May 4. Walter J. Cummings has been closely associated with this railway since its reorganization in 1913. He also has been connected in an official capacity with many other railway projects which he and his brother helped to finance and develop. All his active business life, both as a railway operator and a manufacturer of cars and car equipment, has been spent in studying the needs of the electric railway field.

Charles A. Coffin, chairman of the board of directors of the General Electric Company, has had the rank of Officer of the Legion of Honor conferred upon him by the French government. This was done through Justin Godart, formerly Assistant Secretary of War of France, who is in this country on a special mission. The honor given to Mr. Coffin is in recognition of his services as a member of the executive committee of the War Relief Clearing House for France and as a member of a committee of prominent Americans promoting the establishment of scholarships in French universities for American students after the war.

M. E. Graston, heretofore division passenger and freight agent of the Union Traction Company of Indiana at Indianapolis, has recently been appointed general agent at Indianapolis with authority in all departments at the Indianapolis terminal, subject, of course, to the general department heads. Mr. Graston commenced railroad work in 1890 as telegraph operator and agent at Letts Corner, for the Big Four Railroad. He continued in the service of that company until November, 1914, filling the position of agent at North Vernon, Rushville and Wabash, successively. In January, 1915, he entered the employ of the Union Traction Company in the traffic department, where he remained until June, 1910, when he left the company to become general manager of the electric railway between Indianapolis and New Castle, known as the "Honey Bee Line." This position he occupied until November, 1912, when the "Honey Bee" was taken over by Union Traction Company. Mr. Graston was then made division passenger and freight agent with headquarters at Indianapolis.

Obituary

Edward T. Burrowes, the president of the Curtain Supply Company, Chicago, Ill., died very suddenly recently at his home in Portland, Me. Mr. Burrowes had been president of the company since its organization on May 19, 1899, at which time the E. T. Burrowes Company, the Adams & Westlake Company and Forsyth Brothers Company, sold out their curtain departments to the new concern which was called the Curtain Supply Company. Mr. Burrowes was therefore connected with the car curtain industry from its very beginning, being president of the first company that ever put on the market an automatic car window curtain. Mr. Burrowes leaves a widow and two children.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Franchises

Portland, Me.—The Portland Railroad, which is operated under lease by the Cumberland County Power & Light Company, has asked the Public Utilities Commission of Maine for its approval of the construction of certain branch-off tracks from its track on Sawyer Street, South Portland, to enable it to reach more easily the Portland shipbuilding plant and other industrial plants in that vicinity. The petition also contained requests for new track locations on Portland and Front Streets and on Sawyer and Front Streets

Wilmington, N. C.—The Tidewater Power Company has asked the City Council for a franchise to construct an extension of its lines on South Front Street to the city limits and to build a connecting track on Third Street.

East Cleveland, Ohio.—A referendum election will be held in East Cleveland on June 18 on a new franchise ordinance for the Cleveland Railway recently enacted by the City Commissioners. The ordinance fixes the fare at 5 cents with a 1-cent charge for transfer. The franchise is to continue for twenty-five years, but six months before the expiration of each five-year period the question of changing the fare may be submitted to arbitration.

Greensburg, Pa.—The West Penn Railways has received a franchise from the Borough Council of Greensburg for the construction of a switch at Main and Otterman Streets, east, and the extension of its line from Potomac Street to the borough limits.

Newport News, Va.—Application has been made to the City Council by J. N. Shannahan, of the Newport News & Hampton Railway, Gas & Electric Company, representing the Emergency Fleet Corporation, for permission to construct a railway on Fiftieth and Fifty-ninth Streets and Virginia Avenue to transport workmen at the shipbuilding town now being established north of the city limits.

Track and Roadway

***Anniston, Ala.**—It is reported that business men of Anniston have appointed a committee composed of W. H. Weatherly, W. H. McKleroy, Joseph Saks, Ross Blackman and L. L. Crump to organize a company to build an electric or gas-electric railway from Anniston to Camp McClellan, a distance of 6 miles. The company is in the market for relaying rails and also for second-hand or rebuilt cars if the line is to be electrified. Practically all of the fund of $100,000 has been subscribed.

Georgia Railway & Power Company, Atlanta, Ga.—The last issue of *Here We Are*, the publication of the Georgia Railway & Power Company, states that the roadway department has a number of good-sized jobs on hand, despite the fact that but little new construction is being undertaken this year. Both tracks are being rebuilt on Edgewood Avenue from Piedmont Avenue to Bell Street and from Fort Street to near Jackson Street, new rails and paving being laid. The tracks are being relaid on Stewart Avenue to meet a change in grade. Part of the outbound Whitehall Street track is to be rebuilt. If the city decides to repave Peachtree from Five Points to Pine Street all that track must be rebuilt.

Winnipeg (Man.) Electric Railway.—Orders have been placed by the Winnipeg Electric Railway for a number of automatic electric track switching devices for installation at the most congested points on the company's line. If the devices prove satisfactory in operation, they will be adopted as a permanent improvement.

Portsmouth, Dover & York Street Railway, Portsmouth, N. H.—It is reported that the Portsmouth, Dover & York Street Railway will construct an extension from the junction of Dennett Street and Maplewood Avenue, through Cutt Street to Freeman's Point.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission for the First District of New York has announced that it has fixed June 15 as the date for the opening of the new Lexington and Seventh Avenue lines of the dual subway system. Work is being rushed with all possible speed on the two lines, and there is every indication that all will be ready on the date named except minor details to stations.

Cincinnati (Ohio) Traction Company.—Walter A. Draper, vice-president of the Cincinnati Traction Company, recently wrote a letter to Street Railroad Director W. C. Culkins, in which he objected to extending the East End line to Mount Washington and California, as provided for in a resolution adopted by the City Council, on the ground that the territory is sparsely settled and the line would lose money for the company. He also said that an extension there would depreciate the service some place else, because of the transfer of equipment.

Ohio Electric Railway, Springfield, Ohio.—About 300 ft. of the piling bridge of the Ohio Electric Railway near Hamilton was washed away by high water in the Miami River on May 13. This may prove a serious inconvenience to transportation for some time.

Seattle (Wash.) Municipal Street Railway.—The Board of Public Works has awarded the contract for furnishing materials, labor, etc., for the construction of the elevated line of the Seattle Municipal Street Railway along East Marginal Way and West Spokane Street to C. Geske & Company, Seattle, for $16,186. The contract for the trestle portion of the line, from First Avenue South and Washington Street to Railroad Avenue, south on Railroad Avenue South and Whatcom Avenue to Walker Street, 1½ miles, was let to D. W. Rutherford, Tacoma, for $42,262. The contract for furnishing 800,000 ft. of lumber, consisting of ties, stringers and guard rails for the elevated railway was awarded to the Pacific Northwest Lumber Company at $16,067.

Shops and Buildings

Bangor Railway & Electric Company, Bangor, Me.—A freight house will be erected by the Bangor Railway & Electric Company in Old Town.

Cleveland & Erie Railway, Girard, Pa.—It is reported that the Cleveland & Erie Railway contemplates the construction of a large freight terminal in Conneaut.

Power Houses and Substations

Georgia Railway & Power Company, Atlanta, Ga.—A new 66,000-volt substation has been completed at Calhoun by the Georgia Railway & Power Company. The company has also installed a 2000-kva. synchronous condenser at the Lindale substation.

Interborough Rapid Transit Company, New York, N. Y.—A new transformer station is being built by the Interborough Rapid Transit Company at 150 East Fifty-seventh Street, to cost about $45,000.

Bamberger Electric Railroad, Salt Lake City, Utah.—A fire at the station of the Bamberger Electric Railroad at Thirty-first Street and Lincoln Avenue, Ogden, occurred on May 7 and completely destroyed the plant and equipment of the company, as well as the equipment of the Utah Power & Light Company, and the carhouse adjoining, containing twenty electric cars and several locomotives. The loss is estimated at about $500,000. Plans are being made for the construction of a new fireproof carhouse either at Salt Lake City or Ogden. The reconstruction of the carhouse and sheds and the installation of the equipment for repairing, painting and general upkeep of the rolling stock of the company will cost approximately $100,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Westinghouse Electric Sales $95,735,407

$147,000,000 of Unfilled Orders on April 1, of Which $110,100,000 Is For Regular Products

Evidence of the large demand upon electrical manufacturing companies is shown by the statement in the annual report of the Westinghouse Electric & Manufacturing Company that, as of April 1, 1918, the value of unfilled orders on hand was $147,857,580. Of this amount $110,185,007 was for regular products of the company. On March 31, 1917, the value of unfilled orders for regular products of the company was $39,776,739. Sales billed in the fiscal year ended March 31, 1918, by the company and its proprietary companies, except the New England Westinghouse Company, aggregated $95,735,407. This total compares with $89,539,442 in the preceding fiscal year. The amount of sales billed, as stated for the year just ended, includes shipments since June 15, 1917, from the machine works (formerly Westinghouse Machine Company), also $4,536,000 for munitions.

The volume of sales billed for the regular products of the company, it was stated, was greatly in excess of any previous year. Furthermore, the report said that no facilities heretofore employed on regular products are engaged on munition work.

The income account for the last year follows:

Gross earnings—Sales billed		$95,735,407
Cost of sales—Factory cost, including all expenditures for patterns, dies, new small tools and other betterments and extensions; also depreciations of property and plant, inventory adjustments and all selling, administration, general and development expenses and all taxes		80,225,937
Net manufacturing profit		$15,509,470
Other income—interest and discount	$308,835	
Dividends and interest on sundry stocks and bonds owned	903,559	
Miscellaneous—royalties, etc.	112,869	1,325,263
Gross income from all sources		$16,834,733
Deduction from income—interest on bonds and debentures	$303,917	
Interest on notes payable	1,108,046	
Miscellaneous interest	17,089	1,429,052
Net income available for dividends and other purposes		$15,405,681

The surplus as of March 31, 1917, $18,105,298, was increased by the net income of $15,405,681 for the year, making the gross surplus $33,510,979.

In addition to the regular quarterly dividends at the rate of 7 per cent per annum on the preferred and common stocks, a special "Red Cross" dividend was paid, making a total of $5,610,848 for all dividends paid during the year.

Special appropriations were made for the protection of inventory book values and to establish a research and development fund. After deducting these appropriations and other miscellaneous adjustments the net surplus as of March 31, 1918, is $26,404,694, an increase of $8,299,396 over the net surplus as of March 31, 1917.

Railway Lamp Stocks Growing Stronger

Manufacturers Advise Managers and Purchasing Agents to Place Orders—Shortage May Occur Again

Just how much the observance of the so-called daylight saving law is affecting the sale of incandescent lamps has not been determined. Experts are making estimates and, roughly speaking, it is believed that from 5,000,000 to 10,000,000 fewer lamps a year will be sold. With an annual production of about 210,000,000 lamps, these figures, in comparison, may not look formidable; but, nevertheless, they constitute quite an item. The demand for lamps has fallen off, as it always does, with the lengthening days and approach of summer. Manufacturers now say they are accumulating a good stock at all their plants in nearly every size and type of electric car lamps.

One of the largest manufacturers reports its stock in excellent condition for early shipments. Headlight and projecting lamps are also in a like favorable position. This is also true, possibly in slightly lessened measure, of other producers.

What the manufacturers, some of whom are launching an educational campaign on the subject, desire railway managers and purchasing agents to understand is that within the next few weeks—no later than June, they say—buyers should give serious attention to placing orders for their fall and winter requirements. This is because war conditions are radically different in every aspect from normal times. The transportation situation will be more congested, and another shortage similar to that of last fall may occur. Productive capacity has not been curtailed.

Car Curtain Supply Elects New Officers

To Move Into More Spacious Quarters Owing to Rapid Growth in Business

At a meeting of the directors of the Curtain Supply Company, held on April 30 last, Holmes Forsyth, formerly second vice-president and secretary, was elected president, succeeding the late Edward T. Burrows. Mr. Forsyth has been in active charge of the company since its organization in 1899, having at that time been elected secretary and general manager, which office he has held until his recent election as president.

Ward W. Willets, vice-president and treasurer and one of the organizers of the Curtain Supply Company, was reelected.

Randolph S. Reynolds was elected secretary. He has been with the company since 1912. Prior to that time he was with the Western Steel Car & Foundry Company at Anniston, Ala., and the Pressed Steel Car Company at Pittsburgh, Pa., having been connected with the purchasing departments of these companies from 1905 to 1912. He left the latter in 1912 to accept a position with the Curtain Supply Company and later was made assistant to the general manager.

The Curtain Supply Company, owing to the necessity of having more space due to the growth of its business, has leased almost the entire building at 350-356 West Ontario Street, Chicago, and will be located there after the first of June. The new quarters will be about 50 per cent larger than the old, and in addition to having the advantage of greater and more efficient manufacturing facilities, the company will have its own switch track for shipping and receiving. The company has been at the old location at 320 West Ohio Street, Chicago, for about nineteen years, during which time not only has the business in its regular line of car curtains and fixtures grown in volume but also it has added other departments to handle new articles which it has developed and is manufacturing.

Government Prices of Coal

The United States Fuel Administration has just issued an official list of prices for coal in effect on April 22, 1918. The quotations are for coal f.o.b. at the mines, by districts and for different sizes, with the monthly summer reduction, allowance for rescreening, etc. The circular is known as publication No. 4D, 1918.

Large Order for Checking Device

Bay State Street Railway Buys Fifteen Hundred Economy Meters for Car Service

Following an extended investigation, the Bay State Street Railway, Boston, Mass., has purchased about 1500 Sangamo Economy watt-hour meters for use in its entire active passenger equipment. The order represents an expenditure of about $75,000. It is understood to be for the largest number of checking devices ever ordered by an electric railway outside New York City. It is being filled by the Economy Electric Devices Company, Chicago, exclusive sales agent of these meters, the contract calling for the delivery of about 500 meters per month.

It is planned first to install the meters on rolling stock operating on the Gloucester division, then to extend their application to all the lines of the company north of Boston; and finally, to provide meters for all passenger cars south of Boston. More than 900 miles of line will ultimately be served in this way, and in due course it is expected that meters will be provided for the company's express and freight cars. Within the next week or two the cars on the Gloucester division will be fully equipped.

Five sizes of meters are being purchased, ranging in capacity from 50 to 200 amp. In addition to the passenger cars of the semi-convertible type to be equipped with meters, some of the remaining open cars operated by the road will be thus furnished, interchanging meters with closed cars used in the winter season.

The decision of the company to install these meters is a result of a vigorous campaign on the part of the management, in which the car-service employees are co-operating, to realize the benefits of more economical operation. Before the meters were ordered, representatives of the employees were asked to join the officials of the road in an investigation of the opportunities for saving energy in car operation with the aid of checking devices in the motor circuit.

Through a recent agreement by which the employees are to share in the economies gained in operation, realizing bonuses according to certain expense reductions, the interest of the employees in power saving has been heightened. The use of these meters will enable the company to study with nominal additional expense the economy of various types of car equipment on particular routes and in certain districts, the fitness of motors for stated services, suitability of gear ratios, effect of changes in schedule speed, etc., on power consumption, as well as continuously to check the condition of the mechanical and electrical equipment of the cars.

Record blanks are being developed for the use of motormen in taking and leaving cars equipped with meters, and a number of trial meters tested on Revere and Lynn lines will remain in these services.

The meters will be equipped with cyclometer dials which register from 0 to 10,000 kw.-hr.

Favorable Legislation Will Help Market

More Optimistic Viewpoint Justified—Effect of Rising Prices and Trying Delivery Conditions

Manufacturers of electric railway supplies who have been disappointed with the volume of orders from the transportation field, affected as it inevitably has been by inadequate fares and extraordinary operating costs, need not despair of better times if prospective legislation is realized looking toward increased net earnings of these important utilities. In Massachusetts, for example, the outlook is unusually good for the passage at the present session of laws establishing the principle of service-at-cost on the Boston Elevated Railway, the Bay State Street Railway, and the other properties within the State.

The general situation is now perfectly clear, even to the layman; some means of providing fresh capital to enable these utilities to do their vitally essential part in the public service of a great war period must be had, and the absence of any extended opposition to the service-at-cost principle indicates that if this legislation passes the hand-to-mouth policy in equipment and supply purchasing practiced for many months, one almost said years, past will give way to consistent and long-sighted buying.

The average electric railway purchasing agent has been anything but joyful of late, and with sufficient reason. Rising prices and the most trying delivery conditions known to the industry have combined to depress him; but now that the public has become educated to the war price standard and appears ready to pay the fair cost of service rendered it, including wages to capital as well as to labor, a more optimistic viewpoint is justified. Of course, many plants formerly exclusively devoted to the manufacture of transportation supplies are now working night and day on war orders, and doubtless some of these factories could not take on additional work for the traction properties without a capital outlay difficult to secure, at present.

The vital importance of electric railway transportation as a war tool on this side of the Atlantic, however, is recognized by army and navy officials, especially where the housing problem hampers the rapid development of shipbuilding and munitions plants. As a buyer of material the electric railway in many cases is entitled to priority consideration, and if the question of revenue is settled for the time being by wise legislation it will be safe to anticipate a decided expansion of business in the supply field.

St. Louis Car Company's Strike Settled

War Labor Board Effects Agreement Allowing Increased Wages and Collective Treatment

The National War Labor Board authorizes the following:

Settlement of the strike of the employees of the St. Louis (Mo.) Car Company has been effected by the sub-committee of the National War Labor Board composed of C. E. Michael and Victor Olander, representing capital and labor, respectively. Following an all-day conference with representatives of both sides, the sub-committee submitted a form of agreement providing that the men should return to work immediately; that the company grant a temporary 10 per cent uniform increase in wages; that the company agree to meet with the chosen representatives of the employees to adjust all points of dispute; and that both sides agree to submit any points of disagreement to the National War Labor Board or its authorized committee, whose decision both sides agree to accept. This agreement was joined in by both sides.

May Keep Copper at 23½

Recommendation that the maximum price of copper fixed by the government at 23½ cents a pound at Eastern refineries be continued for seventy-five days, beginning June 1, was made to President Wilson to-day by the Price-Fixing Committee of the War Industries Board. Final decision rests with the President, who is expected to issue a proclamation in a few days.

Rolling Stock

New York State Railways (Syracuse Lines), Syracuse, N. Y., in its order for twenty-five cars, of which the specifications appeared in last week's ELECTRIC RAILWAY JOURNAL, specified the date of ordering as March, 1917, with delivery March, 1918.

L. L. Crump, Anniston, Ala., who, with others, it is reported, has raised $100,000 to organize a company to build a railway to Camp McClellan, are in the market for second-hand or rebuilt cars, if the line is electrified, and for relaying rails. Mr. Crump and associates are also interested in gasoline motor cars, and request information on these.

Southern Public Utilities Company, Charlotte, N. C., is reported as having ordered four steel passenger cars from the Southern Car Company, High Point.

Bamberger Electric Railroad Company, Salt Lake City, Utah, on May 7, at Ogden, Utah, had its carhouse, twenty cars and several electric locomotives destroyed by fire. No salvage is reported on the property. It is said that the company had but six cars remaining and the system was nearly crippled. Efforts will be made to replace the rolling stock at once.

Trade Notes

H. W. Johns-Mansville Company, New York, N. Y., will have its office at Houston, Tex., at 424-426 Washington Avenue after July 1.

Railway Power & Equipment Company, New York, N. Y., has been organized with a capital of $100,000. The directors are A. G. Logan and Ernest Stuart, Brooklyn, N. Y.

Elastic Car Waste Company, Philadelphia, Pa., has removed from Hope and Palmer Streets to Ninth and Columbia Streets, where it will have improved and enlarged facilities.

Eastern Tube & Tool Company, Brooklyn, N. Y., is now the name of what was formerly the Eastern Flexible Conduit Company. The company has added to its former line the manufacture of drill chucks and small tools. The factory is at 41 Gardiner Avenue, and the general office address is 594 Johnson Avenue.

Chester H. Pennoyer on April 7 became general sales manager of the National Conduit & Cable Company, New York, N. Y. He will devote much of his time to traveling in the Eastern States. Mr. Pennoyer is from Oakland, Cal., where he was physical superintendent of the Great Western Power Company during the construction of the big hydroelectric plant.

McGuire Cummings Manufacturing Company, Chicago, Ill., announces that Walter J. Cummings has succeeded his brother, John J. Cummings, deceased, as president of the company. M. C. Bovil, formerly assistant superintendent of the company's plant at Paris, Ill., has been made superintendent of the Paris plant. No change of policy is contemplated in connection with the car and truck building activities of the company.

M. C. Turpin, formerly assistant to manager, Westinghouse department of publicity, has resigned to enter federal service as assistant to manager, technical publicity bureau, ordinance department. Mr. Turpin's work will be on the dissemination of information from the War Department to manufacturers, through the medium of the trade press. Mr. Turpin is a graduate of Alabama Polytechnic Institute and of Cornell University. After several years' experience in the construction and operation of central station plants, he entered the Westinghouse department of publicity in 1909. He is an associate member of the A.I.E.E., N.E.L.A., Pittsburgh Press Club, Pittsburgh Ad Club, and of the Illuminating Engineering Society

New Advertising Literature

Coppus Engineering & Equipment Company, Worcester, Mass.: Bulletin describing its turbo-blowers for undergrate work.

Walter A. Zelnicker Supply Company, St. Louis, Mo.: Bulletin No. 243 listing and describing apparatus, machines and railway specialties being offered by the company.

General Electric Company Schenectady, N. Y.: Bulletin 47070, entitled "Lowest Current Standard Unit Panels for General Power Service." It is in loose-leaf form for filing, illustrating and describing the system and equipment.

Earle Gear & Machine Company, Philadelphia, Pa.: Illustrated booklet, just off the press, entitled "Economy in Cold Sawing," descriptive of the company's "Lea Simplex" saws, both belt and motor driven, and adaptable to a wide variety of work.

Imperial Brass Manufacturing Company, Chicago, Ill: Imperial catalog No. 142, which describes in detail the full line of Imperial welding and cutting equipment and Imperial burning and lead burning outfits. .Various industries which use welding and cutting equipment are listed. Five points of superiority claimed for the Imperial equipment are analyzed: Safety, practicability, durability, economy and portability. The Imperial mixing principle is also thoroughly explained. Several different sizes of Imperial outfits are illustrated and described fully, and all parts are cataloged.

Johnson Fare Box Company, Chicago and New York: Descriptive catalog of the Johnson registering fare box in its different forms for car and station platform operation. Views are shown of different types of metal tickets and change carriers sold by the company. The catalog also describes certain features of operation such as the effect of fare boxes on car schedules, their relation to conductors, maintenance, action with faulty coins or counterfeits, etc.

NEW YORK METAL MARKET PRICES

	May 15	May 22
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26½	26¼ to 26½
Lead, cents per lb	6.90	7.05
Nickel, cents per lb	50	50
Spelter, cents per lb	7 87½	7.50
Tin, Chinese,* cents per lb	$1.05	$1.03
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

* No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 15	May 22
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	18½
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	*$34.00	*$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton.	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 15	May 22
Rubber-covered wire base, New York, cents per lb	27 to 34	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30.40 to 34½	30.40 to 36.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	33.42 to 38.00
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 500-ton lots, per gross ton	$65.00	$65.00
T-rails, high (Shanghai), cents per lb	4¾	4¾
Rails, girder (grooved), cents per lb	4¾	4¾
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount, F. O. B. factory	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount, F. O. B. factory	80%	80%
Car window glass (double .strength, all sizes AA quality), New York, discount, F. O. B. factory	82 & 3%	82 & 3%
Waste, woo (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truckload lots), New York, per bbl.	$3.20	$3.20
Cement (carload lots), Chicago, per bbl.	$3.26	$3.26
Cement (carload lots), Seattle, per bbl.	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.62	$1.58
White lead (100 lb. keg), New York, cents per lb	10	9
Turpentine (bbl. lots), New York, cents per gal	42½	51½

* Government price.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 51 New York, Saturday, June 1, 1918 *Number* 22

Now If Ever Is the Time to Check Motormen's Operation

WHAT shall we say about an electric railway which in this very day and hour wastes enough power to run a $1,000,000 manufacturing plant in the same area of centralized power distribution which recently had actually to stop operations because it lacked but a fraction of the power so wasted! Why do we assert that power is being wasted? Because we don't believe that the motormen on this railway have suddenly become efficient in the use of power by reading a card and signing a pledge! How is the management to know they are efficient unless it uses an instrument that tells the facts?

For nearly twenty years we have preached to the point of apoplexy about the money that electric railways could save by using some device that would encourage the motorman to remember rather than to forget how to operate his car economically. Meanwhile, the checking instruments have been constantly improved; and the reasons for using them, such as big cars and dear coal, have become more imperative. Yet what are the facts, to-day? Hardly 10 per cent of the cars and less than 5 per cent of the operators are using car-checking devices of any kind! Are 95 per cent of American electric railways so skeptical that they must be convinced separately one by one that 10 to 30 per cent of their power is wasted at the car controller? Lack of funds cannot be considered the chief reason, because the instruments can earn their cost before they are fully paid for. This year there is the strong additional incentive for saving because of the prevailing shortage of fuel.

Responsibility for Adequate Rate Placed Clearly on Each Community

THE announcement of the War Finance Corporation that "the localities served by these various public utility enterprises should not expect the War Finance Corporation to make advances to any utility company whose statement shows that it is in actual need of increased revenue" and that the Corporation is not authorized to make direct advances to public utilities to take care of maturing issues, are important developments of the past week. The responsibility for permitting electric railways to charge adequate fares is purely up to the local authorities and that of furnishing necessary capital for utilities to the companies themselves and to the local banks, as we pointed out in an editorial entitled "What the War Finance Bill Will Do and Will Not Do," in our issue of March 30, although the Corporation announces that it is prepared to act as an instrumentality to which the banks can resort to obtain accommodation on advances made by them to the utilities upon a character of security not available for discount at a Federal Reserve Bank. The federal government does not feel it should practically make up the deficits of certain companies so that a group of citizens may continue to enjoy utility service at less than cost. After this, each community must pay for what it is getting or learn to do without.

The announcements of the War Finance Corporation should hasten companies to plan for any capital requirements, with the knowledge that the Corporation is in a position to help the banks and even to make a direct loan in those exceptional cases "where it may be made to appear to the Corporation that a meritorious borrower is being unwisely discriminated against by the banks." It should also hasten state commissions and local authorities to take action on fare increases so both the local banks and the War Finance Corporation may know what their future, as regards income, may be.

How Operators Feel About Odd Unit Fares

NO SENSIBLE and fair person will deny that electric railways are entitled to more revenue, but railway men themselves are in doubt as to the better way of getting that increase. Those who have been closer to income statements than to cars seem to feel that the direct way of charging 1 or 2 cents more for flat fare is the simplest; but those who understand the practical difficulties of fare collection and the public psychology are not so sanguine.

The financier argues that since so many 5 and 10-cent items now cost an extra cent or two, pennies for street car use will be plentiful. The operator knows how difficult it is to get the majority of riders to provide themselves with but one coin representing the exact fare. Hence troubled visions of increased car-hours for the same number of riders are ever before him. He believes that if only there were a 6-cent coin riding would remain practically unaffected. Not so with the odd fare. The latter would continually remind the short rider that he was subsidizing the suburbanite, and he would quit riding and walk after a few distressing waits in getting change from harassed conductors. More than one operator has told us that nothing would please him more than building up short-ride nickel travel and making the long-distance rider pay for what he gets. This would mean that any additional fare collection would be handled outside of the congested section.

In some cases, where the suburban franchise explicitly limits the fare to 5 cents, these men suggest the simple expedient of giving only the minimum service called for in the franchise. This action, accompanied by figures on the cost of the service, is likely to prove a quick short-cut to a saner rate of fare. On the whole, many practical operators feel that an adjustable zone system must come eventually if the street railway industry is to be conducted like a business and not like a philanthropy.

Rush-Hour Service Is Far from Profitable

AT THE 1916 convention the committee on cost of rush-hour service presented a report in which it was stated: "The fact that rush-hour service is not necessarily profitable because a substantial proportion of the receipts are taken during that period is not generally known." Since that time there has been plenty of time for publicity, but owing to war conditions committee activity has subsided and there has been no opportunity to carry out the suggestions of the report to the effect that steps be taken to keep alive interest in this very important topic.

To show that there is need for continued educational work along these lines, one need refer only to a recent editorial in a metropolitan daily paper in which the following comment was made: "The number of street cars and elevated trains that operate through the loop during the rush hours is limited to the physical capacity of the tracks. Inasmuch as business at these hours is more profitable for the companies than at any other period of the day it is to their own interest to operate as many cars as possible."

The editorial in question showed a proper comprehension of the local street railway situation in every other particular, but on this point of the cost of rush-hour service there was evidence of a lack of appreciation of the circumstances which make the transportation problem different from that of ordinary business. The writer of the editorial probably should not be criticised for failure to grasp this point. It is doubtful if it is well understood by all railway managers, to say nothing of the average layman.

Since that committee report was presented, less than two years ago, at least one of its recommendations has gone into general effect—namely, the daylight-saving plan. Another recommendation for the purpose of lowering the peak is coming into more general use—namely, one favoring the adoption of staggered hours for factories and stores. There has also been some consideration of the high cost of rush-hour service in the rulings by commissions here and there that cheaper tickets for workingmen be eliminated.

Perhaps, therefore, we should not despair of getting a sympathetic appreciation of the strange position of electrical railways which have the smallest net return during the hours when riding is heaviest. Electric lighting and power rates are based on the principle that a rate schedule to be equitable to all consumers should make persons who need and create the peak-load service pay a price which will be commensurate with the extra cost of the service they are receiving. Surely, the time will come when the return on investment for electric railways will not be further impaired by requiring the use of more cars during the peak hours where service is already highly concentrated. Here, at least, is a good opportunity for publicity work on the part of electric railway managements.

Parked Autos Steal Streets

CAN you conceive what would happen to a railway which should dare park its cars on a downtown street all day long to avoid dead mileage between the morning and evening rush? Imagination fails us. To picture what an unkenneled press would do, we must go back to the time when we fell inadvertently out of an apple tree plump upon a dozing mastiff. Ah, yes, but this larceny of the public highway seems to be the undisputed privilege of the man who runs a car from a gasoline engine instead of an overhead wire.

It would be useless, perhaps, to talk about this abuse were it not for the fact that it injures the great mass of the public for the benefit of a comparatively few. In every city where complaints about poor street railway service are loudest there also we find that the streets were not only narrow originally but have been allowed to become mere lanes.

A municipality cannot permit the parking of automobiles from curb line to rails without forcing everything that moves to use the car tracks. When that occurs the cars that should be making 8 miles per hour can only do 4 miles per hour, and that means a reduction of carrying capacity by one-half. We can think of no more effective argument for disproving unfair allegations as to insufficient service than to tell the public that the seating capacity of the cars is not merely a question of the number and the size of cars but also of their speed. Let the argument run thus:

"The quicker we can get the cars around, the more seats we can offer you. What's the use of buying more cars when you won't let us work properly those we have? Besides, it would be impossible to get more cars through the streets during the rush hour anyway unless you keep the automobiles from choking the traffic channels.

"In the old days, hitching posts on the main streets were a sure sign of a jay town. There's no difference between a hitched wagon and a parked automobile, so far as your street railway service is concerned. You wouldn't want street cars to be parked all day, so why allow the automobile owner to use public property for a rent-free private garage?"

Boston Public Control Act Is Fundamental in Scope

THE act passed last week by the Massachusetts Legislature, placing the Boston Elevated Railway under the control of public trustees, marks a notable advance in utility regulation. The main features of the act have not been changed since the proposed bill was commented upon in the issue of April 27, but their importance warrants another mention of them. One important feature is the provision that the cost of service shall be at all times covered by the rates. An unlimited sliding scale is provided, and should the traffic under any particular fare or transfer arrangement be too small to yield the guaranteed return of 6 per cent (as well as the lower intermediate returns of the next four years), the deficit in the reserve fund is to be made up temporarily from the tax levies of the municipalities in which the company operates. In the last analysis, this means that the public will obtain and pay for precisely the volume and the character of service which it wants, and it would be hard to suggest a fairer arrangement to investor, car-rider and community.

Another important provision is the transfer of supervision from the Public Service Commission to the five public trustees, appointed by the Governor. This means that in place of the former method of regulation without responsibility for management comes a new authority directly responsible for management. The ten-year terms of the trustees augur well for the protection of the property against political exploitation. If men of high caliber are appointed, as seems likely, efficient operation should be continued.

Not the least of the good features of the act is the fact that it places the company's securities upon an investment plane in Massachusetts only less stable than that now occupied by government bonds; that through it new capital needed to meet the increasing demands of the community for transportation can be obtained, and that service, so essential under war conditions, can and will be improved. We agree with President Brush, whose views regarding the law are printed elsewhere, that the act may well be regarded as epochal in its expression of the basic relation between service and cost. Its administration will be watched with interest.

Provide Now Against a Fuel Scarcity Next Winter

AS "LONG DISTANCE" weather prophets are notoriously unreliable there seems to be no possibility of an accurate forecast of the severity of the coming winter. But while we may not be able to estimate accurately the demands which the weather man will impose on Uncle Sam's coal pile or foresee all of the impediments he will put in the way of our transportation facilities, it certainly does not require a prophet to predict from the evidence now in hand that coal will be a scarce article next winter. We are being urged by the Fuel Administration, the coal people and many patriotic agencies to "make hay while the sun shines" and provide now as fully as possible against our next winter fuel needs. It seems that too much emphasis cannot be placed on the subject of fuel preparedness and on the necessity of keeping our mines working at top speed throughout the summer.

To the large fuel user, however, fuel storage brings with it problems all its own. For example, there is a wastage in fuel and a labor charge involved in the handling and storage of fuel. Again, many utility companies do not have storage space available. Moreover, some of our coals are difficult to store because of the danger from spontaneous combustion. This last is particularly true of the Middle Western coals. As result of past sad experience many large users of fuel now wholly dependent on these coals hesitate over the storage proposition. The submerged method solves the fire hazard problem, but the pits required are expensive and take time and labor for their construction. They are, therefore, out of the question at this time. Fortunately other storage methods are available. The United States Bureau of Mines and several of our state university experiment stations have made extended studies along the general lines of coal storage and coal handling. The results of the work of these public research facilities are available to those interested and should prove of great value in connection with the present coal problem.

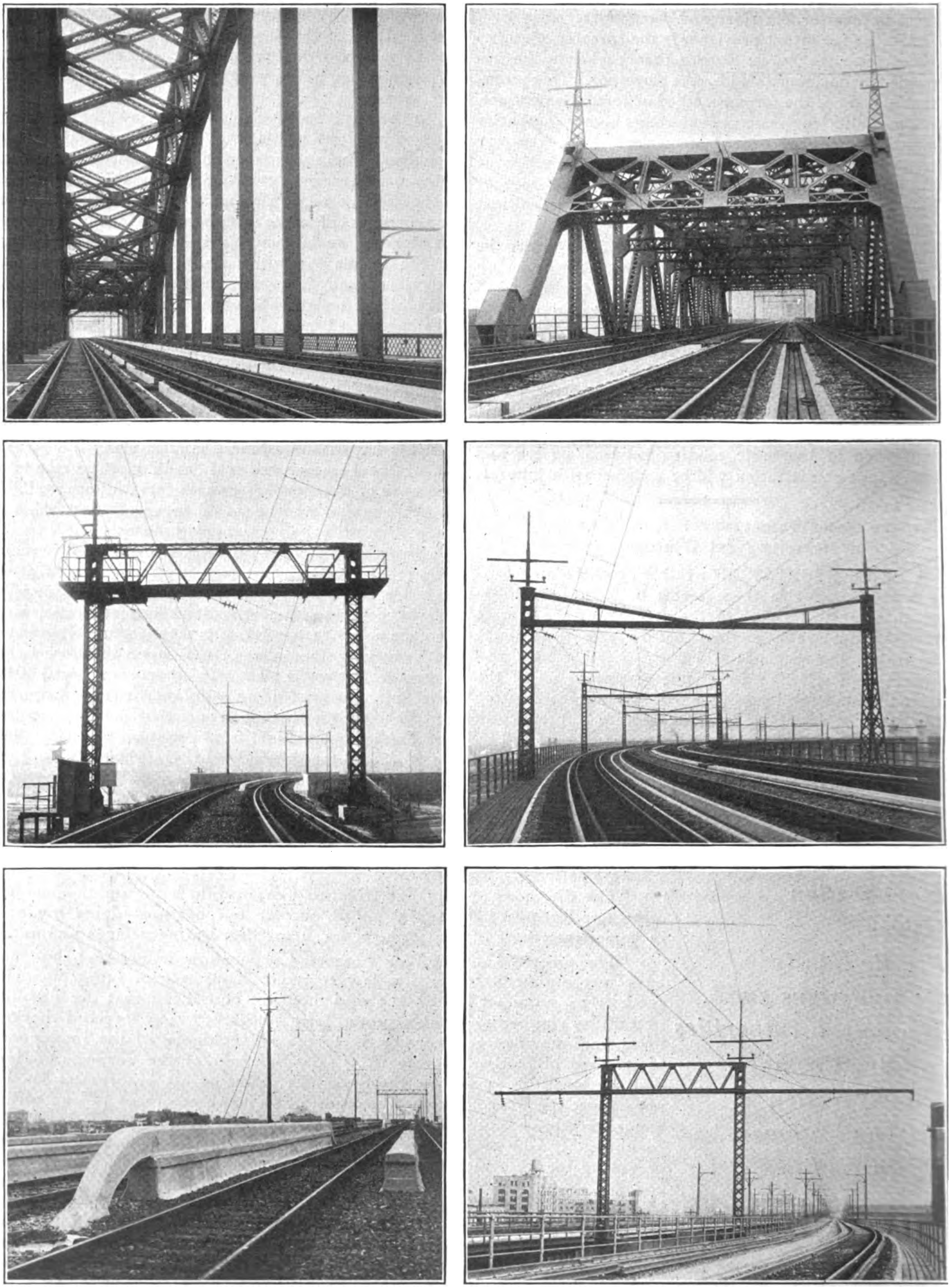
Nearly every railway utility has power conditions and fuel problems which in a way are peculiar to it alone. In some cases the effects of a fuel shortage may be alleviated by a permanent or breakdown connection with another power system which is more fortunately located with regard to the source of fuel supply or which is fed from a hydroelectric plant. In others some possibilities exist in the way of using a different fuel temporarily. But whatever the possibilities are they should be studied and plans should be laid to utilize them to their fullest extent should the emergency arise. Obviously the time to do the studying and planning is now.

War Finance Corporation Urges Public Utility Commissions and Municipal Authorities to Give Prompt Consideration to Applications From Utilities to Increase Their Rates

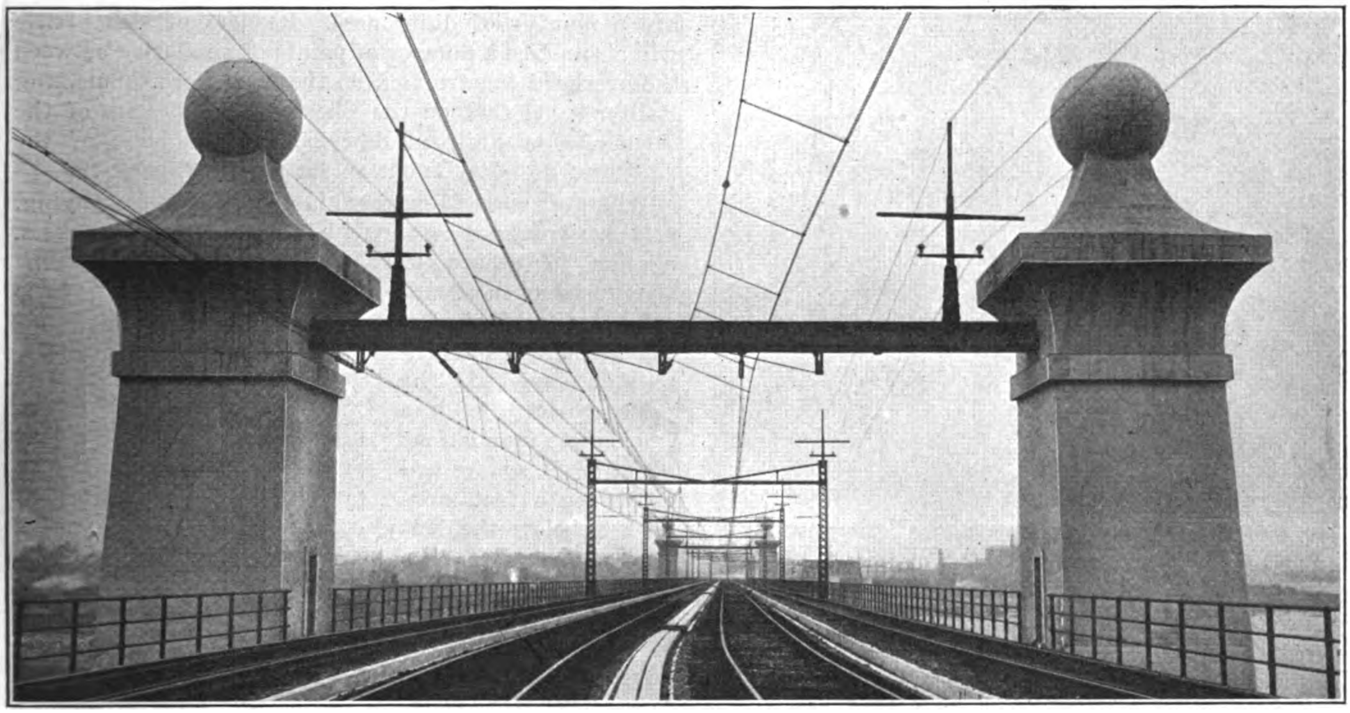
THE *directors of the War Finance Corporation on May 24 authorized the following statement:*

"The directors of the War Finance Corporation have under consideration applications from many public service corporations doing business in various sections of the country, for loans aggregating a large amount.

"The directors of the War Finance Corporation do not feel that they have any authority under the law to make loans except upon adequate security as required by the act, and they are convinced that the inability of a utility company to earn a sum at least sufficient to pay its fixed charges, taxes, maintenance and repairs, is conclusive evidence of the inadequacy of its own obligation as security. The directors of the corporation feel that the localities served by these various public utility enterprises should not expect the War Finance Corporation to make advances to any utility company whose statement shows that it is in actual need of increased revenue. It is a matter for the local authorities to determine whether or not an increase in rates sufficient to maintain the enterprise as a going concern should be granted. It is urged, therefore, that the proper authorities give prompt consideration to applications made by public utilities for permission to increase rates, in order that the directors of the War Finance Corporation may know when applications for loans are presented by public utility corporations whether or not they will be able to give adequate security."



Typical Views of Overhead Construction, New York Connecting Railroad



PORTAL AT SOUTHERN END OF LITTLE HELL GATE BRIDGE SHOWING CROSS BEAM AND SAFETY ANCHOR FOR TROLLEYS

11,000-Volt Overhead on the New York Connecting Railroad

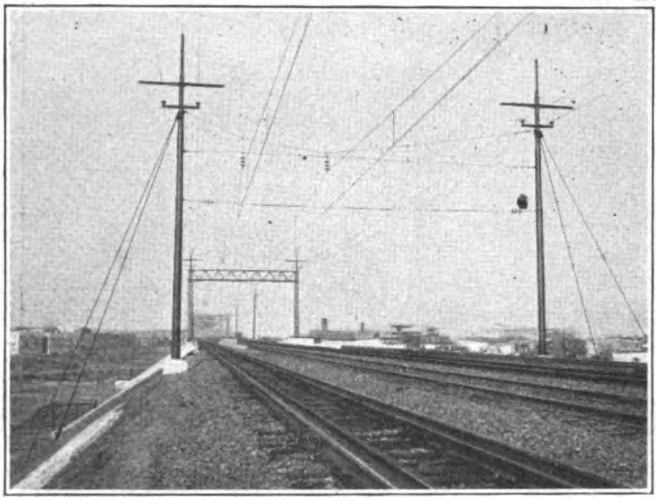
Construction Is Complete and Tested Out—Everything Ready for Electric Operation When New Locomotives Arrive—Some Details of the Telephone and Telegraph Conduit Construction Are Included

THE New York Connecting Railroad is a connecting link between the New Haven and Pennsylvania Railroad systems at New York City. While of not great length, this road is of unusual interest for several reasons. In the first place, it has made all-rail communication possible via New York between Boston and Philadelphia and points south. Formerly through trains between these points had to be ferried around Manhattan Island. A few passenger trains were interchanged between the two systems over a car ferry route of about 11 miles from Jersey City to the Harlem River. The freight interchange was by a still longer ferry, about 13 miles long, between Greenville and Oak Point. These float services were conducted by the New Haven Railroad, which will operate the New York Connecting Railroad.

The new electrification will make it possible to haul trains behind one electric locomotive, of the a.c.-d.c. type used for passenger service on the New Haven road, from New Haven to the Pennsylvania Station in New York City. Most of the distance will be under the 11,000-volt overhead of the New Haven Railroad, the remainder on the 600-volt third-rail line of the Pennsylvania Railroad. The freight tracks of the New York Connecting Railroad are not electrified except for pusher service up the bridge grades, and the freight service is conducted over the Long Island Railroad, under steam operation, to Bay Ridge, thus eliminating a large part of the freight-car ferrying formerly involved in interchange between the two roads. A short ferry trip is necessary from Bay Ridge across New York Bay and will continue to be so.

The New York Connecting Railroad is interesting further because for its length it is an unusually expensive line. The total cost of the road itself was about $30,000,000, and an additional expenditure of $10,000,000 will be involved in the completed project including necessary improvements to the Long Island Railroad. Expensive fills and viaducts, including the famous Hell Gate bridges, have largely contributed to make the construction so costly.

At the meeting of the New York Railroad Club held on March 15, 1918, E. R. Hill of Gibbs & Hill, the designers and builders of the overhead and telephone and telegraph conduit system of this line, read a paper which contained much valuable information regarding the New York Connecting Railroad. This paper was abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for March 23, 1918, page 556. He stated that the length of two-track passenger line, from Port Morris to Sunnyside Yard, which is now completely electrified, is 5 miles. The two-track freight line, from Port Morris to Bay Ridge, which is to be electrified later, is 20 miles long. The famous Hell Gate bridge has a length between abutments of 977 ft., and a length outside the towers of 1150 ft. Its clear height above mean



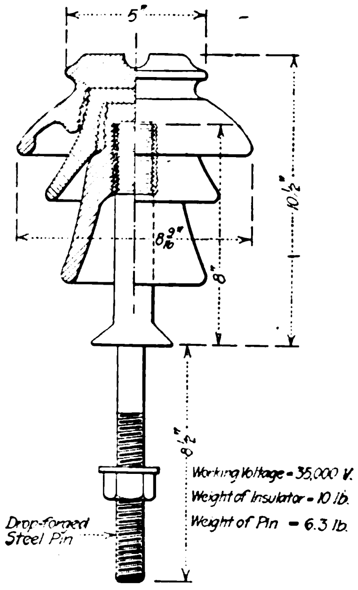
CROSS CATENARY OR WIRE CROSS-SPAN CONSTRUCTION, WITH GUYED TUBULAR POLES (FUTURE SIGNAL BRIDGE IN BACKGROUND)

high water is 135 ft. Mr. Hill explained that the gradients involved in surmounting the Hell Gate bridge, and descending under the East and North Rivers imposed much heavier requirements upon the locomotives than are imposed by the comparatively level New Haven line. It has been necessary to provide locomotives having a one-hour rating of 2550-hp., 50 per cent greater than the capacity of the present heavy New Haven locomotives.

To supply power to these locomotives very substantial overhead construction has been erected. The nature of the line, with its numerous curves and viaducts, has made it necessary to design a number of special structures for the support of the overhead. Provision for expansion occurring in the viaduct trusses and girders, has also required careful consideration in the design. The way in which many of the problems were solved is indicated in the accompanying illustrations.

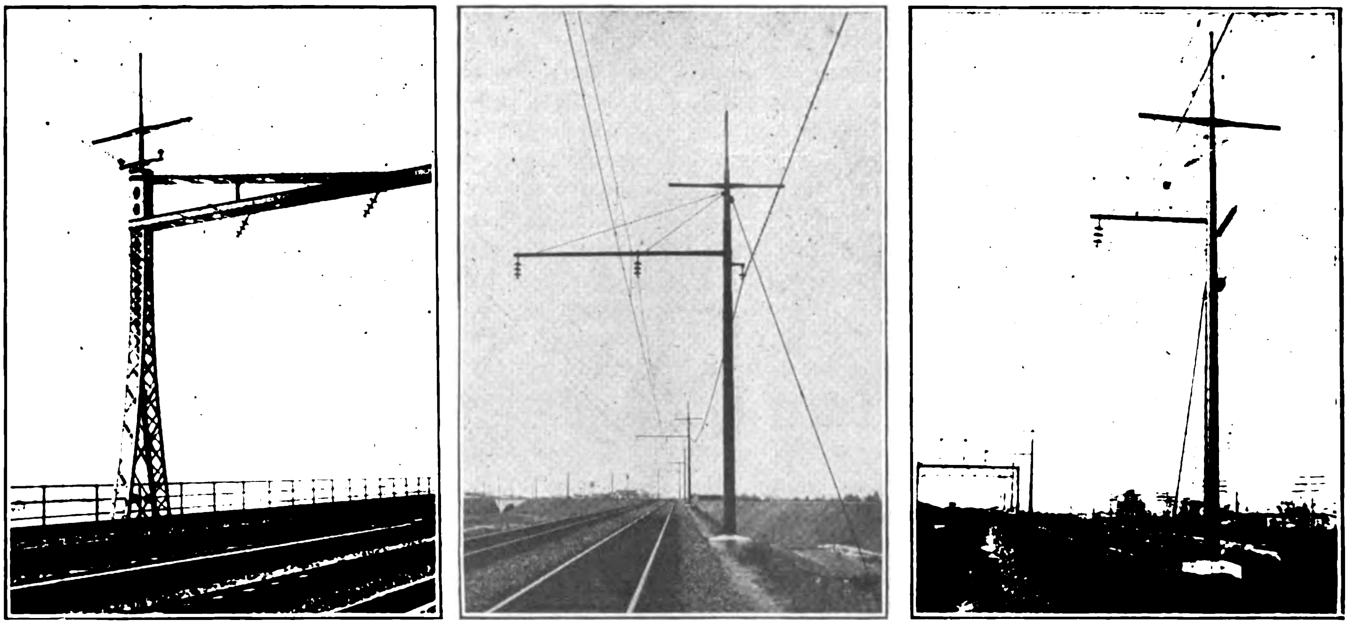
While in general the standard overhead construction of the New Haven road was followed, in details there are a number of differences. Readers of this article will also notice a number of points of similarity between the overhead construction on the New York Connecting Railroad and that on the Chestnut Hill branch of the Pennsylvania Railroad described in the issue of the ELECTRIC RAILWAY JOURNAL for April 27, page 799.

Wherever on the line there is opportunity for guying, pole construction, either with cross span, or brackets, similar in design to those used on the Pennsylvania Railroad electrification at Philadelphia, is employed. The poles are set 6 ft. deep in concrete foundations about 3½ ft. square and extending a foot more or less below the bottom of the pole. The pole height from the rail surface to the point of attachment of the guys is about 35½ ft. The guys are 1½-in. rods attached to the pole by means of collars, provided with turnbuckles for adjustment, anchored firmly in reinforced concrete blocks set not less than 8 ft. below the ground surface, and protected from the anchor to a point above the ground by means of 3-in. boiler tube.



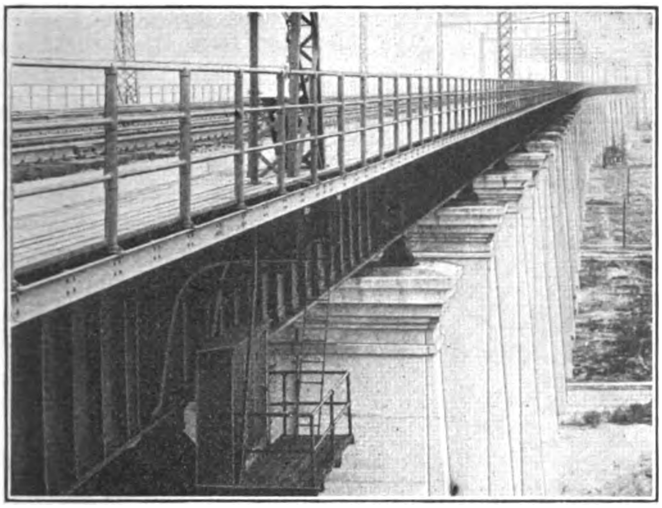
INSULATOR USED AT PRESENT ONLY FOR SIGNAL CIRCUITS

The pole top is occupied by the following attachments: Just above the guy rod collar or clamp is a short crossarm made of two angle irons placed back to back, which carries the 2200-volt signal feeders on pin-type insulators. Above this is a longer crossarm, not yet occupied, which is designed to carry four high-voltage wires to

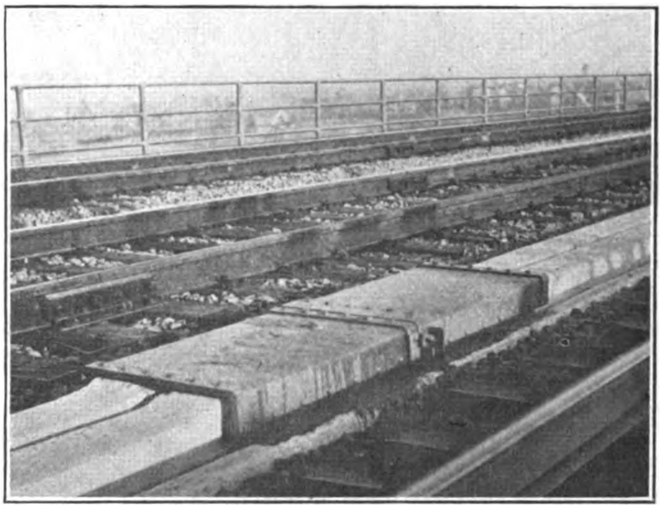


At Left, View of Latticed Post Used on Viaducts. In the Middle, Pole with Bracket for Two Tracks. At Right, Single-Bracket Catenary Support with Extra Heavy Pole on Which a Crossover Trolley and Messenger Are Dead-Ended.

TYPICAL OVERHEAD CONSTRUCTION ON NEW YORK CONNECTING RAILROAD



SIGNAL RELAY BOX ON PIER BENEATH VIADUCT TROLLEY BRIDGE SUPPORTED ON CURVED BRACKETS

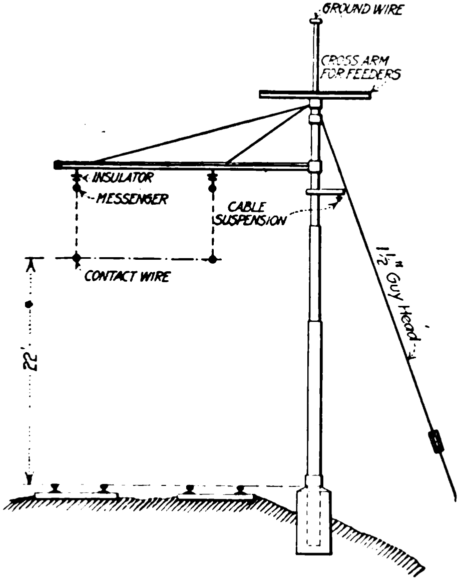


COVER OF IRON SPLICING CHAMBER FOR CONDUITS ON VIADUCT

be used as trolley feeders. Projecting from the top of the pole is a rod which carries at its upper end, a distance of 8 ft. above the upper crossarm, a ½-in. galvanized Siemens-Martin ground wire.

The signal wires, which are No. 00, carry power for the signal system. They are mounted on insulators of a type which is the New Haven standard for 11,000 volts although the initial voltage is much lower. In case of failure on one side of the line the current will be automatically thrown to the circuit on the other side.

The pole top described is standard along the line even on the four-track structural bridges which are fitted on each side with tubular bonnet poles cemented into the structural posts. The same crossarms, etc., are provided as on the other poles. On the passenger connection between Sunnyside Junction and Sunnyside Yard the signals are fed by a single 2200-volt rubber insulated cable, which is carried on a ½-in. Siemens-Martin steel cable outside the one and two-track bracket structures. A switch at Sunnyside Junction automatically throws this cable onto the power circuit that is energized. In the standard bracket construction the angles are formed of angle or channel irons placed back to back. The single-track brackets are attached to the poles by a simple band, the weight being supported by one sag rod. In the longer brackets two sag rods are employed.



ELEVATION OF TWO-TRACK BRACKET SUSPENSION

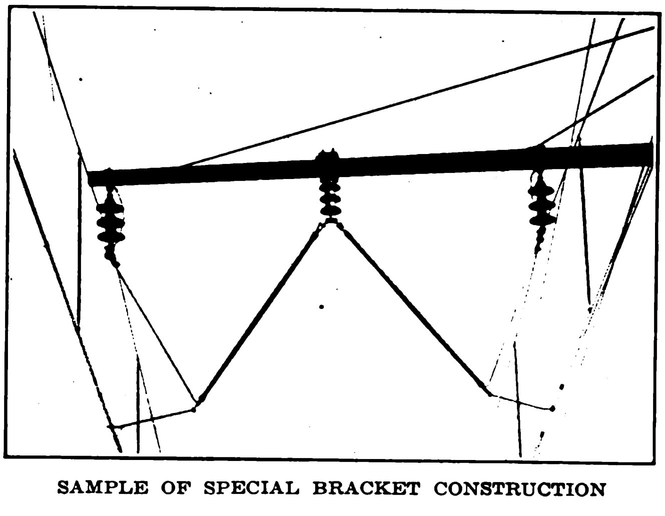
Where guying is not possible, channel-iron cross structures with sag braces, or in some cases latticed bridges, are used. In some places these are supported from steel poles, but in general latticed poles well spread along the line of the track are employed. Where the feet of these latticed poles span expansion joints they are rigidly supported on but one side, the other foot resting upon a plate upon which it can slide, bolts in slotted holes being used to prevent overturning.

As these latticed poles are necessarily supported outside of the bridge girders their weight is carried on two substantial steel brackets each, riveted securely to the outside girders of the viaduct. A photograph has been reproduced to show this construction.

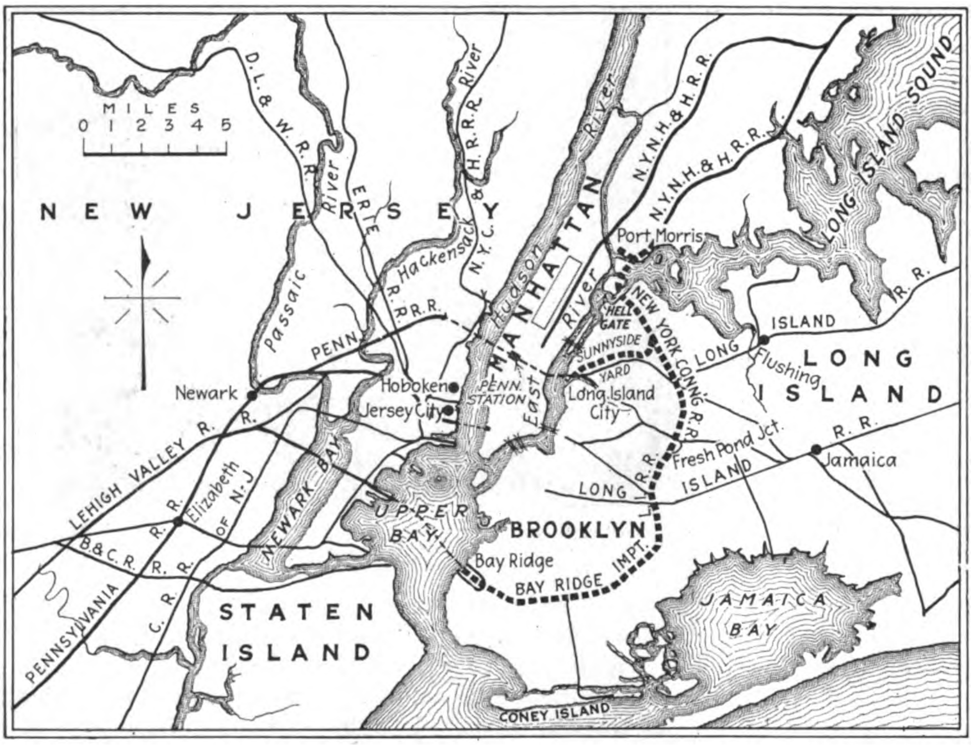
Within Hell Gate bridge the contact wires are supported by cross-wires attached to the steel members of the bridge. This makes a light, inconspicuous system not detracting from the appearance of the bridge. At either end of the Little Hell Gate bridge, towers are used to support a cross-beam for carrying the contact wires. One of these is also used as a safety anchor for these wires. On Bronx Kill bridge the contact wire insulators are attached directly to overhead steel members with safety anchors at each end.

CATENARY CONSTRUCTION FOLLOWS NEW HAVEN STANDARDS

The main messenger is of $\frac{9}{16}$-in. strand similar to that used on the Chestnut Hill electrification. From this the No. 00 copper grooved secondary messenger is sus-



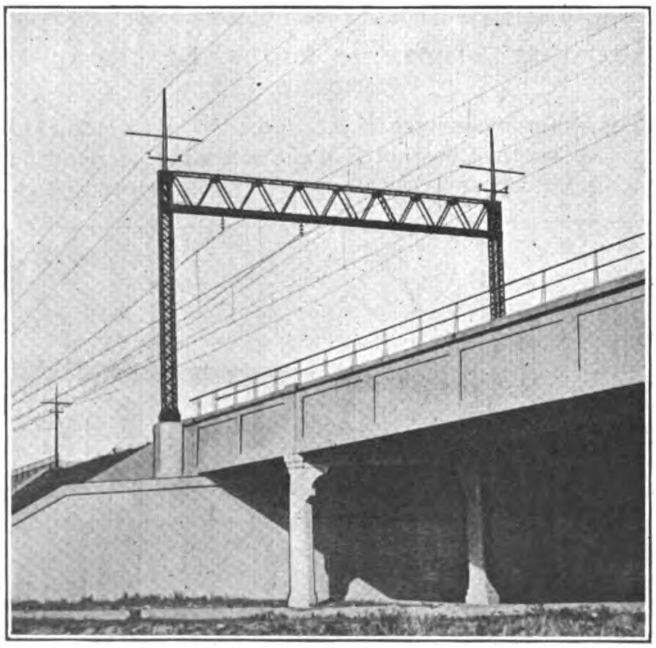
SAMPLE OF SPECIAL BRACKET CONSTRUCTION


MILES
0 1 2 3 4 5
NEW JERSEY
D.L.&W.R.R.
Passaic River
ERIE R.R.
Hackensack River
N.Y.C.&H.R.R.R.
River
Hudson River
MANHATTAN
East River
N.Y.N.H.&H.R.R.
LONG ISLAND SOUND
Port Morris
HELL GATE
SUNNYSIDE YARD
NEW YORK CONNG. R.R.
LONG ISLAND R.R.
Flushing
LONG ISLAND
Newark
PENN. R.R.
Hoboken
Jersey City
PENN. STATION
Long Island City
Fresh Pond Jct.
Jamaica
LONG ISLAND R.R.
LEHIGH VALLEY R.R.
Elizabeth
C.R.R. OF N.J.
NEWARK BAY
UPPER BAY
BROOKLYN
Bay Ridge
BAY RIDGE IMPT.
B.&C.R.R.
PENNSYLVANIA R.R.
STATEN ISLAND
JAMAICA BAY
CONEY ISLAND

MAP SHOWING NEW YORK CONNECTING RAILROAD AND CONNECTIONS

pended by ½-in. round hanger rods of steel, hot galvanized. On the upper end of the rod is a screw-clamp hook, and the lower end of the rod screws into a clamped casting on tangent construction, or is bolted through the clamp on curved construction.

A No. 000 grooved copper alloy contact wire is supported 1¾ in. below the secondary messenger, by means of clamps placed between, but not at the hangers, except on curves where the two wires are clamped together at every hanger. The spacing of the hangers on tangents is approximately 30 ft., with two bolted clamps between adjacent hangers. On curves the hangers are placed about 15 ft. apart.



CATENARY SIGNAL BRIDGE AT SEVENTEENTH STREET AND WILSON AVENUE, ASTORIA

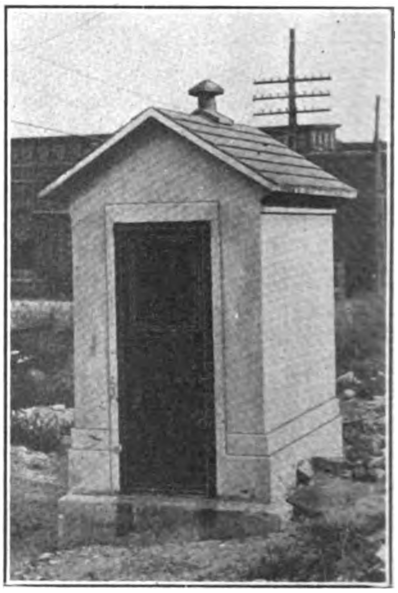
The main messenger wire is insulated from the structures by three 10-in. free-swinging porcelain disks, similar to those used in the yards of the New Haven Railroad. This arrangement was adopted to secure the advantages of economy, insulation and ample strength and, most important of all, to provide insurance against interruptions of service due to the failure of any one insulator unit.

In anchoring and sectionalizing the catenary system three 6-ft. wood-strain insulators were used in multiple with an equalizing yoke. To prevent side swaying of the contact and secondary messenger wires on tangent track in very heavy winds, a steady brace or "steady," was installed. These steadies are insulated from the structures by strings of three porcelain insulators similar to those used to support the contact wire. The contact wires themselves are insulated from each other by single 6-ft. wood-strain insulators.

No steadies or pull-offs are used on curves, the system floating naturally into an inclined position.

EXPANSION JOINTS A FEATURE OF THE CONDUIT SYSTEM

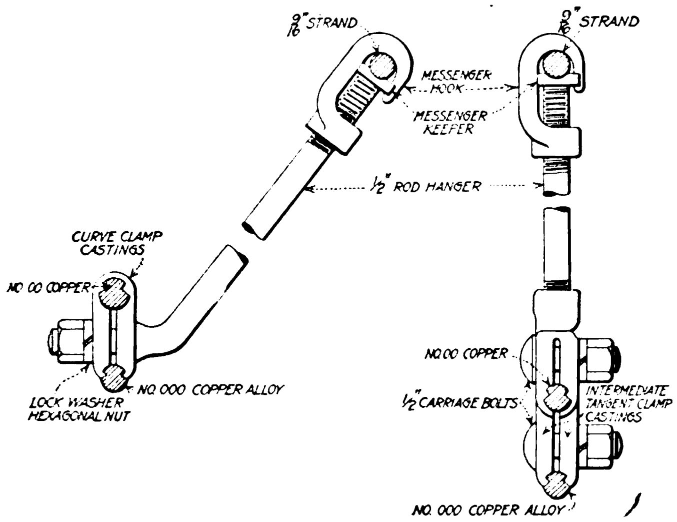
For the purpose of railroad communication a telegraph and telephone conduit line was built connecting with the Pennsylvania Railroad at Sunnyside Yard and the New Haven Railroad at East 132d Street between Harlem River and Port Morris, with connections into the railroad towers and to frequent telephones on the railroad. On the viaduct the conduit line consists of six fiber ducts protected by heavily reinforced concrete and provided with steel splicing chambers. In the fill south of the viaduct a six-way underground conduit line was constructed of vitrified clay ducts incased in concrete. The standard manhole is of pre-cast, oval, reinforced concrete type. Rectangular concrete manholes cast in place were installed at special locations and in the short twelve-duct section west of Woodside Avenue.



CONCRETE TEST HOUSE FOR TELEPHONE CABLES AT WOODSIDE AVENUE

In general the conduit line is located between the tracks. On account of the many expansion joints made necessary by the presence of the numerous viaduct girders, this conduit construction is quite unusual. At these expansion joints the conduit is ended off square with several inches of space between adjacent ends. The gap is covered over with sheet iron bent to clamp the conduits tightly.

On the viaduct the telephone cable was simply offset to allow for expansion and contraction of the steel girder, which amounts to about $\frac{3}{4}$ in. On Hell Gate and Little Hell Gate bridges, however, the maximum expansion in the bridge system will be about 10 in. and here the cable was terminated with potheads and flexible rubber-insulated cable used for connection between the potheads.



CLAMP HOOKED HANGERS FOR USE ON CURVES AND TANGENTS

A forty-five-pair cable was installed along the passenger section. This is lead covered and consists of twelve pairs of No. 13-gage copper wire quaded, thirty-two pairs of No. 16-gage copper wire quaded, and one lead-incased test pair. The test house at East 132d Street is connected with the Harlem River Station by an aerial cable. South of Sunnyside Junction a cable has been run along the freight line to Bay Ridge, most of the way being carried overhead. The poles used are Southern pine impregnated by creosote by the vacuum process. This cable line connects with the Long Island Railroad system at its East River Long Island substation, a new twenty-four-pair cable connecting with Jamaica.

Among the manufacturers of material used on the New York Connecting Railroad electrification were the following:

Structural bridges	Virginia Bridge & Iron Company
Tubular Poles	National Tube Company
Steel messenger and ground wire	American Steel & Wire Company
Copper auxiliary messengers	John A. Roebling's Sons Company
Copper alloy contact wire	Bridgeport Brass Company and Standard Underground Cable Company
Copper signal transmission wire	John A. Roebling's Sons Company
Bonds	American Steel & Wire Company
Insulators	Ohio Brass' Company
Guy rods	American Iron & Steel Manufacturing Company
Catenary hangers and castings	Westinghouse Electric & Manufacturing Company
Signal power cable	Okonite Company
Vitrified clay ducts	Shawmut Manufacturing Company
Communication cable and equipment	Western Electric Company

Rates to Cover Bonuses

French Tramways Have Been Authorized Generally to Increase Rates for Sake of Allowances to Employees

ACCORDING to agreements published in the *Journal Official de la République Française* from October to February, 1918, French tramways have generally granted supplementary pay to employees. The journal mentioned has published in full the decrees issued by the Minister of Public Works and Transports, which have authorized the managements of tramways and interurban railways to increase the tariff for transportation of passengers or merchandise and accessory charges for handling and storage.

These increased rates have been allowed in most, if not all, cases, according to the publication quoted, because of increased wages or bonuses being paid owing to the prevailing high cost of living.

In requesting an authorization for increase in rates the following method of procedure is general. The concessionaire submits to the prefect of the municipality a statement showing the necessity and also the amount of supplementary allowances to be paid. This statement is accompanied with a request for authority to increase transportation charges. After an agreement has been reached and signed by the railroad management and the prefect, the proposition is submitted to the President of the Republic, who, if he approves, signs the proposal. The Minister of Public Works then issues a decree making the agreement effective and ordering it to be entered in the *Bulletin of Laws*.

The decree may be retroactive in so far as it relates to supplementary wage. In some cases these are made payable from a date several months before the proposal was even submitted to the prefect for consideration. As an example of this the agreement between the prefect of the Somme and the director of the Economic Society of Railways was signed on Sept. 15, 1917, and approved by the President on Oct. 30, 1917, but the war bonuses dated from Nov. 1, 1916.

The decrees in general cover the period of the war and one year subsequent to cessation of hostilities. It is stipulated in many agreements that a separate account must be kept both of additional receipts and of expenses resulting from these increases, and that such receipts are exempt from any concession tax only in so far as the receipts exceed the expense. In some cases it is specified that excess net receipts shall be used in road betterment. In other cases the agreement states that deficits under the new rates may be charged to that portion of the receipts due to the municipality as a concession tax.

The Urbana & Champaign Railway, Gas & Electric Company, included in the Illinois Traction System, estimates that only 0.42 per cent of an average man's income is spent for electric railway service, 1.08 per cent for gas, 1.03 for electric light and power service, 45 per cent for food, 16 per cent for rent and taxes, 14 per cent for amusement and charity, 12 per cent for clothing and 10.47 per cent for miscellaneous expenditures.

Helping to Win the War

Electric Railway Lines in Newport News, Va., Wilmington, N. C., and Charlotte, N. C., Are Doing Their Share Toward the Speeding Up of War Work at Cantonment, Training Ground and Shipyard

TO MEET the requirements of the United States in these momentous times, electric railways are utilizing as many resources as their restricted financial condition permits. The service rendered differs—it may be for the transportation of soldiers to and from camp; it may be for the hauling of freight; it may be for the carrying of shipyard or munitions workers. Whatever the service is, however, it is done with a patriotic willingness that makes the describing of it a double pleasure.

This journal has previously published items in regard to the war service of electric railways, but this week it is presenting a more extended description of the work being done in some of the Atlantic Coast cities, namely, Newport News, Va.; Wilmington, N. C., and Charlotte, N. C. Similar articles in regard to other cities in this country will appear in subsequent issues.

Accelerating Aviation and Shipbuilding at Newport News

One Line Built to Langley Field—Shipping Board Is Financing Another to Shipyards—New Power and Car Equipment

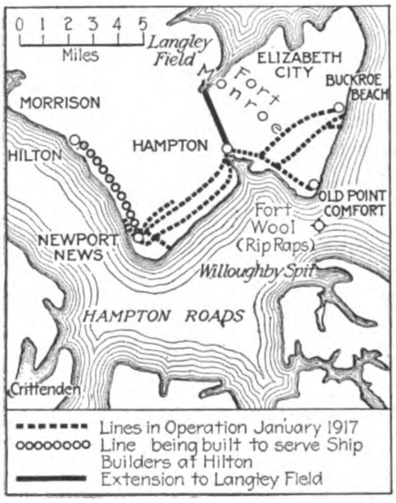
IN 1914, from the very beginning of the world war, Newport News, Va., became one of the most important points for shipments to the Allies, particularly of coal, horses, grain and meat. As the war began in August of 1914, the increase in exports during the following months of that year was not enough to show an imposing total; but the record for the following year is astounding. Thus, in 1914, the value of the exports totaled $8,929,214; and in 1915, $96,800,691 or nearly eleven times as much! It may be of some interest to add that during 1915 the exports included 170,000 horses and mules, 64,000,000 bushels of grain and 1,487,000 tons of coal.

It can readily be imagined that such increases as this have had a most stimulating effect on the local utility —the Newport News & Hampton Railway, Gas & Electric Company. Yet all this activity with the export business has become the smaller part of the enormous expansion on the famous lower peninsula of Virginia. To-day it is the work of the United States itself that is commanding the resources of the company.

Between Jan. 1 and July 1, 1917, 235 dwellings had been put up in Newport News and vicinity because of the activities there, and some 300 more were under way. With the entry of the United States in the war, the total has gone to more than 1000. A part of the building program includes the erection of a model town named Hilton, with schools, churches and other public edifices complete. Furthermore, the Newport News Shipbuilding & Dry Dock Company secured immediate expansion of rooming facilities by leasing Buckroe Beach Hotel from the utility to house 300 men.

At the Newport News shipyard alone there are now 9000 workers with an expected early total of 18,000. Since July, 1917, also, the daily shipyard travel has risen from 3200 to about 5000—an increase of 75 per cent. These men work in two eight-hour shifts.

A second shipbuilding activity there is that of the Newcomb Life Boat Company, which has contracts for $3,000,000 of submarine chasers and wooden ships. It is already employing 350 men and expects to need 3000. The great aviation field and proving ground at Langley Field and the 15,000-acre Field Artillery Drill Grounds now under way represent a considerable increase to the previous war-making facilities at this old-time center of naval and artillery activities. On the whole, then, travel is growing at an enormous rate, for the population has doubled (60,000 to 120,000) since the United States became a belligerent. For example, the riding in March, 1918, showed an increase of 84.88 per cent over that of March, 1917.



RAILWAY LINES OF NEWPORT NEWS & HAMPTON RAILWAY, GAS & ELECTRIC COMPANY

ONE EXTENSION FOR AVIATION SERVICE, ANOTHER FOR EMERGENCY FLEET CORPORATION

To meet the requirements of the government, the company in April, 1917, began the construction of a 3.1 mile line to Langley Field through an associated company called the Hampton & Langley Field Railway. This line was completed in August, 1917. The passenger business is not of primary importance here, the real service of the line being the hauling of freight from an interchange track connection with the Chesapeake & Ohio Railway at Hampton. Twenty carloads of freight are being hauled each way daily with an electric locomotive. The all-day headway for passenger service is only forty minutes, but double-headers of five cars each are run twice a day for the workers at the field.

Through the prompt action of A. Merritt Taylor, manager Passenger Transportation Service Section of the Emergency Fleet Corporation, funds have been advanced to the company for a 3-mile single-track line from the Newport News city line to the new community of Hilton, previously named. In connection with this extension the company will use eighteen cars now on order and give, probably, a fifteen-minute service throughout the day.

Other work of the way department includes a ¼-mile extension into Camp Stuart from the Twenty-third Street line, Newport News, twenty-car storage track loops at Newport News for the shipbuilding service and a loop on Twenty-third Street at the Chesapeake & Ohio Railway connection.

EIGHTEEN NEW CARS, TEN LEASED CARS AND MUCH REBUILDING

As of April 1, 1918, the company had forty-nine motor cars and thirty-four trailers on hand. To these it has added six cars leased from the New York & North Shore Traction Company and from the Norfolk Southern Company, and it has eighteen Brill semi-convertible cars on order. Between 1914 and 1918, it had bought four center-entrance cars, rebuilt another four cars to center-entrance type, rebuilt a number of open cars to all-year type, bought six Brill semi-convertible cars, purchased nine cars from Cleveland, three of which had motors and six of which were equipped with motors by stripping open cars which are now run as trailers, etc. Without going into more details, it is plain that the company had to show war-time ingenuity to get the most equipment for the least new investment.

To keep the enlarged car park in shape, 100 per cent increase of capacity is being secured by adding to one side of the present shop a 41-ft. x 160-ft. section for blacksmith and general inspection and to the other side a 35-ft. x 116 ft. section for painting and carpentry. The present paint shop becomes the new storeroom. The only new tools installed are a bolt threader and a South Bend lathe.

NEW POWER EQUIPMENT AND 6½-MILE TRANSMISSION LINE

The most important work in the power department is the erection of a 6½-mile, 10,000-volt aluminum transmission line from Hampton to the shipyard at Newport News. For these and other needs, three 1000-kva. 3450/10,000-volt transformers were ordered for the power house.

At the Hampton plant, also, the company has just added three 550-hp. B. & W. boilers. In 1917, it installed there a 4500-kw. Curtis turbine, raising the total output to 10,300 kw.

A 500-kw. general electric rotary has also been required for the Newport News substation.

FREIGHT AND ICE FACILITIES—HOUSING FOR PLATFORM MEN

The great congestion of both car and vehicular traffic at Newport News has made it necessary to abandon the store-door delivery heretofore made by the freight department. In consequence, it was necessary to erect a brick terminal at Newport News. The main building is 30 ft. x 85 ft., the office 15 ft. x 16 ft. and the wooden addition, 30 ft. x 50 ft. This business is chiefly the transfer of small lots from the Baltimore steamers at Old Point Comfort to customers at Newport News.

This company is one of the few public utilities doing an ice business. It has increased its storage capacity to 4900 tons.

Not the least of the company's troubles is to hold its men, because of both the wages and the housing conditions. The former have been practically doubled since war days, while the latter have been alleviated by building a forty-men dormitory at Hampton.

IN DOLLARS AND CENTS

The effect of the war at Newport News on the finances of the company may be summarized as follows: Gross earnings in 1913, $794,176; in 1914, $813,861; in 1915, $916,172; in 1916, $1,013,711; in 1917, $1,357,308. No depreciation fund was set aside until 1915, when the amount was $25,080; in 1916, $71,209 and in 1917, $106,619. Despite this the net has increased as follows: In 1913, $59,393; in 1914, $73,212; in 1915, $104,884; in 1916, $117,224; in 1917, $180,665. It is difficult to say what 1918 will show owing to the great increase in cost of labor and material. It may be added that of the $1,357,308 gross in 1917, $541,228 came from the railway; and that the railway ratio of operating to gross was 55.5 per cent.

Of course, it is not to be expected that the company's business will be so large after the war; but much of the present activity will be permanent because of the manifest advantages for manufacturing of the Newport News-Hampton Roads country and the permanent ship and government work. The company very sensibly is using what it has to the limit instead of making investments that would prove hard to carry after the war.

Carrying Soldiers to Carolina Camp

Two Double-Track Extensions 1¼ Miles Each With Extra Cars Cost $200,000 for $500 Daily Maximum Gross with 5-Cent Fare

ONE of the great troop encampments of the South is Camp Greene, which is located about 3 miles west of Independence Square, the center of Charlotte, N. C. To serve this encampment properly, the Southern Public Utilities Company has constructed two double-track loop-terminal lines each 1¼ miles long. One of these is a spur from the main line of the associated Piedmont Northern interurban; the other, an offshoot of the Lakewood Park line. The more distant terminus is 4 miles from Independence Square.

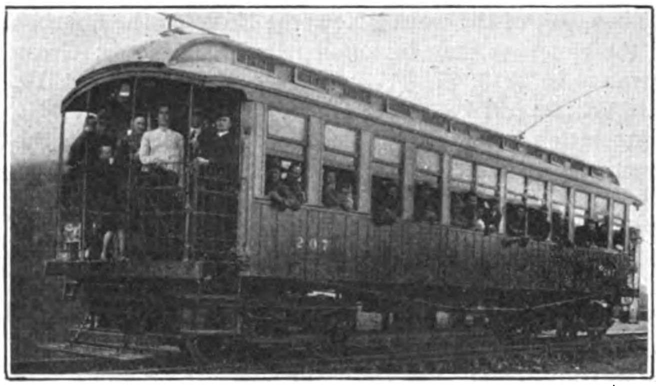
The morning headway on the long line is twenty minutes and on the short line, fifteen minutes; the afternoon and evening headways on both are five minutes. Trips to town are popular with the troops, for this is one of the few camps from which a city can be reached for 5 cents. At the same time travel varies greatly as the number of soldiers ranges from 10,000 to 50,000.

The riding is not in proportion to these figures, however, for furloughs appear to grow scarcer when the camp is crowded. In general, Saturdays and Sundays are the heavy days. Early in May, the week-end travel, which included some civilians, was about $500 a day, or 10,000 fares.

To supply quickly and at least cost the need for rolling stock, the company has supplemented its regular double-truck vestibuled cars by eight elevated railway cars. These former trailers were fitted with two 65 hp. motors and are run single-ended. They seat sixty and can carry 150 passengers. Their total cost was $3,500 each.

The company also bought two double-truck cars from Vicksburg, Miss., and inclosed four of its open cars to which it added air brakes.

These developments for a transient but patriotic purpose have cost the company about $200,000. If funds were available, the company could use a 1000-kw. rotary converter to advantage as the present equipment of two 500-kw. and two 750-kw. machines allows no reserves for contingencies.



SOUTHERN PUBLIC UTILITIES CAR TRANSPORTING TROOPS AND CIVILIANS

Wilmington Helps Shipbuilding

In North Carolina City Shipyards Will Be Served by Extensions—Multiple Unit Cars and Prepayment Areas Considered

LIKE its northern namesake in Delaware, Wilmington, N. C., is an excellent site for shipbuilding. It is now the home of two large projects in that field, one concrete and one steel. The concrete plant, which is already at work, bears the name Liberty Shipbuilding Company. It is located in the southern part of Wilmington with some 300 men at work now and 1000 in the near future.

At a distance of about 1 mile further south along the Cape Fear River is the plant of the Carolina Shipbuilding Corporation, a subsidiary of the Fuller Construction Company, the well-known New York contractor. This company has a contract for twelve 9600-ton steel ships. When building gets under way it will employ 3000 men.

NEGOTIATIONS FOR 3¼ MILES OF NEW TRACK

The Tidewater Power Company, by building 3¼ miles of new single track, would be able to give a double-track service although the old and new tracks would not be adjacent to each other. At this writing negotiations are on with the Emergency Fleet Corporation concerning the financing of this work.

So far as rolling stock is concerned the company is fortunate in being able to use for this twice-a-day service the eighteen large double-truck cars that have hitherto been used chiefly for Saturday afternoon and holiday travel to Wrightsville Beach. These cars have Westinghouse HL multiple-unit control and can therefore be operated in trains as desired. They could be supplemented by some of the company's thirty-two-passenger single-truck city cars. The latter in turn would be replaced by one-man safety cars which the company purposes using. In fact, one of the present cars is being equipped with the automatic devices that are used in one-man operation.

To use its rolling stock more efficiently, the railway is planning a prepayment area at the steel shipyard, and the Liberty Shipbuilding Company has already agreed to consider staggering its working hours. Rates of fare have not yet been fixed.

While the Wilmington company is in no immediate need of cars it is looking ahead to be prepared for the maximum. Probably the purchase of some large second-hand cars with multiple-unit control will be favored. Incidentally, it may be remarked that as the plants are located on the Cape Fear River, boat service by other interests is not out of the question.

HOUSING MOVEMENT IN WILMINGTON

Proof of the lively interest which Wilmington is taking in the shipbuilding program is presented in a citizens' co-operative movement to pledge $1,000,000 for the building of homes for the shipworkers. Apparently no one locality is to be developed, as at a public meeting held on May 9 lots from various parts of the city were offered for building. In several instances the speakers said building now would be a personal hardship but they would be glad to do it for the sake of winning the war. All the building and loan associations of the city also are urging their members to subscribe funds. One project is to secure twenty-five subscriptions of $25,000 each with the rest coming in amounts as low as $10. Wilmington evidently is not going to ask the Emergency Fleet Corporation to do it all!

85,000 Words at One Hearing

President Brush Performs Remarkable Feat at Recent Hearing on Necessity of Financial Relief of Boston Elevated

MATTHEW C. BRUSH, president Boston Elevated Railway, recently appeared before the joint committee on street railways and metropolitan affairs of the Massachusetts Legislature and presented a statement that will undoubtedly hold the record in important respects for a long time to come. Beginning at 11 a.m., he talked during the morning, afternoon and evening with two intermissions for meals, at the rate of more than 225 words a minute, until nearly 10.30 p.m. The report of his address and answers to questions fills a total of 236 typewritten pages and contains about 85,000 words.

So closely did Mr. Brush hold the attention of the members of the committee that no one left the room or gave the slightest attention to any other matter than the remarks of the speaker at any one of the sessions. During the entire hearing not a question was asked to which Mr. Brush was not ready to make a quick, complete and satisfactory reply. So obviously frank were the answers and so obviously helpful was the intent, that before the hearing had progressed to great lengths, the entire attitude of all concerned was that of mutual helpfulness in a common cause.

War Problems Before Oklahoma Association

Recent Meeting Marked by Patriotic Consideration of Current Questions—Value of Public-Relations Work Is Emphasized

THE seventh annual convention of the Oklahoma Gas, Electric & Street Railway Association, held in Oklahoma City on April 22-24, was marked by an attitude of unusual seriousness. The members seemed to realize that present conditions call for co-operative effort, for patriotic willingness to share their portion of the war burdens and for an improvement in methods of dealing with the public.

Numerous addresses were made, and below are published abstracts of those most closely connected with the electric railway industry. The names of the new officers of the association follow: J. F. Owens, vice-president and general manager Oklahoma Gas & Electric Company, president; C. S. Thompson, general manager Shawnee Gas & Electric Company, first vice-president; J. W. Shartel, vice-president and general manager Oklahoma Railway, vice-president, and L. W. W. Morrow, University of Oklahoma, secretary-treasurer.

Relation Between Public and Utility

Public Favor Is Most Valuable Asset of Company—Service Must Be Paid For by Patrons—Changed Conditions Should Mean Altered Rates

BY A. L. MITCHELL

Gas and Electric Engineer, Corporation Commission of Oklahoma

THE Oklahoma commission has gone far during the last twelve months in an effort to harmonize relations between the public and the utilities of the State. In view of the unusual and trying conditions resulting from the war, it has been necessary to restrict service in some instances, to deny requests for extensions or expansion in others and to impose rate advances in still others. The public undoubtedly has been inconvenienced by orders of this character, but it appears that the need has been understood, as there has been no protest.

The fundamental rule governing the relation between the public and the utility, as understood by the Oklahoma commission, was referred to in a recent case involving increased charges for electric railway transportation. In its opinion the commission said:

"The Corporation Commission of Oklahoma conceives it to be its duty to see that the public secures, as nearly as is economically possible, that for which it pays. The commission must also see that the public pays for that which it receives. Where conditions from time to time are making changes in rates necessary, it must prescribe and enforce such changes whether revision downward or revision upward be necessary.

"The commission must take into consideration, as has been done in certain recent cases, the fact that this is an abnormal time; that the individual must pay more for what he purchases than in normal times, and that the public utility must do the same. It follows 'as the night the day' that if the utility must pay more for what it buys, it must receive more for what it sells."

The most valuable asset that any public utility can have is the favor of the public served. The truth of this statement is realized by most utilities at this time. Some are more successful than others in applying their realization of this fact in practice. One of the compensations in the war emergency is that the American people are forgetting supposed differences among themselves in their unanimous hostility toward the nation's enemy. With the public utilities and the public making every effort to be useful in the winning of the war, neither has time to waste in magnifying the importance of a grievance toward the other. It is likely that both will learn that they can work best by co-ordinating their efforts in the building up of the communities in whose best success both can expect to share.

Instilling the Public-Relations Idea

Task of Utilities Is to Get the Public to Make an Intelligent Choice Between Decreased Service and Higher Rates

BY L. W. W. MORROW

Director School of Electrical Engineering, University of Oklahoma

THE task of the utility is to remove the impression that the utilities and the public are working for opposite results—the utilities to squeeze every cent they can from the public; the public to get every cent they can from the utility. The true idea of public relations must be instilled—the utilities and the public are partners; the interests of the employer, employee and the public are one and the same. Co-operation is the keynote to the welfare of each.

It does no good to appeal to the sympathy of the average citizen—it simply shows ignorance of human nature on the part of the utility management. The utility must approach the public from the standpoint of selfishness and self-interest. It must show the public that the utility's interests are the public's interests, and that a consideration of utility conditions will mean money in the pocket of every user of the utility's service.

TEARING UP TRACKS WILL NOT SOLVE THE PROBLEM

How shall the utility present the facts to the public so as to get the public to consider them? The utility, from the public's standpoint, is at present an interested party, and any statements or figures of the utility are questioned on sight. Some argue that the only method of getting the public to consider the utility is for the utility to decrease service. Tear up a few street-car lines, and refuse a few extensions, and the public is placed in a position of the aggressor and not the utility. Then the facts of the utility's condition will reach the audience desired and the public will acquiesce in the principle that service should be paid for on a reasonable basis.

This method will work as a temporary expedient, but it is wrong as a working policy, because of the psychological fact that the public never welcomes proof that it is wrong. Even though convinced of the justness of the utility's act, the public would consider itself ill-treated in that the utility made no effort to show its condition before discontinuing service. The public is accustomed to have the utilities take the steps necessary to give it adequate service and does not relish the work necessary to get service through its own action. The public also feels worse in that it is practically forced to grant a rate increase.

"MORE-THAN-NECESSARY SERVICE" THE SLOGAN

Extension of service and more-than-necessary service are the watchwords of successful utility operation. The task of the utilities is to show the public that present conditions mean decreased service or advance in rates, and to get the public to accept voluntarily the increase in rates upon decision of their representatives.

The gist of every publicity argument should be that unless rates are advanced, service will be decreased. The utility must show:

1. That it is not getting a fair return on the actual capital invested.
2. That its financial condition is not temporary with relief in sight, but is in fact increasing in seriousness with the lapse of time.
3. That the increase is necessary in order to furnish adequate service of the kind the public requires.
4. That the increase desired is only reasonable and just and that the company's motive in asking the increase is only the application of fair dealing to present conditions.

The public must be shown the same things a commission is shown, but it must be shown these things in a simple and direct manner—no lengthy treatise on going value, depreciation, reproduction new, etc., appeals to the public. Simply show that operating expenses are so much, operating revenues are another sum, and the difference is inadequate to furnish the service desired by the public.

PUT PERSONALITY INTO CAMPAIGNS

The utility publicity man must have several essential characteristics. He must be able to marshal his facts and present them in a telling and effective manner. He must believe in his own case enthusiastically and must be perfectly frank with his audience. He must be the personality of his company—no one cares about the hardships of Blank Electric Company, but John Jones is a definite personality and his views and opinions are quoted and considered. The personality of the manager of a utility solves many vexatious problems in public relationship

There are many methods for obtaining publicity—the newspapers, newspaper advertising, circulation, posters and street cars, addresses before civic bodies, personal relationship between the employees and the public are all legitimate means. The newspaper is the chief agent as it reaches the maximum number of people. The publicity of the individual plant must be handled locally—no amount of generalization will be read by the local citizenship. The manager of the local utility is the one person to handle the public. A central bureau can compile his facts and arrange his material, but the manager's personal touch is essential in getting these facts across to his public.

A lecture bureau is a great help in presenting matters of a general nature to civic bodies, but every question that is in dispute should be personally presented by the manager, even though in many cases he is far from being a fluent speaker or logical floor thinker. The importation of a high-grade man by the utility to handle local disputes is poor policy, because it strikes the local people as a plan to talk them out of their side of the case by means of hiring an able lawyer. Instinctively, the local people take an antagonistic mood. The manager, however, lives in the community and is one of the citizens, and on a common basis with the local people from their point of view. Outside help can marshall the facts for the manager and obtain his material, but it should not attempt to intervene directly in local disputes.

How Should Utilities Be Taxed?

Same Valuation Should Be Used in Taxation as in Rate-Making—State Assessment Board is Best

BY PROF. F. F. BLACHLY
University of Oklahoma

THERE are three theories of equality of taxation as applied to utilities: (1) Utilities should not be taxed at all. (2) Utilities should be taxed more than other businesses. (3) Utilities should be taxed equally with other businesses.

The last theory probably has more advocates than either of the other two. All admit that it is difficult to obtain perfection in trying to establish a basis of equality but that such an attempt should be made.

Real equality can only be obtained by classifying property according to special conditions and circumstances. It is much easier to state this general principle than it is to apply it to concrete cases.

The taxation of utilities at their fair market value is the method used in Oklahoma in addition to the gross revenue tax. Thus, to speak theoretically, the property of public service corporations is assessed in the same manner as other property with the exception that the assessing board is different. Were tangible property alone to be considered and were the tangible property of a public service corporation not very different than that of a private corporation, this method might produce fair results. But it is the intangible assets of public utilities which cause the difficulties.

It is left to the discretion of the board to determine the assessment on these extremely elusive values. Since the basis is not the actual property itself, but this property in its relationships with the intangible property, the board has no guiding star in determining what the assessment shall be. The result is that, in Oklahoma at least, there seems to be no stable basis for determining value. Several factors undoubtedly are taken into account, such as capital stock, bonded indebtedness, total revenue, expenses, interest and dividends. I have been unable in any concrete instance to determine just what was the basis for fixing the assessment.

RATE VALUATION SHOULD BE USED

It would seem evident that the same valuation should be used as the basis for taxation as is used in rate making. If franchises, good-will and going value are considered as a proper basis for the determination of rates, they should also be considered when it comes to taxation. If, however, franchises, etc., are not considered in determining rates, certainly they should not be so considered when determining the value of the property for the purpose of taxation.

Particularly in undeveloped or new regions, I do not believe that it is either expedient or possible to remove all speculative value from a public utility and still have it privately owned. Capital simply will not invest in such enterprises. The natural result of trying so to regulate utilities must ultimately bring about government ownership.

Evidently all public utilities should be assessed by a state authority, as opposed to local authorities, for many utilities are not local in nature and even where they are it is almost impossible to secure assessors with a sufficient grasp of the problem to perform their functions properly. The assessing board must have large powers of determining value and it should be made as free as possible from political control. Perhaps the best way to secure this end is to have members appointed for a long term if not for life. The members should be experts in law, accounting, economics and business management. While much of this training can be secured through formal education, much of it must come through the handling of large affairs.

In order to carry out the principle previously stated, that the same base should be used in determining taxes as is used in determining rates, there should evidently be a close relationship between the rate-regulating body and the assessing body. I am not at all sure, however, that the rate-fixing body and the tax-assessing body should not be the same. Many advocate a regular tax commission which should assess all property in the State, including utilities. The only difficulty of such a scheme might be that it would either have to duplicate to a large extent the work of valuation now done by the corporation commission in determining valuations, thus requiring a large and expensive staff, or else the tax commission would have to adopt the value of utilities certified to it by the corporation commission.

War Needs of Electric Railways

Decisive Increase in Revenues Is Needed to Enable Railways to Stand Present Strain

BY G. B. TREAT

Assistant Manager Oklahoma (Okla.) Railway

THE one thing which the public lost sight of, and which should be the key to future action, is the fact that on a pre-war basis the electric railway business as a whole was not attractive to capital. The present distress of the utility is not entirely a war result, but it is the culmination of attempting to carry the burdens of previous years without adequate revenue.

The continued efforts to reduce operating expenses during the last few years have always been made at the expense of the property. Renewals and replacements which should have been made were passed by, so that at the opening of the war the utilities were not in shape to stand the added burden.

If all the relief thus far asked by the utilities were granted, the returns would still be wholly inadequate to meet the present-day demands. Requests for added revenues have been limited by the fear that an adequate return would call for such a large increase as to raise a storm of protest which would ruin all chances of gaining any immediate aid. Had the relief asked for now been applied for six years ago, properties would have been in shape to stand the present strain.

Aid necessary now is not the nominal increase asked for, but a decisive increase, which would aggregate probably not less than 50 per cent for all the electric railways over the country. Failure to receive this will react against the public interest in a way over which the companies will have no control.

Missourians Keenly Alive to Rate Needs

Majority of Addresses at St. Joseph Convention Discuss Increasing Costs—Concerted Effort to Educate Public Is Urged

THAT sweeping increases in rates are necessary to afford relief to public utilities in Missouri was the consensus of opnion at the convention of the State Association of Public Utilities in St. Joseph, Mo., on May 17 and 18. The utility operators have ceased for the time being to discuss detailed problems of operation and are concentrating their attention upon the fundamental question of securing adequate net income.

The convention was opened by addresses from two Missouri mayors. Mayor J. C. Whitsell of St. Joseph expressed willingness to aid the local utilities in educating the public to the fact that net earnings are only a small percentage of the receipts. Mayor H. W. Kiel of St. Louis stated that changing conditions are making the public see the value of utility service. He expressed the belief that higher rates would have to be paid.

In the absence of the president, Bruce Cameron, superintendent of transportation United Railways of St. Louis, his address was read by Secretary F. D. Beardslee. Mr. Cameron dwelt at length on the St. Louis electric railway situation. Last February the employees demanded an increase in wages, but the money to pay it could not be secured under the rates in effect. Application was made for an increased fare, but the city of St. Louis opposed this. The commission, however, has now granted the increase, and the workmen have secured increased wages. Whether the city of St. Louis will attempt to fight still further in the courts and take the responsibility of bringing on a strike remains to be seen. Mr. Cameron favored the skip stop as a conservation measure both for saving coal and for saving time. He predicted that the prices of labor and material would reach higher levels and that high prices would continue for a long time, even after the war is ended. He recommended that changes be made to take these predictions into account, one suggestion being for the coinage of a 7½-cent piece.

J. S. Tritle, manager of the St. Louis office of the Westinghouse Electric & Manufacturing Company, in a paper on "How the Manufacturer Is Meeting the Problems Created by War," presented data on the increased business which his company is doing. On June 30, 1914, the company employed 11,702 men, and on Feb. 28, 1918, it had 36,534. When war broke out on Aug. 1, 1914, the unfilled orders amounted to $8,000,000; on April 1, 1918, they totaled $153,000,000, exclusive of the gun business of the New England Westinghouse Company.

NATIONAL WELFARE DEMANDS UTILITY PRESERVATION

Among the other addresses of interest to electric railways was one by Col. Philip J. Kealy, president Kansas City Railways, on "The National Movement for Increased Revenue." This sounded the keynote of the convention in the following words:

"We are here to work out plans not to reduce operating costs or to effect small economies, but to preserve the very existence of the industry itself. One of the principal things we now have to do is to effect that change in our own psychological attitude that we must later effect on the general public. We must get away from our local viewpoint with all its prejudices and face our problem as a national emergency. We must, in our own minds and in the minds of the public we serve, stamp our companies with a national character and have them considered as a vital and essential part of our war preparations."

The remainder of the paper was a résumé of what has been accomplished nationally along this line and what should still be done. In conclusion Colonel Kealy said:

"The situation is in the last analysis a final test of state regulation. Unless regulation is elastic enough to meet the exigencies of an abnormal situation and to preserve and make possible the service of the companies, it has failed and some other method must be adopted to handle the situation. The commissions face a grave responsibility. In this connection our efforts can be of some material assistance. The commissions have no way of presenting the facts to the people from whom they derive their authority. We must do everything possible to see that the public is thoroughly informed of the necessities of the situation."

THE PUBLIC MUST BE TOLD

The discussion of Colonel Kealy's remarks brought out the point that this work of public education must be done by newspaper advertising, by personal explanation to influential citizens and by all other available means of disseminating information. The question of how to answer the argument that a utility should not break rate contracts, even though it is losing money, also came up. Several good answers were suggested. One form of explanation was that a utility contract is a long-term agreement based on normal times, and that in an abnormal period it is better for both parties to readjust the contract than to have unprofitable and unsatisfactory service.

The address by H. Wurdack of St. Louis on "The Effect of War Upon Utilities" was a discussion of the increased burdens of operation. The speaker concluded that: (1) Regulation will only be tolerated by the American people as long as it seems to work to their advantage; (2) laws and limitations made in peace times to govern peace conditions are in many cases found to be wholly inadequate, improper and inoperative in a war emergency; and (3) commissions, local authorities and communities must allow a liberal and speedy remedy if the total destruction of utilities is to be averted. He also suggested as remedies that fares should be increased sufficiently to reimburse companies for losses already sustained and to cover further increases in costs, that companies should be relieved from paving, tax and other similar burdens and that some means should be provided for financing necessary work at a reasonable rate.

Another who took part in the convention program was J. A. Whitlow, engineer with the Missouri Public Service Commission. Mr. Whitlow declared that the commission, before making any decisions, had been requiring extensive publicity regarding the details of all rate increases in order to maintain favorable public relations for the companies.

As a fitting culmination to the discussion on higher revenues, the resolutions committee submitted a statement which the association, acting as a committee of the whole, will later present to the Missouri Public Service Commission. The purport of the resolution is that all public utilities are entitled to increases in rates sufficient to cover increased costs, and that new rate schedules should not be suspended by the commission until an adverse showing had been made to justify suspension. Furthermore, the resolution declared that all franchise requirements not essential to the maintenance of service should be discontinued for the duration of the war.

COAL PROBLEM WILL BE MORE SERIOUS

Governor Wallace Crossley, fuel administrator for Missouri, predicted more serious coal troubles this winter than prevailed last winter. He expressed the opinion that the activities of the national fuel and transportation departments should be co-ordinated. In the subsequent discussion many operators testified that the grade of coal now being delivered from mines is twice as high in ash as formerly, and that a saving of 30 per cent in coal cars could be secured by compelling mines to ship clean coal. A committee is to be appointed to supply Governor Crossley with accurate data regarding the inferior coal service now being rendered. M. F. Henry, secretary of the Missouri fuel administration, stated that higher freight rates on coal, amounting to from 15 cents to 50 cents a ton, should probably be expected within six weeks.

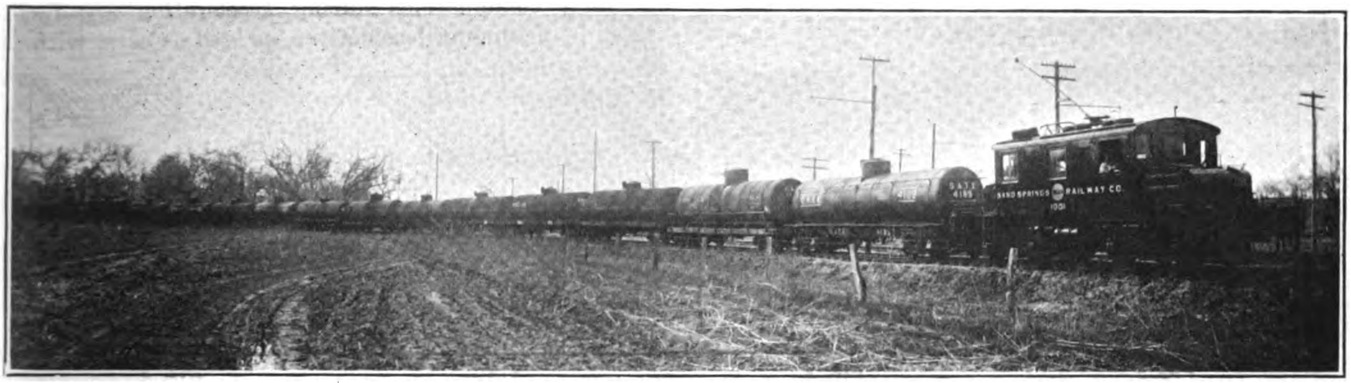
The officers elected for the ensuing year are: President, J. H. Van Brunt, St. Joseph; first vice-president, J. M. Scott, Kansas City; second vice-president, L. P. Andrews, Sedalia; third vice-president, H. Spoehrer, St. Louis, and secretary-treasurer, F. D. Beardslee, St. Louis. The executive committee is P. J. Kealy, Kansas City, and B. C. Adams, Joplin; and the public affairs committee is V. L. Elbert, St. Joseph; J. F. Porter, Kansas City; Bruce Cameron, St. Louis, and E. C. Deal, Springfield.

The results of the first Thrift Stamp Day were so satisfactory that the National War Savings Committee of Greater New York has decided to set aside hereafter every first day of each month as Thrift Stamp Day, and all business houses have been asked to co-operate and make a special drive to boost the sales of Thrift and War Savings Stamps on those days.

Freight Motive Power Equipment

Present Power House and Substation Equipment Is Sufficient if Freight Haulage Is Confined to Off-Peak Hours

BY G. M. WOODS
General Engineer, Railway Department, Westinghouse Electric & Manufacturing Company



SAND SPRINGS RAILWAY OIL TANK TRAIN HAULED BY A 50-TON LOCOMOTIVE

MANY electric railroads appreciate the possibility of increasing their revenue by freight train operation but do not engage in it because they assume that increased investment for substation and feeder capacity will be necessary to handle the power drafts. A properly designed freight locomotive capable of hauling a 250-ton train on a 4 per cent grade or a 1500-ton train on the level will produce no higher current peaks than a high-speed limited passenger car on the same line. Freight service is operated by many roads during the night. It is well that these off-peak hours should be so used instead of permitting the earning power to drop to zero for four or five hours every night. In fact, freight service need not add a single kilowatt to the daylight or evening peaks. It is inherently difficult to obtain a high load factor on most electric railroads and the peak load, rather than the continuous load, determines the substation and feeder capacity.

In Fig. 1 the current taken by a 50-ton interurban car equipped with four 125-hp. motors, operating on grades up to 4 per cent, is compared with that required by a 45-ton low-speed locomotive hauling a 240-ton train up the same grades. The balancing speed, balancing current and accelerating current for 1½ m.p.h.p.s. acceleration of the 50-ton passenger car are shown by curves *A*, *A*-1 and *A*-2 respectively. The balancing speed, balancing current and accelerating current for 0.1 m.p.h.p.s. acceleration of the 45-ton locomotive hauling the 240-ton train are shown by *B*, *B*-1 and *B*-2 respectively. Attention is called to the fact that the passenger car requires a much higher starting current than the 285-ton freight train although in this particular case, on the heavier grades, the balancing current of the locomotive with trailing load is slightly higher than that of the passenger train.

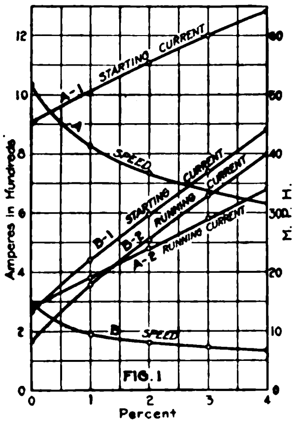


Fig. 1—Comparative Starting and Running Currents Taken by an Interurban Passenger Car and Low-Speed Locomotive

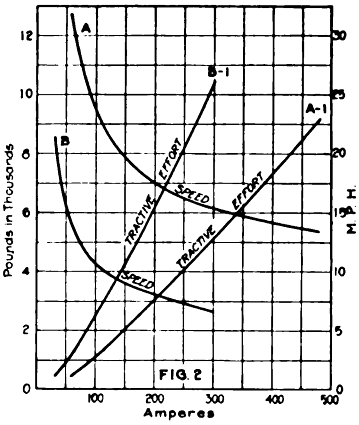


Fig. 2—Comparison of Motor Characteristics for High-Speed Car and Low-Speed Locomotive Motors

LOCOMOTIVE AND PASSENGER MOTORS COMPARED

LOW-SPEED LOCOMOTIVE GIVES HIGH TORQUE PER AMPERE

Freight motive power must be able to exert very high drawbar pull as a primary requisite. Speed usually is secondary. In developing the high drawbar pull, it is essential that the current required should be kept to a minimum. Therefore, the chief advantage of a low-speed locomotive motor equipment is that a very high torque or turning effort is developed per ampere, permitting the locomotive to haul heavy tonnage with relatively low drafts of power.

Low-speed motive power equipment not only reduces the power peaks, but also reduces the total power required to haul a specified weight of train over a given line. This is true because when operating at low speed the frictional and wind resistance of the train is lower, the line losses are lower and less energy is dissipated in braking. Furthermore, a locomotive in freight service spends much of its time on sidings and in switching cars. The individual movements are usually short and must be made at low speeds with the result that the high-speed locomotive is at a disadvantage from the standpoint of safety and ease of operation, while at the same time the proportion of energy wasted in rheostats and brakeshoes is increased by the short runs.

HIGH-SPEED MOTOR DRAWS 75 PER CENT MORE CURRENT FROM THE LINE

In Fig. 2 a comparison is made of the characteristic curves *A* and *A*-1 of a high-speed motor and *B* and *B*-1 of a low-speed motor of the same weight and general type of construction, but designed for locomotive service. The curves for both motors are based on the same gear ratio and wheel size. It will be noted that for any given tractive effort, the current taken by the high-speed motor is approximately 75 per cent greater than that taken by the low-speed motor and that the speed of the former is correspondingly higher. In some cases where low-speed operation is essential, high-speed motors have been connected in pairs of two in series and thus operated at half-voltage and a corresponding speed reduction obtained. This method of operation results in greatly reduced efficiency. It must be borne in mind also that the motor output at half voltage is approximately half the output at full voltage.

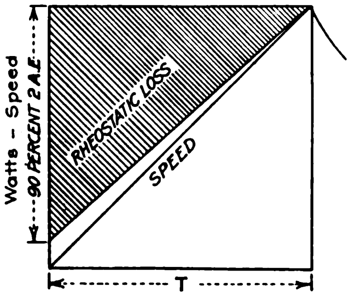


FIG. 3

Fig. 3—Rheostatic Losses for Rheostatic Control

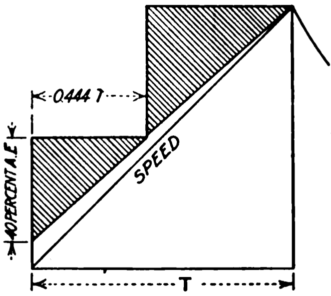


FIG. 4

Fig. 4—Rheostatic Losses for Series Parallel Control

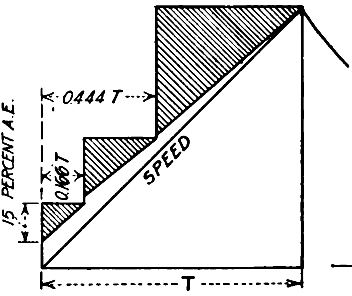


FIG. 5

Fig. 5—Rheostatic Losses for Three-Speed Locomotive Control

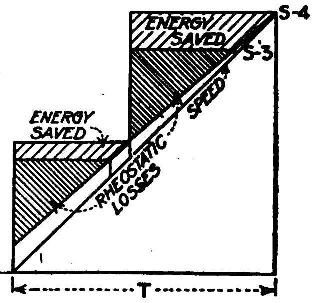
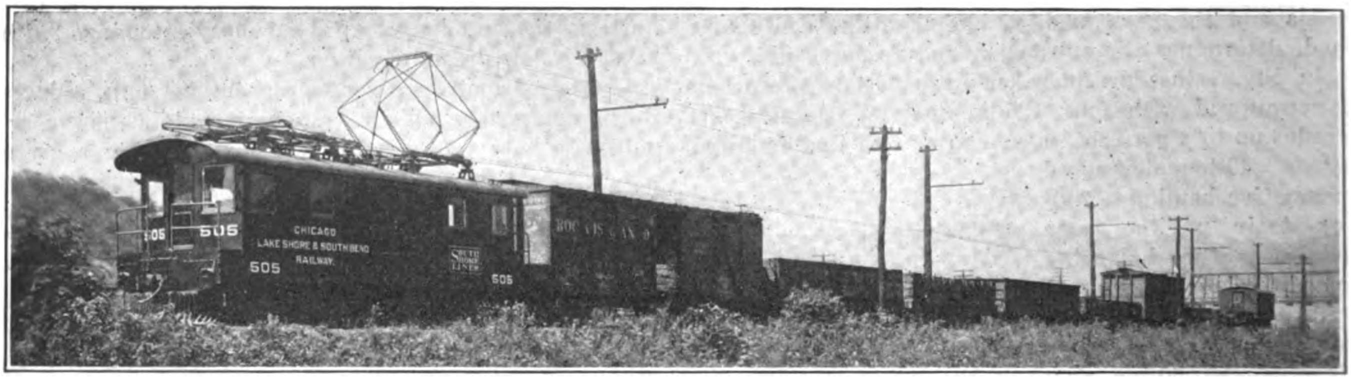


FIG. 6

Fig. 6—Energy Saving Effected by Field Control

DIAGRAMS OF RHEOSTATIC LOSSES WITH VARIOUS TYPES OF CONTROL

The adaptability of the low-speed freight handling equipment to work without overloading the substation is well illustrated by the following case:



CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY FREIGHT TRAIN HAULED BY A 72-TON LOCOMOTIVE

A trailing load of 240 tons was to be started on a 3 per cent grade located at a substation of 300-kw. continuous capacity and capable of 100 per cent momentary overload. With 25 per cent adhesion a locomotive weighing 45 tons was required. If this locomotive had been equipped with high-speed motors: *A*, Fig. 2, the starting current would be 1280 amp., thus loading the substation to 768 kw. or in excess of its capacity, but with four low-speed motors; *B*, Fig. 2, the starting current was 740 amp. and the corresponding substation load was 444 kw. or within the overload capacity.

Further, if this service is started about the time that some of the passenger trains begin to go off the line for the night and ended at a time when the early morning trains are coming on, the improvement in the load factor will be considerable.

Motor combinations during acceleration are facilitated by equipping locomotives, as well as cars, with an even number of motors. Most freight equipments have four motors. The following fundamental explanation of the operation of the control apparatus applies to 600-volt, four-motor equipments.

Placing all four motors in parallel across the line with sufficient resistance in the circuit to limit the first rush of current to a safe value is a most uneconomical and an obsolete method of starting any car or locomotive equipment. The gradual cutting out of this series resistance holds the current, and hence the torque, within relatively close limits as the locomotive accelerates. Control of this type is called "rheostatic."

The control in most general use is known as "series-parallel." In this, the motors are permanently connected in two groups of two motors in "parallel." In starting, these two groups are first connected in series across the line with a variable series resistance and then the two groups are connected in parallel. With series-parallel control, there are two economical running points.

Three-speed control is better adapted to freight operation, because it provides one more economical operating speed than the series-parallel type to care for switching and other low-speed movements. With this method the motors are first connected in "series," then in "series-parallel" and finally, in "parallel" with proper proportions of resistance in each step to secure smooth acceleration. In this scheme, the transition from full "series" to "series-parallel" is effected either by unit switches or some type of changeover switch. There is the advantage in the former scheme that the unit switches permit the motive power tractive effort to be maintained continuously from full "series" to full "parallel."

The shaded portions of Figs. 3, 4 and 5 represent the rheostatic losses of the three foregoing types of control respectively.

A = Accelerating or starting current per motor;
E = Trolley voltage;
T = Time required to reach speed with all resistance cut out with motors in full parallel.

The rheostatic losses with two-speed series-parallel control are 50 per cent less than with rheostatic control, while the three-speed control effects an additional saving of 10 per cent.

An additional feature of design that is most desirable in locomotive service is field control, which regulates the speed of a series motor by varying the effective field turns, thus considerably reducing the rheostatic losses. A very important advantage for freight motive operation is that four economical running speeds are provided with ordinary series-parallel control, thus the running notches of this control are "series" and "parallel" on full field, and "series" and "parallel" on short or normal field. Field control virtually provides a low-speed motor with a maximum tractive effort per ampere for starting or low-speed running, while the higher speed winding is available for road or any other operation that makes a higher speed desirable. The energy saving effected by field control is illustrated in Fig. 6.

Increase in Tramway Fares Essential

As a consequence of the recent wage award of the committee on production, it is said to be essential that tramway fares in Great Britain be increased. This has already been done in many places, but in some cases statutory restrictions prevent necessary revision. In view of this limitation a resolution was passed at a conference of tramway employers and representatives of the unions asking that the government promise that it will take immediate steps to authorize an increase of the maximum tolls and charges, whether statutory or otherwise, which may be demanded on all tramways in an amount to be decided by the Board of Trade. The resolution was signed on behalf of the Municipal Tramways Association by J. B. Hamilton; on behalf of the Tramways and Light Railways Association by R. J. Howley; and on behalf of the National Transport Federation by R. Williams.

As stated more in detail in the "London Letter" this week, Sir Albert Stanley has suggested the appointment of a select committee of the House of Commons to consider the matter. It is believed that the appointment of such a committee would probably prove the best means of facilitating the carrying out of the suggested legislation with the least delay.

An Epoch-Making Law

President Brush Believes that Public Control for Boston Elevated Is Fundamentally Sound—Regulation with Responsibility the Aim

THE act of May 22 providing for the public control of the Boston (Mass.) Elevated Railway is the biggest, strongest, finest piece of legislation ever passed in the electric railway field. Such is the opinion of M. C. Brush, president of the company, as expressed to a representative of the ELECTRIC RAILWAY JOURNAL. The signing of the act was noted in the issue of May 24.

Mr. Brush believes that the plan has all the advantages claimed for public ownership with none of the disadvantages, and it is fair to all interests concerned—car rider, investor, employee and the general public. Based upon the integrity of the Commonwealth itself, it assures a square deal to the 6000 Massachusetts citizens who have invested their money in this property, and it provides a means of securing improved service for the community at actual cost. For a period of four years it compels the stockholder to take less than 6 per cent return upon the par value of his investment, but during this period the car-rider will also carry his share of the burden in the shape of a less satisfactory service than would be provided in normal times. Eventually the car rider will get his service at actual cost, and the future investor in the property will have a fair deal.

Continuing, Mr. Brush said:

"The act permits the community to realize upon its confidence in the management under public control, whereas public confidence in private management under private control has been difficult if not impossible to maintain under recent and present economic conditions. The public control of the company will unquestionably permit many improvements which cannot be satisfactorily effected otherwise. One of these matters is the reduction of stops; another is the provision of a volume of car service expressing the desires of the community, but at its true cost.

"The appointment of the trustees by the Governor is a strong point. This gives the public a real share in the management of the property, since the trustees are appointed by the elected chief executive of the State. The length of their terms, ten years each, minimizes the possibility of politics having an unfortunate effect upon the management.

REGULATION WITHOUT RESPONSIBILITY IS WRONG

"In my opinion, the usual scheme of public utility regulation by commissions without responsibility for the results of management is wrong. The solution of the electric railway problem in the United States does not lie in commission regulation and the 6-cent fare. To attempt to meet present economic conditions in this way is like putting arnica or witch-hazel on a cancer; it may temporarily increase the comfort of the patient, but it absolutely offers no cure for the condition.

"In the Boston act we have a board of trustees responsible for results; the fare and the revenue will be measured by the total service cost as carefully defined in the law, and the public can have exactly the volume and the character of service for which it desires to pay. The act will prevent the car rider from being forced to meet costs which are not properly his, and for the first time in electric railway legislation there is no limit set upon the revenue to be supplied to meet the real cost of the service, including of course the return upon the investment.

"Speaking of this investment, I want to emphasize the fact that every dollar of the money which has gone into the company's securities has been put into the property with the consent of the Massachusetts Railroad Commission and the Public Service Commission; that within the last two years surely not less than 150 special investigators have literally turned this property inside out and examined every last detail of its operations and management, with the result that not $1 of water has been found in its securities. Moreover, there has not been a suggestion of incompetence, inefficiency, dishonesty or imprudence brought forward by a single responsible investigator.

"The present act passed the Legislature by a vote of 157 to 29, in both houses combined—a result which never could have been attained unless every newspaper, municipal and town government, and State official concerned had entire confidence in the organization which has been operating the road. The company's stock has advanced from $27 to $74 per share in a period of about three months—a fact which speaks for itself.

PROPERTY NO LONGER A BUSINESS VENTURE

"In this bill the Legislature has done for the Boston Elevated Railway something which it has done for no other company in the State, *i.e.*, it has pledged the credit of the Commonwealth to guarantee to the stockholder that his investment shall have its fair return even as the public receives a corresponding service at definite cost. The act goes further than any previous one in providing for the necessary revenue for a fair return by taxation in the event that fares, transfer arrangements, etc., should yield an insufficient return. This means that the operation of the property is no longer to be classed as a business venture but as a genuine public service, for which actual costs must be met by the community and the car riders. I believe that the act is fundamental in scope, and that it will be the basis of other public utility rate agreements as its principles become understood and appreciated.

GOVERNMENT OWNERSHIP IS NOT DESIRABLE

"Of course, in expressing my opinion on this bill it must be distinctly understood that I am talking entirely about a public utility financed under Massachusetts laws and not about private enterprises for either semi-public or private purposes. The Massachusetts laws since 1873 have been extremely strict with regard to electric railways. Since all financing of this company has been done under these laws and since the point had been reached where it was evident that the company could not secure sufficient revenue to invite additional capital for transportation facilities, something of the character that has just been passed was inevitable.

"I am not in favor of government ownership or necessarily government control. I believe that if public utilities as well as private utilities are given opportunity to run their properties on a business basis with the privilege of making such charges for their manufactured article whether it be transportation or something else, as will invite additional capital, the results will be better than to have the government own or operate all industries in the country."

SALIENT FEATURES OF NEW ACT

The terms of the proposed enactment were summarized in the ELECTRIC RAILWAY JOURNAL of April 20, page 778. The only essential change in the final act, which now awaits only the formal approval of the stockholders for enforcement, was in the provision for the appointment of the trustees. In the first bill, two of the five were to be appointed by the Mayor of Boston and three by the Governor of Massachusetts. This was changed so that the law provides for all appointments to be made by the Governor. Otherwise the law is substantially the same as the original bill, despite a few changes in phraseology.

For the convenience of readers, however, there is again published herewith a résumé of the main points of the new act:

1. The company is to be managed by five trustees, appointed by the Governor for ten-year terms at a salary of $5,000 per annum.

2. The period of public control shall be ten years or longer at the option of the Commonwealth. The Commonwealth can terminate the public control at the end of the ten-year period or thereafter by legislation passed two years before the date fixed for termination.

3. The trustees operate the property, have power to regulate fares and transfer privileges, and determine character and extent of service, without being subject to the control of any State board or commission.

4. The company shall raise $3,000,000 by sale of preferred stock at not less than par, $1,000,000 to be used as a reserve fund and $2,000,000 for additions and improvements.

5. Fares must be sufficient to meet the cost of service, including depreciation and common dividends at the rate of $5 a share for the first two years, $5.50 for the next two years and $6 during the balance of the period of public operation.

6. The trustees shall adopt a schedule of eight different grades of fares, of which four shall be below and four above the rate of fare first established. The schedule shall be increased when the fare is changed, so that there shall always be not less than four above and four below the existing fare. The trustees may change the method or basis of fare establishment or regrade the schedule at any time.

7. Whenever income is insufficient to meet the cost of service, the reserve fund shall be drawn upon; if more than sufficient, the excess shall be transferred to the reserve fund.

8. When the reserve fund exceeds by 30 per cent or more the original amount and the income during the preceding three months exceeded the cost of service, the next lower grade of fare shall be adopted within one month. When the reserve fund is less than 70 per cent of the original amount, and during the preceding three months the income was less than the cost of service, the next higher grade of fare shall be similarly adopted. The fare shall continue to be decreased or increased if the reserve fund is above or below said limits. In determining the amount of the reserve fund, there shall first be deducted any amounts paid by the Commonwealth under the next section.

9. If the reserve fund at a half-year period is insufficient to meet the deficiency in cost of service, the State shall make up the deficit and assess this upon cities and towns in which the company operates. When reimbursed from the reserve fund, the State shall distribute the amount among the communities assessed.

10. At the end of the period of public control, the company shall revert to the board of directors, who may continue to operate it on the service-at-cost plan with a flexible fare and pay $6 a share in common-stock dividends.

11. The State has the option of taking over the property by assuming the liabilities and paying in cash an amount equal to that paid in by the stockholders.

AMERICAN ASSOCIATION NEWS

Connecticut Section Hears About War

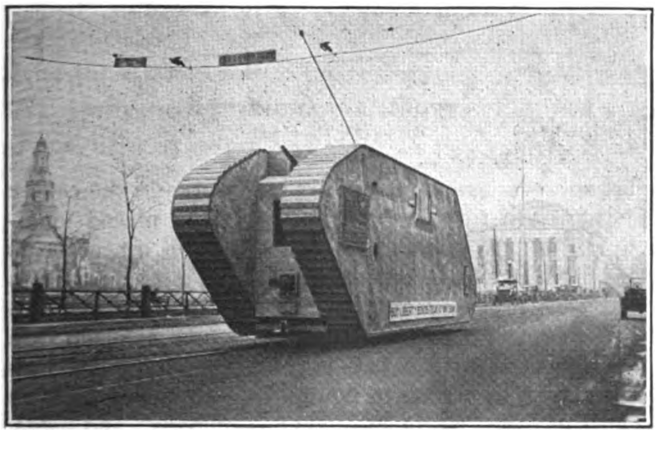
Returned Sergeant from General Pershing's Forces Tells What the Soldiers Need at the Front

TWO HUNDRED AND TWO members and guests attended the combined meeting and dinner of the Connecticut Company Section at the Hotel Stratfield, Bridgeport, on May 16. The first speaker was the Mayor of Bridgeport, Hon. C. B. Wilson. He was followed by one of General Pershing's men, Sergeant Reilly, just returned from the trenches, who told the needs of our soldiers "over there." Mr. Steinke, a cartoonist of one of the Bridgeport local papers, then showed how cartoons are drawn. Hon. E. T. Buckingham, compensation commissioner of the Fourth Congressional District, then gave an interesting talk on the compensation act. Rev. Alexander Allison, Jr., was the concluding speaker and gave a patriotic talk on the war.

As a supplement to the report of the April 30 meeting of the Connecticut Company section, printed in the issue of this paper for May 4, the following notes are of interest. At the meeting the membership committee reported that the section had enrolled to date 343 members, of whom forty-nine have left the company's employ, leaving a total net membership of 249. An announcement was made that the Rhode Island Company section will invite the local members to a joint meeting to be held at Providence probably in June. This is a return courtesy for the "Rhode Island Night" meeting held some weeks ago at New Haven.

Another Liberty Loan Artillery Tank

IN THE recent highly successful drive for subscriptions to the Third Liberty Loan, employees of the Connecticut Company constructed the "tank" shown in the accompanying photograph. This is similar in many respects to the tank used by the Berkshire Street Railway, Pittsfield, Mass., pictured on page 857 of the issue of the ELECTRIC RAILWAY JOURNAL for May 4, 1918. The Connecticut Company's tank was appropriately named "Nathan Hale."



THE "NATHAN HALE" ALONGSIDE THE "GREEN," NEW HAVEN CONN.

Accidents in London Cut Nineteen Per Cent

London Safety-First Council for 1917 Reports Wide Progress and Pledges Continuance of Work During the Present Year

AFTER a year of safety-first work, the London (England) Safety-First Council states in its report for 1917 that it will continue to apply itself to the extension of the safety movement. It plans to develop every conceivable means of reducing accidents, to act as a clearing house for ideas pertaining to traffic safety, to collect and collate statistical information, and to consider carefully the effects of the changing conditions of traffic after the declaration of peace, as a result of the increased production of power-propelled vehicles and the release and adaptation, for trade purposes, of a large proportion of the motor vehicles now employed on war work.

The London Safety-First Council, formed as a result of a conference held near the end of 1916, comprises representatives of nine railways, three tramways, five omnibus companies, three vehicle workers' associations, fifteen technical research societies, seven commercial firms, forty-five local authorities (six of which are also tramway authorities) and others. The administrative work is intrusted to six committees and four sub-committees, namely: drivers' educational committee and advisory sub-committee; street safety committee and advisory and street-lighting sub-committees; railway safety committee and advisory sub-committee; publicity committee; general purposes committee and industrial safety-first committee. To this number it is proposed to add a committee to handle the dissemination of safety propaganda among schools.

The work of the council during 1917 was devoted to the conservation of life, limb and property in the greater metropolitan area. The activities of the various committees during the period are described in the report. From Jan. 1 to Sept. 30, 1917, the total number of persons killed was 489 as compared to 577 in 1916 and 578 in 1915, and the number of accidents to persons or property totaled 27,960 as compared to 34,575 in 1916 and 40,730 in 1915. The reduction from 1916 was, therefore, 15.26 per cent for persons killed and 19.14 per cent for accidents.

The suggestions made and approved by the council during the year covered such matters as street refuges, the position of lamp columns, snow cleaning, the whitening of curbs, crossings over footways, lighting of street obstructions, indication of cul-de-sacs, the rule of the footpath, danger signals on street lamps, lighting of main and side streets, lighting of street refuges, diffusion of public street lighting, illuminated signs at tramway stopping places, standardization of lamps on vehicles, air raid shelters, safety device for the front of motor vehicles and queues for tramcar and omnibus passengers.

In connection with the using of queues, it was said that, as the present practice of forming queues at certain places had proved advantageous, it was desirable that a scheme for its extension should be formulated, and that the police, local authorities, tramway corporations and omnibus companies operating in the greater London area be so informed.

Air-Operated Door and Steps Installed at New Brighton

Safety Considerations Prompt the Substitution of Air for Manual Operation—Other Features of the Cars Are Given

THE Richmond Light & Railroad Company, New Brighton, N. Y., operating 32 miles of track on Staten Island, has recently completed the installation of air-operated doors and steps on thirty-two double-truck four-motor cars purchased from the Osgood Bradley Car Company in 1915. When these cars were purchased the doors and steps were manually operated by means of hand levers, the motorman tending the front doors and the conductor the rear. Under the rules existing then and now passengers board at the rear and leave at the front. Some difficulty was experienced with manual operation, the greatest trouble being due to the failure of the steps to fall when the doors were opened. This difficulty became a matter of safety and it was decided to overcome all trouble by installing air-operated doors.

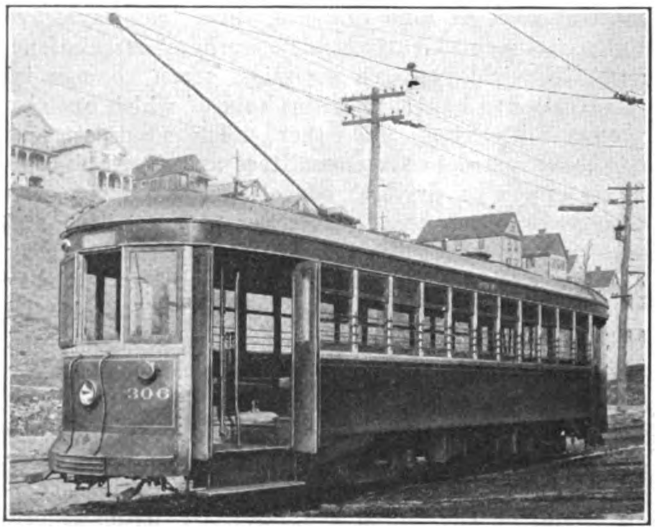


FIG. 1—NEW BRIGHTON CAR WITH AIR-OPERATED DOORS AND STEPS

A contract for the door engines was made with the Smith-Ward Brake Company, New York, and the engine shown in the accompanying illustration was designed especially for the purpose. This is a 6½-in. center-feed pneumatic engine, packed in dry graphite instead of the customary grease. The movement of the plunger operates a series of levers which in turn open and close the doors. Figs. 2 and 3 show the engine as connected. The two handles on the center post, Fig. 3, are for use of the conductor when this is the rear end of the car. A horizontal turn of about 45 deg. actuates the series of levers and admits air behind the piston. The doors open quickly and a reverse action closes them. Fig. 3 actually shows the front end of the car as it appears in operation. The two handles by which the motorman controls the door movement are visible one on each side of the front window. These work on the same levers and in precisely the same manner as do those of the conductor.

The door opening is 52 in. On some lines where the traffic is well distributed and where there are no congested boarding or alighting points, it has been considered wise to use only one-half of the door during cold weather. This has been accomplished by simply loosening a nut on one engine lever and placing a steel strip across the top of the door to hold it firmly in position. The door operation is interlocked with the control circuit so that when doors are open the power is cut out and the car cannot be started. The steps operate in conjunction with the doors, the height from rail to first step being 14 in., from step to vestibule floor 14 in., from vestibule floor to car floor 9 in., and there is a 3-in. ramp in the car floor.

The cars are of semi-convertible steel construction 40 ft. over-all length and 8 ft. 3 in. over-all width, with a seating capacity of forty-six. The Hale & Kilburn walkover seats are arranged six transverse in the center and there are four seats 9 ft. 6 in. long placed longitudinally at the ends. The aisle between center seats is 2 ft. 3 in. wide. As shown in Fig. 3 there is also a slat seat provided on the platform in front of each closed door, the platform being 6 ft. long. Johnson fare boxes are used with a pay-as-you-enter system of fare collection. The cars are equipped with Giant staffless brakes of the National Brake Company and with Automatic Ventilator Company's honeycomb ventilators. Other equipment includes Earle trolley catchers, Providence fenders, H. B. lifeguards, Westinghouse Type 323-B motors and Standard trucks No. 50 with 33-in. wheels.

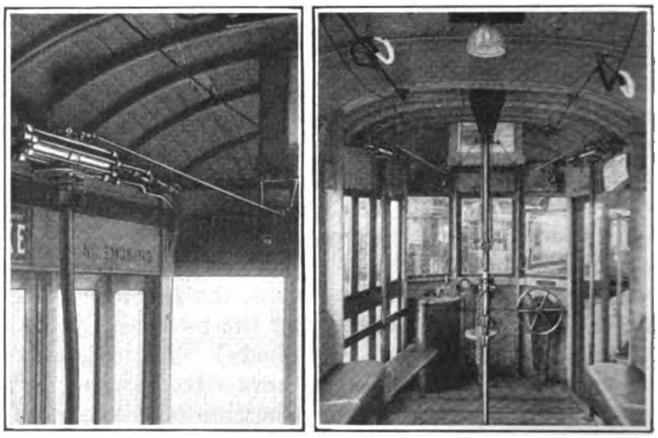


FIG. 2—PNEUMATIC 6½-IN. CENTER-FEED DOOR ENGINE ON NEW BRIGHTON CAR. FIG. 3—END OF CAR SHOWING DOOR ENGINE, OPERATING LEVERS, SEATING ARRANGEMENT, ETC.

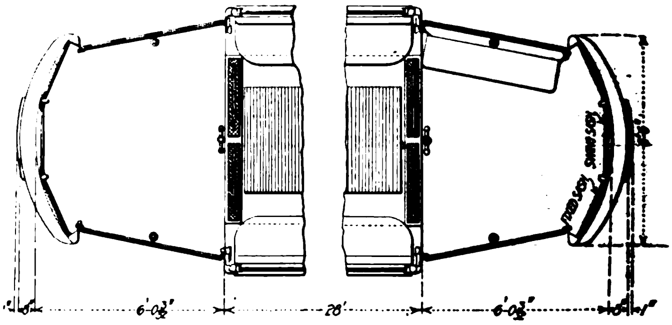


FIG. 4—PLATFORM ARRANGEMENT OF NEW BRIGHTON CAR

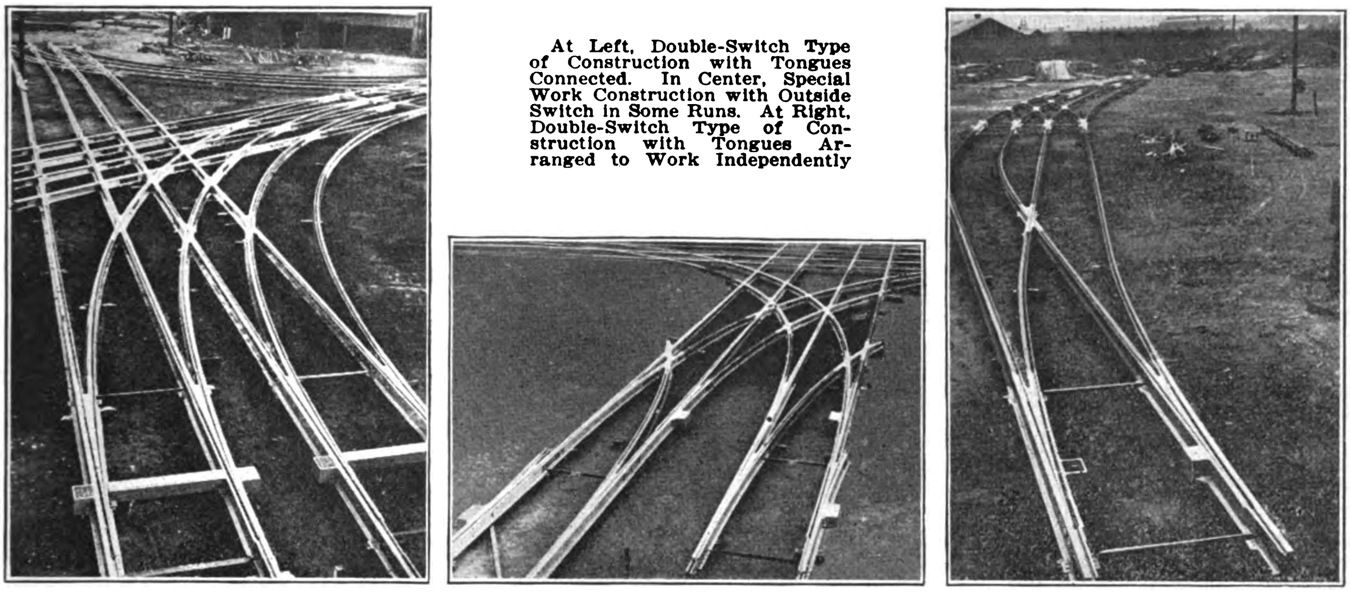
The Ohio Brass Company's system of electric signal lamps is used. There is one lamp at each end of the car arranged so that when the main lighting switch is in, a red signal will show at the rear of the car, receiving current from the trolley circuit. In case of accident to the power or main lighting circuit, a red signal will show at each end and two pilot lamps inside the car located at opposite corners, Fig. 3, will be lighted, the four lamps receiving current from a storage battery and being operated by an automatic relay switch. The regular lighting system consists of seven lamps placed in a row down the center of the roof.

An electric buzzer is located at each end of the car and there are four electric push-buttons located one in each corner, Fig. 3. The buzzers operate from the same storage battery as the emergency lights. Golden Glow electric headlights are used.

Outside-Switch and Double-Switch Types of Special Work Are Common in England

THE outside-switch type of special work, discussed by W. L. Whitlock in the March 16 issue and by M. Bernard in the May 4 issue of the ELECTRIC RAILWAY JOURNAL, is in quite extensive use on English tramway systems.

The accompanying illustrations show some special-work layouts with this type of construction, and the editors of this paper are advised that no particular trouble is experienced with the mate if properly gaged. Trouble can, however, be entirely avoided if both points are switches, the tongues being connected together on facing tracks, whereas on the trailing side they can be either connected or arranged to work independently.



At Left, Double-Switch Type of Construction with Tongues Connected. In Center, Special Work Construction with Outside Switch in Some Runs. At Right, Double-Switch Type of Construction with Tongues Arranged to Work Independently

Two-track layouts with double switches are illustrated. One shows the switches connected, while the other shows the tongues arranged to work independently. These can be set to run to right or left as desired. The particular layouts shown were built by Edgar Allen & Company, Ltd., Sheffield.

The United Railways, St. Louis, Mo., prepared for the introduction of the 6-cent fare on June 1 by converting $31,000 into pennies. The pennies weigh approximately 11 tons.

Difficulties and Precautions Necessary in Storing Coal

The Engineering Experiment Station of the University of Illinois has just completed a study of the problems involved in coal storage and has published the results in a 200-page illustrated book designated as circular No. 6, "Storage of Bituminous Coal." The study was made under the direction of H. H. Stoek, professor of mining engineering. The reasons, advantages and costs of storing coal are given, the kinds and sizes of coal which may be safely stored are described and the many factors entering into successful storage are discussed.

As a result of the difficulty experienced in obtaining coal during the past winter, the more general storage of coal during the spring and summer months is coming to be recognized as the best means of avoiding a coal shortage during the coming winter. Many corporations and individuals will this year undertake for the first time to store large quantities of coal.

The storage of the bituminous coal presents certain difficulties because of its tendency toward spontaneous combustion with its attendant dangers and losses. The methods to be employed in avoiding spontaneous combustion have not generally been well understood and those which have seemed successful in some cases have failed in others. Copies of this circular may be purchased from the Experiment Station.

Conductors to Knit Socks While Not Collecting Fares

The motormen and conductors at the east side carhouse of the Twin City Rapid Transit Company were recently presented with two knitting machines by Horace Lowry, president. If these machines are used to good advantage others may be placed in other carhouses.

The carmen did not like to be outdone by neighboring firemen who they discovered were turning many otherwise idle hours to efficient use by knitting articles for soldiers and sailors. Their ambitions were made known to the Red Cross and resulted in the machines being furnished.

Recent Happenings in Great Britain

Fares Again a Problem—Sir Albert Stanley to Ask House to Appoint Select Committee—Need for Curtailments a Problem

(From Our Regular Correspondent)

In answer to a question in the House of Commons Sir Albert Stanley, president of the Board of Trade, stated recently that he had received a deputation representing a very considerable number of municipal and company tramway undertakings, which urged that owing to the enormous increase of wages and the very heavy increased charges for material, these undertakings receive special consideration in regard to the charges they are making. Sir Albert did not feel he could take upon himself the responsibility of determining that question, particularly in view of the fact that he had stated in the House that the Board of Trade would not deal with the question of increased tramway charges without first referring the question to the House. It was because of that pledge that he promised the deputation that he would ask the House to agree to appoint a select committee to investigate the question.

RELIEF FOR RATES A PROBLEM

Municipal tramway services, in many instances, have for some years been so well organized and used by the public that the tramway committees have found themselves able to transfer considerable sums to the municipal corporations in relief of the rates. That condition has lasted so long that it has come to be regarded as normal, and now, when the rates are mounting, corporations are disinclined to accept a smaller amount for transfer or none, although the committees discover that expenses are so much higher that considerations of sound finance would almost forbid any such remittance. There are two means by which the situation can be met. One is to raise the fares, the other to shorten the distances covered by a certain fare. The public does not take kindly to these methods, and the question is also raised of statutory or workmen's fares which cannot be increased at will. In addition the subjects of maintenance and repairs have come forward at Birmingham and Nottingham and elsewhere.

MR. PRIESTLY APPOINTED TO LIVERPOOL

J. S. D. Moffet, Belfast, has decided not to accept the position of deputy-manager of tramways under the Liverpool Corporation, to which he was appointed, and the tramways committee has appointed Percy Priestly, the general manager of the Oldham Corporation Tramways. Mr. Priestly served his apprenticeship at the Scotia Engine Works, Scotland, and for some five years afterward he was a marine engineer. For six years he was deputy-manager at the Halifax Corporation Electricity Works, and for nine years general manager and engineer of the Mexborough & Swinton Tramways. For the last two years he has been at Oldham.

An important contract for a generating plant has been awarded to Dick, Kerr & Company, Ltd., by the Glasgow Corporation for the new power station in course of erection at Dalmarnock. The contract includes a turbo-alternator set, with condensing plant and step-up transformers designed for a continuous output of 18,750 kw. The turbine will be a single-unit standard Dick-Kerr impulse type machine, arranged to run at 1500 r.p.m. and will operate on steam at 250 lb. per square inch pressure at the stop valve, superheated to 650 deg. Fahr. The turbine will be direct coupled to a 6500-volt, 25-cycle, three-phase Dick-Kerr alternator, having a maximum continuous rating of 24,000 kva. at 80 per cent power factor. The machine will be of the self-ventilating type, provided with fans on the rotor drawing the cooling air through a wet air filter of the Heenan and Froude type. An exciter of the overhung type will be provided. The alternator will be electrically connected to a bank of three Westinghouse single-phase oil-circulated water-cooled transformers, stepping up the pressure from 6500 to 20,000 volts. In connection with these transformers, a separate oil cooler and motor-driven oil-circulating pumps will be provided. The turbine will exhaust into a standard Willans & Robinson condenser, having a surface of 26,000 sq.ft.

WOMEN CONDUCTORS PACIFIED

At a meeting of the war wages committee of the Bradford Corporation, it was reported that the decision of the committee on production with regard to the wages dispute between the conductresses employed on the Bradford tramway service and the tramways committee had been received. The Ministry of Labor had been asked to interpret the award given on March 8, last, by the committee on production relating to tramway and motor-omnibus workers' wages. By that award an advance of £1 a week on pre-war rates was granted, but it was held by the Bradford tramways committee that this, while it applied to the men, did not apply to the women tramway workers, who had been receiving a smaller war bonus than that received by the men. The committee's contention was that under the award the women were entitled to an advance of 4s. a week, making an advance of 13s. a week on pre-war rates. The committee on production has approved this.

Alderman Charles F. Spencer, chairman of the Halifax tramways committee and recently appointed director of National Kitchens, is experimenting with an old tramcar fitted up with ovens and cookers supplied with electricity from the overhead wires. The appearance of the vehicle outside is none too inviting, but inside it is equipped so as to bring cheap, warm and nourishing meals to the doors of the community. Food for the workers had previously been prepared at the central cooking depot in Great Albion Street. Laden with attractive edibles, the traveling kitchen was at noon driven over the tram route to the Fountain at King Cross, a thickly populated industrial part of the borough. There women workers from the factories, women with families, men in overalls, and children all brought dishes, jugs, basins, or other domestic receptacles, to be filled. As soon as the kitchen was opened for business there was a rush for the steaming hot food, which it contained. The experiment will be continued in other parts of the city.

OWL SERVICE DISCONTINUED

At a meeting of the tramways committee of the Birmingham City Council, it was decided, in view of the curfew order and the desire of the government to limit the use of electricity not to run tramcars from the central terminal after 11 o'clock at night. In accordance with the authority given by the City Council, application has been made to the Board of Trade for permission to revise the tramway fares by shortening the penny stages. Under a Board of Trade order 1d. fare covered a journey of 2 miles, and this distance, having regard to the greatly increased cost of working the tramways, is now considered excessive. The ½d. fares hitherto charged for children have been withdrawn on tramcars and omnibuses. Children over the age of three and under fourteen are now carried at half fares, with a minimum fare of 1d. The system of charging 1d. fares for adults on motor-omnibuses has been withdrawn. The minimum fare has been fixed at 2d., and all other stages have been increased by 1d.

SERVICE REDUCED IN LIVERPOOL

The Liverpool tramway service is to be reduced 30 per cent on government orders. It was expected that the restricted facilities, under which two cars would have to do the work of three, would be operative by the end of May. Notwithstanding the record number of passengers which the tramways has been carrying, it has been found essential to conserve both man-power and energy. The curtailment is general. The North of England, thanks to its possessions of coalfields, is ordered to make a 30 per cent reduction, whereas a 60 per cent cut is required by the services in the south. North is separated from south by a line drawn from Boston to Bristol. London is subject to special arrangements. The service now maintained in Liverpool is only a little below the pre-war standard, but the passenger record has increased by about 30,000,000 a year. The present facilities, so far from being ample, are said to be nothing like equal to requirements, especially as the city has become a much bigger center of both engineering and shipping. A. C. S.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

A. E. R. A. Meeting Plans

Subjects Already Selected Are Based on Conditions—Accountants and Claims Topics Not Announced

The following program of sessions for the convention of the American Electric Railway Association on Oct. 8, 9 and 10 at Atlantic City has been adopted:

TUESDAY, OCT. 8

Afternoon—American Association.
Evening—American Association.

WEDNESDAY, OCT. 9

Morning—Accountants, Engineering, Claims and Transportation & Traffic associations.
Afternoon—American Association.

THURSDAY, OCT. 10

Morning—Accountants, Engineering, Claims and Transportation & Traffic associations.

All sessions will be held on Young's Million Dollar Pier. There will be no exhibits. At the meeting on Tuesday evening there will be an address by a prominent member of the national government. For this reason it is hoped that all delegates will arrive in Atlantic City on Tuesday.

The programs of subjects made public by the associations show that they are based on war conditions. Those of the Accountants' and Claims Associations have not yet been decided upon, but the subjects, as tentatively adopted by the other associations, follow:

AMERICAN ASSOCIATION SUBJECTS

Railway Revenue—
  (a) Necessity for increases and insufficiency of any possible economies to meet need.
  (b) Magnitude of increase required, now and in the future.
  (c) Difficulties in the way of securing increases. The extent, if at all, to which employees and investors should be required to bear the burdens of increased costs.
  (d) How the association can help in securing increases.
Future of Electric Railways—
  (a) From the investment banker's viewpoint.
  (b) From the operator's viewpoint.
  (c) As to municipal ownership.
President's Address.
Address by Member of War Board.
Address by Representative of the National Administration.
Lessons from European Experience.

ENGINEERING ASSOCIATION SUBJECTS

President's Address.
Economies in Operation and Maintenance—to cover production and distribution of power, maintenance of roadway, structure and rolling stock.
Engineering Activities in the War Zone.
Difficulties of Securing Materials—
  (a) From the manufacturer's standpoint.
  (b) From the purchasing agent's standpoint.
Engineering War Activities in the United States.

T. & T. ASSOCIATION SUBJECTS

President's Address.
Opportunities for Young Men in Electric Railway Work.
Maintenance of a Transportation Force During the War, with Special Reference to Women Conductors.
The Skip Stop—Spreading the Peak Load—Economies in Using Power.
Electric Railway Transportation in Great Britain as Affected by the War.

ENTERTAINMENT PROGRAM

The entertainments will be of a simpler character than heretofore, to accord with war conditions, but will be such as to keep the delegates busy during their hours "off duty." The principal feature will be a reception and dance on Oct. 9.

E. F. Wickwire, chairman of the 1916 entertainment committee, is in charge this year. The following have been selected to serve with Mr. Wickwire: J. J. Dempsey, vice-president of Brooklyn Rapid Transit System, Brooklyn, N. Y.; E. R. Kelsey, publicity manager of the Toledo Railways & Light Company, Toledo, Ohio; Frank Gale, advertising manager of the General Electric Company, Schenectady, N. Y.; J. C. McQuiston, manager of the publicity department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Strike in Atlantic City

The employees of the Atlantic City & Seashore Railroad, Atlantic City, N. J., went on strike on May 23 following the refusal of the company to grant their demands for increased pay and better working conditions.

Last summer the company announced that owing to the increased cost of operation it could not grant any wage increases. Since that time there had been repeated agitation for changed conditions and better pay. The company refused to recognize the union, but has increased wages. When the company learned that the situation was acute it began importing men so the early summer rush could be handled without much interference. The motormen and conductors than met and sent an ultimatum to the company.

Toledo Injunction Argued

Railway History of Ohio City Reviewed in Injunction Case Growing Out of Wage Advance

At a hearing during the week ended May 25, on the temporary injunction granted the Toledo Railways & Light Company against the city of Toledo, Henry L. Doherty, chairman of the board of the company, reviewed the history of the Toledo Street Railway Commission and its work in preparing the community plan of operation. Mr. Doherty was a member of the commission in the first place, but he eliminated himself or was eliminated, whichever people chose to consider it. Mr. Doherty said his publicity campaign when the Dotson franchise was proposed did not produce the results that were anticipated.

In regard to the community plan, he said Member Thurston put a number of unworkable ideas into it, but that the break came in the proposed manner of handling stock sold to the public. He denied that any of the meetings of the commission had ever been held outside of Toledo.

MR. WITT A WITNESS FOR COMPANY

Peter Witt, Cleveland, testified for the company. He suggested that the income might be increased by speeding up the cars, rerouting cars about the loops, keeping wagons off the tracks on the streets and making as few stops as possible. He urged that a campaign be conducted by the company to make car riding more popular.

F. C. Hamilton, electric railway engineer, New York, presented figures to show that the new rate of fare, 5 cents with 1 cent for transfers, will pay only the increase in wages allowed recently by the company to the conductors and motormen. He said there would be nothing left to increase the dividends of the company.

MAYOR SCHREIBER GRILLED

Mayor Cornell Schreiber testified that he had done nothing that would cause people to think he intended to interfere with the operation of the cars. On the other hand, he had declared that the cars must not stop as the result of a strike or for any other cause. Attorneys took him back to campaigns for office some years ago when he is said to have advised people not to pay more than 3 cents for a ride. He was not a very willing witness on this point.

The injunction was granted to prevent the city from interfering with an increase in fares in Toledo to meet increased wages which had been agreed upon by the company and its employees.

Detroit and Cleveland Wages Under Advisement

War Labor Board in Chicago Hears Contentions of Companies and Men in Michigan and Ohio Cities

After a five-hour session in Chicago, Ill., on May 27, the United States War Labor Board took under advisement the disputes between the employees and the managements of the Detroit (Mich.) United Railway and the Cleveland (Ohio) Railway as to wages and working conditions. William Howard Taft and Frank P. Walsh, co-chairmen, as well as the full membership of the board, were present. There were also present F. W. Brooks, president of the Detroit United Railway, and John J. Stanley, president of the Cleveland Railway, and other officials of the Detroit and Cleveland companies, as well as representatives of the unions and municipal governments in both cities. The case for the employees was presented by Attorney James H. Vahey and International President W. D. Mahon, while Attorney Bernard J. Weadock presented the Detroit company case and Attorneys H. J. Crawford and Andrew Squires told of the Cleveland company situation.

DECISION PROBABLY A PRECEDENT

Chairman Taft announced that an examiner would be appointed to check up the evidence and the exhibits, after which the full board will make a ruling for the purpose of bringing about an amicable settlement. Following the hearing, Chairman Walsh said the employees would receive a fair wage, no matter what readjustments or additional legislation might be required to accomplish this result. The decision of the board in this joint case is expected to set a precedent for other wage disputes affecting electric railways.

There was a dispute between the attorneys at the opening of the case because Mr. Vahey presented, on behalf of the men, demands which were more extreme than those covered in a written demands previously presented to the Detroit company. The board held, however, that the inquiry was "wide open," the purpose being to determine what the men are really entitled to. In brief, the conductors and motormen in both cities ask for straight pay of 60 cents an hour and that 40 per cent of the runs be covered in eleven consecutive hours; 40 per cent in twelve and 20 per cent in thirteen consecutive hours. They also ask that all Sunday and holiday runs be straight time not exceeding eight hours and that the night cars be straight eight-hour runs with ten hours' pay; also for Detroit the men ask time and a half for overtime, which is allowed in Cleveland.

The Detroit men also ask that car inspectors, controller men and pit men be included in the trainmen's agreement. The board made an important ruling on this point to the effect that these men could organize and join the union, but the company would not be compelled to recognize them or to have a closed shop for such employees. The chairman also held that under the principles established by the board, there could be no discrimination as to sex or color, and if the necessity arose, the company should not be prohibited from employing negroes as motormen or women as conductors.

COMPLAINT AGAINST SPREAD OF HOURS

Attorney Vahey complained that the conditions in Detroit and Cleveland as to spread of hours, reaching in some cases more than fifteen hours, was intolerable, and that this should be corrected either by reducing the spread of hours or fixing a penalty where the schedules are made on that basis. In this connection, Chairman Taft wanted further information on the Massachusetts nine-in-eleven-hour law and the Ohio statute, which requires eight hours of rest between two working days. He wanted to know what attracted men to the electric railway business and was told that steady employment was one of the features.

Attorney Vahey dwelt at length on the difficulties and responsibilities of the trainmen's work, which he classed as skilled labor. In referring to wages, he introduced exhibits showing schedules of higher pay in other trades in Detroit and Cleveland, and he contended that the right of the men to a proper standard of living should not be controlled by the lack of financial ability on the part of the companies. He informed the board that the average pay of trainmen was about $90 a month in these cities and he pointed to the recent award for steam railroad employees, giving large increases in wages. Mr. Mahon said that the association was not insisting on an eight-hour day during war times as it realized unusual conditions existed.

EMPLOYEES SURPRISE COMPANY

Attorney Weadock, for the Detroit company, said the new demands presented on behalf of the men had found the companies unprepared to reply, and he asked time to file additional exhibits later on. He explained conditions in Detroit, where he said about 50 per cent of the industries are engaged in war work, resulting in high wages which the company has found it impossible to meet. He told of the situation as to employment of negroes and the refusal of the union to grant them work cards. He also said the union objected to the employment of women as conductors, and that a fine was provided for a motorman who in an emergency might choose to work as a conductor on a trailer. The revised demands of the union, he said, would mean an increase of $5,750,000 in wages —an increase of 110 per cent—and the employment of 1566 additional trainmen. He contended that the work of a conductor or motorman did not constitute skilled labor, and in support of this he quoted from Bulletin 204 of the United States Bureau of Labor Statistics, which classes these occupations as calling for "responsibility rather than skill."

Mr. Weadock also made the point that the Detroit fares were the lowest in the United States and up to a recent date the wages for trainmen were the highest in any city east of the Rocky Mountains. He said that while the recent award to steam railroad employees granted a large increase in pay, this was promptly met by an advance in freight and passenger rates. The electric railways were not in a position to meet expenses in this way. He made a strong point of an exhibit showing that the majority of trainmen in Detroit did not seize an opportunity to earn the maximum amount of wages, and contended that it was not likely they would do so.

Assistant Superintendent Ives filed a number of exhibits on schedules

COMPANY NEEDS LARGER REVENUE

Mr. Weadock made a point of the financial situation of the Detroit company, saying that in spite of an advance in rates of fare last year, there was a deficit in the net revenue. He expressed the hope that the War Labor Board would make some recommendations that would result in larger revenues for the company, with which to meet increased costs. Chairman Taft explained that the board was not conscious of having any power to do this, but the members would consider the situation. The corporation counsel of Detroit said the city was interested primarily in service, and that he also hoped the board would point the way to meet any increased costs which might be fixed by its award.

Attorney Crawford told of the peculiar situation in Cleveland under the Tayler ordinance. He pointed out that the maximum rate of fare allowed under the ordinance was now in force, but even with this new revenue it was estimated that there would be a deficit of $925,000 in the current year, even without increasing the trainmen's wages. These new demands would mean an added burden of $2,500,000. Attorney Squires emphasized these points and said the moral influence of the War Labor Board would be helpful in pointing the way to secure new revenue. The company did not like to reduce the service, even though this was permitted under the provisions of the ordinance.

Fielder Sanders, City Commissioner of Cleveland, said the city and the company were co-operating and every possible step had been taken to reduce expenses and increase revenues. The only possible remedy which he had in mind was a provision for staggered hours for factory and store closing, which would cut the peak in half. He referred to the experience of Washington and Rochester along these lines and he thought the recommendations of the board would pave the way for its adoption in Cleveland.

Boston Stockholders to Act on June 3

The directors of the Boston (Mass.) Elevated Railway on May 24 called a meeting of stockholders to be held on June 3 to take such action as the stockholders deem advisable with reference to the acceptance of the act to provide for the public operation of the Boston Elevated Railway, and also to pass upon the matter of authorizing the issue of $3,000,000, par value, of preferred stock for the purposes specified in the act.

Chicago Freight Ordinance Not Yet Drafted

About two months ago the State Council of National Defense requested the City Council of Chicago, Ill., to take under consideration the matter of passing an ordinance which would permit the transportation of freight and express over the elevated and surface lines. This would make possible the delivery, receipt and interchange of freight by and between the various electric interurban lines which radiate from Chicago, but are now obliged to maintain their terminals from 6 to 8 miles from the heart of the city.

The matter was referred to the committee on local transportation, who in turn referred it to a sub-committee with H. B. Capitain as chairman. This committee is now drafting an ordinance which will permit the handling of freight and express, but will restrict this to certain classes. Considerable difficulty is being experienced in framing an ordinance which will permit the handling of such materials as will directly benefit the community and yet not permit undesirable freight to be handled.

The committee is at present very busy trying to work out other ordinances in connection with the surface and elevated lines, but reports that the freight ordinance may be put through before the end of the summer vacation.

Organizing to Insure Clean Coal

To guard against the waste and serious loss resulting last winter from the shipments of dirty coal, which occupied car space and also seriously decreased industrial plant efficiencies, the Fuel Administration has organized a division of inspection, with C. M. Means as manager. A chief inspector has been appointed in each of twenty-one representative districts and where necessary assistant inspectors will be added. These inspectors will examine coal in the mines, also as dumped from mine to tipple, watch the picking tables and again inspect the coal as it is loaded in cars for shipment.

Standards will be established for insuring proper preparation according to use, so that all coal shipped must be of the quality required for its particular purpose. By condemning coal at the mine, a great improvement in the transportation situation should result in that the railroads will in effect be hauling heat units, not ash. Miners who get out dirty coal will be penalized, and a bonus system is being developed. Mines that cannot supply properly prepared coal will not be allowed to ship by rail.

Wage Increase in San Diego

The following scale of wages for motormen and conductors of the San Diego (Cal.) Electric Railway will be in effect commencing June 12. First year, 32 cents an hour; second year, 34 cents an hour; third year, 35 cents an hour; fifth year and thereafter 38 cents an hour.

One-man car operators are allowed 3 cents an hour in addition to the regular rate of pay.

The new scale represents an average increase of 10 per cent over the scale which went into effect on Aug. 15, 1917, and, in addition, increases the rate of bonus for operators of one-man cars to 3 cents an hour instead of 2 cents.

When Vice-President and Managing Director W. Clayton became connected with the company in San Diego the platform men received 20 cents an hour. This was in 1901. From that date the men have never asked for an increase; but six times since that time voluntary increases have been authorized, usually coming to the men, as in the case of the last announcement, as a clear-cut surprise. The increases were allowed in October, 1906; January, 1910; January, 1912; January, 1914, August, 1917, and June, 1918.

Portland Jitneys Win

At a special city election in Portland, Ore., on May 17, the people voted about two to one for the return of the jitneys. This result is attributed to the vicious campaign of misrepresentation and the widespread sentiment against the 6-cent fare in effect on the lines of the Portland Railway, Light & Power Company.

Two regulatory measures were before the voters on May 17. One was known as the "Jitney Bonding Ordinance" and was placed on the official ballot by action of the City Council. It provided that the bond of $2,500, which has been in effect, should be reduced to $1,000 for one or a few jitneys, with a single $10,000 bond for any number more than a few. This ordinance did not provide for any regulation of jitneys as to service, routes, schedules, transfers, etc.

The other bill was entirely a jitney service measure. It was known by that name and was placed on the official ballot through the initiative of the employees of the Portland Railway, Light & Power Company. The purpose in this case was that if the jitneys did come back they would be required to give reasonable, regular and dependable service.

The Portland Railway, Light & Power Company has reprinted in pamphlet form a series of fifteen advertisements published in the daily newspapers, relating to the 6-cent fare case and the two jitney measures.

Reading Employees Strike

A considerable number of trainmen in the employ of the Reading Transit & Light Company, Reading, Pa., went on strike on May 22 following the refusal of the company to meet a demand for an increase in wages of 6 cents an hour. A statement of the company follows:

"Eight employees of the Reading Transit Company were dismissed from the service of the company on May 23 when it was learned that they were implicated in a movement started by an out-of-town organizer which might have resulted in crippling the car service.

"All of the men employed by the company were recently granted an increase of 1 cent an hour in wages to go into effect on June 1, when their rate of pay will be from 28 to 31 cents an hour, depending upon a length of service of from one to three years.

"To all appearances the men were satisfied with this advance until the advent of an out-of-town agitator, who is said to have come to Norristown to look into labor troubles in other industries. The railway men had never made any demands upon the company for wages, neither had the men come to the company with any other complaint or grievance. When the company learned of the new method being employed to create dissension among the men it was deemed best for the preservation of service to the public to dispense with the service of those dissatisfied. The men also were told that the company was willing and eager to meet its employees about any matter they decided to take up, and that it was unnecessary for them to have the services of an outsider to look after their interests. The discharged employees were told that if it could be shown that the company had made a mistake in their dismissal the matter of their reinstatement would be promptly taken up."

News Notes

Increase in Wages in Tampa.—The Tampa (Fla.) Electric Railway has recently increased the pay of all trainmen and all carhouse, track and other employees not on a monthly salary basis 2 cents an hour.

Men Reject Wage Offer.—The employees of the Worcester (Mass.) Consolidated Street Railway have voted to reject the offer of a wage increase as made to them by the company. They consider the offer of the company inadequate in view of the present economic conditions.

Increase in Wages in Sacramento.—An increase of 3 to 5 cents an hour in the pay of 175 motormen and conductors employed on the local railway lines operated by the Pacific Gas & Electric Company, Sacramento, Cal., was announced on May 17 by representatives of the company. It was to become effective immediately.

Winnipeg Paralyzed by Strike.—Union headquarters at Winnipeg, Man., on May 21 called the 15,000 union men to strike in the morning in sympathy with the city employees now on strike. This, added to the 12,000 already out, paralyzes the city's trade. The cars of the Winnipeg Electric Railway stopped on May 21 for the duration of the strike. The city firemen are all out.

Increase in Pay for Oakland Men.—The San Francisco-Oakland Terminal Railways, Oakland, Cal., has increased the pay of the conductors and motormen. For the first six months the employees will receive 33 cents an hour instead of 30 cents, for the second six months 35 cents instead of 32, and for the third six months 36 cents instead of 34 cents as at present. No increase will be granted for the fourth six months or thereafter.

Ninth Chicago Traction Report Out.—The ninth annual report of the Board of Supervising Engineers, Chicago Traction, has just been issued. This covers the year ended Jan. 31, 1916. It contains the financial exhibits of that year for the Chicago Surface Lines, and also a reprint of the document previously issued in reference to an investigation of traffic conditions and electric railway service in Chicago. This was abstracted in the ELECTRIC RAILWAY JOURNAL of July 29, 1916; Aug. 5, 1916, and Aug. 12, 1916. The issuance of the eighth report of the board was noted in the issue of Jan. 19.

Will Meet Commission Order.—S. B. Way, vice-president and general manager of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has announced that the company will not oppose or appeal from the recent decision of the Wisconsin State Industrial Commission fixing the conditions under which women may be employed on electric railway cars in that State. Mr. Way is reported to have said that the company had its day in court during the hearing before the commission, which decided against it. The general terms of the commission ruling in this case were noted recently in the ELECTRIC RAILWAY JOURNAL.

Resumption of Franchise Resettlement Sessions.—It is understood that the three committees from Oakland, Berkeley and Alameda, appointed to consider the resettlement franchises for the San Francisco-Oakland Terminal Railways, formed themselves into a joint committee of nineteen and have had many meetings. It is said that the labors of this joint committee are about at an end and that at a very near date a perfected resettlement franchise will be reported to the Councils of the three cities for appropriate action in accordance with the provisions of the three charters, which provisions were favorably passed upon by the voters at elections.

Wage Award Accepted.—A new wage scale, drawn up by a board of arbitration, was accepted on May 16 as satisfactory by men and the Steubenville, East Liverpool & Beaver Valley Traction Company. Under the new contract, which is for one year, beginning May 1, 1918, the first-year conductors and motormen in passenger service will receive 38 cents an hour; second-year men, 40 and 42 cents an hour, and third-year men and thereafter, 45 cents. Conductors and motormen for freight service will receive 50 cents an hour. Under the old scale the men received 30 cents an hour for first and second year service and 32 cents an hour for service after the second year.

Details of Charlotte Wage Advance.—The new schedule of pay for motormen and conductors of the Southern Public Utilities Company, Charlotte, N. C., effective from May 1 and to which brief reference was made in the ELECTRIC RAILWAY JOURNAL of May 25, page 1024, is as follows: First three months, 18 cents; war bonus, 2 cents. Second three months, 19 cents; war bonus, 2 cents. Second six months, 20 cents; war bonus, 3 cents. Second year, 21 cents; war bonus, 3 cents. Third year, 22 cents; war bonus, 3 cents. Fourth year, 23 cents; war bonus, 4 cents. Fifth year, 25 cents; war bonus, 5 cents. The increases are made to aid the men in meeting the increased cost of living.

Women Employees Strike.—Women conductors on the cars of the Wisconsin Gas & Electric Company in Kenosha, Wis., went on strike on May 22 in what is believed to be the first strike of its kind in this country in which women employees have participated. The women followed the lead of men who walked out when their demand for an increase of 10 per cent in their wages was refused. The company recognized the changed economic conditions but said an increase could not be made if the company was to meet operating expenses. May 24 the company paid off the twenty-four conductorettes and sixteen motormen in full and they turned in company property in their possession. Up to May 27 service had not been resumed.

Labor Unrest at Scranton.—The trainmen in the employ of the Scranton (Pa.) Railway went on strike on May 25. The men say they will not return unless they are paid 40 cents an hour. On May 27 conductors, motormen and track laborers of the Lackawanna & Wyoming Valley Railroad, operating between Scranton and Wilkes-Barre, issued an ultimatum to the company that unless the men receive an increase of wages of 30 per cent they will go on strike. The company has offered the men 10 per cent. Employees of the Northern Electric Street Railway, operated under lease by the Scranton & Binghamton Traction Company, have made demands upon the management for a wage adjustment. It was expected in this case that a conference would be held on May 28.

Appeal to City on Wage Request.—Surface and elevated railway employees appealed to the City Council of Chicago, Ill., on May 20 to approve of their demands for higher wages. The Council concurred in a belief that the men are entitled to more pay, but took no other action except to refer the matter to the committee on local transportation. Alderman H. D. Capitain, chairman of the local transportation committee, asked the Council to "go slow" on the wage question. He said the traction ordinances now before that body do not provide for the city having any voice on it. Alderman Thomas F. Byrne insisted that the Council go on record as favoring an increase for the car men. The Council did this unanimously. Details of the proposed wage scales were reviewed in the issue of the ELECTRIC RAILWAY JOURNAL for May 25, page 1022.

Programs of Meetings

National Safety Council

The annual congress and safety exhibition of the National Safety Council will be held at the Hotel Statler, St. Louis, Mo., Oct. 14 to 16. Several sectional programs are now complete. It is expected that many innovations will be introduced this year. W. H. Cameron, Continental & Commercial Bank Building, Chicago, Ill., is general manager of the council.

Pennsylvania Street Railway Association

The annual meeting of the Pennsylvania Street Railway Association will be held at the Hotel Adelphia, Philadelphia, Pa., on June 7 at 2 p.m.

By reason of the exigencies of the war and the abnormal conditions created thereby this will be a short session; nevertheless there are some questions of vital interest to the railway and the affiliated organizations which will be up for discussion and it is the purpose to outline policies of action in regard to them.

The usual dinner will be served at 7 p.m.

New York Electric Railway Association

The thirty-sixth annual meeting of the New York Electric Railway Association will be held at Hotel Champlain, Bluff Point, N. Y., on June 22. The association is to deviate somewhat this year from the plan of its program in previous years. There will be no discussion of technical papers. Instead there will be a general discussion of the financial conditions of the properties, etc., by the representatives of the railways, banking interests and manufacturers. William Howard Taft, Ex-President of the United States, and William H. Edwards, Collector of Internal Revenue, Second District, New York, are to be the speakers at the supper which will take the place of the annual banquet.

Financial and Corporate

D. & H. Lines Burdened

Electrics in 1917 Showed Decreased Operating Income—United Traction Deficit $95,000

The adverse conditions which prevailed in the preceding three years not only continued during 1917 for the allied electric lines of the Delaware & Hudson Railroad, but were greatly augmented by the increased cost of labor and supplies. According to the 1917 annual report of the parent company, the results of the electric railway subsidiaries in the last year were as follows:

UNITED TRACTION NET OPERATING INCOME $209,536

The operating revenues of the United Traction Company, Albany, N. Y., for the calendar year 1917 amounted to $2,458,848, the operating expenses to $2,055,196, and the net operating income to $209,536. These data show an increase in operating receipts of $14,791 over 1916 and $94,136 over 1915, but the figures are still $40,502 below the gross of 1914 and $87,774 below 1913. The operating expenses of 1917 increased $83,524 over 1916; $110,935 over 1915; $297,027 over 1914, and $451,135 over 1913. The net operating income was $70,414 less than in 1916; $5,997 less than in 1915; $312,081 less than in 1914, and $529,815 less than in 1913. The net deficit for the year, after paying fixed charges, was $95,356.

The operating revenue of the Hudson Valley Railway, Glens Falls, was $703,073, the operating expenses $503,562 and the operating income $157,334. In comparison with 1916 the operating revenue increased $29,075; this was an increase over 1915 of $90,030, and over 1914 of $39,709. Operating expenses increased $31,439 over 1916; $29,011 over 1915, and $40,046 over 1914. Net operating income was $3,721 less than 1916, but exceeded 1915 by $59,883, and was less than 1914 by $2,882. The net deficit from railway operations for the year was $30,137 greater than in 1916 but was less than in 1915 by $54,106.

The operating revenues of the Plattsburgh (N. Y.) Traction Company were $38,878; the operating expenses, $28,417, and the operating income, $9,021. The gross receipts of 1917 were in excess of those of 1916 by $994, 1915 by $7,682 and 1914 by $5,706. Operating expenses exceeded 1916 by $4,276, 1915 by $6,983 and 1914 by $6,738. Net operating income decreased $3,361 below 1916, exceeded 1915 by $450, and was less than 1914 by $1,378. The net income for the year decreased $3,207 below 1916, but exceeded 1915 by $816, and was less than 1914 by $1,241.

TROY & NEW ENGLAND OPERATING INCOME $9,107

The operating revenues of the Troy & New England Railway, Troy, N. Y., amounted to $29,824; the operating expenses, $19,315; the operating income, $9,107. The gross receipts decreased $4,435 under 1916; $2,764 under 1915, and $5,333 under 1914. Operating expenses decreased $4,279 as compared with 1916, and $5,054 as compared with 1915, but exceeded 1914 by $367. Net operating income decreased $131, but exceeded 1915 by $2,143, and was less than 1914 by $5,775. The net deficit of the year increased $521, but was less than 1915 by $1,669, and in excess of 1914 by $6,190.

Electric Railway Statistics

Returns From 7501 Miles of Line for February Show Net Income Fell Off 12.71 Per Cent

A comparision of electric railway statistics for February, 1918, and the corresponding month of 1917, made by the information bureau of the American Electric Railway Association, indicates that the net earnings and operating income of electric railways is still badly affected, in the East.

Data for February, representing 7501 miles of railway, figured on the per mile of line basis, show an increas in operating revenues of 3.17 per cent, an increase in operating expenses of 11.02 per cent and a decrease in net earnings of 12.71 per cent. Data representing approximately 75 per cent of this mileage indicate a decrease in operating income of 19.84 per cent, an improvement over the previous month.

The returns from the city and interurban electric railways, as shown in detail in the accompanying table, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

The three groups all show a considerable increase in operating expenses, particularly the Eastern. On the other hand, the largest increase in revenue, one of but 6.27 per cent, occurred in the Southern district. This district as a whole makes the best showing, though its returns are far from being satisfactory. Returns for the Eastern group indicate a slight increase in revenues and a decrease in net of 37.78 per cent.

The operating ratio of all groups has increased, particularly that of the Eastern district, which increased from 68.09 per cent in 1917 to 74.48 per cent in 1918. The operating ratio for the country as a whole has gone from 66.91 to 72 per cent.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR FEBRUARY, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
		Per Mile of Line				Per Mile of Line				Per Mile of Line				Per Mile of Line		
	Amount, February, 1918	1918	1917	% Increase Over 1917	Amount, February, 1918	1918	1917	% Increase Over 1917	Amount, February, 1918	1918	1917	% Increase Over 1917	Amount, February, 1918	1918	1917	% Increase Over 1917
Operating revenues	12,699,574	$1,693	$1,641	3.17	$8,129,041	$1,595	$1,551	2.84	$1,192,267	$1,390	$1,308	6.27	$3,378,266	$2,188	$2,113	3.55
Operating expenses	9,141,853	1,219	1,098	11.02	6,058,559	1,188	1,056	12.50	715,819	834	761	9.59	2,367,475	1,533	1,409	8.80
Net earnings	3,557,721	474	543	†12.71	2,070,482	407	495	†37.78	476,448	556	547	1.65	1,010,791	655	704	†6.96
Operating ratio, per cent	1918, 72.00; 1917, 66.91				1918, 74.48; 1917, 68.09				1918, 60.00; 1917, 58.18				1918, 70.06; 1917, 66.68			
Average number of miles of line represented	1918, 7,501; 1917, 7,391				1918, 5,098; 1917, 5,055				1918, 858; 1917, 803				1918, 1,544; 1917, 1,534			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$8,833,208	$1,615	$1,576	2.47	$5,210,443	$1,405	$1,369	2.63	$599,570	$1,588	$1,466	8.32	$3,023,195	$2,181	$2,157	1.11
Operating expenses	6,601,983	1,207	1,096	10.13	4,111,167	1,109	994	11.57	356,083	943	807	16.85	2,134,733	1,540	1,445	6.57
Net earnings	2,231,225	408	480	†15.00	1,099,276	296	375	†21.07	243,487	645	659	†2.12	888,462	641	712	†9.97
Taxes	619,551	113	112	0.89	376,611	102	100	2.00	50,896	135	127	6.30	192,044	139	142	†2.11
Operating income	1,611,674	295	368	†19.84	722,665	194	275	†29.45	192,591	510	532	†4.14	696,418	502	570	†11.93
Operating ratio, per cent	1918, 74.74; 1917, 69.54				1918, 78.93; 1917, 72.61				1918, 59.38; 1917, 55.05				1918, 70.61; 1917, 66.99			
Average number of miles of line represented	1918, 5,471; 1917, 5,414				1918, 3,708; 1917, 3,666				1918, 378; 1917, 372				1918, 1,386; 1917, 1,377			

† Decrease.

No Power Over Depreciation Rate

Highest New York Court Annuls 20 per Cent Maintenance and Depreciation Order of First District Commission—Authority Not Granted by Statute

The Public Service Commission for the First District of New York has no authority to require an electric railway to reserve a definite percentage of its revenues for maintenance and depreciation. This is the final outcome of a legal battle which has been waging since such an order was promulgated in February, 1912, in connection with the reorganization of the old Metropolitan Street Railway in New York City.

The successor company, the New York Railways, was required, before paying any interest on its income bonds or dividends on its stock, to set aside each month 20 per cent of its gross operating revenue for maintenance and depreciation and, if this was not expended during the month, to credit the unexpended amount to an account called "Accrued Amortization of Capital."

The company objected to the order on the grounds that the commission was without power to make it; that the required reservation was not always needed in full for the purposes designated and that the directors were the proper persons to determine the depreciation rate and amount of reserve. On Jan. 18, 1918, the Appellate Division of the Supreme Court in certiorari proceedings affirmed the order, with the finding that the regulatory law had conferred full power upon the commission to regulate the methods of public service corporations.

APPELLATE DIVISION OVERRULED

The decision of the lower court, however, was reversed on May 14 by the highest court in the State, the Court of Appeals. The opinion of this court states that the commission bases its authority to make the order upon Section 52 of the public service commission act, which provides for the establishment of a system of accounts. In regard to this the court, with the unanimous approval of the six judges sitting on the case, says:

"Section 52 was plainly intended to make the method of accounting by these corporations uniform so that the accounts could be readily comprehended by those required to examine the same. By establishing a system of accounts the corporations were required to show under particular heads what they had done. It was not to regulate the management of their finances but to show what the management was.

"The other sections of the act clearly do not in express terms authorize the commission to require the creation of a reserve fund to renew the plant when the same shall be worn out or shall become obsolete. It is not pretended by anyone that they do.

"The power of the Public Service Commission is extensive, and the act creating the commission should be construed in the same spirit in which it was enacted. Still, when a particular power is exercised by the commission or is claimed for it, that power should have its basis in the language of the statute or should be necessarily implied therefrom. The assertion of authority under review here is outside and beyond the statute.

"The decision in Quinby vs. Public Service Commission (223 N. Y. 244) is controlling here and requires us to hold that the Public Service Commission had no authority to make the order requiring the company to reserve 20 per cent of its gross operating revenue for maintenance and depreciation and for the creation of the amortization of capital account."

MORE THAN $3,000,000 ACCUMULATED

As of June 30, 1917, the account for "Accrued Amortization of Capital" amounted to $3,127,258, equivalent to more than 10 per cent on the outstanding adjustment income 5 per cent bonds. Although interest on these bonds is non-cumulative, the bondholders assert that the fund should be distributed among them. No interest payment on these securities has been made since 1916.

Accounting Conference

Railway Men Object to Any Definite Depreciation Percentages in New Tentative Classification

The Public Service Commission for the Second District of New York on May 22 discussed with representatives of various electric railway corporations from all parts of the State a proposed new accounting classification for electric railway lines. The conference was called for the purpose of ascertaining the views of corporation accounting officials as to differences between the proposed system and the classification now in force. The new tentative classification was briefly described in the ELECTRIC RAILWAY JOURNAL of Feb. 2, page 228.

No serious objections were made to the classification as a whole, but the requirement that definite percentages of property costs should be set aside in a depreciation reserve was opposed. The electric railway representatives took the ground that the amount to be set aside to provide for retirements and the method of determining it were matters for the directors of the corporations to decide and not the commission.

M. S. Decker of Albany, representing those present at the hearing, objected to the requirement that a depreciation reserve be created and maintained by charges to operating expenses for depreciation equal to a fixed percentage of the cost or book value of depreciable property, based upon the probable life in service of the different classes of property. Mr. Decker said that unless peculiar conditions were shown, 2 per cent upon the average total cost would be regarded under the new classification as the minimum percentage to represent depreciation accruals, with 5 per cent as the maximum for way and structures and 10 per cent for equipment. He explained that the Court of Appeals, in the recent case of the New York Railways vs. the Public Service Commission for the First District (abstracted in another column), has held that the public service commission law does not confer power upon the commission to order the use of definite depreciation rates.

Chairman Hill said that the commission would consider the decision of the Court of Appeals and various suggestions which were made, and that changes would be formulated as the result of the hearing. Another conference will then be called.

Northern States Railway Earnings Drop

The gross earnings of the Northern States Power Company, Chicago, Ill., for the year ended Dec. 31, 1917, amounted to $7,154,508, an increase of $1,067,355 over the preceding year. The operating expenses showed heavy increases, but the year was closed without any loss in net earnings as compared to 1916. In view of the customary allowances for depreciation and amortization, aggregating $575,000, it was necessary to draw on the accumulated surplus for $240,970 of the common stock dividends.

The gross earnings from electric railway operation in the four communities served by this company were $89,976, or 1.26 per cent of the total gross in 1917, as compared to $102,067 or 1.68 per cent in 1916. The railway gross, both as to amount and as to percentage, was the smallest since 1911, inclusive. The railway net earnings in 1917 amounted to $8,429 or 0.25 per cent of the total net, as compared to $25,075 or 0.75 per cent in 1916. The contrast in the net results between 1917 and the years preceding 1916 can be sufficiently judged from the fact that 1916 was the poorest year since 1911.

On March 25, 1918, the total sales of preferred stock to patrons of the company amounted to 5425, aggregating $2,774,000 par value of stock. Since Jan. 1 the number of new shareholders each month and the volume of preferred stock sold have greatly exceeded the results of any preceding period. The average number of shares is seven.

Latest Report in New York

The eleventh annual report of the Public Service Commission, Second District of New York, which has just been issued in bound form, contains some electric railway financial data, which with allowances for changes in the fiscal year and other comparative points, indicate the existence of certain suggestive tendencies. The revenues and the expenses both increased somewhat in the calendar year 1916 as compared with the year ended June 30, 1916. The railway operating revenues at $34,086,000 represented an increase of 4.3 per cent as compared to those for the fiscal year ended June 30, 1916, while the railway operating expenses at $22,364,000 were an increase of 4.9 per cent. The railway tax accruals amounted to $2,105,000, an increase of 5.6 per cent, and although interest charges decreased 1.1 per cent, other deductions from gross income increased 6.7 per cent. The result in 1916 was net income of $1,882,000, an increase of 13.4 per cent over that of the year ended June 30, 1916, but a decrease of 36.5 per cent from the results in the year ended June 30, 1907, the first year of the series recorded. The dividends at $3,123,000 were larger than net income.

The total of fares and transfers recorded (669,895,000) was greater in the year ended Dec. 31, 1916, than in any previous year, but the total revenue car mileage (105,847,000) was slightly less than for the year ended June 30, 1914, which was the highest year of the series. The operating ratio for the calendar year 1916, at 65.76 per cent, was the highest since 1909.

Direct Aid for St. Louis

War Finance Corporation Loans $3,235,000 for Six Months—Brooklyn and Tennessee Lines Ask Help

The War Finance Corporation on May 28 announced the approval of a direct loan to the United Railways, St. Louis, Mo., subject to the approval by counsel of the legality of the issue and all proceedings, of $3,235,000 for six months from June 1, 1918, at a 7 per cent rate. The loan is secured by the entire issue of first and underlying mortgage bonds of the Union Depot Railroad, plus $800,000 in Liberty Bonds.

This company has already secured from the Public Service Commission of Missouri the right to establish a 6-cent fare, which will become effective on June 1. Conditions surrounding the application were such, in the opinion of the directors of the corporation, as to bring it within the provisions of the act covering advances in exceptional cases.

A conference was held in Washington on May 28 between T. S. Williams, president Brooklyn (N. Y.) Rapid Transit Company, and the War Finance Corporation in regard to a grant of funds to meet the $57,735,000 of notes maturing on July 1. The decision of the corporation has not been announced.

The Tennessee Railway, Light & Power Company, Chattanooga, Tenn., recently made application to the War Finance Corporation at Washington for a loan to provide for the payment of $2,500,000 of 5 per cent gold coupon notes of the company which matured on June 1. Inasmuch as it was not certain the company could secure action in time to provide for the payment of the notes at maturity, the holders were requested not to present the notes for payment until the decision of the War Finance Corporation is reached.

Warning About Direct Federal Financing

Government Seeks to Remove General Misconception—Except in Unusual Cases, Utility Financing Must Be Done Through Companies or Banks

The War Finance Corporation has already found the heaviest end of its business to be the consideration of applications for direct loans. The pressure for such loans has become so great that the directors have deemed it necessary to issue a statement to the effect that the financing of utilities and other war industries should be handled by the companies themselves or through the banks. The government will directly finance local utilities only in exceptional circumstances, making such a step a matter of national importance.

NO GENERAL DIRECT FINANCING

The statement, which was issued on May 28 and should be read in connection with one of May 24 appearing on page 1041 of this issue, follows in part:

"The resources of the War Finance Corporation are not intended to be loaned directly to war industries, unless in an exceptional case, but only indirectly through the banks.

"In the progress of the bill through Congress advances under the exceptional cases clause were further restricted as to security and amount—thus indicating the intention of Congress that the borrower must show some exceptional circumstances clearly entitling him to relief. In no circumstances was it the intention that the corporation should make loans except upon adequate security.

"The corporation was organized as an instrumentality to which the banks of the country could resort to obtain accommodation on advances made by them to war industries upon a character of security not available for rediscount at a Federal Reserve Bank. It is hoped that as need arises the banks of the country will avail themselves of the facilities thus afforded, so that they may be amply able to extend credit to those industries of the country which are necessary or contributory to the prosecution of the war.

A WORD TO THE UTILITIES

"From the applications received by the War Finance Corporation there seems to be an impression in certain quarters that the corporation was specially designed to provide funds for meeting maturing obligations, particularly those of public utility companies. The law expressly provides that the corporation shall not make direct advances to provide funds to meet such maturing obligations, except possibly in some rare case which could clearly be brought within the exceptional cases clause. Of course, the corporation will stand ready to lend its assistance to banks and bankers in proper cases where they have themselves made advances in war industries, whether for the purpose of meeting maturing obligations or otherwise, and direct advances in deserving cases that come clearly within the provisions of the law.

"Holders of maturing obligations, whether of public utilities or of other concerns which may find themselves unable, because of temporary conditions, to meet their commitments punctually should consider whether, in the public interest as well as their own, they should not co-operate by consenting to reasonable renewals. Public utility companies particularly, in cooperation with the communities in which they operate, should have the opportunity of adjusting themselves to the changed conditions brought about by the war.

"No machinery has been specially provided for direct purchases of obligations of the public utilities, whether to meet maturities or otherwise, either through the War Finance Corporation or through any other governmental agency. The situation of these public utility companies is, therefore, quite different from that of the railroads, where Congress has made specific provision for the purchase of their securities by the government in certain exigencies. Yet even the railroads are expected, wherever possible, to meet their own maturities and to pay what the money is worth to accomplish that end.

UTILITIES AND RAILROADS DIFFER

"It must be remembered that the railroads are under federal operation, and that their rates are subject to federal control, and that the government therefore is in a position to see to it that their charges shall be sufficient to meet the cost of the service rendered. In the case of the public utilities, however, neither their operation nor their rates are subject to federal control. Wherever the charges do not amount to adequate compensation for the services rendered, relief can be had only through the appropriate local authorities, and time is essential to enable the companies and the communities in which they operate to reach a satisfactory solution of this important problem.

"It is not a problem which can be disposed of by having the federal government through the War Finance Corporation assume the burden of financing the operations of these local companies, except in exceptional circumstances which may make it a matter of national importance that advances should be made.

"The local authorities will no doubt respond as promptly as possible, in cases where relief is needed because of changed conditions, as it is clear that the soundness and the efficiency of public utilities are intimately connected with a vigorous and successful prosecution of the war."

Three cases pending are referred to elsewhere on this page.

Financial News Notes

Cleveland April Statement Shows Small Surplus.—The operating report of the Cleveland (Ohio) Railway for April was submitted to the board of directors on May 23. It shows a surplus of $3,757. As the maximum rate of fare was in force only twenty days of the month, it is estimated that the surplus for June will probably be around $5,000. This, however, will not be sufficient to take care of the increase in the wages of motormen and conductors which is expected as a result of arbitration.

Tacoma Municipal Railway Results.—H. Roy Harrison, Commissioner of Public Works of Tacoma, Wash., is working out a plan, in co-operation with the Council, for the refunding of the original municipal railway bonds to care for the development which is necessary as a result of the enormous increase in traffic to the tideflats. Tacoma plans to purchase ten more cars for its tideflats line. A statement of C. D. Atkins, retiring Commissioner of Public Works, shows that the city line has been just about breaking even for the last six months.

United Railroads Report Shows Net Loss.—The report of the United Railroads, San Francisco, Cal., for the year ended Dec. 31, 1917, recently filed with the California Railroad Commission, shows that the net loss sustained by the company for the year, after charging off interest, taxes, etc., was $1,566,654. The total operating revenue is shown as $6,355,531, or a decrease of $965,398 from the previous year. Operating expenses are shown to be $5,594,575, or an increase of $788,412 over the previous year. Net revenue from railroad operations is $760,956, a decrease of $1,753,810. Figures for accidents total twenty-three killed and 585 injured.

Deposit of Southern Ohio Bonds Asked.—R. M. Stinson, chairman of a bondholders' protective committee, has addressed a letter to holders of the first consolidated mortgage 5 per cent bonds of the Southern Ohio Traction Company, Hamilton, Ohio, asking them to deposit their holdings with the Cleveland Trust Company, Cleveland, Ohio, or the Girard Trust Company, Philadelphia, for the protection of their rights. The letter states that default has been made in the payment of interest on the bonds due on May 1, 1918.

Partial Abandonment.—The last car on the Bethel line of the Interurban Railway & Terminal Company, Cincinnati, Ohio, ran from Bethel to its terminus at Coney Island recently and the work of tearing up the tracks was then begun. The road was placed in operation in 1902, but it did not pay and on petition of C. M. Leslie and Charles S. Thrasher, receivers of the Interurban Railway & Terminal Company, of which system it is a part, the State Utilities Commission gave permission to discontinue operation of the road and Common Pleas Judge Cushing authorized the receivers to dispose of the equipment.

$2,000,000 of New Milwaukee Electric Notes.—A syndicate composed of Spencer Trask & Company, Harris, Forbes & Company, New York, N. Y., Coffin & Company, Boston., Mass., Wisconsin Trust Company, and the First National Bank, Milwaukee, Wis., has purchased $2,000,000 two-year 7 per cent secured notes of the Milwaukee Electric Railway & Light Company, dated May 1, 1918, and maturing May 1, 1920. A public offering of the notes is now being made at 98½ and interest, yielding 7.80 per cent. The notes are a general obligation of the Milwaukee Electric Railway & Light Company, and are additionally secured by deposit to the trustee of $3,000,000 general and refunding mortgage 5 per cent bonds.

Interborough Dividend Reduced.—The directors of the Interborough Rapid Transit Company, New York, N. Y., on May 28 cut the regular dividend in half, declaring a quarterly dividend of 2½ per cent instead of the previous dividend of 5 per cent, payable on July 1 to stock of record of June 20. That is, the dividend rate is reduced from 20 per cent per annum to 10 per cent per annum. At the same time, "in view of the action taken by the Interborough Rapid Transit Company," it was announced, directors of the Interborough Consolidated Corporation suspended "for the present" the usual quarterly dividend of 1½ per cent upon the preferred stock of that corporation. The statement of the Interborough Rapid Transit Company said that "on account of war conditions and the advisability of conserving the cash resources of the company, the directors deem it inadvisable at the present time to declare the full dividend." In 1910 9 per cent was paid; in 1911, 10¼ per cent; in 1912, 15 per cent; in 1913, 12 per cent; in 1914, 15 per cent; in 1915, 22½ per cent, and last year and the year before, 20 per cent. The Interborough Consolidated Corporation has paid 6 per cent on its preferred stock since its organization as the holding company in 1915. The preferred stock of the Interborough Consolidated, is non-cumulative. Last year its earnings, derived from Interborough Rapid Transit dividends, amounted to 7.14 per cent on its outstanding preferred stock.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$20,321	*$10,962	$9,359	$3,917	$5,442
1m., Mar., '17	18,277	*9,637	8,640	3,525	5,115
12m., Mar., '18	236,118	*123,837	112,281	43,463	68,818
12m., Mar., '17	218,061	*102,432	115,629	42,212	73,417

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$7,978	*$9,100	†$1,122	$1,372	†$2,494
1m., Mar., '17	8,413	*9,858	†1,445	1,167	†2,612
12m., Mar., '18	121,903	*123,455	†1,552	15,350	†16,902
12m., Mar., '17	125,302	*114,195	11,107	13,446	†2,339

CLEVELAND, PAINESVILLE & EASTERN RAILROAD, CLEVELAND, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$42,252	*$27,210	$15,042	$11,421	$3,621
1m., Mar., '17	38,254	*24,322	13,932	11,389	2,543
3m., Mar., '18	118,422	*81,683	36,739	34,062	2,677
3m., Mar., '17	107,053	*68,047	39,006	34,261	4,744

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$87,459	*$49,131	$38,328	$13,037	$25,291
1m., Mar., '17	76,062	*43,077	32,985	9,913	23,072
12m., Mar., '18	961,980	*535,977	426,003	146,715	‡305,356
12m., Mar., '17	862,126	*462,488	399,638	110,502	289,136

EL PASO (TEX.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$107,532	*$68,350	$39,182	$6,588	$35,594
1m., Mar., '17	108,183	*67,849	40,334	5,114	35,220
12m., Mar., '18	1,273,511	*814,316	459,195	70,951	388,244
12m., Mar., '17	1,163,578	*713,531	450,047	60,593	389,454

JACKSONVILLE (FLA.) TRACTION COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$78,899	*$51,080	$27,819	$15,989	$11,830
1m., Mar., '17	61,510	*38,338	23,172	15,777	7,395
12m., Mar., '18	733,980	*501,123	232,857	190,964	41,893
12m., Mar., '17	643,882	*431,016	212,866	185,832	27,034

LAKE SHORE ELECTRIC, RAILWAY, CLEVELAND, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$164,940	*$121,542	$43,398	$36,227	$7,170
1m., Mar., '17	132,542	*90,386	42,156	34,369	7,787
3m., Mar., '18	447,657	*348,220	99,437	108,650	†9,213
3m., Mar., '17	380,290	*273,502	106,788	103,125	3,663

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$299,172	*$173,024	$126,148	$28,238	‡$107,493
1m., Mar., '17	199,545	*114,173	85,372	29,182	56,190
12m., Mar., '18	2,839,727	*1,593,416	1,246,311	346,484	‡957,327
12m., Mar., '17	2,000,099	*1,188,249	811,850	347,923	463,929

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$25,848	*$17,274	$8,574	$8,070	$504
1m., Mar., '17	25,394	*20,529	4,865	7,278	†2,413
12m., Mar., '18	303,213	*230,241	72,972	92,558	†19,586
12m., Mar., '17	311,898	*226,956	84,942	86,404	†1,462

PENSACOLA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$37,035	*$23,787	$13,248	$8,136	$5,112
1m., Mar., '17	25,220	*15,999	9,221	7,818	1,403
12m., Mar., '18	380,689	*229,982	150,707	94,337	56,370
12m., Mar., '17	289,452	*165,299	124,153	92,764	31,389

SAVANNAH (GA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$94,377	*$64,355	$30,022	$24,944	$5,078
1m., Mar., '17	77,252	*52,672	24,580	24,077	503
12m., Mar., '18	1,019,522	*683,811	335,711	293,366	42,345
12m., Mar., '17	855,893	*566,586	289,307	284,792	4,515

TAMPA (FLA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$92,931	*$50,945	$41,986	$5,086	$36,900
1m., Mar., '17	89,765	*46,954	42,811	4,373	38,438
12m., Mar., '18	995,353	*573,696	421,657	58,550	363,107
12m., Mar., '17	980,349	*534,499	445,850	52,328	393,522

* Includes taxes. † Deficit. ‡ Includes non-operating income.

Traffic and Transportation

P. S. C. Hearing Continued

President McCarter Examined in Regard to Various Details of Railway Company's Petition

At the continued hearing on May 16, 17 and 20 before the Board of Public Utility Commission of New Jersey on the application of the Public Service Railway, Newark, N. J., for increased revenues, President Thomas N. McCarter was examined in regard to various details of the company's petition. Marshal Van Winkle, counsel for the municipalities, questioned him in regard to the salaries paid by his company. Mr. McCarter said that the total was $130,000 or 0.65 of 1 per cent of the company's gross revenues, and that he would supply the details to the commission in confidence. He did not believe that it was to the public's interest and certainly not to the company's to have the information spread broadcast.

PRESIDENT OPPOSES POST MORTEMS

Most of the adjourned hearings on May 22 and 23 were taken up with the presentation of testimony by an accountant for the municipalities in the opening of their direct case. It was the opinion of this witness that the company is overcapitalized and that excessive rentals must be paid under old leases. Mr. McCarter objected to this class of testimony. After urging the urgency of relief, he read into the record a formal statement, in part as follows:

"The proof offered by the other side can only be intended to lay the foundation for an effort to persuade this commission to disregard consolidation agreements and leases, all of which were made more than ten years ago. Every one of these agreements was made according to the law as it stood at the time. They have been on record subject to inspection, and no attack on any has ever been made or suggested in any court having jurisdiction to pass upon their validity, and, surely, the commission has no jurisdiction to do so.

PRESENT AN EMERGENCY CASE

"If the proposed evidence is offered to show that the underlying and preexisting companies were overcapitalized, we reply that this fact, even if true, is entirely irrelevant here, because Public Service Railway is not asking for increase of rates in order to pay interest or dividends on securities that never should have been issued, if any such are outstanding.

"This is not a rate case in the ordinary sense, but, if time permitted, the company would not object to having it so treated. It is clearly impossible to do so within the time that relief must be granted. The evidence in this case shows beyond doubt that the property of the electric railway is worth much more than $100,000,000, excluding the value of its franchise. The amount of value mentioned is shown by the very careful appraisement made by Dean Cooley, and the money expended on the property since that appraisement was made. By adding to the value so fixed the cash actually expended for the cost of establishing the business of the company and the value of property of the company not appraised by Dean Cooley, this value is clearly shown. The income of the company, if the increase asked for in the pending application should be allowed, would not give the company 8 per cent on more than $81,000,000, which is certainly much less than the value of its property."

The chief witness for the cities on May 24 and 27 was Delos F. Wilcox, of New York, who expressed the belief that the company ought to seek the consent of the individual municipalities to a modification of the franchise fare provisions. He favored the continued use of free transfers, believing that the transfer passenger almost always gets poorer service than straight cash passengers. He also advocated the advisability of the "one city one fare" idea as a matter of public policy.

Indiana Company's Strong Plea

In support of its petition for an increase in interurban passenger rates from 2 cents to 2½ cents a mile, the Chicago, South Bend & Northern Indiana Railway introduced evidence before the Public Service Commission of Indiana to show that for two years past the interest on the bonds of the company had not been paid out of earnings, but from funds provided by the directors of the company. It was brought out at the hearing before the commission that trucks and passenger automobiles are greatly reducing the revenue of the company.

H. O. Garman, engineer of the Public Service Commission, testified that his valuation of the property of the company would be $4,390,915 new, and that its present value is $3,816,203. Representatives of the company stated that the valuation of $3,816,203 was much too low, but that they would be willing to accept it for rate-making purposes, because they could show good reason for an increased rate of fare, even at that valuation.

Evidence introduced by Samuel T. Murdock, secretary of the company, showed that $5,774,000 in actual cash had been put into the property. Mr. Murdock testified that no money had been paid out for dividends; that nothing had been paid in salaries to directors, and that the directors paid their own traveling expenses.

No changes are being asked in the city fare in South Bend.

State-Wide Appeal in South

Public Utilities in Tennessee Put Before the Governor Their Case for Relief from Present Burdens

The officers of the public utilities of Tennessee who called upon Governor Tom C. Rye recently represented the state committee appointed by the national committee on public utilities. The members present were T. H. Tutwiler, president of the Memphis Street Railway, chairman; S. E. DeFrese, manager of the Chattanooga Gas Company, secretary, and representatives of other public utility corporations of the State.

GOVERNOR ASKED TO INQUIRE

As stated previously very briefly in the ELECTRIC RAILWAY JOURNAL, the object of the conference was to request Governor Rye to take official cognizance of the conditions under which public utility corporations of the State are now operating, and that he officially ask the co-operation of the public in helping these concerns to maintain their maximum efficiency in line with President Wilson's request for unrestrained co-operation by all the public of the United States with these institutions.

Besides addresses by Mr. Tutwiler and Mr. DeFrese, short talks were made by Col. A. M. Shook, Percy Warner and Col. H. M. Harvey.

Mr. Tutwiler called the Governor's attention to the fact that the rendition by these utilities of their respective services is vitally essential to the industrial, commercial and social welfare of the country, and particularly so during the present war. He pointed out that everything which the utilities must buy, acquire or pay for has advanced, while their hands are generally bound by contracts. They must sell their products at the pre-war prices, and unless they are given the same liberty as other individuals or corporations, or are otherwise relieved, the public utilities must stagger on toward inefficient service, final collapse and financial disaster. In this connection Mr. Tutwiler said in part:

"It is in anticipation of appealing for relief in the forms of increased rates or the elimination of some burdens, or both, that we have requested this conference with you as Governor, desiring to lay before you informally and generally some of the difficulties of the situation now confronting the public utilities of the State."

MR. TUTWILER'S PLEA

Later Mr. Tutwiler in an interview emphasized the importance of maintaining the public utilities at their maximum efficiency. He quoted from the President's letter calling upon State and local authorities to act in accord with the necessities of the situation. Mr. Tutwiler added that the railway of Memphis had already filed application with the City Commission for a permit to increase rates from 5 to 6 cents, and that a number of other companies throughout the State were doing the same thing.

Syracuse War Fare Plea

City Agrees to Commission Assuming Control Provided Added Revenue Is Used to Help City

The New York State Railway's petition for an increased fare in Syracuse has been held open without date, by the Public Service Commission for the Second District, pending the investigation by Price, Waterhouse & Company of the books of the railway. This investigation is under way, following a conference by the Public Service Commission, the city and the railway company's representatives as to the form of the audit.

AGREEMENT WITH CITY DISCUSSED

The company's petition was heard by the commission on May 17. Corporation Counsel Hancock represented the city, Warnick J. Kernan of Utica and B. E. Tilton, general manager, the railroad company, and Lamont Stillwell, Solvay; George B. Dolson, Liverpool, and Irving Higbey, Eastwood.

Mr. Hancock told the commission about the agreement made by Syracuse and James F. Hamilton, vice-president and general manager of the New York State Railways, under which a wage increase was made from May 1 and an agreement reached as to submitting the 6-cent fare question to the Public Service Commission for a determination after the audit of the railway's books. He said the railway had agreed to its part of the agreement.

Mr. Hancock, for the city, formally withdrew objection to the commission exercising jurisdiction in the proceeding and in doing so called the attention of the commission to the following:

1. Any order made should protect Syracuse by providing that the petitioner shall consent to the exercise of jurisdiction by the commission in case the city should hereafter make an application for a reduction of any increased rate of fare which may be granted by the commission in this proceeding.

2. The question of the effect of the franchises granted by the city to the petitioner or of the statutes upon the jurisdiction of the commission is not before the commission and should not be passed upon, inasmuch as the proceeding is submitted to the commission by consent.

3. For the purpose of putting in issue any and all allegations of the petition bearing upon the necessity of justice of a 6-cent fare, the city formally denies the same.

4. In the event that the commission should decide that the petitioner is entitled to the increased fare within the city, the attention of the commission is called to the fact that a very important consideration influencing the city to consent to the exercise of jurisdiction by the commission was assurance of the petitioner that it would take steps to insure the expenditure of any increased revenue received in Syracuse for the benefit of its Syracuse system, and the city now asks that any order made herein require, so far as the commission can, that the Syracuse system receive the benefits of any increased revenue which may accrue in Syracuse from any order which may be made in this proceeding.

5. The city of Syracuse does not in the event that the commission decides that the petitioner is entitled to increased revenue within the city, in any way concede that a 6-cent fare would produce an increased revenue, or that the petitioner should not first be required to retain a 5-cent fare with an additional charge for a transfer. The city simply suggests that this question should be considered by the commission in fairness to citizens who believe that a 6-cent fare will not produce increased revenues commensurate with the additional burden imposed upon those compelled to pay the same, and that an additional charge for a transfer would be more profitable to the petitioner and fairer to the public.

Mr. Kernan, representing the New York State Railways, said he agreed with Mr. Hancock's statement. The company had already committed itself to the expenditures of the Syracuse revenues in a wage increase of 4 cents an hour, but Mr. Tilton did not feel that he should pledge himself at this time to further specific details. The company recognizes the fairness of the city and it will be the effort of the company to see that of any increase in revenue in Syracuse the city receives the benefit of the increase.

"I want you to go further," said Chairman Hill, "and say not only what the intentions of the railroad are but that you will agree that the commission may hold you to the intentions."

"I now agree," said Mr. Kernan, "that under the proposition of Mr. Hancock whatever order is made may have a provision to that effect so far as the commission can do so by any order entered at this time."

The representatives of Solvay, Liverpool and Eastwood asked that any determination affecting Syracuse should also apply to lines to those places. The railways' representatives agreed with these suggestions.

A WAR MEASURE

Chairman Hill said that the question was being treated as a war measure in order to get a prompt adjustment of the fare matter. According to Mr. Hill the question came down to one of ratio of income to investment.

Zones in Pittsburgh June 20

The expected new schedule of rates of fare on the lines of the Pittsburgh (Pa.) Railways was announced on May 20 to become effective on June 20. Signs were posted in the cars, but these gave no information beyond stating that the new schedules could be seen at the company's offices and at the carhouses.

In the majority of cases the fare is 7 cents, but on all lines a point is designated to which a ride may be had for 5 cents, based closely on a radius of 2 miles from the center of the city. Where there is a loop at or near the 2-mile point, this is usually selected as the limit of the 5-cent fare.

Five cents will be charged on the crosstown line, but transfers from those cars to other lines for a ride beyond the 2-mile limit will be charged for at 2 cents. No tickets will be sold in lots of less than eight, and the charge for eight will be 55 cents. Six-cent fares in Pittsburgh are abolished, but for municipalities surrounding the city and on lines of the company they will be the rule within the municipal limits, exeept that McKeesport will have a 5-cent fare somewhat similar to that prescribed for Pittsburgh.

A booklet has been issued by the company giving the details of the increases in fares.

The decision to go to zone fares was noted in the ELECTRIC RAILWAY JOURNAL of May 25, page 1029.

New I. T. S. Rates

Brief Review of the Decision of the Illinois Commission Extending Relief from War Burdens

The decision of the Public Utilities Commission of Illinois allowing increased rates to the Illinois Traction Company, Peoria, Ill., referred to briefly in the ELECTRIC RAILWAY JOURNAL of May 25, page 1029, was rendered on May 16. The commission granted almost in its entirety the petition of the company for emergency relief for electric railway, electric light and gas property in fourteen cities in which the company operates. In Cairo and Jacksonville 6-cent fares are allowed, while in Bloomington, Decatur, Danville, Champaign, Urbana, Galesburg and Quincy the company is permitted to eliminate tickets and go to a straight 5-cent fare.

AN EMERGENCY CASE DECIDED QUICKLY

The case was presented and considered as an emergency matter. The presentation of the testimony in connection with it has been referred to previously in the ELECTRIC RAILWAY JOURNAL. The primary purpose of the application of the petitioners was to secure necessary additional operating revenue to meet temporary abnormal conditions. The commission says some of the changes proposed were so radical in their nature, so far-reaching and in some instances were so indefinite in their effect, that in the opinion of the commission they should not be approved upon such record as was made in the case. In this connection it says that the action of the commission at this time in regard to these matters is not to be considered as the final determination of their merits and that they may be presented in separate proceedings for further consideration by the commission if the petitioners so desire. Considering the facts and circumstances, however, the commission finds that certain classifications, rates, rules and regulations omitted from the schedules of the petitioners were just and reasonable and should be continued in full force and effect as provided.

Four principal questions were raised by the objectors to the increases proposed in the various schedules. It was contended, first, that the ordinances granting franchises constituted a contract which precluded the commission from increasing the rates; second, that each separate utility should be charged with its separate expenses and credited with its separate earnings, and that the return to be allowed should be computed separately for each class of service rendered, irrespective of emergencies; third, that a detailed valuation and appraisement of each separate utility should be made; fourth, that the companies should be content to receive returns upon their investment much less than are ordinarily adequate and reasonable and if necessary to forego all return if to receive the same necessitated an increase in rates.

With regard to the first contention,

the commission was of the opinion that it was without force and quoted from previous cases decided by it. With respect to the second contention, the commission said that for the purpose of the present case it was not necessary to make a complete separation of the various units of property that constituted the combined plant of a single company. With regard to the third contention, the commission was of the opinion that a complete and detailed valuation of each of the petitioner's properties was not necessary to a determination of the issues involved. With respect to the fourth contention, the commission considered it was without force. The commission held that it was its duty in each case to determine what might be reasonable rates alike for the public and the utility.

SHOULD REGULATE RATES UPWARD AS WELL AS DOWNWARD

In a separate opinion by Mr. Lusey, commissioner, especially concurring, he said:

"The respective utilities clearly demonstrated the necessity for the relief petitioned for, and I am of the opinion the schedules filed should have been approved as a plain matter of right. I regard it as just as much the duty of this commission under the law to afford relief to a utility even though such relief results in increased rates to the public when the facts and circumstances warrant such relief, as I regard it the duty of the commission to afford similar relief to the public, by a reduction of the rates, when the facts and circumstances warrant such action, and I am further of the opinion that the public served by these respective utilities neither expect nor desire that the utility shall furnish service at a return which will not pay the operating expenses of the utility, much less allow any return on the money which has been invested by the stockholders."

The new rates are effective from May 1. They are to remain in force for the period of the war, the commission, however, retaining jurisdiction on this point.

Municipal Line Increases Fares

New rates went into effect on May 1 on the Edmonton (Alta.) Radial Railway, operated by the city. As a result the cash fare has been increased to 7 cents till 11 p.m. After that hour the rate is 10 cents. The revised rates fixed by the Council are as follows: Tickets purchased off the cars at ticket-selling stations, five for 25 cents; tickets bought on the cars, four for 25 cents. No workmen's tickets are now issued. Children under six years of age are carried free. Tickets for children more than six and under fifteen years of age, and high school pupils carrying certificates, ten for 25 cents, or one-half fare. Children carried after 11 p.m. pay half fare. Between 5 and 6.50 p.m., 5 cents is charged on baby carriages and large parcels. No change has been made regarding transfers.

Up to May 21, the new tariff had worked very satisfactorily. It is hinted that there is a slight decrease in traffic, but on the whole, the revenue compared with the same period last year has increased.

The ticket system is of great benefit on the one-man cars. It saves considerable time in collecting fares and making change.

New St. Louis Fare Insufficient

Richard McCulloch, president and general manager of the United Railways, St. Louis, Mo., on May 24 announced that he estimates the 6-cent car fare granted by the State Public Service Commission will be insufficient to cover the increased cost of wages, material and taxes, and as soon as this is demonstrated—if it is—the company will ask the State body to grant a further increase in the fare. Mr. McCulloch also announced that the commission will be asked to grant a 6-cent fare in St. Louis County.

Albany Fare Changes Suspended

The Public Service Commission for the Second District on May 21 ordered suspended the operation of the tariff schedule of the United Traction Company which was filed with the commission on May 2. The commission's order directs the suspension of the new rates for sixty days from and including June 2, or until Sept. 29. The commission has decided that it will order a hearing concerning the propriety of the proposed increased fares and that pending the hearing and decision, the suspension of the new rate schedule is ordered.

The new schedule was filed on May 2 and would have become effective on June 2 if sanctioned by the commission. It provided that a rate of 6 cents per capital was to be charged for one continuous ride between Albany and Rensselaer and that transfers were only to be issued within the "Albany-Rensselaer Through Zone."

The first official action by the cities affected by the proposed new schedule of fares was taken by the city of Rensselaer. Mayor McIntyre, through Corporation Counsel Ernest L. Boothby, filed an objection to the proposed schedule on the grounds that the rates contained therein, as far as Rensselaer is concerned, were "unlawful, excessive, inequitable and discriminatory."

Mayor McIntyre contended that the United Traction Company was prevented, by statutory limitations, from increasing the rate of fare or changing the system now governing the issuance of transfers. Under the regulations which have been in force the rate of fare between points in Albany and Rensselaer is fixed at 5 cents, with the privilege of transfer to points within the lines operated in the two municipalities.

At a conference of officials representing Albany, Rensselaer, Troy, Watervliet and Cohoes, held recently, it was decided best to have each city and community affected by the new rate schedule conduct its own case, as the aspects differ.

Union Traction Company Hearing Concluded

The hearing of the petition of the Union Traction Company of Indiana, Indianapolis, Ind., to the Public Service Commission of that State, to increase its interurban passenger rate to 2½ cents a mile was held before the commission on May 22. Evidence introduced showed that it was anticipated the deficit of the company for the year 1918 would amount to $273,290, after deducting sinking funds and fixed charges. The chief engineer of the commission indicated that he thought $33,000 a mile was a fair value to use in making an estimate of the property for a rate-making basis. Representatives of the company stated that this value was too low in comparison with similar properties, and that such properties had been valued at more than $50,000 a mile. The company's inventory shows a total valuation of $15,616,463, and the value of the interurban property as $13,642,667. The engineer of the commission thought this was very conservative, and that the physical value of the interurban property alone was probably about $15,500,000.

Transportation News Notes

Wants to Eliminate Tickets.—The Fort Wayne & Northern Indiana Traction Company has filed a petition with the Public Service Commission of Indiana asking authority to eliminate its six-for-a-quarter tickets in Logansport, and to abandon its track on High Street in that city from Sixth Street to Spencer Park. The petition also requests authority to use one-man cars in Logansport and on certain lines in Fort Wayne.

Schenectady Fare Petition Withdrawn.—The Public Service Commission, for the Second District of New York at its regular session on May 23 granted an order permitting the Schenectady Railway to withdraw its petition for a 6-cent fare. No special hearing on the merits of the petition was held, but on April 18, after the decision of the Court of Appeals in the Quinby case, there was a hearing as to whether or not there was a franchise limitation in Schenectady.

Dallas Skip Stop Giving Satisfaction.—The skip-stop system of operation, now being tried by the Dallas Railway in the downtown section of the city and on the Ervay Street line, will likely be extended to all lines in the city, according to announcement by Richard Meriwether, general superintendent of the company. Mr. Meriwether reports a saving in schedule time of 12 to 15 per cent on lines on which the skip-stop system is in operation. There has been practically no complaint of inconvenience from patrons.

Lincoln Now Suggests Six-Cent Fare.—The State Railway Commission of Nebraska has deferred action upon the motion of City Attorney Peterson for a reopening of the case to take additional evidence regarding the value of the Lincoln Traction Company's property. E. J. Hainer, counsel for the company, urged that the commission increase the rate of fare first and then proceed to take an inventory of the company's property if it wanted one. He said that a 5-cent fare, originally asked for by the company, would not be enough. He urged a 6-cent fare.

Preparing for Portland Hearings.—It is expected that on June 8 the final cross-examination will be conducted in connection with the application of the Cumberland County Power & Light Company, Portland, Me., for an increase in fares on the Portland Railroad, operated under lease, and that on the same day the testimony of the opposition will be presented. The company is seeking a 6-cent fare in the central zone, covering the thickly populated sections of Portland and South Portland, with 2 cents a zone outside. The case was opened early in March, and the tariff providing the rates just mentioned is under suspension.

Courts Against Dallas Jitneys.—Jitneys in Dallas, Tex., have lost again in their fight for the right to continue operation. The State Supreme Court has held the Lindsley ordinance, enacted during the administration of Henry D. Lindsley as Mayor and designed to put the jitneys out of operation, to be valid in all particulars and a proper exercise of the police powers lodged in a municipality. The case grew out of an attempt by the city to enforce this ordinance. It has been in the courts for nearly two years. Some of the moves in connection with the matter were reviewed briefly in the ELECTRIC RAILWAY JOURNAL for May 25, page 1031.

Increased Tariff Filed for Elmira.—The Elmira Water, Light & Railroad Company, Elmira, N. Y., on May 23 filed with the Public Service Commission for the Second District a new tariff schedule affecting local passenger traffic, to go into effect on June 20. The changes proposed were: Fares between points on lines other than Seneca Lake division, except between points within the city limits of Elmira, corporate limits of Elmira Heights and Horseheads, increased 1 cent. Fares between points on the Seneca Lake division, Center Mills, Croton, Elmira, Horseheads, Millport, Mountour Falls, Pine Valley and Watkins, increased to basis of 2 cents a mile.

Package Car Discontinued.—The Beaver Valley Traction Company, New Brighton, Pa., has filed with the Public Service Commission a notice of discontinuance of its package car, effective on June 8. The package car business of the company has been continuously decreasing. The total daily mileage operated by this car approximates 70 miles. The operating cost per car-mile, due to present business conditions, runs as high as 28 cents or a total cost of operating this car of $19.60 a day, while for the last three months the average daily receipts have been $7.15 a day. These facts have all been explained by the company in a notice addressed to the patrons of the car.

Lewiston Fare Case Being Heard.—A hearing was held on May 21 before the Public Service Commission of Maine on the application of the Lewiston, Augusta & Waterville Street Railway for permission to increase its zone charges from 5 cents to 7 cents. Subsequently cross-examination was conducted and it was expected the case would be closed on May 29. A decision will probably be handed down without delay as this is an emergency case. The company did not earn its operating expenses for the first quarter of 1918. It is also beset by the prospect of higher interest on obligations maturing in 1918 and a new wage scale. Some time ago the property was re-zoned, ten 5-cent fares being substituted for seven 5-cent zones in one instance.

New C. E. T. A. Tariff.—The Central Electric Traffic Association issued under date of May 9 effective on June 15 joint passenger tariff No. 19, canceling joint passenger tariff No. 17, of rates for interchangeable 2000-penny coupon tickets. This interchangeable 2000-penny coupon ticket will be honored between all stations on the roads participating in the tariff, located in Illinois, Idaho, Indiana, Kentucky, Michigan and Ohio. These penny coupon books are to be used for purposes of simplicity, it being possible to tear off the exact fare and make them available for use with any rate of fare. The coupons are perforated along the strip so that one-half of the detached strip of coupons can be retained by the road lifting the same and one-half can be used in balancing accounts. Roads other than those listed are also considering using these books.

Uniform Steps in Spokane.—E. E. Lillie, superintendent of the Spokane Traction Company, has agreed to make a standard of height of less than 17 in. on all steps by removing the block from the truck bolster. Heretofore there has been no standard at which the treads of the step should be maintained above the rail. They have varied from 15½ in. to 21⅜ in. It is also proposed to change the gate operation. At present the gates are operated by the motorman, but hereafter the conductor will operate the gates. Disappearing steps will be attached to the gates so that when the gates are open a step will come out from under the present step. The steps of the cars of the Washington Water Power Company were formerly 18¼ in. above the rail, but in the majority of cases these have been lowered to 15 in. As the cars go through the shops the platform sills are being lowered to this standard.

St. Joseph Wants Six-Cent Fare.—The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has an application pending before the Public Service Commission of Missouri for permission to increase its railway rates from 5 cents to 6 cents. Last February the company obtained permission to eliminate the sale of tickets at reduced rates and went to a straight 5-cent fare. In this connection J. H. Van Brunt, vice-president and general manager of the company, has made a statement to correct the impression that the company received a 1-cent fare increase through the order eliminating tickets. He has pointed out that the majority of fares before the installation of the straight 5-cent fare were not tickets. The average fare was 4.67 cents. This made the increase only 0.33 of a cent. Mr. Van Brunt says that while this has helped, it has by no means dammed the leak in the expense accounts of the company.

City Agrees to Advance in Fare.—The Public Service Commission for the Second District of New York on Jan. 31, after an investigation, permitted the Waverly, Sayre & Athens Traction Company to increase its rate of fare in Waverly to 6 cents. The company filed a tariff but later voluntarily canceled it upon ascertaining that there existed a franchise restriction limiting fares to 5 cents. The trustees of Waverly, by resolution on May 8, modified the franchise restriction so as to permit a 6-cent fare during a certain period. The commission on May 23 granted an order permitting the company to file a new tariff, effective from June 1. This enables the company to make a 6-cent fare on the entire line; that is, 6 cents from Waverly to Sayre and 6 cents from Sayre to Athens. The company collects 12 cents from Waverly to Athens on through passengers, also a 6-cent fare in the village of Waverly. The right to charge 6 cents in Pennsylvania is not limited to a period of the war, as is the case in New York State.

Increase in Fare Asked for Wilmington.—The Tidewater Power Company, Wilmington, N. C., has appealed to the Corporation Commission of that State for increased fares. The company desires to charge a flat 6-cent fare on its city lines and to discontinue the sale of tickets for local rides. The company would also advance fares over the line from Wilmington to the beach. Instead of the present rate of 35 cents for the round trip to the beach, or three round-trip tickets for $1, the company asks that it be permitted to charge a straight cash fare of 25 cents and 20 cents for tickets. To Wrightsville Sound, it asks permission to raise the rate to 25 cents for the round trip or 15 cents straight fare. In Wilmington, chief interest is centered on the proposal to advance the commutation rate to residents of the beach traveling to Wilmington. This special rate, for twenty-six round-trip tickets, has been $7.80 from Wilmington to Wrightsville Beach and the company asks to advance it to $9.36. Between Wrightsville Sound and Wilmington it asks for an increase in the commutation rate from $4.68 to $5.85 for the twenty-six round-trip tickets.

Personal Mention

George R. McComb has been appointed assistant treasurer of the Illinois Traction System, Peoria, Ill., to succeed W. H. Carnahan, deceased.

W. H. Elder has resigned as secretary and auditor of the United Traction Company, Albany, N. Y., to become connected with a firm of public accountants in New York City.

E. B. Smith, formerly with the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been appointed auditor of the Muskogee Gas & Electric Company, Muskogee, Okla., succeeding J. H. Schmidt who has resigned to enter business for himself.

Alba B. Johnson, Philadelphia, who is president of the Baldwin Locomotive Works, on May 24 was elected president of the Railway Business Association. Mr. Johnson succeeds George A. Post, New York, who had served as head of the association since its formation in 1908.

Horace A. Abell, of the engineering department of the New York State Railways, Rochester, N. Y., has been appointed engineer in charge of way and structures of the Rochester lines of the company. Mr. Abell succeeds Donald B. Falconer, who resigned on April 1.

S. H. Grauten has been appointed electrical engineer of the Kansas City (Mo.) Railways, his duties covering design, construction and operation of the substations and electrical distribution system. This work includes the rehabilitation started about a year ago and under which three substations have been completed and will soon be in operation.

Chester P. Rexford has been appointed claim agent and park manager of the Union Street Railway, New Bedford, Mass., to succeed the late Isaac W. Phelps, who was claim agent for twenty-two years. Mr. Rexford went to work for the company on Sept. 8, 1902, in the office. He then rose gradually through the offices of cashier and paymaster and on Nov. 1, 1910, was appointed to the accident department as assistant to Mr. Phelps. He has also been assistant park manager up to this time.

Charles J. Finger has been elected president and treasurer in charge of operation of the Columbus Magnetic Springs & Northern Railway, Richwood, Ohio. Mr. Finger's record in railway work dates back twenty-five years, and includes service on South American roads, the Texas & Pacific Railroad and in the central part of the country. He was general manager of the Ohio River & Columbus Railway and combined lines. He was later appointed receiver and general manager of the Ohio River & Columbus Railway.

Archie Evans, for a number of years secretary to H. B. Fleming, chief engineer of the Chicago (Ill.) Surface Lines, has been commissioned a first lieutenant in the construction division of the Quartermasters' Corps, National Army, and on May 14 reported for duty at Washington, D. C. Mr. Evans became connected with the Chicago City Railway in 1906 as a stenographer and after several promotions was made secretary to the chief engineer, the duties of which position he has continued to perform under the new arrangement of unified operation of the surface lines.

Henry Worth Thornton, an American, whose appointment four years ago as general manager of the Great Eastern Railway, England's most important system, caused much comment both here and abroad, has been named a brigadier general of the British Army. Mr. Thornton received the rank of colonel shortly after the beginning of the war and was advanced to brigadier general in appreciation of his exceptionally efficient work as director of the Channel transports. Previous to going to England Mr. Thornton was general superintendent of the Long Island Railroad and president of the Northwestern Railway, operating the electric railways at Meadville, Pa., and vicinity.

John M. Ryan has been appointed roadmaster of the Boston (Mass.) Elevated Railway surface lines, succeeding to the position recently resigned by Col. T. F. Sullivan. Mr. Ryan was graduated from the Norwich University, Northfield, Vt., with the class of 1895, receiving the degree of C. E. The same year of his graduation he entered the service of the engineering department of the city of Cambridge. In 1897 he became connected with the Boston Elevated Railway in the civil engineering department. In 1899 he was appointed engineering inspector on surface track construction work. In 1912 he went from the engineering force to the road department of surface lines, being appointed supervisor of surface tracks.

V. R. Hawthorne has been elected acting secretary of the Master Car Builders' Association and the Master Mechanics' Association. He has been serving as temporary secretary of the associations since the death of J. W. Taylor. Mr. Hawthorne was born at Oleon, Pa., on Nov. 27, 1886. He entered the service of the Pennsylvania Railroad in June, 1905, and has been with the company continuously since that time. While at Altoona for that company he was appointed on the M. C. B. special committee making time studies. Early in 1917 he was appointed special master car building inspector, reporting to J. T. Wallis, general superintendent of motive power of the Pennsylvania Railroad. He was assigned on special M. C. B. committee work of the American Railway Association in April, 1917.

F. D. Ward has been appointed superintendent of rolling stock, for the Bay State Street Railway, Boston, Mass., succeeding to the duties of H. W. Irwin, acting superintendent of car repairs, recently resigned. Mr. Ward's first experience in railway work began with the Grand Avenue Railway, Kansas City, back in the nineties. Later he became associated with properties in Chicago, controlled by the late C. T. Yerkes. When Mr. Yerkes became interested in the London, England, underground railway properties, he took Mr. Ward with him to look after the car equipment for the new tubes. For about eleven years he was associated with the American Car & Foundry Company, doing important engineering work on car design and equipment. A period of this time was spent in Italy, where he had charge of a large car equipment contract for his company. For the last four years Mr. Ward has been an active member of the Smith-Ward Brake Company, New York.

Albert E. Gulliver, chief engineer of the power station of the Trenton & Mercer County Traction Corporation, Trenton, N. J., has resigned his position to engage in special work for the British government pertaining to marine operations. He will be located in Canada and will make his home in Halifax. Mr. Gulliver became connected with the Trenton company two years ago. He was formerly in the employ of the Public Service Corporation of New Jersey. Mr. Gulliver was graduated from the London Polytechnic Institute. After leaving school he entered the employ of Harland & Wolf, at Belfast, noted shipbuilders and engineers. Later he was commissioned in the Royal Indian Marine, a branch of the English navy. During the Boer war he was engaged in the transport service and later in the merchant marine, plying across the North Atlantic. He then settled in the United States and became erecting engineer for the Westinghouse Electric & Manufacturing Company.

Obituary

Edward C. Meier, president of the Heine Safety Boiler Company, Phoenixville, Pa., died suddenly on May 7, while attending the meeting at Philadelphia of the District Production Division of the Emergency Fleet Corporation. He was stricken just after making a short address giving his views on speeding up the construction of boilers and died within a very short time. Mr. Meier was born in 1870. He was a son of Col. E. D. Meier, founder of the Heine Safety Boiler Company, and became president of the company in 1916 on the death of his father.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Franchises

Selma, Ala.—The Selma Traction Company has received a thirty-year franchise from the City Council of Selma to construct a line from Alabama Avenue and Mechanic Street to the Municipal Swimming Pool.

Butte, Mont. — The Butte Electric Railway has received a franchise from the City Council to construct double tracks along Main Street from Galen Street to Quartz Street.

Newark, N. J.—The Board of Commissioners of Newark has granted permission to the Public Service Railway for a double-track extension of its tracks from Chestnut Street through Elm Road and Gotthardt Street to Hamburg Place, ½ mile.

Caledonia, Ohio. — The Columbus, Delaware & Marion Railway has received a franchise from the County Commissioners to erect electric transmission lines from Marion to Caledonia, about 10 miles.

Tulsa, Okla.—The City Commission of Tulsa has repealed the ordinance recently passed granting the Oklahoma Union Railway a franchise for an outlet to the north of Tulsa, including right-of-way over First Street. The ordinance was enjoined by property owners on First Street and this case is now pending in the courts. It was claimed that a franchise such as was granted was worth at least $200,000, whereas the company was paying nothing for it.

Montpelier, Vt.—The Barre & Montpelier Traction & Power Company will receive a new franchise from the City Council of Montpelier.

Track and Roadway

***Decatur, Ala.**—The construction of an electric railway from Decatur to Florence, Sheffield and Tuscumbia, a distance of about 45 miles, is under consideration. H. L. Morrill and D. S. Echols, Decatur, and C. E. Warwick, Vicksburg, Miss., are interested in the project.

San Diego (Cal.) Electric Railway.—Work has been begun by the San Diego Electric Railway on the reconstruction of 1 mile of track in San Diego.

Municipal Railway of San Francisco, San Francisco, Cal.—The United States War Department has tentatively offered to furnish $150,000 for the extension of the Potrero line from the Union Iron Works to Hunter's Point, where the new government drydock is to be constructed. While the government will own the line, it will be operated as part of the Municipal Railway and will ultimately be taken over by the city. Under the tentative plans, employees and passengers will be carried in the daytime and between certain hours at night only material will be carried. Under the present plan, the line will operate on Army Street to Kentucky Street, south to Evans Avenue and then out to Hunter's Point Boulevard.

***Savannah, Ga.**—The Foundation Company contemplates the construction of a 1-mile line from its shipyard on the Brampton Tract to connect with the Port Wentworth extension of the Savannah Electric Company.

Chicago (Ill.) Surface Lines.—Work has been begun by the Chicago Surface Lines on the construction of a 5-mile extension from South Chicago to Hegewisch. Upon the completion of the Monroe Street bridge construction will be begun on an extension of the Monroe Street line from Franklin to Canal Streets. The bridge will be opened to the public by August and the car line will be completed a month later.

Evanston (Ill.) Railway.—This company will rehabilitate its tracks between Dempster Street and Main Street at a cost of about $30,000. New steel rails will be laid on a concrete foundation.

Tri-City Railway Company of Illinois, Rock Island, Ill.—Double tracks will be laid by the Tri-City Railway Company of Illinois along Eleventh Street from Eighteenth Avenue, Rock Island, to Center Station and Sears, Ill. The present right-of-way is desired by the city for street purposes and the company will give the city a deed for this right-of-way. The company also agrees to double-track Eleventh Street from Eighteenth Avenue to Aiken Street when required. In return for this service the city guarantees that it will extend for twenty years the franchise of the company in South Rock Island Township which will expire within two years.

Inter Urban Railway, Des Moines, Ia.—Work will be begun at once by the Inter Urban Railway double tracking 1600 ft. of its Camp Dodge line, south of Brennan Crossing. Bids have been advertised for grading the cut just beyond the Beaver crossing, where 3000 ft. of double track will be laid.

Bay State Street Railway, Boston, Mass.—As a result of conferences by government officials, the Quincy City Council, General Manager Wakeman of the Fore River Shipbuilding Yard and R. B. Stearns, vice-president of the Bay State Street Railway, about $150,000 is to be spent in improving the present facilities of the Bay State Street Railway in Quincy. The government experts reported that, while the power was ample, its distribution was poor owing to the extraordinary demands made upon it. They have accordingly recommended that a substation be established at the Hancock Street carhouse. The temporary bridge across the Neponset River is to be widened to accommodate a double track. Part of the cost of these improvements will be paid by the government.

Detroit (Mich.) United Railway. — Work will be begun soon by the Detroit United Railway on the construction of an extension to the Ford submarine chaser plant in Springwells.

***Caledonia, Minn.**—It is reported that the right-of-way for an electric railway between Caledonia and Houston has been purchased. It is stated that officers of the Preston Light & Power Company, Preston, Minn., are interested in the project.

McComb & Magnolia Railway & Light Company, McComb, Miss.—A report from the McComb & Magnolia Railway & Light Company states that the company plans to place in operation 4 miles of its line, between McComb and Fernwood, this year. Guy M. Walker, New York, N. Y., president. [Dec. 29, '17.]

Jersey Central Traction Company, Keyport, N. J.—After the Jersey Central Traction Company had refused to obey the order of the Middlesex County Board of Freeholders and make certain repairs to the tracks on Stevens Avenue, South Amboy, the county body refused to allow the company's cars to operate on that thoroughfare. Director William S. Dey, of the Board of Freeholders, had the tracks on Stevens Avenue buried in sand, thus preventing cars from being run. William Hitchcock, general manager of the company, promised to make the repairs and the freeholders agreed to remove the sand.

Brooklyn (N. Y.) Rapid Transit Company.—The Brooklyn Rapid Transit Company has announced its intention of restoring service on the Norton Point railroad line between the Sea Beach-West End terminal and Sea Gate at Coney Island. Last October the operation of this line was stopped because of the reconstruction of the elevated lines to Coney Island, and the building of the new terminal there. A trolley service was substituted on Surf Avenue with transfer privileges at Thirty-seventh Street to Sea Gate. Transfers were also given to the Culver and the Brighton Beach lines. These privileges will be continued when the rapid transit service is restored.

New York Municipal Railway, Brooklyn, N. Y.—The Public Service Commission for the First District of New York recently received bids for the construction of column foundations for Route 49, Section 3, a portion of the Culver Rapid Transit Railroad in Brooklyn.

The lowest bidder was William G. Cooper, Inc., New York, whose proffer was $171,256. Bids were also received by the commission for furnishing two portions of ballast for new rapid transit lines. The Upper Hudson Stone Company, New York, bid $1.90 for portions *D* and *E* of this contract, while the New York Trap Rock Company bid $2.05 for portion *B* and $1.85 per cubic yard for portion *E*. All of the above bids have been taken under consideration by the commission.

Interborough Rapid Transit Company, New York, N. Y.—The Board of Estimate on May 28 voted $300,000 in corporate stock for the Interborough Rapid Transit Company to complete the connections between the old subway and the new subway at Times Square, Manhattan, and Borough Hall and Atlantic Avenue, Brooklyn.

Northern Ohio Traction & Light Company, Akron, Ohio.—Work will soon be begun by the Northern Ohio Traction & Light Company on the construction of an extension of its Belden Avenue line. The cost of the improvement will be approximately $50,000.

Chillicothe & Camp Sherman Electric Railway, Chillicothe, Ohio.—Application has been made by the Chillicothe & Camp Sherman Electric Railway to the Public Utilities Commission of Ohio for permission to issue $75,000 in common stock, $150,000 in preferred stock and $150,000 in first mortgage bonds for the construction of its proposed line from Chillicothe to Camp Sherman. George A. Vaughters, Chillicothe, is interested. [May 4, '18.]

Cincinnati (Ohio) Railway.—Mayor Galvin of Cincinnati recently received a letter from W. Kesley Schoepf, president of the Cincinnati Traction Company, setting forth the terms on which the proposed Warsaw Avenue extension will be made. The Price Hill Business Men's Club has proposed to finance the extension and provide the rails. Mr. Schoepf requires that the city or the people of Price Hill contract with a reliable contractor to build the extension according to standard specifications under the supervision of the city engineering department and with the approval of the company for the estimated sum of $112,078. He also specifies that the rails are to be obtained by the people of Price Hill and that they shall be of the new standard 7-in. section 91-375 type or any other section equally acceptable to the company. The total amount of the estimate for the construction of the extension must be placed with some bank or the guarantee of a bank must be obtained that it will make payment as the certificates are issued. The work must be commenced by July 1. Mayor Galvin said this matter is up to the people of Price Hill who made the proposition.

Niagara Falls, Ont.—The Ontario Railway & Municipal Board has approved the plans of the Provincial Hydro-Electric Commission for the construction of a line from Chippawa through the Township of Stamford. W. W. Pope, University Avenue, Toronto, secretary.

Dallas (Tex.) Railway.—The plan of the Dallas Railway to take up its track on Tyler Street from Seventh to Jefferson Street and to extend the so-called North Loop line westward out Seventh Street to the city limits, an extension of about 1 mile, has met with strong opposition on the part of residents of the North Loop section. These residents have presented their objection to M. N. Baker, supervisor of public utilities, who has promised a hearing before final action is taken. The North Loop residents assert that abandoning the track on Tyler Street will break all connection between the North Loop line and the Sunset and Bundary lines, thus effectively cutting Oak Cliff into two distinct street car districts. Since several amusement parks and other places have been built on the North Loop with the aim of drawing patronage from all of Oak Cliff, they would suffer material loss by the proposed changes in the street car lines.

Eastern Texas Traction Company, Dallas, Tex.—Construction work on the proposed interurban line to be built by the Eastern Texas Traction Company from Dallas to Greenville will be resumed as soon as the European war ends, according to announcement by J. W. Crotty, vice-president and general manager of the company, made to a stockholders' meeting held in Dallas recently. The proposition has been fully financed through the Dallas Electric Company, grading has been finished and all bridges built, and everything is in readiness for the laying of steel to begin as soon as conditions in Europe are such that steel can be secured. Lack of steel was declared to be the cause of the suspension of work. Fully $50,000 worth of crossties and a large amount of other material is now on hand ready for use as soon as steel is to be had. The stockholders' meeting was held for the election of directors, which resulted as follows: F. E. White, J. W. Crotty, Ralph Wade, J. W. Gardner and W. B. Hamilton, Dallas, and R. M. Chapman and Joseph F. Nichols, Greenville. The officers of the company were re-elected as follows: F. E. White, Dallas, president; J. W. Crotty, Dallas, vice-president and general manager; Joseph F. Nichols, Greenville, vice-president; and Ralph Wade, secretary-treasurer. (Feb. 23,'18.)

Shops and Buildings

Columbus, Ga.—A contract has been awarded to Gifford & Whittaker for the construction of a transfer station at the intersection of Tenth and Broad Streets for the convenience of street car patrons. The building will be approximately 40 ft. x 20 ft. and will be constructed of brick and stone. There will be a general waiting room, a ladies' rest room, a smoking compartment for men, colored waiting rooms and toilets. The cost will be about $7,000.

Public Service Railway, Newark, N. J.—This company is having its carhouse, which has been used as a storehouse at Washington Park for the past twenty years, moved from the site where the government bag loading plant is being constructed. Two galvanized buildings are being built to take the place of the structure being removed.

Long Island Railroad, New York, N. Y.—Plans have been prepared by the Long Island Railroad for the construction of a one-story brick engine house, at Eighth Avenue and Sixth Street, Brooklyn, about 38 ft. x 102 ft., to cost about $15,000.

New York (N. Y.) Railways.—The New York Railways has leased its former plant at 17 Front Street to the Battery Warehouse Corporation at an aggregate rental of about $200,000.

Power Houses and Substations

Tri-City Railway & Light Company, Rock Island, Ill.—A new 22,500-kw. turbine is being installed at the power house of the Tri-City Railway & Light Company in Moline.

Bangor Railway & Electric Company, Bangor, Me.—A 500-kw. generator is being installed in the Veazie power plant of the Bangor Railway & Electric Company at a cost of about $55,000.

Montgomery Transit Company, Norristown, Pa.—This company reports that it has under construction a new substation at Skippack.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa.—Current to assist in the operation of the Trenton, Bristol & Philadelphia Street Railway is now being supplied by the Trenton & Mercer County Traction Corporation, Trenton, N. J. A cable for the transmission of current from the Trenton company's power house was strung for 1½ miles through the streets and across the lower Delaware River bridge to Morrisville, where the Pennsylvania company's cable was tapped. The cable was strung at the request of the government so the trolley service running to the Tullytown and Bristol government plants could be improved.

Tacoma Railway & Power Company, Tacoma, Wash.—The city lighting department is considering a contract with the Tacoma Railway & Power Company, under which the company will install, maintain and operate the large generator which the city purchased and for which no space has been provided. The Tacoma company has offered, for $1,800 a year, to install it and operate the generator and hook it up with its own switchboard, so that if the peak load were exceeded the company could cut in the city line on its own current. Hamilton Gronen, commissioner of light, estimates that it would cost the city $10,000 to build a substation on the tideflats.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Armature and Field Coils Active

Anticipating Heavy Business During the Summer Months Railways Are Buying for Replacements

On account of severe spring storms, the demand for armature and field coils has increased measurably. One manufacturer, in commenting on market conditions, said the sale of armature and field coils to electric railways is very active. While it is a normal movement at this time of the year, in anticipation of heavy summer service, a greater quantity of coils is being purchased than a year ago.

This and other manufacturing companies are in a position to ship promptly. The only obstacle, it was stated, would be the freight embargoes and the difficulty of obtaining priority orders. It was conceded that on the question of priority certificates the official transportation committee was inclined to favor shipment of all material for traction roads and other public utilities. Prices, it was stated, have not been changed nor were any looked for. Concern was expressed in connection with obtaining material, although it was conceded an improvement in the situation was evident.

Westinghouse Company's New Works

Essington Plant Embodies the Latest Building Construction With Most Modern Equipment

Spurred on by the urgent need of the government for ships the Westinghouse Electric & Manufacturing Company has made a record in the erection and operation of its new works at Essington, or South Philadelphia, about 9 miles from Philadelphia on the banks of the Delaware River. The plant is now devoted entirely to the production of ship propulsion machinery for the navy and the merchant fleet. A little more than a year ago the present site was plowed field, now it contains seven large buildings which gives employment to 2500 people. These buildings, comprising a floor space of over 600,000 sq.ft., include a pattern storage shop, foundry forge shop, power house, erecting shop, and two machine shops.

Two steam railroads, an electric line and the river afford means of transportation, though the last mentioned has not as yet been utilized.

The greatly increased demands on the Westinghouse company for steam-electric generating units led to the necessity of seeking enlarged facilities, as those at East Pittsburgh were already crowded. It is expected that eventually this plant will be of a size comparable with the East Pittsburgh works, which now employ in the neighborhood of 25,000 people, and cover a floor space of more than 100 acres.

Commercial Bribery May Become Criminal Offense

The Federal Trade Commission Urges Enactment of Law in Order to Preserve Competition

The Federal Trade Commission has recently sent to both branches of Congress a communication urging "the enactment in the public interest, as an aid to the preservation of fair and free competition, a sufficient law striking at the unjustifiable and vicious practices of commercial bribery and that such law be so comprehensive as to strike at each person participating in any such transactions."

The Federal Trade Commission has found commercial bribery to be general throughout many branches of industry, and scores of complaints have been issued by it on that account. Fourteen states at present have laws prohibiting such practices, but they fail to reach the root of the evil and eradicate it—in fact, they are practically dead letters. The commission can only deal with commercial bribery as an unfair method of competition, having no criminal jurisdiction, and can deal only with one side, having no power to reach the receiver.

In its communication to Congress the commission states that it "has made considerable investigation of bribery of employees of customers as a method of securing trade. These bribes take the form of commissions for alleged services, of money and gratuities and entertainments of various sorts, and of loans —all intended to influence such employees in the choice of materials. It is evident that this inexcusable added cost is finally passed on to the consumers.

"Corrupt employees having the power to spoil and disapprove materials have been able to bid one salesman against another until in many cases they have extorted secret commissions, so-called, as large as 20 per cent of the value of the goods sold.

"In order to prevent a resort to a common method of corruption, it is recommended that the law should also prohibit the giving of any such gifts or other considerations to members of the agent's or employee's family, or to any other person for his use or benefit, direct or indirect."

Railway Credits Sound in Middle West

Many Roads Taking More Time and Are Frequently Giving Notes for Credit Extension

The credit of electric railways in the Middle West is just as sound as it ever was, in spite of the fact that it is sometimes impossible for the utilities to pay their bills as promptly as before the high level prices.

Electric railways are frequently asking for more time, although some continue to discount their bills and in a few cases bills are discounted where previously time has been asked. In general, when time is asked it is granted by the manufacturers although in a few instances manufacturers are holding strictly to thirty days and refusing business on any other basis.

In many cases credit is being taken in the form of notes, although occasionally it is refused altogether. Interest at 6 per cent is being charged on some overdue accounts and some manufacturers are trying to make this the basis of credit and time extensions. There is, of course, a limit to this service, as manufacturers might find themselves running a banking institution.

The fact that railways are asking for more time is due primarily to the high prices resulting from the war. Equipment, overhead and track have all suffered severely and unforeseen expenditures have been necessary at the prevailing high prices.

"Cost-Plus" Basis to Be Abandoned

The "cost-plus" basis of undertaking government work is more or less familiar to manufacturers in the electric railway field. It has caused dissatisfaction it appears for several cogent reasons. Now, to follow advices from Washington, D. C., the policy of the War Industries Board, as officially stated, in abandoning cost and percentage as a basis of contracts with the industries of the country which is now in force on steel where prices have been established, will be extended to other materials in the near future.

Upset prices for work will be divided with the government on the basis of affording profit over certain figures, with a system of premiums for early, and penalties for late delivery. The general tendency is to get away from the cost and percentage basis, because of the many opportunities which are afforded to manufacturers unduly to increase their costs.

War Absorbs the Entire Output of Metal Conduit

Shipbuilding Takes More Pipe than Was Originally Anticipated — Factories Are Behind in Their Shipments

Metallic conduit and conduit fittings are now in such a position that it is impossible to obtain deliveries without showing that the material is required for a project necessary toward the successful waging of the war. In order to secure pipe, manufacturers must show the ultimate use of the conduit. It will therefore be impossible, one of the manufacturers stated to a representative of the ELECTRIC RAILWAY JOURNAL, for a purchaser to secure new pipe after the present supply is exhausted, except for industrial purposes or such other purposes as are definitely linked up with the war.

The available supply of pipe is by no means sufficient to take care of the market. The shipbuilding program of the United States has taken a very large amount of conduit, much larger in fact than was previously anticipated. Factories are behind in shipments, but find themselves in no position to better the situation at present.

This situation in conduit came as a result of the manufacturers in the iron and steel industry pledging their entire output to the service of the government and our allies so long as required. The direct and indirect requirements of the United States and its allies, it is stated, are equivalent to between six and eight months' production. As a result commercial iron and steel for the moment are receiving no attention. This situation, of course, will continue as long as 100 per cent of the production is necessary for war purposes.

Bituminous Coal Prices Reduced Ten Cents

The Reduction Will Effect a Saving to Consumers of Approximately $60,000,000

Ten cents a short ton has been stricken from the mine price of all bituminous coal in the United States by order of Fuel Administrator H. A. Garfield. The new price took effect at 7 o'clock on Saturday morning, May 25, and represents an average reduction of nearly 5 per cent.

The reduction will mean an annual saving to consumers of a sum estimated by the Fuel Administration at $60,000,000. Under the President's plan, the railroads will furnish cars to all coal mines alike, without discrimination, except as dictated by the prior requirements of the railroads for operating purposes and the needs of operating consumers and of the war. The introduction of the principle of even car supply, it is expected, will reduce the general average overhead of mine operation, thereby justifying the administration in putting out a price reduction order. It is understood that the mine prices thus fixed will remain undisturbed until the United States Fuel Administrator has before him the cost returns for the twelve months ending Aug. 31, 1918. The returns thus far are being carefully studied by Fuel Administration accountants and engineers with a view to making the utmost saving to the public that is consistent with a maximum production of coal.

The order will have no effect on the price of anthracite coal, which forms the bulk of the domestic consumption fuel in the eastern part of the country.

Consumers of bituminous coal who have already entered their orders for the year's coal supply, but whose coal has not yet been delivered, will, of course, receive their supplies at the reduced price. The new price applies to all bituminous coal which left the mines after 7 a.m., on May 25, no matter how long the order for the delivery of the coal has been standing.

Coal delivered after 7 a.m., May 25, under contracts which have been entered into since Dec. 29, 1917, will be billed at the new price. Under the regulation of the Fuel Administration all such contracts call for the delivery of coal at the government price effective at the time of delivery.

Higher Rates to Make for Fare Box Business

Makers Are Preparing for a Heavy Demand—Substituting Metal Tokens for Paper

With the change of car fare, from 5 to 6 cents, already granted to a number of traction roads in Connecticut, Pennsylvania, Massachusetts and the Middle Western States, manufacturers of fare boxes are arranging their plants to meet the demand for a device to care for the new fare.

Where a nickel has been the uniform fare heretofore and to avoid an accumulation of pennies in the boxes, the token or metal coin, instead of paper tickets is to be substituted in many cases, according to the fare box manufacturers and distributers. It is believed the sale of fare boxes to accommodate the 6 cent or higher fare can be taken care of more conveniently and easily than in any other way by the use of metal tokens. In the Middle West the metal token or special coin has been adopted in a number of places and is highly popular. It is said these tokens occasionally are used as currency in local transactions.

The boxes now being used separate, register, and count four different fares automatically, the counting device being operated by a cam mechanism.

The Cleveland (Ohio) Armature Works, Inc., has filed articles of incorporation, under the laws of the State of Delaware with a capital stock of $2,000,000, to manufacture electric machines, generators and batteries. The incorporators are C. L. Rimlinger, M. M. Clancy and F. A. Armstrong of Wilmington, Del.

Wire Unaffected Because of Rubber Import Restrictions

Electrical Manufacturers Consulted in Advance of Order Limiting Incoming Crude Materials Supply

An order from the War Trade Board limiting the importation of crude rubber from overseas to a total of 25,000 tons from May 6 to July 31 is apparently not creating any discernible disturbance or concern with electrical goods manufacturers using this material in their finished products. Several leading producers of rubber-covered wire and cable, rubber insulators, etc., when asked if this action would curtail their output or have a tendency to increase prices, said that with the exception of rubber insulators, due to be advanced any day, no trouble was anticipated unless the restricted period was extended longer or indefinitely. Then there would be reason for anxiety.

Wire and cable manufacturers frankly state that rubber had been plentiful and cheap, and every company of any standing had certainly a three months' or more reserve stock of crude rubber on hand. In fact, it is reported that electrical goods producers had been consulted by the government regarding their supply of rubber before the action was taken. Therefore no one would be hampered or have legitimate or trade output lessened in any measurable degree.

The War Board stated in its notification that the "requirements for the production of goods for the United States and allied governments will be met in full. The remainder of the 25,000 tons permitted under the restriction will be allocated among the manufacturers of rubber products on the basis of their consumption in 1917."

Crude-rubber importers, on the contrary, are in a different frame of mind. A leading concern that has important dealings in crude rubber with the electrical trade was very much perturbed over the situation. The War Trade Board had sent out a questionnaire to the 175 importers of crude rubber, to which 174 responded. It was thus ascertained that on March 31 there were on order or in store 11,224 tons; engaged abroad or en route, 20,754 tons, with a further lot of 14,800 owned by Americans and intended for this market, making a total of 46,778 tons. It was further stated by this importer, who seemed to represent the sentiment of his branch of the business, that the annual (1917) consumption of crude rubber in this country was 169,000 tons. He therefore figured that the 46,000 odd tons in sight in no way could supply the normal demand.

The price of crude rubber established by the government on May 8 is 68 cents a pound for upper refined, 63 cents a pound for first latex (first milk), 62 cents a pound for red smoke sheets. The producers of electrical goods use all three grades in liberal quantities. Seven years ago Para rubber sold for $3.85 a pound.

Trade Notes

W. E. Hawley, formerly connected with the George Cutter Company, South Bend, Ind., in the switchboard department, is now with the Penn Electrical & Manufacturing Company, Irwin, Pa., manufacturer of switchboards and panelboards.

Safety Car Devices Company, St. Louis, has received an order for ten of its safety control equipments from the Charleston Consolidated Railway & Lighting Company, Charleston, S. C. These equipments will be used on the ten safety cars of thirty-five-passenger capacity, mentioned in the "Rolling Stock" column of the issue of this paper for May 18.

Heywood Brothers & Wakefield Company, Wakefield, Mass., manufacturer of car seats, chairs and fittings, in recently declaring an extra 5 per cent dividend on its common stock, made payment in Liberty Loan bonds of the third issue. The arrangement appears to have been very satisfactory to the stockholders. This was in addition to the regular 8 per cent dividend on the common.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has received an order from the United Electric Light & Power Company of New York City for a 22,000-kw. turbo-generator set. The generator will be rated at 25,900 kva. at 85 per cent power factor, 8000 volts, three-phase, 62½ cycles. It will be direct connected to a Westinghouse 22,000-kw. turbine. The order includes a 40,000 sq. ft. surface condenser and the usual auxiliaries.

Crouse-Hinds Company, Syracuse, N. Y., has placed on the market a dust and moisture proof cover for double push-button switches. These covers with the switch operating mechanism attached can be installed on either their FS or FD series condulets. This makes possible the use of this switch for lighting subways or platforms where dampness and dust prevail. Complete description of these covers is given in condulet bulletin No. 1000-H, which has just been published by this company.

New Advertising Literature

Combustion Engineering Corporation, New York, N. Y.: Bulletin C1, illustrating various installations of the method and operation of the "Cover Stoker," the title of the pamphlet.

Laclede-Christy Clay Products Company, St. Louis, Mo.: High-capacity stokers for higher volatile coals are described in a booklet. The operation of these is given.

Delta Star Electric Company, Chicago, Ill.: Bulletin No. 33, devoted to high-tension switching and protective equipment. This sixty-four-page bulletin has 309 illustrations and contains considerable technical information. Copies will be sent upon request.

Rolling Stock

Levis County Railway, Levis, Quebec, Canada, is reconstructing two double-truck cars.

Boston (Mass.) Elevated Railway's bill providing for the State taking over the property has been signed by the Governor and the order for 300 new cars will probably be placed soon.

Bamberger Electric Railroad, Salt Lake City, Utah, which had twenty passenger cars and several electric locomotives destroyed by fire on May 7, as reported in last week's issue, is arranging to buy new rolling stock deliverable as soon as possible. In the meantime second-hand cars are being secured to supply the deficiency.

Philadelphia (Pa.) Rapid Transit Company has put in operation, on its Hog Island shipyard branch, a type of car of the most advanced construction, which differs materially from the company's standard equipment. These 100 cars, the order for which came through the United States Shipping Board, Emergency Fleet Corporation, were built by the J. G. Brill Company and are now about nearly all delivered. At the time the contract was placed with the Brill Company specifications on an additional 100 were requested, on an option of thirty days. The option was not taken up, therefore current reports of the original order being expanded to 200 cars are without authority.

NEW YORK METAL MARKET PRICES

	May 22	May 29
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26¾	26¼ to 26¾
Lead, cents per lb	7 05	7 65
Nickel, cents per lb	40	40
Spelter, cents per lb	7½	7½
Tin, Chinese,* cents per lb	$1.03	$1.00
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†32.10

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* No Straits offering. † Government price in 50-ton lots, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 22	May 29
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6
Zinc, cents per lb	5½	*12
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton.	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$50.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 22	May 29
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30.40 to 36.10	30¼ to 36.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	33.42 to 38.35	38.00 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$65.00	$67.50
T-rails, high (Shanghai), cents per lb	4¼	4¼
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5 80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35

	May 22	May 29
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.60	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1 58
White lead (100 lb. keg), New York, cents per lb	9	10
Turpentine (bbl. lots), New York, cents per gal	51½	53

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* Government price. † These prices are f.o.b. wharves, with boxing charges extra.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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Says a Public Service Chairman: "Play Fair on Skip Stops"

ELECTRIC railways never had a finer opportunity to give better service with existing equipment than is offered by the skip stop, but the opportunity must be accepted in the spirit of moderation and fairness. In fact, the way the railways handle this war-made situation will have much to do with the consent of commissions to further methods of alleviation."

The foregoing is the sense of what a wide-awake public service chairman said in private conversation lately. In his community the skip stop had been introduced successfully on the basis of about eight stops to the mile in the city, six to the mile in the suburbs and four to the mile in the country. Exceptions had been made according to local traffic peculiarities. On the whole the public was highly pleased, and the railways were able to give at least 10 per cent more service. To-day, the commissioner is very happy over results so mutually beneficial, but it was evident that he would not tolerate any withdrawal of cars so long as the present heavy travel continues. He made it clear that the keeping of faith means to the railway interests a mass of good-will worth countless thousands of dollars.

Who's Next for the Company Section Membership Trophy?

AT A WONDERFULLY enthusiastic meeting of the Rhode Island Company section held at Providence last Monday evening, M. C. Brush as vice-president of the American Electric Railway Association awarded the company section charter membership cup to that section. The cup will be held at Providence until another section is formed with a charter membership of more than 216.

The meeting was attended by a number of men interested in the affairs of the association and the industry from New York and Boston, who by their presence and remarks indicated that they realized the importance and significance of the award. There are already rumors of plans to capture the cup, and the local section officials generously said that while they appreciated the honor thrust upon them, in the interest of the industry as a whole they hoped they would not be allowed to keep it long.

In his presentation address Mr. Brush outdid himself as an orator in summarizing the essentials of success in the electric railway business, as in others. The chief of these, he said, is the ability to make and keep friendships, "capitalizing but not commercializing" them. These friendships are a necessary feature of a company organization and no better agency than the company section exists for fostering them. If this is so then the sooner more sections are formed the better, and they might as well be formed with more than 216 original members.

Who's next?

Electrical Operation Soon Over the Hell Gate Bridge

UNTIL the presentation of the recent New York Railroad Club paper by E. R. Hill, published in the March 23 issue of this paper, very little was generally known in regard to a piece of heavy track and overhead construction in New York City on which the Pennsylvania and New Haven Railroads were expending large sums of money. To be sure, the Hell Gate Bridge had attracted wide attention, due to the length and height of the span and to the beauty of the arch, but the relation of this bridge to the whole project was understood only in a very general way. Mr. Hill gave some data of the road and a description of the locomotive to be used, and these have now been followed by the descriptions of the overhead construction given in last week's issue.

It is, of course, unfortunate that the locomotives in this case must be equipped to draw their power supply from both alternating and direct current. The situation is in no way different, however, from that which confronted the New Haven engineers when first they selected single phase in spite of the necessity for bringing the trains into the "Grand Central Station" of the New York Central over the third-rail track. As far as the passenger terminal in New York is concerned, the New York Connecting Railroad might have been equipped with third-rail and direct current. In view of the future, however, when the line to Bay Ridge will be electrified, it is necessary to provide alternating current overhead so that the New Haven freight locomotives, which are straight single phase, can be used from New Haven to Bay Ridge.

For an "off" year in electric railway work the progress being made in 1918 in heavy traction lines is encouraging. The very extensive work on the Milwaukee, the Chestnut Hill branch work at Philadelphia, the improvements on the Norfolk & Western, the New York Connecting Railroad and the new locomotives which are to operate over it, etc., are all at least partly to be credited to this year. It is hoped that the federal railroad administration will find time to study this progress and to extend electric operation wherever it can be profitable under war-time conditions. It is safe to say of electrification as was until recently said of electrical engineering in general, that "it is still in its infancy." It is a husky infant, however, and needs only a fair chance to develop rapidly to maturity.

Bankers Have a Duty to Perform for the Nation

AN EFFORT must be made through ordinary banking channels to work out the salvation of electric railway financing. This is the meaning of the recent statements of the War Finance Corporation, as noted in last week's issue, to the effect that its resources are intended to be loaned directly to war industries only in exceptional cases and then upon adequate security.

Such an attitude presents a big problem to utilities. Of the $225,000,000 of securities maturing during 1918, $90,000,000 have already come due. In most cases, however, the refinancing has been held up pending decision on the question of governmental aid. This has now been settled in a disappointing way—a way which requires the utilities to take the most active steps to provide for their financial needs. No time should be wasted in wishing for a moratorium for utility issues. A general moratorium might not be injurious, but a special one on utility securities, inviting a most invidious comparison, would not only have a terrible effect now but would also leave such issues a marked class afterward.

Nor should each individual utility hope too fondly that it will come within the exception clause. Study the details of the one direct loan successfully secured by the United Railways of St. Louis—a six-months' loan for $3,235,000, supported by $3,500,000 of mortgage bonds and $800,000 of Liberty Bonds, and protected also by a fare increase to 6 cents. Read what the War Finance Corporation has just said about this: "It is a short-time loan, which, because of the high class of collateral secured, is certain to be liquidated at maturity, and the temporary relief granted by this advance will give the company opportunity to make permanent financial arrangements through regular banking channels."

The gist of the matter, therefore, is this. The Capital Issues Committee will scrutinize minutely all applications for approval of new capital, but even when its consent is acquired the government will probably not advance the money except in cases where the new construction is for its own immediate benefit. And for maturing issues, consent for the refinancing of which is not required, the government will give aid only in rare cases where the security is excellent, the term of the loan short and the prospect good that the banking assistance unavailable at the time will be forthcoming at the end of the period.

This puts the situation in all its large phases directly up to the banks. Undoubtedly some of them have in recent months shown a reluctance to handle utility business—a reluctance which has been manifested in demands for prohibitive interest charges. Now, however, their plain duty has been pointed out, and they should perform it with despatch. And, it should be added, they can make a profitable return. If a bank loans money to a utility at 8 per cent and then rediscounts 75 per cent of the loan at say 6 per cent, as it can do through the War Finance Corporation, the difference in interest payments will make a much higher return on the balance representing the bank's own advance.

The big handicap in getting banks to look upon utility financing as a desirable class of business is, of course, the inadequacy of present-day rates. As pointed out in detail later, we believe that the rate situation will have a more favorable aspect from now on. If the banks feel less optimistic, however, and deem it unwise now to tie up their reserves for long periods in utility enterprises, then the war finance corporation act will be a dead letter for utilities, and the government in the nation's interest will be obliged to consider amendments or new legislation. But this remains to be seen. What the utilities must do now is to make every effort to induce the banks to co-operate with the government for the preservation of the utility industry. No time should be lost.

Federal Government Can Raise Utility Rates for General Welfare

THE RATE situation, we believe, is picking up. This is most fortunate, for the question of adequate rates underlies the important topic discussed above, utility financing, and all other phases of the great work of serving the public. Why do we think the rate situation is improving? Because each week sees utilities here and there being granted higher rates? Partly. But in the main we feel as we do because we think men in the utility industry and the public outside are beginning to realize that utility rate-making is not of purely local concern and that the situation has assumed a phase which demands national attention and action.

Two noteworthy expressions of this idea have been made in the last few days, one by P. H. Gadsden before a gas meeting in New York and the other by the United States Railroad Administration. Mr. Gadsden raises a most interesting point—can the federal government authorize adequate rates for local utilities? While, as he observes, nothing is known of any disposition on the part of the Administration now to regulate rates, the question concerns a future possibility in regard to which the powers of the natural authorities are receiving increasing recognition.

Mr. Gadsden's argument can be briefly stated. It is that the power of the federal government over an industry in war time depends not upon the latter's participation in interstate commerce but upon its necessity, under the demands of war, for the nation's welfare. Thus even local industries can become so impressed with national characteristics as to place them within the sphere of federal control. In such an event the power of the national government, during the war and a reasonable time thereafter, is paramount, overriding ordinary state and municipal rights.

Electric railways and other utilities are war industries; their maintenance at maximum efficiency is necessary for the successful prosecution of the war. President Wilson and other leading men of the country have recognized this and have urged local authorities to grant relief. Unless these words of advice are heeded, it is not at all unlikely that the federal government may be obliged, as a last resort, to take such a step as Mr. Gadsden describes. If our memory serves us correctly, Congress during the Civil War period authorized an increase to cover the higher costs of operation.

If the federal government intervenes in this matter in the future, government control of service and other matters will undoubtedly not be desired, for the state regulatory authorities are better equipped to supervise such features of operation. But if an expeditious uniform rate increase must be had, the nation may be depended upon to find a way.

If Interurbans Need Money, They Should Raise Rates Now

WE SPOKE above of the national concept of utility operation, and of the general need for higher rates. More encouraging than the growing recognition of what the national government may have to do to provide adequate relief, however, is the actual movement under way to secure increased revenues for one particularly deserving branch of electric railway service—interurban.

Most of the interurban electric railways have been in urgent need of higher rates, but as a rule they have not felt it wise to raise their rates above the steam railroad rates, which in many states have been restricted by law to 2 cents a mile. As a result, the interurban earnings have suffered severely. For example, a compilation made by the Electric Railway War Board shows that the net income of 127 interurbans in 1917 was only $9,816,180 as compared to $21,228,006 in 1913, a loss of $11,411,826. Moreover, twelve companies during the first quarter of 1918 reported a deficit of $533,000 as compared to a net income of $318,000 for the similar period in 1917.

Now, however, Director-General McAdoo with a wave of his magic wand has increased the steam railroad passenger rate to 3 cents a mile, and the interurbans have an unparalleled opportunity to secure adequate revenues. The increase in costs on the steam lines has been officially recognized by the government, and it certainly cannot be said that electric lines are not entitled to the same just treatment as the steam lines.

The government is not blind, however, and it sees clearly that present interurban rates are inadequate. Indeed, the situation is so evident that the United States Railroad Administration, through the Electric Railway War Board, has expressed the desire that electric railways take immediate steps to raise their rates proportionately to accord with those announced by the government and to make their new rates effective as nearly simultaneously therewith as is possible. It will support the effort of interurbans with the state commissions.

There will probably be certain localities where it may be expedient to depart from a fixed rule, but all deserving interurban carriers—and most of them are—should feel no hesitancy in asking for a 3-cent rate, or at least for such a rate as will maintain the former relation with the steam rates. As the War Board has pointed out, this is no time for vain dreams of profitable competition with the steam lines. Co-operation is the need of the hour, and there is business enough for all. It would be foolish for an electric road to start a competition in rates with the government.

The new steam passenger rates go into effect on June 10; the freight rates on June 25. Several interurbans are already filing higher tariffs, and most of them are expected to do so. All really in need should. If the state commissions understand the urgency of relief, as previously pointed out by President Wilson, no further support from governmental sources should be necessary.

Give a Company Money, and It Will Get Results

IS NOT the public-control plan for the Boston Elevated Railway a victory for the proponents of municipal ownership? Will the steam railroads ever go back under private control? These and similar questions which are frequently raised to-day in certain quarters are designed to make the unthinking public believe that the death-knell of private ownership and operation of railroads and utilities has been sounded.

But such is not the case. The idea that the public must take full charge of such enterprises as a matter of public necessity is nothing but the result of muddled thinking. Government ownership advocates seek to camouflage the issue, but the public will not be deceived.

What is the main issue? Simply this—that the rates paid by the public shall cover the full cost of service, including a fair return to the investor on the property in public service. The cost of service must be paid —no matter whether a utility is publicly or privately operated. Municipal ownership and operation will not decrease costs; indeed, if experience is any guide, such a system of control means wastefulness and inefficiency.

In the readjustment of railroad and utility operation to meet present abnormal conditions, therefore, the vital question is not who is operating the property but what will be paid to the operator. Under the Boston control plan, whose general principles have now been extended to the other Massachusetts roads if they wish to adopt the plan, the directors of a company, with the same provision for a flexible fare, could accomplish as much as will the public trustees.

In other words, the successful outcome of the Boston or Massachusetts situation will not at all be owing to the larger part played by the public in the operation of the facilities; it will be due to the revenue-producing mechanism which could not be used—or certainly could not be used so readily—by the companies while under private operation. Given the same opportunities and the same means, private operation will show better results than government operation. Given better opportunities and better means. the government may operate a commercial enterprise successfully, but this will be due solely to the better advantages and will be in spite of, not because of, the government control.

We believe that private ownership and operation will continue in America, but we also believe that the public interest in utility operation will henceforth be better protected. The co-operative or partnership idea governing the relations between the utility and its public will spread widely in the electric railway field; it is being advocated for the steam railroads after the war. Whether the closer relation will come through a more nearly perfect commission regulation, partial city representation on a board of control or sole city membership thereon will depend upon local conditions. The main point is that the credit of utilities must be restored by a sound and fair and farsighted rate system. As the utility operators have proved worthy of public trust, and as the needs of the utility do not demand heroic measures in the form of direct city aid, just so is the degree of public control likely to be minimized. The keynote of the future, however, will be participation, and in unity of interest and understanding progress should be made.

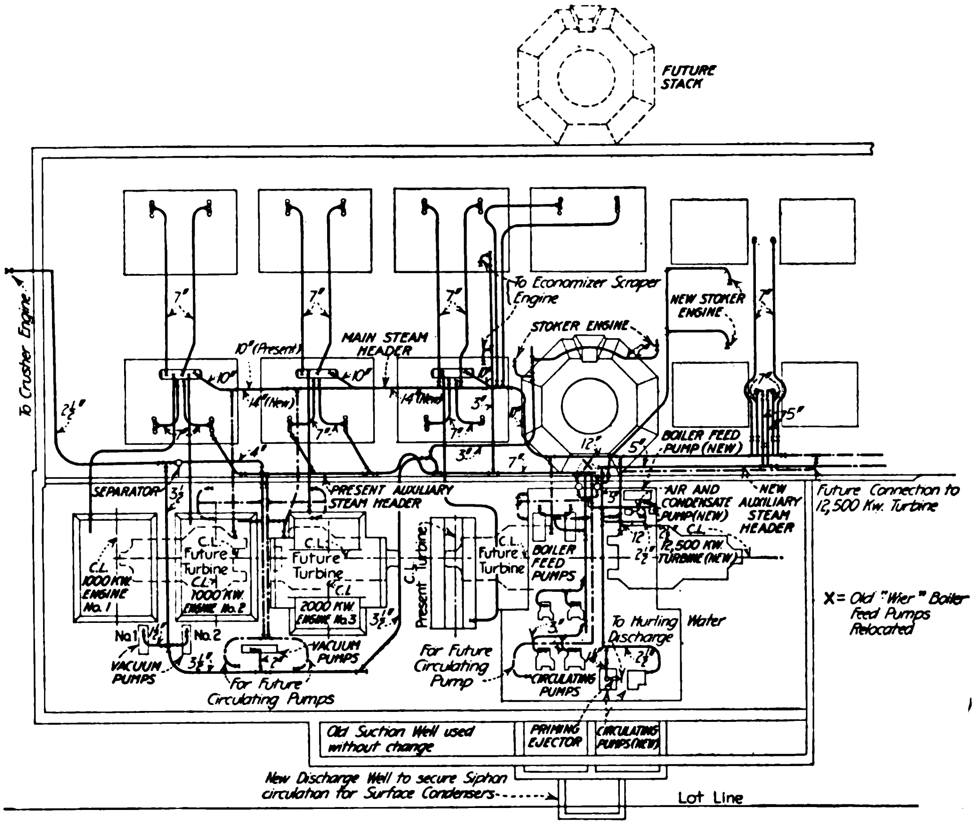
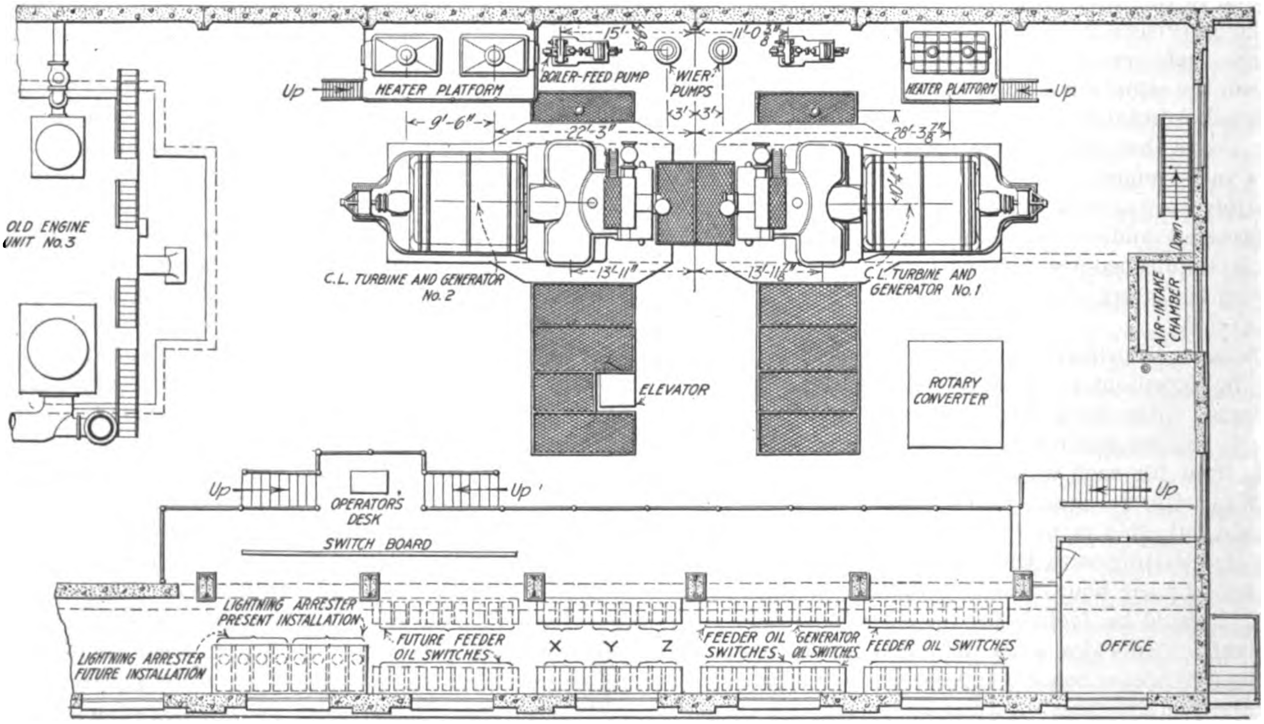

FUTURE STACK
To Crusher Engine
2½"
7"
7"
7"
10" (Present)
MAIN STEAM HEADER
10"
10"
14" (New)
14" (New)
7"
7"
7"
3"
4"
3"
7"
To Economizer Scraper Engine
STOKER ENGINE
NEW STOKER ENGINE
7"
5"
12"
5"
BOILER FEED PUMP (NEW)
X
SEPARATOR
3½
PRESENT AUXILIARY STEAM HEADER
C.L. 1000 KW. ENGINE No. 1
C.L. Future Turbine
C.L. 1000 KW. ENGINE No. 2
C.L. Future Turbine
C.L. 2000 KW. ENGINE No. 3
3½"
C.L. Present Turbine
C.L. Future Turbine
BOILER FEED PUMPS
AIR AND CONDENSATE PUMP (NEW)
NEW AUXILIARY STEAM HEADER
12"
2½"
C.L. 12,500 KW. TURBINE (NEW)
Future Connection to 12,500 Kw. Turbine
X = Old "Wier" Boiler Feed Pumps Relocated
No. 1
1½"
No. 2
VACUUM PUMPS
3½"
7"
VACUUM PUMPS
For Future Circulating Pumps
For Future Circulating Pump
3"
To Hurling Water Discharge
2½"
CIRCULATING PUMPS
Old Suction Well used without change
PRIMING EJECTOR
CIRCULATING PUMPS (NEW)
New Discharge Well to secure Siphon circulation for Surface Condensers
Lot Line

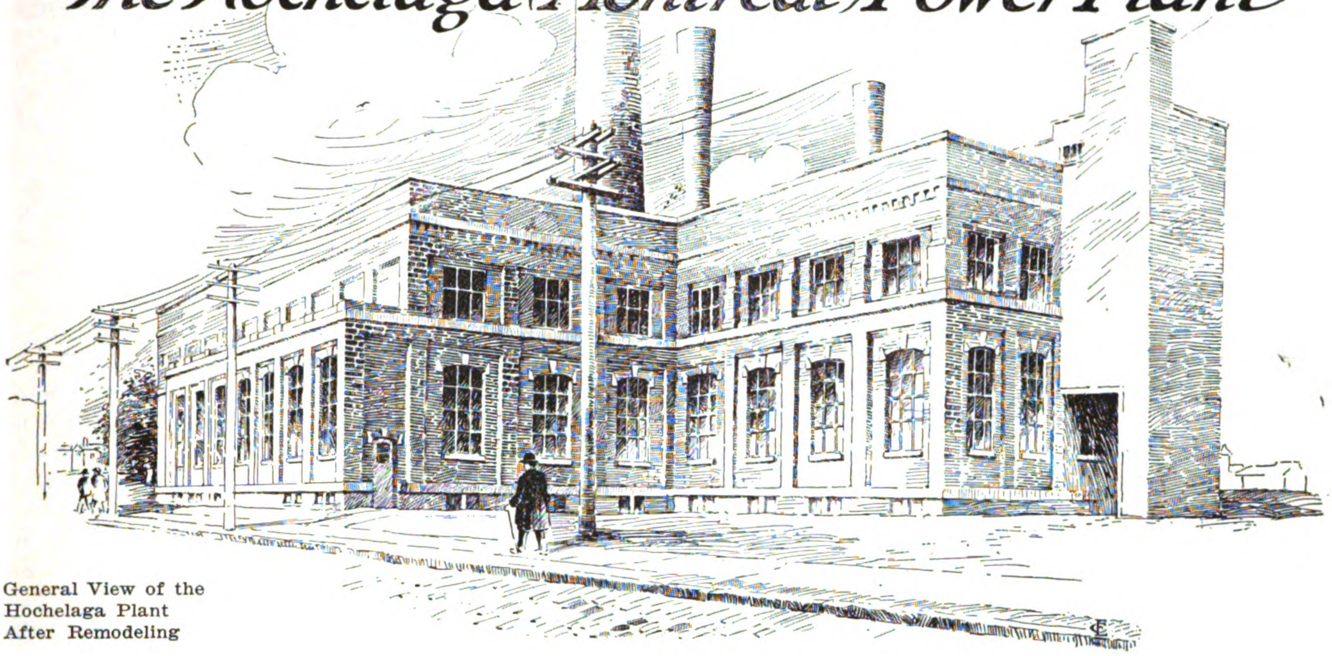
DIAGRAM OF STEAM PIPING WITH OUTLINE OF POSSIBLE FURTHER IMPROVEMENTS


Up
HEATER PLATFORM
15'
3'-6"
11'-0⅜"
BOILER-FEED PUMP
WIER PUMPS
3'
3'
HEATER PLATFORM
Up
9'-6"
22'-3"
28'-3⅞"
10'-2"
OLD ENGINE UNIT No. 3
C.L. TURBINE AND GENERATOR No. 2
13'-11"
13'-11⅞"
C.L. TURBINE AND GENERATOR No. 1
Down
AIR-INTAKE CHAMBER
ELEVATOR
ROTARY CONVERTER
Up
OPERATORS DESK
Up
Up
SWITCH BOARD
LIGHTNING ARRESTER PRESENT INSTALLATION
LIGHTNING ARRESTER FUTURE INSTALLATION
FUTURE FEEDER OIL SWITCHES
X
Y
Z
FEEDER OIL SWITCHES
GENERATOR OIL SWITCHES
FEEDER OIL SWITCHES
OFFICE

X = STATION OIL SWITCHES
Y = GENERATOR OIL SWITCHES No. 2
Z = FEEDER OIL SWITCHES

PLAN OF STEAM TURBINE END OF ENGINE ROOM

Remodeling The Hochelaga (Montreal) Power Plant



General View of the Hochelaga Plant After Remodeling

THE CHANGES which are going on in the main power house of the Montreal Tramways, Montreal, Quebec, are typical of conditions on all progressive properties where obsolescence is forcing the retirement of engines which in their day were in the front rank of progress. Accompanying the changes in the engine room of this power house are others just as important in the boiler room and in the control and distributing section of the plant.

The relation of the Hochelaga power plant to the general power system at Montreal was outlined in articles printed in this paper on Jan. 12, 1918, page 72, and on March 9, 1918, page 449. On page 74 of the first issue mentioned was a brief statement of the changes in progress in the power plant itself. In the present and last of the series of three articles on the power situation at Montreal some further details and the engineering considerations entering into the rehabilitating process form the basis of discussion.

From the earlier articles it will be remembered that the Hochelaga steam plant was built in the eastern end of the city of Montreal in 1906 to take care of relay power requirements in the eastern and northern sections. It was built as a standby, the principal dependence of the Tramways for energy being upon the local abundant water power. The units which were installed at that time, two 1000-kw. and one 2000-kw. marine type compound McIntosh & Seymour direct-current sets, were model machines for the time. One of these machines can be seen in the background in a photograph reproduced on page 1089.

In the selection of the Hochelaga power plant for improvement as part of the general power rehabilitation plan, its convenient location with respect to circulating water for the condensers was an important consideration. As can be seen by reference to the map on page 73 of the Jan. 12, 1918, issue, the plant is located close to the St. Lawrence River. While not at the center of gravity of the power system it is within economical transmission distance of all the substations and, as it is to supply only relay power, the remoteness of location from the gravity center of the system is not important.

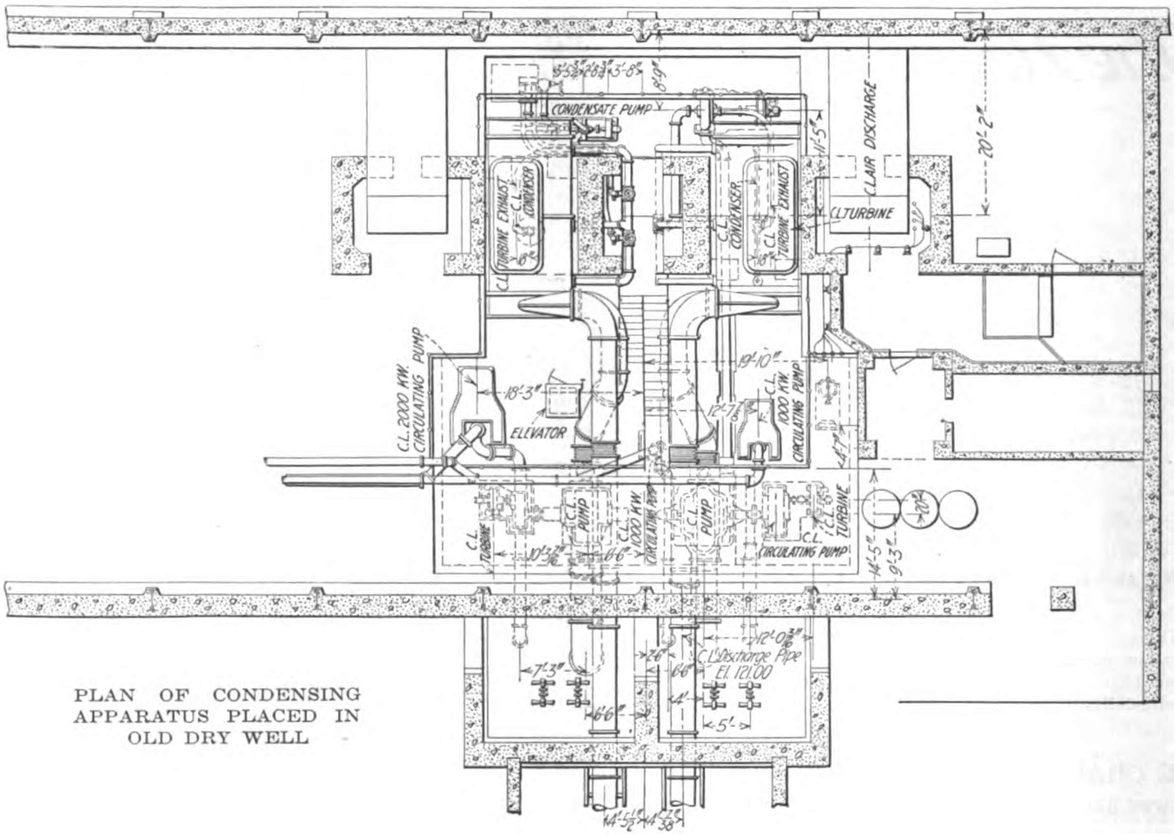
TURBINES ARE THE LARGEST IN CANADA

The plant has been laid out for the final installation of four 15,630-kva. turbo-generators if it is desired to continue the development along present lines. At present one unit is in position and operating, while the second is in process of installation. These two turbines will take care of requirements for some time to come, and the detailed plans for further improvements will not be made for the present.

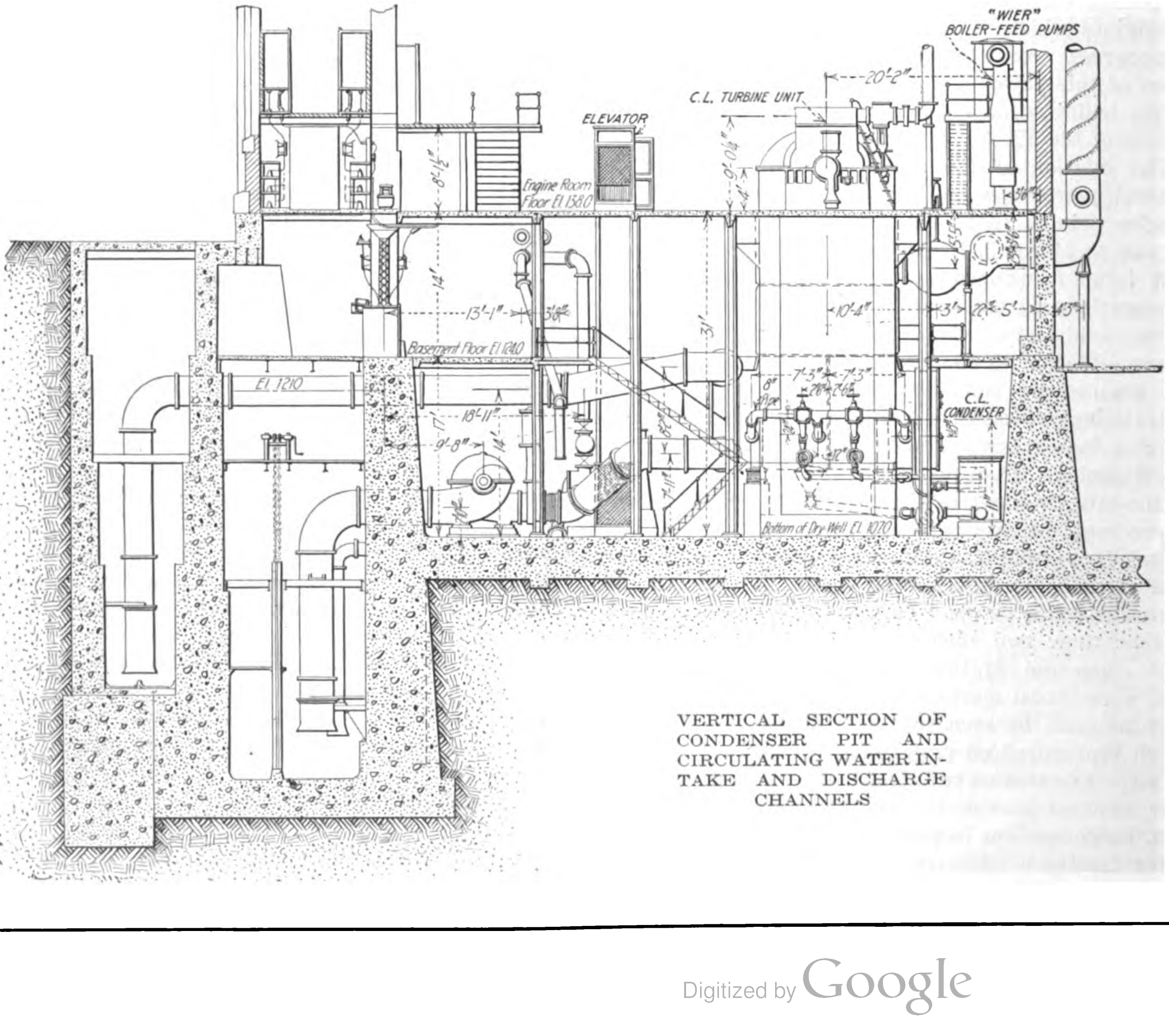
The present turbines are so far the largest that have been installed in Canada. As located they will furnish a striking example of the great increase in capacity and reduction in cost resulting from the use of turbo-generators. The accompanying boiler room changes illustrate also the development that has taken place in the last ten years in boiler and stoker practice.

Elaborating a little upon the last point it may be mentioned that the original designers evidently planned that the station should be symmetrical about the transverse axis through the dry well and chimneys. They probably did not intend to install more than two additional engine units of about 2000-kw. capacity each, making the ultimate capacity about 8000 kw. Now by extending the engine room a single bay, ample space has been provided for an ultimate development of 50,000 kw., or about four times as much, based on overload ratings of the engine sets for peak loads.

In the new work so far as practicable the rearrangement is being carried out on the unit plan, with respect to the apparatus serving each main turbine unit. Thus the boilers, heaters, feed pumps, condensing apparatus,


CONDENSATE PUMP
C.L. TURBINE EXHAUST
C.L. CONDENSER
C.L. CONDENSER
C.L. TURBINE EXHAUST
C.L. AIR DISCHARGE
C.L. TURBINE
20'-2"
11'-5"
8'-9"
3'-8"
C.L. 2000 KW. CIRCULATING PUMP
18'-3"
ELEVATOR
19'-10"
12'-7"
C.L. 1000 KW. CIRCULATING PUMP
C.L. TURBINE
C.L. PUMP
C.L. 1000 KW. CIRCULATING PUMP
C.L. PUMP
C.L. TURBINE
C.L. CIRCULATING PUMP
10'-3"
6'-6"
14'-5"
9'-3"
20"
7'-3"
7'-6"
6'-6"
12'-0"
C.L. Discharge Pipe El. 121.00
4'
5'
6'-6"
14'-5½"
4'-2"

PLAN OF CONDENSING APPARATUS PLACED IN OLD DRY WELL


"WIER" BOILER-FEED PUMPS
C.L. TURBINE UNIT
20'-2"
ELEVATOR
8'-1½"
Engine Room Floor El. 138.0
9'-0¼"
4'
14'
13'-1"
10'-4"
3'
5'
Basement Floor El. 124.0
31'
El. 121.0
18'-11"
17'
9'-8"
14'
7'-3"
7'-3"
8"
12"
7'-11"
C.L. CONDENSER
Bottom of Dry Well El. 107.0

VERTICAL SECTION OF CONDENSER PIT AND CIRCULATING WATER INTAKE AND DISCHARGE CHANNELS air washers, etc., will be installed in groups. This feature is illustrated in the drawing of the main and auxiliary steam piping, reproduced on page 1084. Incidentally this drawing shows how the engine room was blocked out in a general way with possible future extensions in mind, although as stated before specific plans for the future have not been made. A general plan was, however, considered desirable in connection with the installation of the first turbine so that the progressive steps should all form part of the final results with as little wastage as possible.

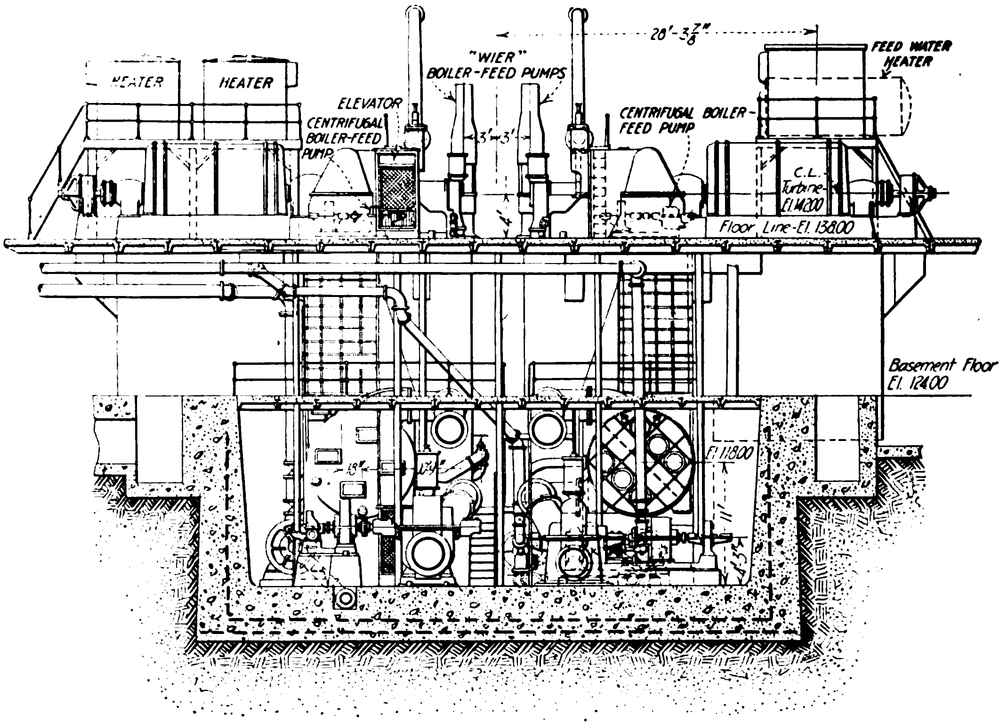
A number of drawings have been reproduced herewith to show the general layout of the turbine room and particularly of the auxiliaries. The turbine units are General Electric-Curtis machines producing three-phase power at the transmission voltage of 13,200. Thus no step-up transformers are required in connection with them. The water rate of the turbines at full load is approximately 12¼ lb. per kilowatt-hour when supplied with steam at 190 lb. per square inch pressure and 150 deg. Fahr. superheat. The foundation pier underneath the turbine end bearing is 31 ft. long and that underneath the generator is 14 ft. long. The latter has the usual form of a hollow box. The turbine pier is in the shape of a channel and is so designed that it could be united with a similar pier under the second turbine which will be adjacent, thereby also forming a hollow pier. However, the present foundation has proved so satisfactory that this provision for uniting with the other pier will not be made use of. Particular attention is directed to the arrangement for circulating the air from the turbines to the furnaces. In the turbine room plan, page 1084, is seen an air intake chamber which draws air from outdoors at a point about 8 ft. above the ground-floor level. The air passes through the turbine and is discharged into the boiler room basement behind the boiler foundations. This arrangement effectually muffles the noise and at the same time supplies warm air to the stoker blowers.

SAVING ONE-HALF THE POWER IN CIRCULATING THE CONDENSING WATER

A study of the cross-section on this page will show an unusually deep location of the condensers. They are so located for the purpose of saving power in circulating the condensing water. The St. Lawrence River at Hochelaga has had a flood height of 123 ft. elevation and an extreme low level of 92.35 ft. elevation, a difference of nearly 31 ft. This accounts for the depth of the dry well originally constructed in the engine room to accommodate the circulating pumps for the barometric condensers of the reciprocating engines.

The principal problem met by the engineers in connection with the installation of the present and immediately prospective turbines was to make use of this dry well for the new condensing equipment so as to secure siphon circulation at all stages of the river. To have placed the condensing equipment in the engine room basement, as in the ordinary arrangement, would have entailed an extra pumping head of 20 ft., and would have required 250 hp. per condenser for pumping instead of 125 hp. and an annual cost for extra steam alone of at least $6000 based on operating one-half the time.

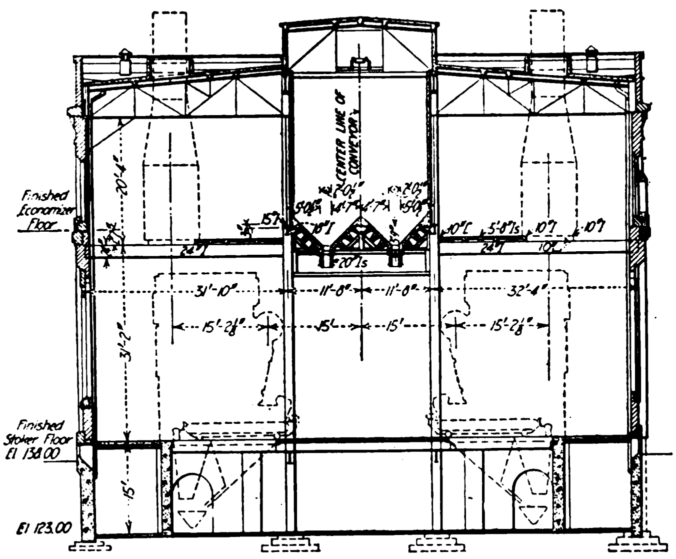
By the arrangement shown in the drawing, it was possible to obtain siphon circulation at a maximum pumping head of 22 ft. under the most unfavorable conditions, which would occur at extreme low water when two turbine units are taking circulating water through the existing intake and discharge conduits. This required the placing of the condenser nozzles 14 ft. below the turbine exhaust, with a cast-iron connecting trunk between, and the construction of a somewhat unusual foundation for the turbo-generator. It also required constructing a new discharge well just outside the old dry well and running a new discharge conduit at a lower level under the street to connect with the original conduit at its lower level.



VERTICAL SECTION OF CONDENSER PIT SHOWING TRUNKS FROM TURBINE EXHAUST AND REINFORCEMENT OF DRY WELL FLOOR

The entire weight of this exhaust trunk and the condensers, and part of the circulating piping with the contained water, is carried on four sets of springs under the condenser feet. The details of this arrangement were carefully worked out for all conditions to avoid undue thrust on the turbines. This feature was cared for by the condenser manufacturer who supplied the springs and the jacking plates.

The total range of motion of the above-mentioned supported weight may be ½ in. As the piping connected



DIAGRAMMATIC CROSS SECTION OF BOILER HOUSE WITH DIMENSIONS OF PRINCIPAL FEATURES

to the condenser is subjected to the same motion, the main circulating pumps are provided with multi-corrugated copper expansion joints. The smaller piping for air and condensate is designed to be sufficiently flexible by the use of bands.

Before we leave the subject of the dry well it may be noted that the pier which carries the weight of the turbine end of the unit rests on the dry-well floor. To distribute the load of this pier over the floor of the original dry well a heavily reinforced-concrete mat was installed in the bottom of the dry well covering the entire area below the condensers.

The surface condenser used with the first unit, together with the necessary auxiliaries, is of Alberger make. A C. H. Wheeler condenser will be used with the second unit. These condensers and their auxiliaries are of standard types. In connection with them tanks are provided to supplement the feed water heaters to avoid overflow and loss of condensate. These tanks are so piped that the ordinary source of makeup is from the warm water discharged from the turbine bearings and oil cooler.

NOVEL COMBINATION OF EQUIPMENT IN BOILER PLANT

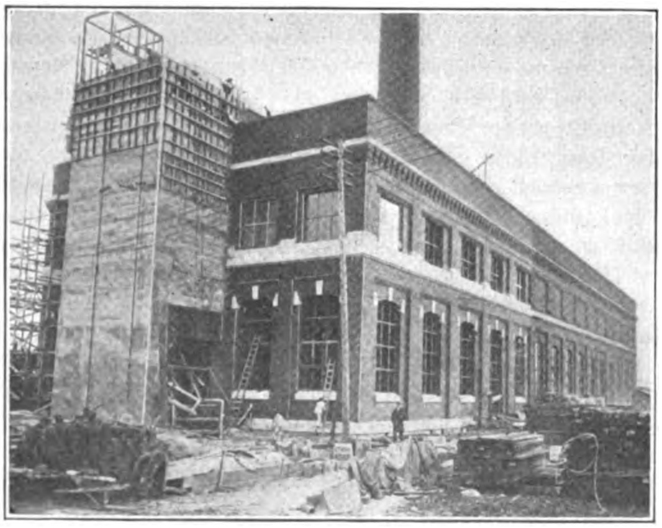
The particular combination of draft apparatus, economizers and stokers installed at Hochelaga is said to be the second of this particular type on the continent. It embraces a combination of the low-ejector type stack, steel tube economizers and chain grate stokers of relatively large grate area set in a furnace embracing the entire base of the boiler, that is, the full tube length and breadth. To provide for the increase in boiler capacity made necessary by the installation of the turbine units four 1100-hp. Babcock & Wilcox marine-type boilers were installed, and equipped with superheaters, economizers and ejector drafts, as just mentioned, the drafts being furnished by motor-operated fans. Still further to increase the boiler house capacity, the output of the older boilers is being increased by the addition of induced-draft fans, underfeed stokers replacing the present chain grates, etc. By these improvements the steaming capacity of the old boilers will be at least doubled, and better use will be made of the economizers which accompany them.

By extending the boiler house to its ultimate size and later adding another stack, and particularly by the removal of the chain grate stokers from the old boilers, ample steaming capacity will be available eventually to handle the peak load of 50,000 kw.

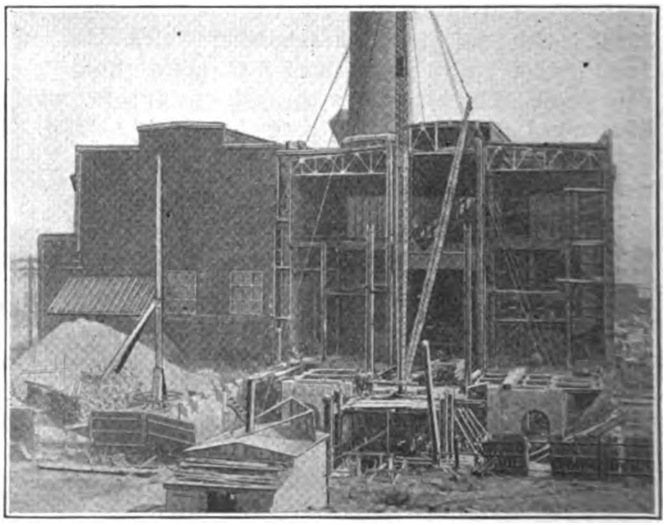
The rating of the new boilers corresponds closely to the maximum rating now commonly used in connection with turbo-generators and electrical apparatus. The rating of the unit corresponds to 1080 boiler horsepower on the Centennial rating. The heating surface of the boiler alone is about 5620 sq.ft. Disregarding the economizer this corresponds to 1.9 times the ordinary full-load rating of a boiler. For coal of 13,500 B.t.u. and 70 per cent combined efficiency of grate, boiler and economizer, the rate of combustion is 17 lb. per square foot of grate surface at the rating of the unit.

BOTH MOTORS AND TURBINES ARE USED FOR AUXILIARY DRIVE

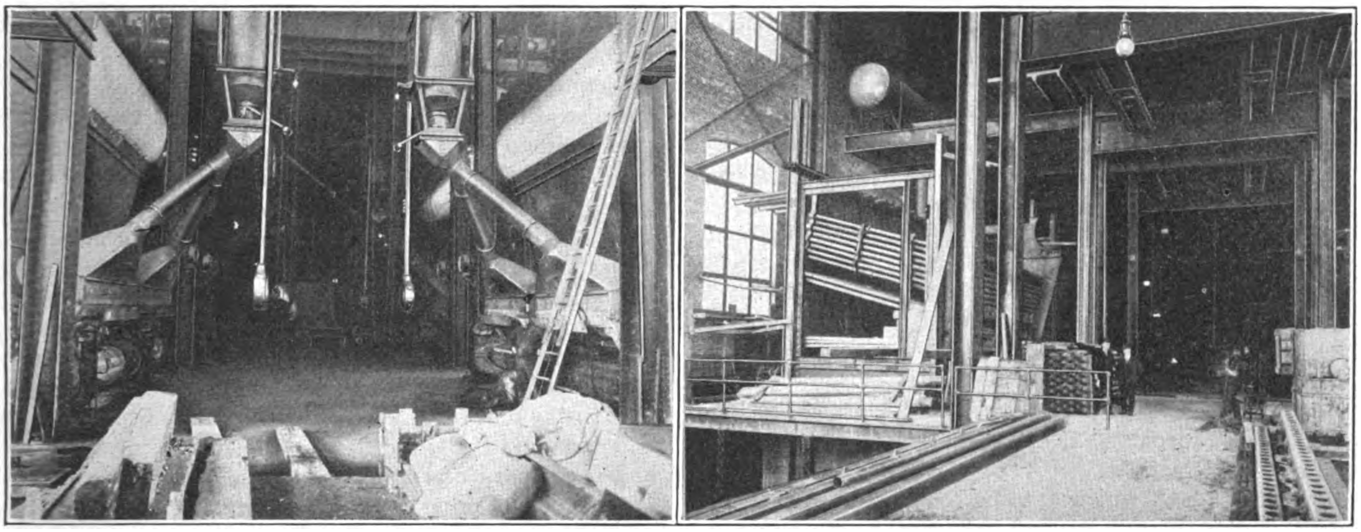
To make good use of the economizers forming a part of the boiler units in supplying the first turbo-generator, it was important to restrict the amount of auxiliary steam. On the other hand it was desired to provide enough steam even in winter to maintain a feed tem-



PROGRESS PICTURE SHOWING EXTENSION OF POWER PLANT BUILDING



PROGRESS PICTURE SHOWING THE SEVERAL SECTIONS OF THE BOILER HOUSE



CONSTRUCTION VIEWS IN THE BOILER HOUSE SELECTED TO SHOW, AT THE LEFT, EQUIPMENT FOR FURNACE COAL SUPPLY, AND AT THE RIGHT THE STRUCTURAL STEEL FRAMING

perature well above the point at which injurious sweating would occur on the steel economizer tubes.

To meet these requirements both motor and turbine drives were used for auxiliaries. Some adjustment was provided to accommodate the summer and winter requirements, as well as variable load on the entire unit, by piping the exhaust from the turbine which drives the combined air and condensate pumps so that it may discharge to the open heater or into an intermediate stage of the main turbine.

CONTROL APPARATUS WAS PLANNED FOR THE FUTURE

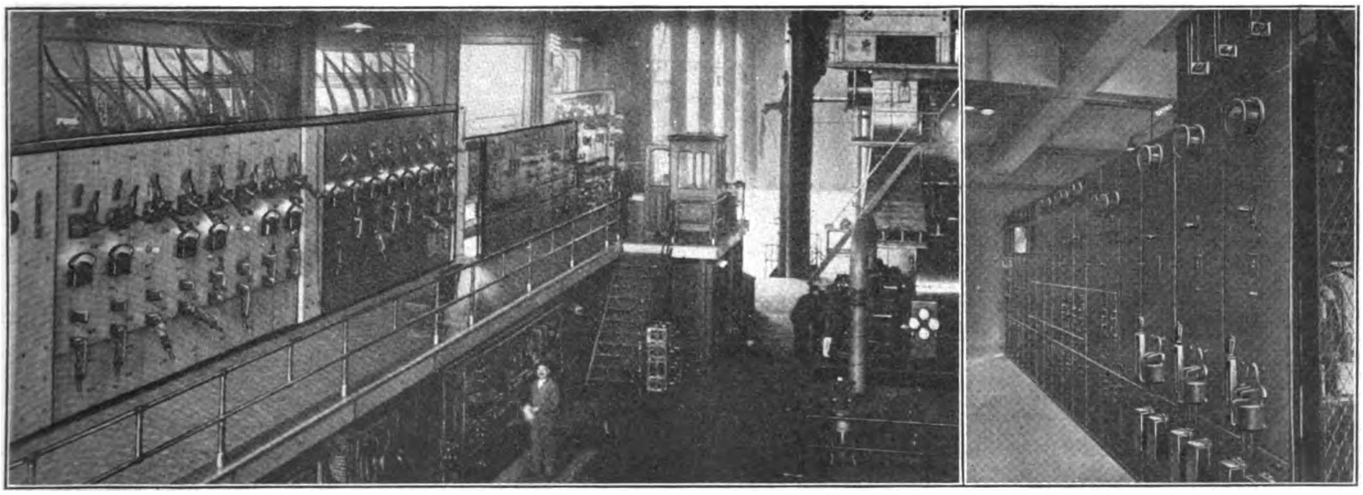
The arrangement of the switchboard gallery in the Hochelaga plant before remodeling lent itself admirably to the addition of the alternating-current switching apparatus. The new arrangement can be seen in the turbine room plan on page 1084 and in the photographs on this page. For the circuit control General Electric motor-operated H6 switches were installed, and the usual modern arrangement of brick bus chambers, disconnecting gear, Tirrill regulators, etc., were provided. An Edison storage battery furnishes power for the remote-control power supply.

The main control panel was placed on the gallery opposite the operator's desk, while the switch gear was easily accommodated under the gallery. The direct-current feeder panels, seen in the photograph but not in the drawing which was reproduced to show only the improvements, were left undisturbed in their position on the gallery. The 600-volt d.c. busbars were formerly in the basement, but by a very simple rearrangement of floor levels they were placed above the switchboard thus minimizing the amount of copper required and getting the bars out of the way. In view of the possible ultimately large development of the plant oil switches of unusually large rupturing capacity were selected.

The turbine room contains a 2000-kw. steam turbine which has heretofore been used in connection with a rotary converter. Its voltage is but 2300 so that, to enable it to supply power to the high-tension system, it has been necessary to install a transformer to raise the voltage from 2300 to 13,200. A 3000-kw. unit is used for this purpose.

Power leaves the plant over No. 0000 three-conductor, round-conductor cable, with ¼-in. insulation, and ¼-in. paper jackets. This cable has a capacity to carry 4000 kva., which is the capacity of two substation units. This cable was fabricated by the Northern Electric Company, and in connection with it cable potheads of Standard Underground Cable Company's make are employed.

In concluding this series of articles on the power situation at Montreal it may be well to reiterate the



AT LEFT, SWITCHBOARD GALLERY WITH CONTROL PANELS IN THE BACKGROUND. AT RIGHT, ALTERNATING-CURRENT PANELS UNDER GALLERY earlier statement that this work has been carried out in accordance with a comprehensive plan. Much of the transmission system has been placed underground in conduit of the best possible construction, attractive substations have been built with architecture designed to render them harmonious with their surroundings, provision has been made to utilize to the fullest possible extent the water power of the neighborhood, and finally the Hochelaga steam plant has been put into shape to furnish reserve power at the minimum possible cost.

All of this work has been carried out under the immediate supervision of W. F. Graves, chief engineer Montreal Tramways, with the collaboration of K. B. Thornton, consulting engineer, and the construction engineering department of the General Electric company. The installation of the second turbine in the Hochelaga plant, which is to be completed this summer, will practically finish the work contemplated for the present. It will round out the program which has been in progress for several years.

Rates and Wages Discussed at Iowa Convention

Iowa Association Holds Two-Day Meeting—Joint Meeting with N. E. L. A. on May 31—Officers Elected

THE Iowa Electric Railway Association held its annual convention at the Hotel Chamberlain, Des Moines, on May 31. There was no printed program and no definite papers were scheduled. The morning session took more the form of a round table discussion with interest entered on the topics of labor conditions and rates. The general opinion of the men assembled was that the only solution to the interurban railway problems was for the government to consider these roads as "affiliated railroads" with the steam lines, grant them the same passenger and freight rate increases and give them a proper amount of business but not take over their active operation.

During the discussion on wages, the representative of one property stated that men coming into the employ of his company signed an agreement not to join a union but that a few weeks ago the employees had become unionized. He mentioned that he had seen an article in a recent issue of the ELECTRIC RAILWAY JOURNAL stating that the Nashville Railway & Light Company, Nashville, Tenn., had been granted an injunction by the court to prevent its employees from unionizing and that his company was investigating to see what it could do in this respect.

During the discussion on fares it was proposed that rates should depend upon the amount of riding done by any particular patron, *e.g.*, that the basic rate should be 10 cents per ride for visitors and occasional riders, with, say, five rides for 25 cents for regular patrons and residents. The idea did not apparently receive favor, as it did not bring forth discussion.

RATE INCREASES

The afternoon session was held in unison with the Iowa Section, N. E. L. A., holding its convention at the some hotel on May 31 and June 1. The topic was a discussion of rate increases, led by F. A. Warfield, rate specialist Illinois Traction System, Peoria, Ill. Mr. Warfield spoke at length on four points, *i.e.*, the national aspect of the present conditions under which utilities are operating, the peril of the situation to the utilities, the extent to which the local communities shared a rate increase equally with the utility and the fact that present conditions are a test of commission regulation. Mr. Warfield believes that valuation should be dispensed with at this time in the consideration of fare increases.

Speaking of the Illinois Traction System, some of the points brought out in the discussion were that increases had been requested for electric, gas, heating and railway service in every town in which this company operates, that in the matter of emergency increases every request had been granted in full with the matter of valuation and appraisal waived, but that to obtain permanent increases, valuation and appraisal had been requested with a financial report covering the past five years. A 6-cent fare has been granted in these towns and is being sought in two others, while the company is considering asking for an 8-cent fare on one property. Increase requests are based on a percentage depending upon the service requirements of the town, a 7 per cent return being held necessary on the investment over and above 4½ per cent for depreciation. Upon being questioned, Mr. Warfield unhesitatingly stated that his company much preferred the commission regulation of Illinois to the municipal regulation of Iowa.

OFFICERS ELECTED

Following the joint session the following officers of the Iowa Electric Railway Association were elected: President, C. E. Fahrney, general manager Ottumwa Railway & Light Company; vice-president, F. J. Hanlon, general manager, Mason City & Clear Lake Railroad, Mason City; secretary and treasurer, H. E. Weeks, secretary Tri-City Railway & Light Company, Davenport.

Don't Help the Kaiser

THE Northern Ohio Traction & Light Company, Akron, Ohio, has recently been using a series of sixteen patriotic safety posters as part of a city safety campaign. The safety director of the city asked the company to help secure better observance of the traffic laws. Through the civic committee the company procured prints of accident drawings and E. Burt Fenton, publicity agent of the company, wrote the text.

It was generally agreed that all of the publicity matter should have a patriotic tinge. Accordingly such slogans as the following were used on the cards:

"It cost Uncle Sam his [the pedestrian's] services for a long time and helped the Kaiser that much. Don't gamble with your life!"

"While he was laid up he was aiding the Kaiser. Be your own traffic cop."

"The Kaiser welcomes all these little accidents as a first aid to autocracy. Why play his game?"

"The Kaiser was pleased when they all went to the hospital—except those the undertaker got. Avoid close shaves."

The cards were placed in the street cars of Akron and most of the interurban cars running into the city. A little later the same series will be used in Canton and Massillon.

Federal Government Can Raise Utility Rates*

Under Welfare Clause of Constitution, Washington Has Paramount Power to Regulate Local Utilities Because of Their National Essentiality Under War Conditions — Banks Should Not Shirk Duty of Financing Utilities

By P. H. GADSDEN
Resident Washington Member American Electric Railway Association War Board

THE whole war program for which the industries of the country are now mobilizing is predicated on continuous and, in most cases, increased service from the public utilities. This fact has just begun to be recognized by the general public.

The electric, gas and transportation utilities must be relied upon absolutely to furnish:

1. The increased demand for power, heat and light.
2. At least 20 per cent of the toluol necessary for the prosecution of the war.
3. An important short-haul freight service to relieve the congested steam railroad conditions at terminals and industrial centers, together with more transportation facilities for the new army of workers engaged in the industrial cities being established by reason of war demands. More than 80 per cent of factory employees are now being transported daily by street and interurban railways.

NATIONAL USE MEANS NATIONAL REGULATION

The fact that the operations of any industry under the exigencies of war have become essential to the nation's welfare immediately impresses upon that industry a national character and justifies the federal government in exercising the federal power to regulate and control. To state it differently, the power of the federal government over an industry in time of war rests not upon the fact that such industry may or may not be engaged in interstate commerce, but upon the more comprehensive basis that such industry, under the demands of war, has become necessary to the nation's welfare. When such a situation has been created, the power of the federal government, certainly during the period of the war and for a reasonable time thereafter, is paramount to that of the state.

In pursuance of these general principles, we have seen the government progressively fix the prices of wheat, milk, sugar, etc., through the Food Administration; of anthracite and bituminous coal, and coke, through the Fuel Administration; and of pig iron, aluminum, steel, cement, lumber, hides and leather, and a large number of other basic articles, through the price-fixing committee of the War Industries Board. Within the last few days a Textile Administrator has been appointed, with large powers over the entire textile industry of the country.

Prior to the war the federal government did not possess the power to regulate the prices of these articles. How then has it been derived? From the increasing necessities of the situation. As each article in turn becomes more and more necessary to the nation's welfare and more and more intimately connected with the prosecution of the war, it comes within the sphere of federal control and becomes impressed with such a national character as to justify the national government in regulating and controling it.

I am not at this time making a plea for government control of public utilities. Personally, I think that such action on the part of the government should only be taken as a last resort after all other measures of relief have first been tried. I am seeking to direct attention to the fact that the power exists both to fix rates and to control the operation of public utilities.

We have seen both powers exercised by the government in recent months. In the case of coal, copper, sugar, aluminum, tinplate, etc., the necessities of the situation have up to this time been satisfactorily met by fixing the price. On the other hand, in the case of the railroads, we have the most striking illustration of the inadequacy of the regulation by price fixing. When it became apparent that the regulation heretofore exercised by the government did not meet the situation, the government unhesitatingly took the next step deemed necessary fully to meet the needs of the war program.

While so far as I know there is no disposition on the part of the Administration at this time either to take control of utilities or to regulate their rates, I think there is a growing recognition of the fact that the power to do so exists under the Constitution. If in the future conduct of the war the interests of the nation should make either course of action necessary, I do not believe there will be any hesitation on the part of the government to act. Whether such action should be taken by the government will, and should, depend solely upon the needs of the nation as they develop from day to day in the prosecution of the war. The necessity will create the authority to act.

NATION-WIDE MOVEMENT FOR HIGHER RATES

The recognition by the President and the Secretary of the Treasury of the intimate relation of the gas, electric railway, and electric light and power industry to the whole war program, with the establishment to their satisfaction that the operations of these utilities are essential to the nation's welfare in time of war, has encouraged a nation-wide movement for increased rates. The United States has been divided into eight districts, and in each district a regional committee has been appointed to present to the public service commission in each state the critical condition of public utilities, the essential nature of their functions to the whole war program and the imperative necessity for increased rates from a national viewpoint.

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*Abstract of address delivered in New York on June 6 before joint meeting of American Gas Institute and National Commercial Gas Association, called for purposes of amalgamating these associations into the American Gas Association.

Such representations have already been made before commissions in a number of states, and there has been a gratifying response on the part of some of the commissions. In non-commission states, committees have been appointed to present the situation to the governors and to the state Councils of Defense, Chambers of Commerce and municipal bodies. Here, too, the efforts have met with a considerable measure of success.

The results, while encouraging, are not sufficiently general to afford the relief required. There is no doubt that many companies will fail to secure the necessary increases of rates unless the national government is willing to come more directly and practically to their relief. In his letter to Secretary McAdoo, the President, evidently anticipating just such a situation, said:

"I shall be glad to have you communicate with the local authorities whenever the information in your possession suggests that such a course is desirable and in the national interests."

We are still in hopes that the action not only suggested but authorized by the President will be put into execution. If the wishes of the President can be brought directly and officially to the attention and consideration of the regulatory bodies of this country, there will no doubt be prompt and cheerful response on their part.

In this connection, it is interesting to note the attitude of cities as to rates of municipally owned and operated utilities. It has not been practicable to secure a complete list of all increases in such rates, but records show that more than seventy municipal plants have already made substantial increases.

BANKS HAVE FINANCING DUTY TO PERFORM

Utilities have for months been looking forward to the organization of the War Finance Corporation to afford relief in financing maturing obligations, and in securing new capital required to make enlargements and additions made necessary by the war program. It was confidently expected that public utilities as a class would be recognized as coming under Section 9 of the act and be treated as an "exceptional case," and that the directors would feel authorized to make direct loans to them.

We have been greatly disappointed over the construction placed upon this section of the act. The directors in a statement on May 28 set out the policy and the purpose of the act as construed by them. [ELECTRIC RAILWAY JOURNAL, June 1, page 1069.] This means that little, if any, aid can be expected by direct loans, and that public utilities must seek advances from the banks to take care of their maturities.

There is an impression in Washington that public utilities have not exhausted their efforts through the ordinary banking channels. The board is by no means satisfied that the necessary accommodations cannot be secured from the banks. It is incumbent upon utilities, therefore, to make every effort to induce the banks to co-operate with the government in assisting companies to protect maturing obligations, and, in turn, getting assistance from the War Finance Corporation under Section 7 of the act. In this connection the banks of the country have a plain duty to perform which they cannot afford to shirk and which in proper and meritorious cases they will not be allowed to escape.

Should it prove to be impracticable to obtain the necessary relief from the banks under Section 7, and it is further established that a *bona fide* effort has been made by the public utilities along those lines, then consideration will have to be given by the banks, the companies and the government to such amendments of the act as will afford the relief which the act was intended to provide and which the necessities of the situation absolutely demand.

LESSONS TO BE DRAWN FROM THE PRESENT SITUATION

1. The present system of rate regulation has broken down. It was admittedly designed to regulate rates downward, and it is not adapted to granting prompt relief to meet violent changes in operating costs. Under conditions which existed before the war, the costs of labor and material were looked upon as a constant factor, and the only variable factor recognized was the capital employed. No provision was made for unusual variations in the prices of labor and material. After the war we should strive for and insist upon some system of rates more quickly responsive to conditions—some system which, under definitely fixed conditions, will work automatically.

2. We must, as far as possible, retain the community of interest which has been brought about by the war. We must recognize that the fixing of rates for a given company in a particular state is a matter common to all public-utility interests in that state and should not be left to be handled alone by the industry affected.

3. We must preserve the national aspect and character which is now so generally recognized. After the war, our efforts should be directed to impressing upon the public mind that we are just as essential to the social, economic and industrial life of the community in peace as in war, and that the maintenance of public service facilities in a high state of efficiency is a necessary part of the preparedness of the nation, not only for war hereafter should it come, but also for the great industrial strife certain to come when this war is over.

Guarantee versus Regulation

Mr. Mortimer Discusses Massachusetts Plan—Would Not Be Surprised if Federal Government Took Over Power Systems

STATE ownership or guarantee of the integrity of public utility investments must come if the properties are to continue to grow and meet the needs of the communities served. This is the opinion expressed by J. D. Mortimer, president North American Company, following a decision by the Wisconsin Railroad Commission granting an increase in fare to 5 cents for the subsidiary city lines in Milwaukee but failing to grant relief for the suburban lines. A summary of this decision is published in the news section this week.

COMMISSIONS ARE WORKING THEMSELVES OUT OF JOBS

Mr. Mortimer is quoted as follows:

"The more I see of regulation, the more convinced I am that the commissions are rapidly working themselves out of their jobs. Regulation seems to satisfy the politicians as long as the tendency of rates is downward, but regulation apparently becomes entirely unsatisfactory to these same people when regulation of rates is upward. For the purposes of political dis-

(*Continued on page 1093*)

Service-at-Cost Offered to all Massachusetts Electric Railways

Legislature Enacts Measures Providing for Public Control of Bay State Street Railway and State Directors of Other Roads Accepting Service-at-Cost Plan—Membership of Public Service Commission Reduced from Five to Three

FOLLOWING close upon the passage of the Boston Elevated Railway public control act, accepted by the stockholders on June 3, the Massachusetts Legislature enacted two measures of great importance to the other electric roads of the state and established a basis for service-at-cost operation throughout the commonwealth. A special act (Chap. 188) provides for the public control of the Bay State Street Railway, and another new law (Chap. 280) offers all other electric lines in the state an opportunity to accept state supervision combined with service-at-cost, but without the same full management by representatives of the public which is provided in the Boston Elevated and Bay State cases.

BAY STATE PUBLIC CONTROL ACT

The Bay State public control bill provides for the organization of a new company to acquire the property of the present company at a judicial sale or otherwise, provided the plan is approved by vote of a majority of the directors and two-thirds of its stock. The new company is to be managed by five trustees appointed by the Governor and approved by the Executive Council. The trustees and their successors are to control the road for ten years, and each is to receive an annual salary of $5,000. To pay for the property of the Bay State company, the new company may issue securities, but they shall not amount in the aggregate to more than the investment value of the property, as given in the decision of the Massachusetts Public Service Commission dated Aug. 31, 1916, nor shall they represent an annual interest and dividend charge (common stock dividends being computed at the rate of 6 per cent) in excess of 6 per cent upon $40,282,340, plus such amounts as may be determined by the commission to have been additions or improvements since the above date. The commission is to make further adjustments of the rate base which will represent present values on a 6 per cent basis of all rentals on account of street railway property leased by the company and included in the above computation. The value of any property sold or otherwise disposed of by the receiver prior to the organization of the new company is also to be deducted by the commission.

The new company is authorized to issue serial mortgage bonds not to exceed $5,000,000 at any one time outstanding, payable in instalments within ten years. Amounts deducted from earnings otherwise applicable to dividends and applied to the redemption of serial bond instalments are to be capitalized in the form of common capital stock of the new company issued at par and distributed to stockholders to the extent that the stockholders do not receive such dividends in cash. Such shares are to take the place of serial bonds. The new

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(*Concluded from page 1092*)

cussion, it is unwise for an office holder to admit that public utilities are subject to the same economic laws as the grocery store, the coal yard or the manufacturing plant; that is, that the selling price of the product should increase with the cost of production.

"Inability to procure promptly increased rates made it necessary for the State of Massachusetts to assume responsibility for the operation of the Boston Elevated Railway, and the same causes resulted in the receivership of the Bay State Street Railway and the formulation of legislation providing for its reorganization and the guarantee of returns by the State. Regulation is undergoing the same experience in other states. I agree with Mayor Hoan [of Milwaukee] that the present condition is decidedly unsatisfactory, but my remedy is different from his in that I advocate state ownership rather than municipal ownership.

FEDERAL GOVERNMENT MAY TAKE OVER POWER PLANTS

"It would not be surprising if the federal government took over first the control and later the ownership and operation of the central electric power systems in all the States. Many power companies are interstate in character, and the tendency is toward complete interconnection of power supply and transmission systems. Electric power is now used so generally for motive-power purposes that it is one of the industries most essential in the conduct of war. Its control by the federal government is probable, particularly in view of the coming electrification of steam railroads.

"In order to permit state ownership of electric railways and gas companies, a constitutional amendment would be required; that is, an amendment that would permit the state to pledge its credit to procure the money necessary to acquire such utilities and to provide for their expansion.

NOT OPTIMISTIC ABOUT SUBURBAN LINES

"I am not very optimistic about our ability to continue to operate the suburban lines with the present rates of fare. The increases in operating expenses have been such as to leave a deficit in earnings on these lines without providing any interest on the $1,500,000 which we have there planted. I am afraid that the plans upon which I was working in an attempt to continue the operation of these lines are not likely to mature.

"We are calling the attention of the public to the essential facts so that they will be able to judge and express their opinion as to whether they want the lines continued in operation."

company cannot acquire the Bay State company until the trustees are satisfied that provision has been made for the paying in of $1,000,000 in cash by the holders of shares of the new company for rehabilitation of lines or other corporate purposes and for the immediate issue of serial bonds to the amount of $2,500,000. From the proceeds of such sale $500,000 is to be set aside as a reserve fund and $2,000,000 is set aside to be expended by the trustees in additions, improvements or in the payment of receivers' certificates or notes for such purposes. Serial bonds to the additional amount of $1,500,000 may be sold in the discretion of the trustees.

FINANCIAL AID OF STATE PROVIDED

If the earnings of the new company otherwise applicable to dividends are not sufficient to redeem the instalments of the serial bonds, not exceeding $4,000,000, as they mature, the trustees will make up the deficiency out of funds received from the State Treasurer, who is required to purchase from the trustees an amount of serial bonds equal to the deficiency. The bonds so purchased are to be held for the benefit of the municipalities contributing to their purchase price. In case the treasurer of the state is called upon to purchase any serial bonds, the amount is to be contributed by cities and towns in which the new company operates. Pending such purchase by the State Treasurer of serial bonds, the trustees may borrow the money necessary to enable them to pay maturing instalments of serial bonds. The amount due for contributions by cities and towns for the purchase of serial bonds is to be added to the state tax next thereafter assessed upon the municipality, and the municipalities are authorized to borrow beyond their statutory debt limit to meet the assessment, provided the money is borrowed upon terms which will permit repayment on or before the maturity of the serial bonds.

The trustees have the right to fix fares, regulate transfers, determine the character of service and its extent, and in general operate the property after the manner of the usual board of directors, and without being subject in these respects to the Public Service Commission or any other state board. Provision is made for public hearings by the trustees, or by one trustee, in cases of service complaint. No contracts for the construction, acquisition, rental or operation of any additional lines or for the extension, sale or lease of existing lines can be entered into without the consent of the board of directors, unless, after such consent has been refused, the Public Service Commission determines that public necessity and convenience require such a contract and that the return on outstanding securities will not be impaired. In case of such determination the directors have the right of appeal to the Supreme Court of Massachusetts.

FLEXIBLE FARES PROVIDED

The trustees must fix such fares as in their judgment will provide sufficient income to meet the cost of service, which is to include proper maintenance and all other operating expenses, taxes, rentals, interest on bonds, serial bonds and other interest payments and stated dividends on the preferred stock and 6 per cent on the common stock of the new company, such allowances for depreciation, obsolescence, rehabilitation, losses in respect to property sold, destroyed or abandoned as they may deem adequate or as may be required by the Public Service Commission, and all other lawful charges against income or surplus. They must also after a public hearing from time to time adopt and publish a schedule of at least four different grades of fare of which at least two shall be above and two below the schedule then in effect. The lines of the company north and south of Boston are to constitute two fare districts. The aggregate of the items entering into the cost of service of the new company is to be allocated by the trustees between the two districts for the purpose of estimating the basis for rates and fares. After notice and hearing the trustees are to make such further division of the two districts into smaller fare districts as they may deem reasonable and such further allocation of the aggregate of the items among the smaller districts as will in the trustees' judgment fairly distribute the aggregate so as to avoid as far as is consistent with the public interest and reasonably practicable the inclusion of such items in the computation of service cost in any fare district as may properly be laid upon territory outside of such a district. The trustees may from time to time after notice and hearing revise any such fare districts.

Any city or town by majority vote may from time to time for the purpose of preventing increases in fares or of reducing fares or of avoiding discontinuance or reduction of service enter into an agreement with the trustees in accordance with which the city or town is authorized to contribute, during the period of the war and for two years thereafter, to the cost of service any part or all of the increase in the cost of operation due to increased wages or the cost of supplies or coal, in excess of the average cost for the year ended July 1, 1914, as determined and apportioned by the trustees, provided that the contribution of a city shall not in any one year exceed the sum of 50 cents per $1,000 of the preceding year's assessed valuation and that such contribution of a town shall not exceed $1 per $1,000 valuation. If part only of the municipalities in any fare district contribute to cost of operation in this way, the trustees may make such fare adjustments as appear equitable.

USE OF THE RESERVE FUND

The reserve fund is to be used for the purpose only of making good any temporary deficiency in income pending an increase of fares, and until such use may be invested at the discretion of the trustees. Excess income above the cost of service is to be added to the reserve fund.

If, at the end of March or any other quarter year, the amount of the reserve fund shall exceed by 50 per cent or more the amount originally established, plus such increases as may be made under the act, and during the preceding three months the income shall have exceeded the cost of service, the trustees are required, within thirty days, to put into effect a lower schedule of rates, and vice versa. The rates are to be decreased or increased quarterly as the amount of the reserve fund is above or below these limits. If in the discretion of the trustees it shall become advisable to increase the reserve fund at any time the trustees are authorized to do so by the sale of securities, and the trustees are authorized, subject to the approval of the Public Service Commission, for the purpose of preventing undue increases of fares during the period of abnormal prices caused by the present war, to postpone making amortization charges and charges against earnings to cover depreciation until such period not exceeding one year after the termination of the war as they may fix.

After the expiration of the ten-year period of management and operation by the trustees the company is to have all the powers and restrictions of a street railway organized under the general laws and it must be willing to sell to the state or any political subdivision thereof at any time during the period of public control its entire property. The new company during the period of the war and for two years thereafter is not to be required except with the express approval of the Public Service Commission after a hearing to pay any part of the expense of the construction, alteration, maintenance or repair of any highway, street or bridge or structure maintained upon it, or of the abolition of any grade crossing or removal of surface wires to underground locations, although the usual cost of street opening for company work is to be met by the company.

No shares or securities of the new company are to be held by the Massachusetts Electric Companies or similar voluntary association for more than four months after the transfer of the Bay State property and franchises to the new company. The Supreme Court is to have jurisdiction in equity to review and modify or enforce order or rulings of the trustees.

SERVICE-AT-COST BY OTHER COMPANIES

The general service-at-cost bill as enacted is available to all electric railways in the State, except the Boston Elevated and the Bay State companies. Cost of service includes: operating expenses, taxes, rentals, interest on all indebtedness, dividends on preferred stock, 6 per cent interest on the stock investment as determined by the Public Service Commission, and such allowance for depreciation and obsolescence as may be fixed from time to time in the case of each company by the commission, and all other expenses and charges which, under the I. C. C. classification of accounts and under the laws of the State, are properly chargeable against income or surplus. "Capital investment" is defined as the amount of cash or fair value of the property paid for in securities and properly expended for capital purposes, such amount to be determined by the commission; but if the commission has approved the security issues, no further determination in regard to capital investment is necessary.

No company may accept this Act until it has provided a reserve fund of not less than 6 per cent or more than 12 per cent of the gross earnings of the preceding year, except as otherwise provided. This fund may be provided by the issue of securities. The reserve fund must at all times be segregated and used only for making up a deficiency of income, when the income of the company is insufficient to pay the cost of the service. The reserve fund may be invested in United States, Massachusetts State or municipal bonds. The reserve fund must be fully subscribed for upon acceptance of the act by the company concerned but must be paid in not more than two years, as directed by the commission. Any company may furnish a larger reserve fund with the approval of the commission.

Any company desiring to accept the Act (Chap. 280, 1918 Legislature) is required, at the time of its application to the commission, to determine the amount of its stock investment, to apply to the commission also to determine the status of its then unfunded debt. The commission thereupon is required to disallow any amount which, in its opinion, was improperly incurred. Interest charges upon the debt so disallowed are to be borne by the company and charged to the amount which would otherwise be available as a return upon the stock investment. Interest charges upon the residue of the unfunded debt are to be included in the cost of the service.

When the income is less than the cost of service, the reserve fund is to be used to make up the deficiency, and if the cost of service is less than the income, the excess automatically becomes a part of the reserve fund.

Any company accepting the Act must file, with its acceptance, a schedule of nine different rates of fare and of transfer privileges. One such grade is designated as the initial grade which it desires to establish and which will, in its opinion, enable it to earn an income sufficient to meet the cost of servce. Four other grades are to provide for progressive increases and four for progrssive decreases in revenue, and each interval of increase or decrease must be calculated to increase or decrease the revenue by 30 per cent of the normal reserve fund. Within thirty days thereafter and after notice and public hearing, the commission must either approve of the schedule so filed or establish a schedule similarly designed, in place of it; but if during any period of sixty days, more than one company files its acceptance of the act and a schedule of proposed rates of fare, the commission is not required to approve or establish the grades of fare for any such company until thirty days after the Board shall have passed upon all such schedules, previously filed in accordance with this section. Whenever by reason of any change in the existing rate of fare, there are less than four grades above or below the rate of fare in force, the company must file with the board a schedule of added grades of fare, so that there will always be both above and below the existing rate of fare not less than four grades, and the commission must within sixty days either approve of the schedule so filed or itself establish a substitute for the necessary additional grades of fare.

If at any time it is in the interest of either the public or the company that the schedule shall be changed, either with regard to the method or the basis upon which fares and transfers are established, or because the steps between the different grades are too small or too great, or for any other reason, the company, with the approval of the commission, may change the schedule. Except as thus provided, the commission is given power to modify such a schedule only after it has been in effect for a period of one year, provided, however, that no modification of the schedule which diminishes the rate of return on the stock investment may be continued for more than four months.

If on March 31 or any other corresponding quarter termination, the amount of the reserve fund is less than 70 per cent of the normal reserve fund, and during the preceding twelve months the income has been less than the cost of the service, the company is required, within thirty days, to put into effect the next higher grade of fare, and the fare is required to be decreased or increased if the amount is greater or less than these limits as of such quarterly dates. The company, with the consent of the commission, may put into effect the next higher or lower grade of fare at any time when the reserve fund is less or greater than the normal amount.

The company is required to provide an improvement fund of an amount required by the commission but not exceeding 5 per cent of the capital investment. This fund may be raised by the issue of securities. It must be fully subscribed within sixty days after the determination of the capital investment of the company and is to be paid in from time to time as required by a plan of gradual improvement to be submitted to and approved by the commission. Any company accepting this act becomes bound, by its acceptance, to sell its entire property and franchise as a going concern to the State or any municipality therein, for an amount equal to the stock investment, plus the preferred stock, the purchaser assuming the bonds, contracts, leases, and all other outstanding liabilities of the company. The provisions of the act do not affect the right of the State or municipality to acquire, by right of eminent domain, the property and franchises of any company accepting the act.

The governor, with the consent of the council, is required to appoint for a term of three years, three persons to be members of the board of directors of any company which accepts the act, of whom at least two shall be residents of a municipality served by the company, and none shall be an owner of its securities. Meetings of the directors must take place at least monthly, and in case such a board has an executive committee or finance committee, at least one member is to be one of the governor's appointees.

The commission must be furnished, monthly, with such statements as are required, including the condition of the reserve fund, the income and expenses of the present month, etc. The State is to be divided by the commission into street railway districts, and for each district within which one or more companies has accepted the act, the commission is to appoint one or more resident supervisors for terms of three years, their salaries and expense allowances to be fixed by the commission and paid by the company as an operating expense; or, if their duties extend to more than one company, apportioned among the several companies, as the commission may determine. It is to be the duty of the supervisors to keep in constant touch with the operation of the companies and to inform the commission of all complaints of the service. In case any special investigation is deemed necessary by the commission, it may order such an investigation at the company's expense. The commission may require such changes in the management or operation of any company which accepts the act as, in its opinion, may be necessary for the efficient conduct of the business of the company in the interests of the public. Any foreign company furnishing electric light or power to any street railway operating under the act must file annually with the Gas and Electric Light Commission a schedule of all rates charged to its customers for power, when the electricity is furnished by a central plant to others than the railway company, and with such other information in such form as the Gas Commission may require. That commission is authorized to prohibit the transmission of electrical energy for either light or power, unless such information is filed as requested and the prices charged therefor are determined to be fair and reasonable by the Public Service Commission.

A majority stock vote is required for the acceptance of the act by any company. The Public Service Commission may permit any company to begin to operate under the act if it has met all other requirements except as to the determination of its capital investment, but no dividends on any common stock are to be declared until the commission has determined the capital investment. The commission may order the company to dispose of any property no longer of service to the company. Any loss thus incurred may be distributed over a period of not more than ten years. During the war, and for one year thereafter, the commission may authorize any company to set aside for depreciation a smaller amount than would be adequate in normal times.

If a majority of the State directors of a company believe that the order or decision of the commission would impair the ability of the company, to pay 6 per cent on the stock investment, they must seek reconsideration, with final appeal to the Supreme Court of Massachusetts, which may appoint three commissioners to consider the facts and questions at issue, and whose decision shall be final.

PUBLIC SERVICE ACT ALSO CHANGED

By another Act (Chap. 283) the Public Service Commission is hereafter to consist of three members. The terms of the commissioners are ultimately to be three years each, and any commissioner may hold hearings in the name of the full board. The present board goes out of office July 1 and the Governor is required to appoint three members, two of which are to be members of the present board, to take office at that time.

Arkansas Utilities Hold Meeting and Adopt New Association Name

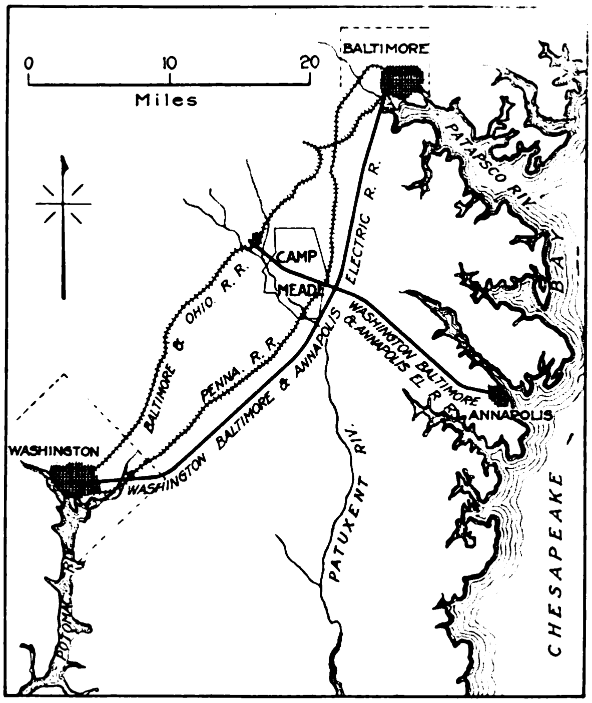
PATRIOTISM was the underlying theme of the eleventh annual convention of the Arkansas Association of Public Utility Operators at Hot Springs, Ark., on May 21, 22 and 23. Ringing addresses were delivered by the State Food Administrator, representatives of the fuel administration and State distribution of thrift stamps and by the Mayor of Hot Springs. S. E. Dillon, manager of the Hot Springs utilities, presided as president of the association. Among the technical papers considered those which attracted the most interest related to rate increases. The probability of Arkansas having a public utilities commission was also discussed. D. C. Green, vice-president and general manager Fort Smith Light & Traction Company, was elected president of the association for the ensuing year.

A shorter name, the Arkansas Public Utilities Association, was adopted.

How an Electric Railway Serves a Cantonment

The Washington, Baltimore & Annapolis Electric Railroad Supplied the Land Upon Which Camp Meade Is Built and Is Now Caring for a Traffic Which Often Amounts to 17,000 Passengers a Day Each Way

IN 1838 the Annapolis & Elkridge Railroad was built between Annapolis and Annapolis Junction, and was one of the first railroads constructed in the United States. It was taken over by the Annapolis, Washington & Baltimore Railroad, and a little more than a decade ago the latter railroad was purchased by the Washington, Baltimore & Annapolis Electric Railroad, which constructed the line between Baltimore and Washington and electrified and rebuilt the old line between Annapolis and Annapolis Junction. The new company sprang into immediate popularity, and in addition to the large general and business travel between three such important centers as Washington, Baltimore and Annapolis, it has always enjoyed a large business from government officials and employees connected with the great government institutions in Washington and Annapolis.



MAP SHOWING CAMP MEADE AND RAILROADS WHICH SERVE IT

Shortly after the United States entered the war, the management pointed out to the committee appointed to select camp sites for the training of the proposed National Army the desirability of a site on its line at Admiral for one of the proposed camps, at the same time furnishing the committee with full descriptions of the physical qualities of the land, facilities for water and other properties of the tract in which the committee was interested. The committee evincing interest in the site, the management of the railroad secured leases from the owners of the property and upon its acceptance by the government, the railroad sublet the entire tract to the United States government.

At that time there was only a single-track line between Annapolis Junction and Naval Academy Junction, the line passing through the camp site, and that was laid with 56-lb. rail. The first thing to do was to provide freight facilities by which the materials required for the construction of the camp could be taken to the site. The Pennsylvania and Baltimore & Ohio Railroads also needed access to the camp for freight, and the easiest way by which it could be supplied was by the use from Annapolis Junction and Naval Academy Junction of the electric road's right-of-way. An accompanying diagram shows the trackage and terminal system of the W., B. & A., the Pennsylvania and the B. & O. in Camp Meade.

Active construction at Camp Meade was not begun until July 1, 1917, and by Sept. 2, 8500 carloads of material had been hauled into camp, besides the material required to change the original single-track 66-lb. rail along the Washington, Baltimore & Annapolis Railway to a double track laid with 85-lb. rails and to build a double-track line for the Pennsylvania and one for the Baltimore & Ohio Railroad with the sidings shown on the map. The Baltimore & Ohio line from Annapolis Junction to the camp was begun about July 20 and completed Sept. 15.

During this time, of course, a large number of men were required in the construction of the camp. Some of them lived at the camp, but from 2500 to 3000 men preferred to commute daily on the electric line. About 70 per cent of these lived in Baltimore, 20 per cent in Washington and 10 per cent in Annapolis. On Sept. 19, the electric line hauled into camp 25,000 troops, and this number has been growing until now the camp houses about 41,000 men. The government is now planning to increase the camp in size about 50 per cent.

TRAVEL TO AND FROM CAMP IS CONSTANT

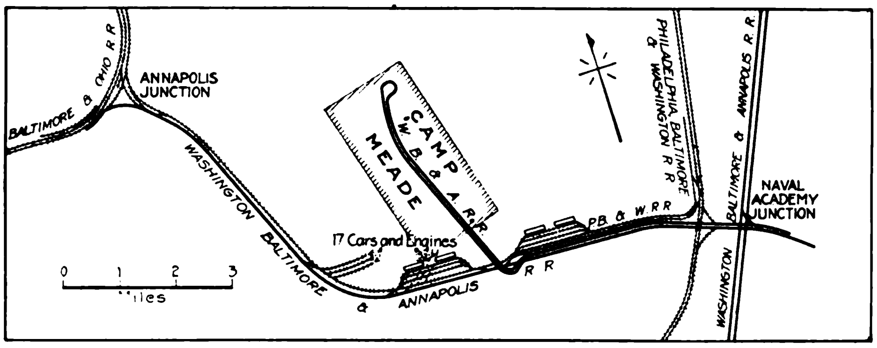
At present the company is hauling to and from Camp Meade daily about 700 laborers, besides a large number of visitors. The peak of this load comes on Saturdays and Sundays when it has been the practice to admit visitors to the camp and also to give about half of the men in training twelve or twenty-four hours' leave. The travel into the camp amounts to about 17,000 persons on these days from Baltimore, and some 6000 from Washington and Annapolis. This is in addition to the travel of the soldiers themselves, which is of course in the other direction, and is about the same magnitude. The accompanying table gives the mileage and fares charged between Baltimore, Washington and Camp Meade, the fares in Washington including a transfer to the local system of the Washington Railway & Electric Company.

To haul this traffic the company soon found that its

	Distance in Miles	One-Way Fare	Round Trip Fare
Baltimore—Washington	40.54	$0.85	$1.50
Baltimore—Camp Meade	16.56	.45	.80
Washington—Camp Meade	25.98	.50	.90

former single-car schedule was inadequate. Consequently it purchased last year eight modern high-speed electric locomotives built by the Westinghouse Electric & Manufacturing Company and fifty-four modernly equipped trail cars.

This enables the company to run during the week an hourly schedule to the camp of trains with four or five cars. On Saturdays and Sundays this headway is cut in half.

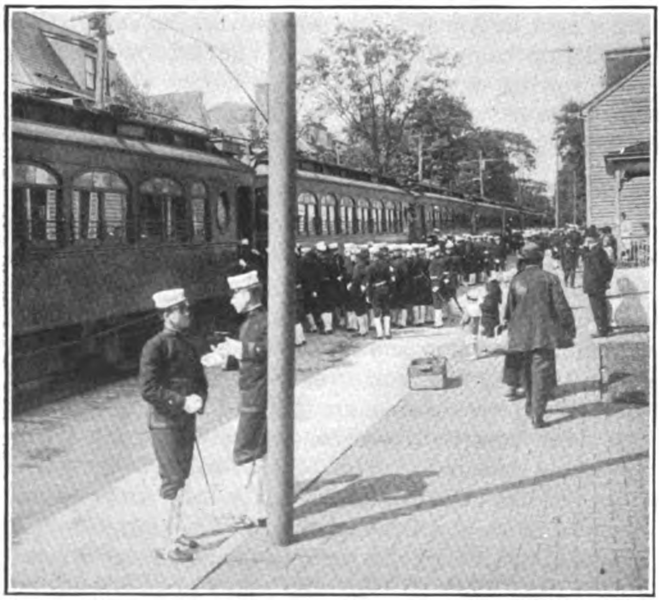


ELECTRIC RAILWAY LOOP AND OTHER RAILROAD CONNECTIONS AT CAMP MEADE

To care for the frequent traffic the company has equipped its entire line from Baltimore to Camp Meade with block signals, supplied by the Union Switch & Signal Company, and has installed a $10,000 interlocking system, built by the General Railway Signal Company, at Naval Academy Junction.

The company has also constructed two large and commodious stations. The principal one, known as Loop Station, is located half-way between this civic center and Admiral, Md.

The belief that the government will continue the occupation of Camp Meade after the war has led to other extensive building plans. One of these is at its repair shops, where the company has constructed an addition of brick and concrete, covering 241 ft. x 46 ft., at a cost of $45,000. Another important improvement under way is an extensive freight and passenger station in Baltimore. This building will occupy the greater part of the block bounded by Lombard, Eutaw, Pratt and Howard Streets and will have a floor area of 15,600 sq.ft. and a passenger track capacity of twenty-three cars.



CADETS AT ANNAPOLIS BOARDING SIX-CAR ELECTRIC TRAIN

The Washington, Baltimore & Annapolis Electric Railroad not only supplies all the passenger transportation but it also furnishes all of the electric energy for lighting and power purposes at Camp Meade. This demand, with the fact that Congress last year authorized additions to the Naval Academy building at Annapolis to cost $3,500,000 and to provide for an increase in attendance at the Academy of 1000 naval students, with a contract which the company has received to furnish electric energy necessary to operate a large radio station which the United States is planning to erect near Annapolis, has induced the company greatly to extend its power equipment. The primary power for the operation of its cars, outside the city of Baltimore, is purchased from the Potomac Electric Power Company of Washington, but the transmission and substation equipment is owned by the railway company.

During the last year the company has enlarged its substation at Scott Street, Baltimore, by the addition of two 500-kw. rotaries, its Naval Academy Junction substation by the addition of one 750-kw. rotary, and Bennings substation by the addition of three 800-kw. transformers.

Watch Inspection by Pacific Electric

Records indicate that more than 2000 watches were inspected on the Pacific Electric Railway, Los Angeles, Cal., in 1917, all of which had to be maintained at standard. At least once every quarter, every employee in train service submits his watch to one of the twenty-six authorized inspectors who subjects it to a critical examination as to its mechanical condition which must be such as to insure a close rating and not to vary in excess of thirty seconds in one week. Twice a month he must have it compared with a standard clock by an authorized inspector and every fifteen months it must be cleaned and oiled.

As tangible evidence of the fact that the employee's watch has passed inspection and conforms to the company requirements, Webb C. Ball, general time inspector, has worked out a plan whereby the employee carries a card certificate on which, besides the facts concerning the make, grade, number of jewels, etc., are also entered the dates of every comparison with standard regulator; without these credentials an employee cannot continue in service.

The Twin City Rapid Transit Company, Minneapolis, Minn., last spring agreed to plow every available foot of ground on its lines, between St. Paul and Stillwater, St. Paul and White Bear and St. Paul and Mahtomedi, turning the ground over to the men operating the cars. In addition the company will haul the crops to the city for the gardeners.

Three Cents a Mile for Interurbans

War Board Urges Filing of New Tariffs to Raise Rates to Steam Railroad Figure or at Least Maintain Former Parity—Federal Railroad Administration Favors Immediate Action and Will Support Companies

WITHIN a short time electric interurban railways in the United States will probably increase their passenger and freight rates to correspond with the rates ordered by Director-General McAdoo for steam railroads. This means a raise of passenger rates to 3 cents a mile and an increase of 25 per cent in freight rates, or at least such an increase as will maintain the previous differential between electric and steam rates.

The national scope of the movement can be judged from the facts that the Electric Railway War Board is urging interurbans to file applications for the higher rates and that the United States Railroad Administration desires the electric lines to secure new rates effective simultaneously with the steam railroad increases and will support efforts to this end. City electric railways will not be affected, but it is expected that most interurbans will file new tariffs at the earliest possible date. Several companies have already arranged to do so. The War Board feels that local authorities should respond without delay where relief is needed.

RATE PROBLEM HAS BEEN HARD FOR INTERURBANS

The earnings of the interurban electric railways in the United States are derived chiefly from passenger traffic, generally more than 80 per cent and often more than 90 per cent coming from this source. As is well known, however, the passenger rates on the high-speed interurban lines as a rule are the same as those of the steam railroads, which in many states are restricted by law to 2 cents a mile. What this has meant to interurbans can be judged from the following survey of the recently existing situation.

Since in Ohio and Indiana the 2-cent fare laws did not apply to the interurban lines, the Public Service Commissions, recognizing the urgent need of immediate relief, recently permitted certain interurban companies to increase their fares to 2½ cents a mile. The results of this action, however, were disappointing because the steam lines competing between the same points offered the statutory and smaller fare of 2 cents a mile. As a result a material part of the interurban traffic, which is almost entirely intrastate in character, went to the steam lines. It was evident, therefore, that the interurban companies could not secure the necessary additions to their revenues through higher fares unless the fares of the steam railroads were increased at the same time.

The statutory rate of 2 cents per mile in various states had been fixed at a time when operating costs were far less than now. It was manifest that if such rates were justified when made, they were insufficient now. Indeed, the Interstate Commerce Commission recognized this fact, and it approved as fair and reasonable a steam railroad rate for interstate traffic of 2½ cents a mile.

But an anomalous situation was thereby created. The fares paid by two passengers riding in the same seat on the same steam railroad train might be 2 cents per mile for one and 2½ cents per mile for the other, depending on whether the passenger was making an intrastate or an interstate journey. Such a difference in rates for identical service caused constant evasion of the law, it being common practice for interstate passengers to pay their fares in instalments at intrastate rates so as to avoid the through interstate rates.

By reason of the facts stated, it had become a matter of vital consequence to the interurban companies that the intrastate steam railroad rates be raised to the level of the interstate rates. With that done, the interurban companies would have a chance to meet the emergency confronting them. Otherwise they would have none.

REAL EMERGENCY CONFRONTS INTERURBANS

As to the reality of the emergency confronting the interurban electric railways of the country, there can be no doubt. Their expenses have increased in recent years to a greater extent than their gross revenues. The margin of safety was extremely small in almost every case even before the United States entered the war, and since that time it has rapidly approached or passed the danger point.

With the view, however, of ascertaining the exact situation of the interurbans, the War Board recently sent out to a large and representative list a blank for a five-year income statement and also the first quarters

COMPARATIVE INCOME STATEMENT OF 127 INTERURBAN ELECTRIC RAILWAYS

Items	1917	1913	Increase
Passenger revenue	$183,925,488	$152,923,648	$31,001,840
Express revenue	1,911,044	1,644,071	266,973
Milk revenue	587,252	514,920	72,332
Freight revenue	12,715,270	7,386,879	5,328,391
Other transportation revenue	1,682,726	1,672,673	10,053
Total revenue from transportation	$200,821,780	$164,142,191	$36,679,589
Revenue from other railway operations	6,925,543	5,229,628	1,695,915
Railway operating revenues	$207,747,323	$169,371,819	$38,375,504
Way and structures	$20,376,854	$15,423,315	$4,953,539
Equipment	16,901,711	11,976,814	4,924,897
Power	29,598,661	57,881,906	27,681,698
Conducting transportation	55,694,943		
Traffic	963,376	970,496	*7,120
General and miscellaneous	20,616,173	15,433,900	5,182,273
Transportation for investment	124,073	124,037	....
Railway operating expenses	$144,297,645	$101,686,431	$42,611,214
Net revenue from railway operations	$ 63,449,678	$ 67,685,388	* $4,235,710
Auxiliary operations—revenues	$ 15,589,699	....	....
Auxiliary operations—expenses	8,849,333	....	....
Net revenue from auxiliary operations	$ 6,740,366	....	$ 6,740,366
Taxes assignable to railway operations	$ 13,417,547	$ 10,343,626	$ 3,073,921
Operating income	$ 56,742,497	$ 57,341,762	*$ 599,265
Non-operating income	10,082,693	8,969,002	1,113,691
Gross income	$ 66,825,190	$ 66,210,764	$ 514,426
Deductions from gross income	57,009,010	45,082,768	11,926,252
Income balance	$ 9,816,180	$ 21,228,006	*$11,411,826

*Decrease.

of 1917 and 1918, and a blank for fuel costs, traffic statistics and financial data. Part of the collated data resulting from this research are reproduced herewith.

The statement on page 1099 for 127 interurbans, for example, shows that between 1913 and 1917 the passenger revenue gained $31,001,840, but the railway operating expenses increased $42,611,214. Taxes rose $3,073,921, and income deductions $11,926,252, with the result that the net income fell from $21,228,006 in 1913 to $9,816,100 in 1917, a loss of $11,411,826.

An examination of the returns of twelve important companies for the years 1913 and 1917 and for the first three months of 1917 and 1918 showed even more startling results. The net income was $4,111,000 in the year ended June 30, 1913, and only $656,000 in the year 1917, notwithstanding the fact that the railway operating revenues in 1917 were $4,000,000 greater than in 1913.

In the three months ended March 31, 1917, the net income was $318,000, but in the three months ended March 31, 1918, the charges exceeded the available income by $533,000. In other words, the income statement for the first quarter was more than $850,000 worse in 1918 than in 1917. Even if the operating results for the last nine months of 1918 are no worse than those of the last nine months of 1917, the twelve roads will show a deficit of $215,244 on the year's operation, as compared with a net income of $656,699 in 1917.

RAILROAD ADMINISTRATION DESIRES HIGHER INTERURBAN RATES

When Director-General McAdoo on May 25 promulgated General Order No. 27, increasing the wages of steam railroad employees, and General Order No. 28, fixing higher passenger rates, effective on June 10, and higher freight rates, effective on June 25, the War Board forwarded copies of these to the interurban lines, together with orders of the Interstate Commerce Commission authorizing new joint rates between administration carriers and others not under federal control.

The War Board also sent a letter explaining its opinion regarding interurban increases. The most striking part of the communication was at the beginning, where the board directed the attention of electric carriers to the following facts:

> The United States Railroad Administration desires that electric railways take immediate steps to bring their rates to a parity with the new government rates and to make their new rates effective simultaneously therewith, and it will support your effort with the state public utility commissions to make this possible.

The War Board then went on say that it had discussed these questions with a number of men prominent in the industry and, as a result of the statistics which it had been gathering, was fully advised as to the straitened conditions in which most of the electric lines find themselves at this time. It remarked that General Order No. 27, increasing the wages of steam railroad employees, had completely unsettled the labor conditions on electric lines and would result in further shrinkage in their net income.

NO CUT-THROAT COMPETITION SHOULD BE STARTED

Continuing, the War Board said:

> Increased revenues and financial relief must be provided immediately if the industry is to survive. By adopting the new government rates, electric railways will not only insure an immediate increase in their revenues but by competing with the government-controlled roads on an equal footing they must win such recognition from the Railroad Administration as will result in co-operation, instead of competition, to the mutual advantage of both classes of roads.
>
> To attempt to attract business from steam railroads controlled by the government by maintaining lower rates and in turn seeking relief from the government, both financial and otherwise, is not consistent, and we believe unwise. Each will then have alloted to it that class of business which it is suited to serve with the greatest advantage to the community and to itself, and neither will be required to render any service without adequate compensation.
>
> There is more than enough business for all, and when once a proper understanding and relationship have been established between steam and electric roads, there will no longer be an excuse or an incentive for a road to take on, at a loss, a class of business for the handling of which it is not suited merely to keep it away from another road which is equipped to handle it with profit.
>
> The whole-hearted co-operation of electric lines with the steam roads will give the government a new and broader conception of the functions and value of the former, not only as an indispensable element in the daily life and convenience of the communities which they serve but also as an invaluable aid to the nation in its herculean efforts to meet the present war crisis. When the government has come to a true realization of their real value, the financial needs of electric railways should be provided for as promptly and as fully as the steam road requirements are now being cared for.
>
> For all of these reasons, you are strongly urged to file an application with the proper state and federal authorities for the right to increase your rates, both passenger and freight, to bring them up to the new steam railroad rates or at least by such amount as will retain the present parity between your rates and the steam railroad rates.
>
> The local and state authorities should respond without delay in cases where relief is needed because of changed conditions, as it is clear that the soundness and efficiency of electric railways is intimately connected with a vigorous and successful prosecution of the war.

COMPILATION OF NEW RATES UNDER WAY

With the foregoing letter E. C. Faber, manager of the War Board, also enclosed a draft of a petition adaptable for presentation to any commission. The leading clause of this reads:

> In addition to authority already in hand for increasing joint fares applying from points on the line of your petitioner to destinations on the lines of Administration carriers, it is desired also to advance fares between points on the lines of your petitioner proportionate to those established for the carriers under the control of the Administration, namely, to a minimum rate of —— cents per mile. Unless this permission is accorded, the fares of the Administration carriers between points competitive with your petitioner will be prejudicially effected by reason of the fares of your petitioner being constructed on a much lower relative basis, the rate per mile for the schedule of charges now effective being——.

The War Board is now sending out to interurbans a data sheet showing the steam railroad passenger rates now in effect between points on the interurban line and the new rates effective on June 10, and also the present interurban rates between the same points. Another column is provided for new interurban rates, from which data will be collated in regard to the movement for higher interurban rates throughout the country.

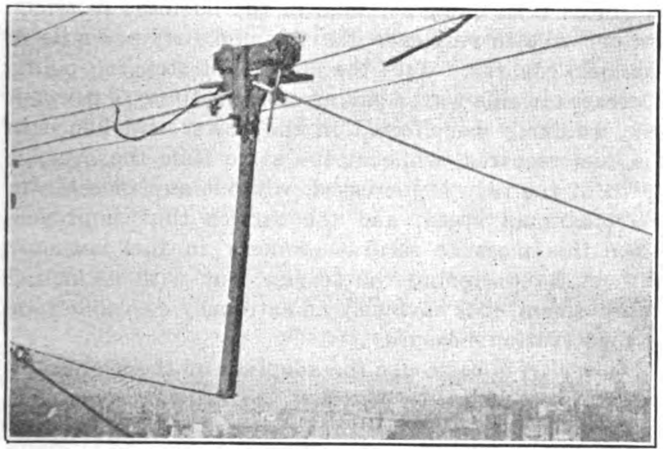
Interurban electric railways in Ohio, Indiana, Kentucky and Illinois have taken steps to apply for increases in both the passenger and the freight rates. The company in general feel that the passenger rate should be 3 cents a mile and that an addition of 25 per cent should be made to the freight tariffs. On some of the electric lines passenger rates do not average 2 cents a mile, and in no case does the average reach 2½ cents a mile, although some have been allowed to increase their rates since the war began.

Cutting Loose Insulation from Overhead Lines

An Inexpensive Tool Used With Good Results as an Aerial Insulation Cutter by the Denver Tramway Company

By O. P. Morse
Superintendent of Overhead and Bonding

After experiencing considerable trouble on our 13,000-volt high-tension line during wet weather we made some tests and found that loose insulation was responsible for the trouble. At points where loose ends of insulation lay across one or more wires, a small amount of moisture on the insulation carries enough current to cause a short-circuit. Investigation showed that practically one-third of our 27 miles of line had loose insulation of this character, although this wire had been in service only ten years.


INSULATION CUTTER IN OPERATION ON THE OVERHEAD LINES OF THE DENVER TRAMWAY

As this wire was all installed on 50-ft. poles or higher, the removal of this loose insulation became somewhat of a problem. Otherwise it would have been necessary to renew the wire, a very expensive procedure at this time.

After several unsuccessful efforts to remove the loose ends by burning with a blow torch which was made to travel underneath the wires we made up the small tool shown in the accompanying illustration. This has proved very satisfactory.

The insulation cutters consist of two old hacksaw blades each 1 in. wide by 3 in. long, sharpened and fastened to a wooden block. These blades were made to form a V with the outer ends ¾ in. apart. The block to which they are fastened has a rounded groove for guiding the insulation into the cutter. Two wooden wheels serve to support this and provide the means for running it along the wire. This is done by linemen on each pole pulling it in either direction by means of ropes fastened to the end of the tool. At some points loose insulation was found which kept very close to the wire, being loose at the center and supported at the ends. To cut this insulation loose the cutter was provided with a vertical arm 3½ ft. long. A rope was attached to the bottom of this arm and, by pulling, the tool was tipped slightly so as to raise the cutter up against the wire and cut the insulation loose.

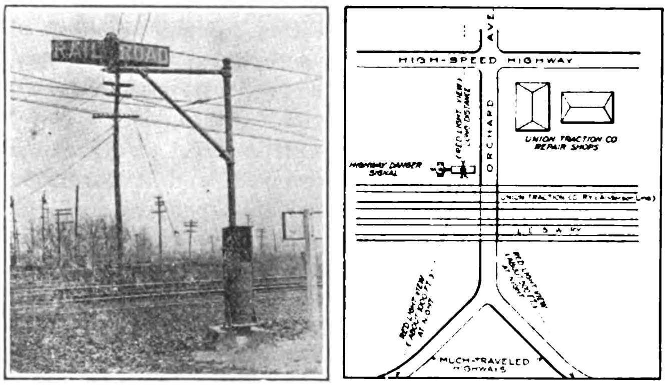
In regular operation it was found that six wires could be cleaned off between poles in twenty minutes, and a crew of two linemen and a foreman were able to clean up all our lines in twelve days. We now intend to have the line overhauled once about every three months. This work should not take more than one or two days.

The cost of this tool was only $5 and it will last indefinitely.

Winking Highway Signal Protects Dangerous Crossing on Union Traction Company's Tracks

The Union Traction Company of Indiana has recently made a trial installation of a flashing highway danger signal. This is located just outside the city of Indianapolis at the point where Orchard Avenue crosses the Anderson line. This crossing is particularly dangerous to highway traffic due to the presence of a fork in the roads at that point, making it impossible for automobilists or other drivers to see ahead for any great distance. The very considerable travel on this highway makes it necessary to have an effective signal at this point.

Accompanying illustrations show the layout of roads and tracks at this point and a view of the signal as installed. The flashing signal used is made by the A G A Railway Light & Signal Company, Elizabeth, N. J. In this signal the light is produced from acetylene and the operating mechanism automatically governs the flow of gas in such a way as to make it intermittent. A small pilot light burning continuously ignites this efflux of gas and produces the flash or winking effect. This arrangement is economical of gas. The distinctive characteristic of this light is that it suddenly bursts out and is as suddenly eclipsed. The automatic extinguishing and relighting of the main flame insures attention that would not be possible with a steady burning light or one that grows and fades. The light flashes through a red lens in the center of the lamp and at the same time illuminates the lettering on the lamp box as shown in the illustration.


RAILROAD
HIGH-SPEED HIGHWAY
ORCHARD AVE.
UNION TRACTION CO REPAIR SHOPS
HIGHWAY DANGER SIGNAL
(RED LIGHT VIEW LONG DISTANCE)
UNION TRACTION CO. RY. (Anderson Line)
L. E. & W. RY.
RED LIGHT VIEW (ABOUT 800 FT.) AT NIGHT
RED LIGHT VIEW (ABOUT 800 FT.) AT NIGHT
MUCH-TRAVELED HIGHWAYS
LOCATION OF SIGNAL AT ORCHARD AVENUE CROSSING NEAR INDIANAPOLIS, IND., AND VIEW OF SIGNAL INSTALLED ON LINE OF THE UNION TRACTION COMPANY OF INDIANA

The signal as installed is supported by a wrought-iron pipe mast through which the gas pipe is conducted to the burner. The gas container is a 12-in. x 36-in. tank mounted at the base of the structure. It has capacity for sufficient acetylene gas to operate the signal for 300 days without recharging. While the signal as installed on the lines of the Union Traction Company flashes constantly, it can be connected with the track circuit so that the danger signal will be given only as a train approaches the crossing.

Skidding Test on Cast-Steel Wheels

By Howard W. Quinn
Acting Superintendent of Car Repairs, Bay State Railway, Boston, Mass.

SOMETIME ago the writer conducted a skidding test on Davis (American Steel Foundries) one-wear, cast-steel, manganese-tread wheels. It was desired to determine to what extent a skid of very unusual length would flatten these wheels and to that end a stretch of level, tangent track 110 ft. in length was prepared for the test and was divided into three parts parts, as indicated in the accompanying sketch.

The first section, 30 ft. in length, had both rails greased with heavy oil; the next 30 ft. section had both rails greased and sanded, and the remaining 50 ft. section had both rails covered with dry sand. The test was made with a 30-ton, double-truck Brill "Easy Access" car with 33-in. wheels and consisted in starting the car and attaining an approximate speed of 35 m.p.h. at the moment of entering upon the 30-ft. greased section of track. An emergency application of the air brakes readily locked all eight wheels and they were permitted to skid until the car came to rest in the position indicated in the accompanying sketch, with the forward pair of wheels just clear of the farther end of the 50 ft. dry-sanded section. It will be observed that the forward pair of wheels skidded the full 80 ft. while the rear pair skidded some 25 ft. less or 55 ft. under the most severe conditions obtainable. Careful watch was kept by observers on the street to determine whether or not the wheels revolved, and it developed that the wheels remained fixed thus constraining the entire abrasive action to the eight points of contact with the rails, which points were prick-punched for identification before moving the car. A careful, visual examination of wheel treads disclosed a brightly polished eliptical spot of about $\frac{3}{8}$-in. major axis and $\frac{1}{4}$-in. minor axis, which could not be considered objectionable or render the wheels unsuitable for additional service. That the manganese treads are somewhat ductile was evidenced by the slight flowing of the steel to the trailing side of the contact elipse where it was deposited in a very thin ridge of about $\frac{1}{16}$ in. in height. After the test was completed the test car was again put back on the line, and the wheels rendered satisfactory daily service for fifteen months at which time they were removed as worn out. An accurate record of the additional mileage made was not kept, so it is impossible to state the exact amount of this, but it was high, and no evil results were experienced from the test.

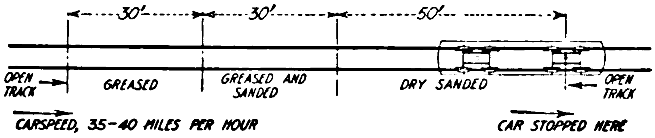


DIAGRAM OF TRACK USED IN WHEEL-SKIDDING TEST ON BAY STATE STREET RAILWAY

Estimated Savings in Skip Stops

Fuel Administrators Throughout the Country Are Seeking Co-operation of Public Service Commissions and Utility Companies to Conserve Fuel

IN AN article on war conservation of power and light in this week's issue of the *Electrical World*, Charles E. Stuart, chief of power and light division, United States Fuel Administration, discusses some of the economies of the skip stop which he refers to as one of the most promising methods by which economy in the use of fuel is being obtained. Continuing he says:

"With the present practice of having cars stop on signal at any street corner, there are usually from twelve to fourteen stopping points per mile. With the skip-stop system, properly applied, these are reduced to not more than eight per mile in the business districts, six per mile in residence districts and four per mile in the open country. With the number of stopping points decreased in this way, a saving of from 10 to 15 per cent can ordinarily be effected in the power and hence in the fuel required, while at the same time the average speed of the cars is increased, without any increase in the maximum speed, and the service thus improved. Since this measure secures economy in fuel not only without handicapping the service, but with an actual improvement, it is obviously an extremely desirable type of conservation measure.

"Our plan is to secure the adoption of the system by voluntary co-operation between the railway companies and the various municipal authorities or state commissions and to bring about this co-operation through the federal fuel administrators for the several states. These administrators are all men of influence in their communities, and so far we have found in every case that a request from the state administrator to the proper authorities was all that was necessary to secure permission for the introduction of the system as a conservation measure during the war. With permission thus provided for, the railway companies have all been glad to adopt the plan.

"Through our efforts, through the independent efforts of various local administrators or through the efforts of certain railway companies themselves, the skip-stop system has been adopted, or is about to be adopted, as a coal conservation measure in Detroit, Washington, Baltimore, Brooklyn, Cincinnati, Columbus, Dayton, Toledo, Indianapolis, Evanston and South Bend, Ind., Newark and the other cities of New Jersey, New Haven and all the other cities of Connecticut, and in Oakland, Berkeley and Alameda, Cal.

"The Connecticut Company has reported a saving in fuel of 10 per cent for its New Haven lines, and reports indicate saving in the other places at rates varying from 3600 tons per year in Columbus to 21,000 tons per year in Detroit.

"Various schemes for reducing car heating have been contemplated, but as yet no definite plans have been formulated."

The Fuel Administration is also devoting attention to the saving of power through the elimination of uneconomical isolated plants, better utilization of power and light in factories, development of water power and interconnection of power systems.

LETTERS TO THE EDITORS

Economy of Checking Devices for Motormen

ECONOMY ELECTRIC DEVICES CMPANY

CHICAGO, ILL., June 4, 1918.

To the Editors:

I have read the leading editorial in the June 1 issue with great interest, because it is a straight-from-the-shoulder statement of the situation. You make the point very forcibly that power is being wasted, and every manager of the numerous roads using energy-checking devices has, in substance, voiced your editorial. It is safe to say that almost without exception every such road will testify that irrespective of schedule refinements, the checking of the motormen through the use of a checking instrument will bring about at once substantial savings and will hold these savings.

As a rule it is not good form for the manufacturer to criticise his possible customers, but I have found the electric railways ready to admit just what is stated in your article and conclude their admissions with some qualifying statement, as, for example: "We know we could reduce our energy consumption 10 per cent, but the labor situation is so delicate at this time that checking devices could not be introduced on our property without a disturbance."

It has been our experience that no class of motormen is willfully wasteful, but unless the men are operating under some checking system they have no knowledge of their power efficiency so long as they keep from accidents and handle their cars on time. The trolley wire is there with an unlimited supply of power, so far as the handling of the controller and brakes on any one car is concerned. It is true men are taught the correct handling of controller and brakes when they are broken into service, but without some stimulus any individual will settle down to the easiest way of doing his duties. Even if the company kept no records of the readings, a device by which the men could check their own performance would undoubtedly be so used and would prove an inspiration to better performance. Actually the acceptance of the Economy meter by the car crews as a fair measure of their performance has been thoroughly discussed in labor conferences, and the checking of men in accordance with their power consumption has been approved by both parties to the conferences.

You mention that possibly one reason for the slowness of the electric railway industry in universally adopting car-checking devices is the lack of funds, and your statement is true that this cannot be finally considered as a real reason because the instruments can (and do) earn their cost before they are fully paid for. We have several examples of properties which have installed meters at a cost of from $50 to $60 per car. The annual carrying and operating charges have been around $20 a car, and the actual power saving has been around $100 per car per year—and this at the pre-war coal prices.

It is true that the introduction of a checking device calls for a new department or a sub-department; but if that department can support itself, pay off its capital charges and show a 25 per cent profit on the investment for the first year, it certainly should be worth prompt introduction. But the railroads want to be shown and in several instances we have equipped lines or parts of lines by carrying out tests or permitted the roads to carry on their own tests, with our instruments. And in no case has this failed to convince the management that savings in substantial amounts were easily possible. Because of these conditions we have offered a leased-payment plan by which, in a period of years at a fixed rental per day, the meter would become the property of the road.

L. E. GOULD, President.

What the Rail Rate Raise Means

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY,

MILWAUKEE, WIS., MAY 28, 1918.

To the Editors:

The $880,000,000 a year increase in railroad freight and passenger rates, ordered by Director-General McAdoo, comes in season to save several hundred thousand railroad employees from being too grossly underpaid in a time of high prices. They will get $300,000,000 a year of the $880,000,000, and most of this $300,000,000 will go to employees who for years before the war were grossly underpaid.

The rate increase comes too late to enable the railroads to increase their equipment sufficiently to meet the traffic needs of the nation at war. The other $58,000,000 a year will be used in this way, as rapidly as possible, but it will buy less than half as many cars, engines, etc., at present prices, as the same sum would have bought any time prior to 1915. The railroads have been eager to buy more cars and more engines and to increase their mileage and enlarge their terminals for years past, but they have been denied rates adequate to pay for these betterments.

The Interstate Commerce Commission and the state railroad and public service commissions are now seen to have failed of their duty in this respect. State and city attorneys, eager to "save the people" by suing to prevent badly-needed rate increases, have contributed to the failure of the Interstate and state rate commissions to provide for the maintenance and due expansion of the country's commercial public highways. State and city chambers of commerce and other business organizations, each seeking its own local or sectional advantage, have shortsightedly and in the final result disastrously thrown their influence against the granting of rates needed to enable the railroads, as a whole, to pay good wages, give ample good service, make necessary extensions of plant, and yield an assured fair return on investment.

The railroad companies cannot escape a large share of responsibility for the railroad system's progressive decline in total efficiency during the past twenty years. Their controllers while still in private management could have got what they needed, with public approval, had they merchandised their service, just as all other merchants do, by intelligently and persistently advertising its cost and value.

Operators, rate regulators, public attorneys, political shysters, honest but uninformed reformers and provincially selfish business organizations collectively brought the railroads to a point where the federal government had no alternative but to take them over and operate them with the backing of public credit, in order to make them, so far as possible, satisfy the requirements of the nation at war.

It appears from the newspaper reports that some of the state commissions are "stunned" by this invasion of their field by the federal government. The effect of Director-General McAdoo's order is to take control of railroad rates away from the state commissions for as long as the federal government shall operate the roads. It may be added that the state commissions are likely to be "stunned" a second time, in the same way, if they do not with necessary promptness grant the rate relief essential to maintain the credit and the efficiency of the street railways, gas and electric services and other public utilities still under their control. The same factors that made the steam railroads incompetent to meet the public's requirements during peace and utterly incapable of satisfying the nation's war demands have during the same period been operating to strangle the municipal public utilities of the country.

A shortage of gas and electric energy and a crippling of electric railway facilities for vastly increased requirements of war industries is in sight. It may easily become as great a menace to the nation's war industrial efficiency as the breakdown of the steam railroads shortly before the government took them over. And it may be expected to produce the same result, if the state and city authorities which still have power to regulate utility revenues fail to grant in time the increased rates needed to keep these utilities efficient. The United States is going to win the war. It is going to make and keep the country's industrial power and its urban transport equipment competent to do its full share in winning the war. If the state and city authorities which now control these utilities fail to assure their competency, it goes without saying that when the situation becomes sufficiently acute to warrant such action, the federal government will find a way to assure it.

The hasty assumption that increased railroad and public utility rates will be a "burden on the people" is unwarranted. The people as a whole will pay these increased rates with increased wages and increased incomes. The dollar of 1915 is to-day worth only 50 cents across the counters of merchants of all kinds. The absurdity and the rank injustice of requiring investors in and employees of regulated industries to accept as their wage the same number of the 50-cent dollars of 1918 that they got of the 100-cent dollars of 1915, when everybody else is getting a doubled wage or near it, must be admitted by all who have any desire whatever to be fair to the utilities.

For the period of the war at least, radical newspaper manufacturers, radical politicians and any others who have hitherto prospered by "hammering the railroads and public utilities" will have to find new bogies or fall silent. The decree of a radical government raising railroad rates $880,000,000 a year and railroad wages $300,000,000 a year, as a plain matter of justice and national health, pretty effectively disposes of this particular bogy. Director-General McAdoo, being a first-class salesman, has explained his order in a way to make it acceptable to the public. The railroad operators could have done this years ago, had they been salesmen.

FRANK PUTNAM.

AMERICAN ASSOCIATION NEWS

"Do It With a Purpose"

This Was Mr. Brush's Message as He Awarded Charter Membership Cup to Providence Section

THE recently formed Rhode Island Company section met at Providence on June 3 to accept the custody of the company section charter membership cup presented to the association by the ELECTRIC RAILWAY JOURNAL and to listen to addresses by M. C. Brush, president Boston Elevated Railway, and W. C. Slade, superintendent of power and lines of the local company. Mr. Brush stirred his audience powerfully by his appeal for patriotic co-operation with the government in the faithful performance of transportation duties. Mr. Slade gave an illustrated lecture, in non-technical language, showing how the automatic substation is playing an important part in power distribution economy and how it is actually being applied on the Rhode Island Company's lines. In addition to the longer addresses, a message to the section from James H. McGraw was read, and Martin Schreiber, Newark, N. J., Charles C. Peirce, Boston, Mass., and H. H. Norris, New York City, spoke briefly on the week of the company sections.

Disclaiming any desire to "preach" to his audience Mr. Brush took occasion to point out a few essentials of success in railway work, particularly for the benefit of the younger members of the section He illustrated his points with interesting personal reminiscences. Success, he said, is due largely to the friendships which one forms. These should be capitalized but not commercialized. Most of the friction which occurs in the work of any organization is due to lack of acquaintance on the part of responsible officials or their representatives. The company section affords excellent opportunity to promote friendship.

Above all, Mr. Brush said, there must be a purpose in everything that is done. If a man wants to read "Nick Carter" he is justified in doing so if he believes that he will thus accomplish some definite aim. On the other hand, it is wrong to do anything just to "pass away the time." In bringing the matter closer home he said that if those present at the meeting did nothing on the next day in a manner different from that which characterized their previous work the meeting for them would have been a failure.

Mr. McGraw's message to the section was as follows:

> You have done a wise and patriotic thing in organizing this company section. It ought to be a potent factor in making the Rhode Island Company stronger and more useful to the important communities which it serves. We look to New England to furnish many of the munitions of war. In this work electric railway transportation is an essential element. My plea is that you aid your company and thus your country by giving this community even better than first-class service.
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> You have made a splendid start, but it is only a start. The section will not run itself. Teamwork is urgently necessary from the start. For a while the starting enthusiasm will carry you along. Then will come a period of reaction. This will be the time when you must all put your shoulders to the wheel. After this the company section will be an integral part of your whole organization and it will function naturally and with less effort. Wise planning is necessary now, and especially in tiding you over your first summer. With your enormous charter membership you ought to accomplish great things from the very start.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Finances, Wages, Fares

All Three Enter as Considerations Affecting the Immediate Future of the International Railway

An investigation will be made into the financial affairs of the International Railway, Buffalo, N. Y., by the City Council to determine whether or not the company should be granted permission to increase its rate of fare within the city from 5 cents to 6 cents. The City Council asked the Public Service Commission for the Second District to make the inquiry but the commission has refused to take any official action in the matter, apparently holding that owing to franchise restrictions the fare question is one to be settled between the city and the railway.

Urgent pleas are being made to the Council by Edward G. Connette, president of the railway; Thomas Penney, vice-president and general counsel; E. J. Dickson, vice-president, and Henry W. Killeen, of Penney, Killeen & Nye, of counsel for the company, for immediate action because the employees of the company are threatening to strike unless their pay is raised immediately.

SIX-CENT FARE ESSENTIAL

President Connette has told representatives of the motormen, conductors and shopmen that he is willing to grant a substantial wage increase, but owing to the financial condition of the company, an advance in wages cannot be granted until after the 6-cent fare application of the company has been approved by the municipal authorities. The company in a signed statement to the City Council sets forth that the entire revenue obtained from the additional 1 cent collected from passengers will be used in giving employees a substantial wage increase and for improvements and additions to the company's tracks, rolling stock and other equipment. President Connette also promised that none of this additional revenue will be used for paying dividends. It is estimated that the additional 1 cent collected from passengers will increase the company's revenue approximately $1,200,000 a year.

After a series of conferences and public hearings the Council made a report to the public which said that "the transportation service supplied by the International Railway is now and has been inadequate for several years and has been at times intolerable. Reports filed with the New York State Public Service Commission show that the company derives large revenues from the operation of its lines in Buffalo and that these revenues are quite sufficient to enable the company to pay fair and reasonable wages to its employees. The wage paid to the employees by the company is solely a matter between the company and its employees and the company is in error in seeking to involve the Council in any wage controversy."

An opinion to the City Council by the Corporation Counsel says that the Council has no power to make an agreement with the company providing for an increase in the prevailing rate of fare without authority from the New York State Legislature. He holds that the Milburn agreement between the city and the International Railway providing for a 5-cent fare with free tranfers cannot be terminated without legislative authority.

In answering this opinion of the Corporation Counsel, Henry W. Killeen, of counsel for the company, says that it is imperative that the 6-cent fare be granted as an emergency measure by the Council. The International Railway can then have the city's decision ratified by the Legislature.

Finds Franchise Burdens Onerous

The application of the Puget Sound Traction, Light & Power Company to the City Council of Seattle, Wash., for relief from its franchise obligations during the period of the war, and a reasonable length of time thereafter, has been referred to a committee consisting of Councilmen Erickson and Lane, and Thomas F. Murphine, superintendent of public utilities. The action was taken after A. W. Leonard, president of the company, appeared before the joint committee on franchise and judiciary, explaining the necessity of some action being taken to enable the company to improve its service. Mayor Hanson met with the committee and asked Mr. Leonard numerous questions dealing with the holdings and earnings of the company. Mayor Hanson also asked Mr. Leonard if the franchise obligations were suspended by the city, would better service be furnished by the company. To this Mr. Leonard said he would not want to make any definite promises unless he knew that he could back them up.

Councilman Thomson stated that he would write Mr. Leonard within a week, giving his ideas regarding the proposition of the city taking over the company's lines.

The day previous to the hearing before the joint committee on franchises and judiciary, Mayor Hanson addressed a communication to Mr. Leonard, making formal demand that the company comply with its franchise provisions "without further delay or equivocation."

Chicago Essentials Fixed

Officers of Surface and Elevated Lines to Report Back Soon on Acceptability of Terms of New Grants

New ordinance developments progressed another step in Chicago, Ill., during the two weeks ended June 1, when the tentative draft of the franchise was corrected and approved by the sub-committee of the City Council. The essential features have now been determined and representatives of the surface and elevated roads agreed to report back within a short time as to their acceptability.

RENEWALS A PROBLEM

There was considerable discussion of the renewals question, the attorney for the committee contending that property should be maintained at 100 per cent, while the companies argued that it should be kept up to a standard of good operating condition. Mr. Busby referred to the Surface Lines renewal fund, which now aggregates $8,500,000, and is growing at the rate of $1,500,000 each year. It was finally agreed that the requirement for renewals be fixed at 8 per cent, and if more money is needed for actual renewals this should be provided by the company if so ordered by the local commission. There was considerable debate over the protection for the 1 per cent of gross earnings, which is to be allowed the company if earned over and above the 6 per cent guaranteed return on capital account. The sub-committee finally decided that the 1 per cent would be cumulative if an excess were earned in any succeeding year. It was also decided that capital investment would be limited so as to give protection to this 1 per cent allowance.

AMORTIZATION CONSIDERED

There was considerable discussion of an amortization fund and both sides agreed the minimum should not be set too high, as this would mean that the present generation would pay for the property and that the succeeding generation get all the benefits of cheaper service. The question of service in and out of the city, about which there has been much dispute, will not be settled until the bills are drafted for the Legislature next fall. The matter of financing the new corporation was also discussed at length.

The local newspapers are favoring speed in the settlement of long pending traction controversies and have urged the committee not to quibble over small points, because if the matter is not settled by the City Council this summer, it must go over for at least two years.

Boston Plan Approved

Stockholders Vote for Public Operation and Authorize New Issue of Preferred Stock

The stockholders of the Boston (Mass.) Elevated Railway on June 3 voted to accept the act of the Legislature providing for public operation and to issue $3,000,000 of 7 per cent State-guaranteed stock to carry out the purposes of the law.

At the meeting M. C. Brush, president of the company, said that the flotation of the stock issue was absolutely necessary if the act was to become effective and that the notices would be sent out immediately requesting subscriptions. Mr. Brush was quoted as follows:

"In my opinion, this legislation is the most constructive ever enacted in the United States for a public service. The electric railways of this country are, generally, in very bad financial condition. Under this plan the stockholders are assured that obsolescence of the road and equipment will be taken care of, that the affairs will be well managed and the service kept up to reasonable requirements, at least, and that the State will pay your dividends if the road doesn't."

He then reviewed the difficulties of securing the passage of the bill, saying that he had devoted a large part of his energies to it for two years and that the directors also had worked untiringly. About 150 men, as he estimated it, had devoted a considerable part of their time to the study of the electric railway problem and finally had worked out what was believed to be a sound and workable plan. Mr. Brush gave it as his opinion that once the plan is found to work as well as is expected, it will never be given up by the State. Under no conditions can it be thrown over before the end of ten years, and then only by serving two years' advance notice.

The terms under which the road will be operated have been reviewed previously at length in the ELECTRIC RAILWAY JOURNAL.

Atlantic City Strike Settled

The strike of the motormen and conductors in the employ of the Atlantic City & Shore Railroad, Atlantic City, N. J., has been settled. The men have been restored to their positions and are receiving an increase in wage. The settlement was brought about at a conference between Clarence L. Cole, receiver for the company, and representatives of the Amalgamated Association. It was agreed to settle future deadlocks by arbitration. The men agree to work ten hours a day and are to be treated by the company as individuals and not as a unit of the union. The union is to conduct its affairs as it will, and the company reserves the same right.

Previous to the strike the employees were receiving 25 cents an hour the first year on the Atlantic City line; 27 cents the second year and 29 cents for three years or longer. Those on the Ocean City line were being paid 27, 29 and 31 cents. The former will now receive 31, 33 and 35 cents an hour while those on the Ocean City division will be paid 33, 35 and 37 cents an hour. All shop employees and those engaged in various other lines of work benefit by the 6-cent advance.

The strikers demanded that six men be discharged who remained at their posts when the strike was declared, but finally consented to have them remain because they were old hands. The company will now have to pay out annually to the men in its employ $14,000 more in wages.

Franchise Negotiations Fail

The City Council of Norfolk, Va., has voted against the combination of the electric lighting and power and traction franchises, in the new franchise proposed by the Virginia Railway & Power Company. This will probably put an end to all negotiations looking to a rerouting plan for Norfolk under a new franchise. W. H. Venable, counsel for the company, stated during the discussion of the proposition that his company could not consider a franchise which would not include light and power as well as traction. Later on Mr. Venable stated the company would take no further steps. He declared that it was impossible to look upon the two branches of the company's business as other than a whole because bonds had been issued covering all the activities of the company and the trustees representing the holders of the bonds would not consent to a separation of the businesses.

Wage Advance in Philadelphia

The management of the Philadelphia (Pa.) Rapid Transit Company on May 28 expressed its appreciation of the loyalty of its employees who stood firmly against the attempt of outside influence to disrupt the service, and in anticipation of the increased fare for which it has made application, announced that it had decided to advance the wages of all employees, paid on an hourly basis, 2 cents an hour. The wages of men, paid on a monthly basis and receiving less than $200 a month, will be correspondingly advanced.

The advance will be made effective as of May 16, 1918. The company will endeavor to secure the increased fare at the earliest possible date and upon receiving the same will at once make the further increase of 3 cents an hour in keeping with its original promise.

On May 29 two weeks had elapsed since the attempted walk out, to which reference was made in the ELECTRIC RAILWAY JOURNAL of May 25, page 1023. In fairness to the men who have operated the cars, May 29 at 8 p m. was fixed as the limit of time during which the few men who at that time were still out could return to duty without the loss of their seniority rights.

St. Louis Wages Adjusted

Men Get Advance of Ten Cents an Hour, With Guaranteed Minimum of $70 for Extras

The agreement reached between the officials of the United Railways, St. Louis, Mo., and a committee representing the local union of the Amalgamated Association of Street & Electric Railway Employees of America has been ratified by the men in the employ of the company by vote. The agreement contains forty-eight sections.

AGREEMENT FOR THREE YEARS

The company will increase the pay 10 cents an hour. This is equivalent to a flat increase of 35 per cent. The agreement is to continue in force for three years from June 1, 1918, but the rates of wages and the hours may be readjusted on June 1 of each year the agreement is in force if either the company or the association demands a rearrangement on or before April 1 of such year. If the company and the association are unable to agree within thirty days upon the hours and rates of wages to be paid for the ensuing year the matter is to be submitted to arbitration. All extra men are to be guaranteed $70 a month provided they report three times every day. For each miss or other absence from duty in a thirty-day month, one-thirtieth of $70 is to be deducted.

The wages of motormen and conductors in the employ of the company effective June 1 will be as follows:

DETAIL OF NEW RATES

Beginning and during the first year, 36 cents an hour.

Beginning and during the second year, 37 cents an hour.

Beginning and during the third year, 38 cents an hour.

Beginning and during the fourth year, 39 cents an hour.

Beginning and during the fifth year, 39½ cents an hour.

Beginning and during the sixth year, 40 cents an hour.

Beginning and during the seventh year, 40½ cents an hour.

Beginning and during the eighth year, 41 cents an hour.

Beginning and during the ninth year, 41½ cents an hour.

After the end of the ninth year of continuous service, 42 cents an hour.

This wage scale is to apply to the wages of certain employees, between March 1 and June 1, 1918, as set out in section 1 of the terms of the agreement.

INCREASE IN OTHER DEPARTMENTS

United Railways officials estimate that the combined increase to carmen, mechanical, reconstruction and other employees will cost the company $1,400,000 yearly. President McCulloch's order increasing the pay of shop and roadbed men concludes as follows:

"The company is making this increase by reason of the decision of the Public Service Commission of Missouri authorizing the company to increase its rate of fare on June 1."

Strikes in New York State

The trainmen in the employ of the United Traction Company in Albany, Troy, Watervliet, Green Island, Cohoes and Rensselaer in New York went on strike on June 3, but returned to work the following morning.

The settlement agreement was reached after a ten-hour conference, which terminated shortly after 4 a.m. Participants in this included, besides representatives of the company and the men, Walter A. McClatchy, federal housing agent for the Watervliet arsenal, and Mayor James R. Watt.

The trainmen, who struck for an increase in wages of 9 cents an hour, were granted an increase of 6½ cents an hour. Other employees covered in the agreement are to receive a 20 per cent increase. The question of additional pay, not to exceed 40 cents an hour, will be settled by the War Labor Board.

The employees of the Schenectady Railway went on strike the previous morning, but in this case the negotiations for a settlement were not so successful. Up to June 4 the men in that city were still out. They also demanded a 9-cent wage increase. The company there offered the men 4 cents additional. Efforts to apply to Schenectady the same terms of settlement as agreed upon for Albany failed.

D. U. R. War Attitude Stated

Frank W. Brooks, president of Detroit (Mich.) United Railway, has issued a statement on the proposal of the municipal authorities for federal control of the company's lines. Decision to ask the national government to take over the system followed an intimation from the company that it might be necessary to ask for an increased rate of fare. Mr. Brooks said:

"In common with other business undertakings, we are trying to adjust ourselves to the changing conditions with respect to both the labor shortage and the growing costs of everything and to meet the requirements of the munition factories and other war industry plants. We have already extended tracks to the Dodge Brothers ordnance plant and are now making extensions to the Ford shipbuilding plant.

"Of course, if the federal government in its wisdom wants to take over our 900 miles of railways, we will very willingly lend every aid we can. In fact, we will be glad to have the government take everything we own, if it will help win the war."

Reading Strike Settled

All differences between the striking trainmen of the Reading Transit & Light Company, Reading, Pa., and the company have been adjusted, and the cars resumed operation on May 28. The strike was settled after a series of conferences between the company and representatives of the men brought about by William Young, chief mediator of the State Department of Labor.

Under the adjustment eight dismissed employees have been reinstated and all the men now in the service of the company have been granted an increase in wages to 34 cents an hour. Any man employed after June 1 will receive 32 cents an hour for the first year, 33 cents an hour for the second year and 34 cents an hour for the third year. An advance of another cent will go into effect on Jan. 1, 1919.

The company refused to recognize the trolleymen's union, but expressed its willingness to receive committees of its employees at any time to adjust differences, with the explicit understanding that non-union employees shall be represented on such committees by at least three members. The company will continue to employ men regardless of whether they are members of the union and there is to be no attempt at interference with the company's enforcement of discipline.

The men went on strike on May 22 following the refusal of the company to meet a demand for an increase in wages of 6 cents an hour.

Strike in Northern New Jersey

On the morning of June 6 the trainmen in the employ of the Public Service Railway on its lines in Northern New Jersey went on strike. The territory which was affected included Newark, Jersey City, Hoboken, Paterson, Passaic and other places.

The walkout was due to the company's refusal to grant the conductors and motormen a flat rate of 45 cents an hour and 65 cents an hour overtime. The company offered a rate of 30 to 40 cents an hour—30 cents an hour to men who had been in the employ of the company six months; 35 cents an hour to men employed from six months to five years, and 40 cents an hour to those in the service more than five years.

Just outside of Newark are three great shipyards that are working in day and night shifts to speed up the shipbuilding program. Many other war industries also are in the territory affected. The company did its best to restore service promptly on the most important lines. In some cases volunteer workers from the shipyards operated cars to transport their fellow workmen.

Thomas N. McCarter, president of the railway, in a statement on June 6 charged that the strikers had been guilty of breach of faith. He recited the negotiations between the company and employees, and said that when the offer of the company was put to a committee of workers, that committee, after considering the proposition in private, agreed to accept the company's offer. Without word or warning, he said, the men met and repudiated the action of their own committee and walked out.

The company has had a considerable number of women in training for use in platform work, but they were not used to replace the men who went out.

Scranton Arbitration Under Way

After a week's idleness the striking trainmen of the Scranton (Pa.) Railway returned to work on June 2. The men decided to place their case in the hands of the National War Labor Board for an early adjustment. This decision was reached at a meeting held on June 1, after a telegram had been received from former President Taft and Attorney Frank P. Walsh, of the National War Board, declaring that by remaining on strike the men were violating the agreement between labor and capital upon which the War Board was founded. An offer to arbitrate the controversy was made with the statement that the award would be effective as of the date work was resumed.

Messrs. Taft and Walsh, chairmen of the board, met on Sunday, June 2, in Scranton. This meeting was attended by members of the executive committee of the union and officials of the railway. At this conference the attorney for the men sprung a surprise by requesting an increase of 40 per cent for men receiving 30 cents an hour or more and 50 per cent for men receiving a wage less than 30 cents an hour. The original demands were for a flat rate of 40 cents an hour for all conductors and motormen, regardless of how long they had worked for the company.

Mr. Walsh would not venture to predict how long it would take to settle the case. An expert examiner has been appointed to handle the details in Scranton. The company attorneys and representatives of the men will present the case to him. He will assemble the data and present them to the chairmen for final adjudication.

News Notes

Employees Accept Wage Increase.—The employees of the Morris County Traction Company, Morristown, N. J., have accepted a flat increase of 2½ cents an hour offered by the company, with a promise of a further increase on Sept. 1.

Connecticut Men Accept Compromise.—By a referendum vote the trainmen have accepted the compromise offered by the Connecticut Company, New Haven, Conn., which includes compensation ranging from 34 cents to 40 cents an hour. The time schedules will have to be adjusted to local conditions.

Wilmington Men Strike.—Employees of the Wilmington & Philadelphia Traction Company, Wilmington, Del., went on strike on May 31, but returned the following day on the company's promise to increase their wages 8 cents an hour at once, with a further increase of 2 cents if the company receives permission to increase its fares to 7 cents.

Increase in Pay for Camden Men.—The motormen and conductors on the South Jersey division of the Public Service Railway at Camden, N. J., have received an increase in pay of 2 cents an hour. The new rate went into effect on June 1. The beginners now receive from 28 cents to 30 cents an hour and the regular crews from 34 cents to 36 cents.

Wants Franchise Burdens Lifted.—The City Council of Seattle, Wash., recently received a communication from the Seattle & Rainier Valley Railway requesting an early conference with the Council regarding relief from franchise obligations, which the company declares cannot be much longer carried in the face of advancing prices of labor and materials. The matter has been referred to the committee on franchise and city utilities.

Course in Radio Communication.—On account of the urgent need of the government for men qualified to render special technical service in the Signal Corps, the University of Illinois will offer a course in radio communication during the summer session of 1918. This course is for men who wish to prepare themselves for research and development work or for field service in the Signal Corps of the Army. Instruction will begin on June 17, and will continue until Aug. 9.

Municipal Railway Bows to Men's Demands.—The threatened strike of the employees of the Brantford (Ont.) Municipal Railway was averted on May 30, when the men accepted the new rates of pay offered by the Railway Commission which operates the line. The old rates were 23, 25 and 26 cents an hour, for first, second and third year men respectively. The new rates will be 29, 31 and 32 cents an hour. A deficit is now very probable unless fares are raised.

New Offices for International Railway.—The offices of the International Railway, Buffalo, N. Y., have been moved from Ellicott Square to the Littell Building, corner of Huron and Franklin Streets. The railway company occupies the third floor and part of the second, and has about 50 per cent more office space than in the other building. This building was erected by H. H. Littell, a pioneer in the electric railway business. It has been remodeled for the accommodation of the new tenants.

New York Subway Labor Situation Met.—The threatened strike of laborers on subway construction contracts has been averted for the present by an agreement between the Public Service Commission for the First District and the authorities of New York City. Comptroller Craig has offered to finance the contractors in order that they may be able to meet the demands for higher wages made by the laborers. The adjustment between the city and the contractors will be arranged in the future.

Trenton Men Insist on Demands.—The trainmen in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., threaten to walk out after June 10 if the company does not grant their demands for an increase in wage. The traction corporation recently gave the employees an increase of 2 cents an hour, but the men say that the raise is not sufficient for them to meet the advancing cost of living. A meeting was held on June 3 following a conference with the traction officials and it was decided to take a vote on the question on June 10.

Employees Favor Fare Increase.—The motormen and conductors in the employ of the Pittsburgh (Pa.) Railways through the officers of Division No. 85 of their union, have made public a resolution commending the receivers in their effort to place the Pittsburgh Railways on a paying basis. The men say they feel that as every trade has received a substantial increase of wages within the last two years, there should be no hesitancy on the part of other workers to pay a cent or two extra for electric railway service, the cheapest commodity they can procure in the city.

Wage Increase in Birmingham.—A voluntary increase of 3 cents an hour has been made in the wages of its motormen and conductors by the Birmingham Railway Light & Power Company, Birmingham, Ala. This increase, which is the second since the war opened, brings the pay of the men to a minimum of 26 cents an hour, and a maximum of 33 cents, while the original contract between the company and the conductors and motormen called for a sliding wage scale ranging from 21 cents for the new employees to 28 cents an hour for those who have been in the service of the company for a number of years.

Commission Has Power Despite Franchises.—Attorney-General Brown of Pennsylvania has advised the Public Service Commission of that State that in his opinion the Legislature has given the commission power to regulate and allow increases in rates, notwithstanding the fact that municipal ordinances, granting franchises, may contain provisions fixing the charges that can be made. In concluding his communication to the commission Mr. Brown said: "Specifically answering your inquiry, I have now to advise you that the Public Service Commission of the Commonwealth of Pennsylvania does have the power legally to authorize a street railway to increase a rate of fare, notwithstanding the fact that that rate was specified by local authorities as a condition upon which they gave their consent to the company to construct its lines within the municipal limits."

Aurora-Elgin Wage Differences Settled—Through the efforts of business men of the community, a satisfactory agreement has been reached between the men and the Aurora, Elgin & Chicago Railroad, Wheaton, Ill. Negotiations lasted all day May 31. The men refused to accept an increase of 5 cents an hour. This the company stated was the greatest amount the financial condition of the property would permit it to offer. Business men came forward and placed themselves on record as being unanimously in favor of increased rates of fare for the railway. With this in mind an increase of 10 cents an hour was granted, but for the first three months the men will receive only half of the increase in cash. Within this time it is expected that the Public Utilities Commission will grant the company the right to increase fares, and as soon as this is done the men will receive the 50 per cent of the increase previously withheld. By the new agreement the men will receive from 34 to 46 cents an hour and an additional 5 cents an hour for overtime.

Programs of Meetings

Illinois Electric Railways Association

The Illinois Electric Railways Association will hold its annual meeting at the St. Claire Country Club, St. Louis, Mo., on June 20. Breakfast for the members attending will be served in St. Louis at the Missouri Athletic Club. Britton I. Budd, president of the Chicago Elevated Railways, and member of the War Board of the American Electric Railway Association, will speak on the activities and work of the War Board in connection with electric railways. Following this there will be a general discussion of the present conditions under which railways are operating. Lunch will be served at the Country Club, and those desiring to leave in the afternoon may do so. It is expected that the majority will remain, however, as golf at the club constitutes the program for the afternoon. The meeting planned for June 20, will take the place of the regular annual meeting usually held in January, but postponed this year.

New York Electric Railway Association

Replies already received indicate a very large attendance at the thirty-sixth annual meeting of the New York Electric Railway Association at the Hotel Champlain, Bluff Point, Lake Champlain, N. Y., on June 22. As stated previously in the ELECTRIC RAILWAY JOURNAL the supper, which will take the place of the annual banquet, will be addressed by Ex-President William Howard Taft and William H. Edwards, collector of internal revenue for the second district of New York.

There will be only one formal paper. It will be by Prof. Thomas Conway, Jr., of the University of Pennsylvania, and will deal with the financial condition of the different properties and the burdens under which they are struggling. Representative railway men, bankers and manufacturers have been invited to attend and discuss the situation from their different standpoints with the purpose in mind of suggesting remedies that might be applied and the policy that should be pursued by the companies to accomplish the results desired.

Financial and Corporate

What Federal Financing Requires

War Finance Corporation Tells Why It Granted a Direct Advance of $3,235,000 to St. Louis Company

The ruling of the War Finance Corporation on May 28 that its resources are intended to be loaned directly to war industries only in exceptional cases and upon adequate security, and its approval on the same day of an advance to the United Railways, St. Louis, Mo., have been causing much discussion in regard to what requirements are necessary to bring a utility under the exception clause of the act. The situation has now been somewhat cleared up by the issuance of a statement from the corporation in regard to the reasons for its action.

It appears that the points which actuated the corporation in granting the St. Louis advance were these: (1) the war work being performed by the company; (2) the short term of the loan; (3) the high-class collateral furnished, and (4) the prospect that the company itself will be able to handle the financing permanently through regular banking channels at the expiration of the temporary relief.

Up to the time when the War Finance Corporation issued its ruling, about 196 applications for direct aid had been received from utilities. No details have been announced in regard to the companies concerned, the policy of the corporation being to give out notice of only loans approved. It is believed by competent observers, however, that most of the pending applications will not receive favorable action, for the companies are not likely to fulfill the requirements for treatment as exceptional cases. How any individual utility will fare, however, will, of course, depend upon the facts in its particular case.

Reasons for St. Louis Advance

As stated in the preliminary note in the ELECTRIC RAILWAY JOURNAL of June 1, the direct loan of $3,235,000 to the United Railways of St. Louis is for six months at 7 per cent and is secured by $800,000 of 3½ per cent Liberty Loan bonds, and by the entire issue of $3,500,000 of first mortgage 6 per cent bonds of the Union Depot Railroad.

Based upon a valuation recently placed by the Missouri Public Service Commission upon the United Railways, the property covered by the mortgage of the Union Depot Railroad is said to be worth more than double the amount of the advance made by the War Finance Corporation.

The official statement of the War Finance Corporation says that the corporation was glad to make the loan for the following reasons:

"The United Railways serves many industries now engaged in work both necessary and contributory to the prosecution of the war.

"The security offered is in kind and value adequate under the meaning of the war finance corporation act.

"It is a short-time loan, which, because of the high class of collateral secured, is certain to be liquidated at maturity, and the temporary relief granted by this advance will give the company opportunity to make permanent financial arrangements through regular banking channels.

"The Missouri Public Service Commission has authorized an increase in fare now in effect from 5 to 6 cents, which will tend to enable the United Railways to meet the increased cost of material, increased taxes and large increases in wages recently granted to its employees.

"An ordinance was recently passed by the City of St. Louis by which all controversies between the city and the United Railways were settled and which provided a working basis between the city and its principal public utility that seems fair both to the people and to the company."

No Federal Funds for New Orleans

The New Orleans Railway & Light Company, which had $4,000,000 of two-year 6 per cent gold debentures falling due on June 1, was unable to meet its obligations, according to an announcement made by President D. D. Curran. The reason was the refusal of the War Finance Corporation, upon which the company had relied, to advance the necessary funds. In a circular letter to the noteholders President Curran requested an extension and promised that interest would be paid promptly.

President Curran's letter to holders of the debentures follows in part:

"Greatly to our surprise, after hearings over a period of ten days before the War Finance Corporation at Washington, that board suddenly issued a ruling to the effect that 'the resources of the corporation are not intended to be loaned directly to war industries, but only indirectly through the banks.'

"In these hearings the company's showing was apparently very satisfactory. This is further evidenced by the War Finance Corporation engineer's report on the physical property, the condition in which it was maintained, and the relationship with the public authorities and its patrons.

"In spite of the abnormal operating conditions and greatly increased operating expenses, the company's earnings for the twelve months ended Dec. 31, after payment of all underlying interest, showed approximately three and a half times the amount required for interest of these debentures.

"A further statement will be issued at an early date with regard to the terms of the proposed extension. In the meantime holders are requested not to present their debentures for payment of principal. Under these circumstances we request your active and friendly co-operation."

Interborough Applies

Application has been made to the War Finance Corporation by the Interborough Rapid Transit Company, New York, N. Y., for a loan of $37,700,000 for a period of three years. The money is needed for completing the equipment of the new subways and for elevated extensions. The loan, if granted, is to be secured by $39,489,000 of first and refunding mortgage 5 per cent bonds of the company. The Public Service Commission has stipulated that the company shall not issue the bonds to net less than 93½ per cent.

Revenue Hearings Began on June 6 in Washington

The ways and means committee on May 29 fixed June 6 as the date for beginning public hearings on the new revenue bill and tacitly sanctioned a plan for a brief recess while the revenue measure is in the making.

The plan approved by the ways and means committee calls for a recess during July, on the theory that the revenue measure will be completed in committee on Aug. 1, with passage of the bill in the House by the middle or last of August, and a recess of the House while the bill is under debate in the Senate. Leaders are of the opinion, however, that the measure cannot be ready for the President's signature before late in October.

In a statement after the committee meeting on May 29, Chairman Kitchin announced that the revenue measure would follow the general trend outlined by President Wilson in his recent message to Congress urging the new levies. Chairman Kitchin's statement, which also outlined the rules which will govern the committee's public hearings, follows:

"The committee on ways and means announced to all concerned that it will hold public hearings at Washington beginning June 6, 1918.

"It is deemed necessary largely to increase the revenue from taxation. It seems to the committee that it will be necessary to raise the needed increased revenue chiefly from taxes upon incomes, excess or war profits, luxuries and semi-luxuries.

"In order to avoid duplication of arguments and suggestions it is requested that persons having the same problem to present will agree upon one representative to present their views.

"The hearings will be conducted in the hearing room of the committee, 321 House office building. Persons desiring to be heard should if possible apply to the clerk of the committee previous to the date set for the hearings for an assignment of time."

American Cities Net Drops

The combined income statement of the constituent companies of the American Cities Company, New York, for the year ended Dec. 31, 1917, as follows:

	1917	1916
Gross earnings from all sources........	$16,670,444	$15,464,361
Operating expenses and taxes †.....	11,145,998	9,965,083
Net earnings........	$5,524,446	$5,499,278
Interest, bond discount, amortization and miscellaneous........	3,895,499	3,810,259
Net income applicable to dividends..	$1,628,947	$1,689,019

†Renewal and replacement reserve included.

The gross earnings of the constituent companies in 1917 increased $1,206,083 or 7.9 per cent, but the operating expenses, taxes and renewal and replacement reserve increased $1,180,915, while deductions increased $85,240. The result was a decrease of $60,072 in the income available for dividends on stock. The operating ratio in 1917 was 57.58 per cent as compared to 55.71 per cent in 1916.

If the proportionate interest of the American Cities Company in the undivided surplus earnings of the constituent companies were added to the surplus earnings for the year, the result for 1917 would be $878,421. The parent company controls city lines in Memphis, the lighting property at Houston and the railway and lighting properties in New Orleans, Birmingham, Little Rock and Knoxville.

Allen & Peck Reorganized

C. Loomis Allen has announced his retirement from Allen & Peck, Inc., Syracuse, N. Y., operators and managers of public utilities, of which he was the head. Allen & Peck, Inc., has been reorganized into Peck-Shannahan-Cherry, Inc., with J. N. Shannahan of Hampton, Va., as president. The other new officers are: Vice-presidents, E. F. Peck, Hampton, Va., and T. C. Cherry, Syracuse; secretary and treasurer, Milford Badgero of Rochester.

Peck-Shannahan-Cherry, Inc., has taken over from Allen & Peck, Inc., the railway properties: Rochester & Syracuse Railroad, Inc., Auburn & Syracuse Electric Railroad, Syracuse Northern Electric Railway Company (South Bay line), Syracuse & Suburban Railroad. Newport News & Hampton Railway, Gas & Electric Company, Maryland Electric Railways, Annapolis.

Mr. Allen is to continue in the electric railway business in Syracuse, individually, as an engineer and manager. He will have an office in the executive headquarters of the Syracuse & Suburban Railroad in the Vinney Building.

Judge Dodge in the United States District Court at Boston, Mass., has authorized Receiver Donham of the Bay State Street Railway to issue two notes of $26,817 each, payable on Sept. 1 and Dec. 1, 1918, respectively, in payment of the balance due on a premium of $107,271 on a contract for workmen's compensation insurance.

Financial News Notes

Sold Under Foreclosure.—The property of the Eastern New York Railroad, Ballston Spa, N. Y., has been sold at mortgage foreclosure sale to I. W. Wiswall for $25,000. The road consists of 15 miles of line.

Authorized Capital Increased.—The Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., has filed a certificate at Albany, N. Y., increasing its authorized capital stock from $200,000 to $400,000.

Small North Dakota Property Scrapped—The property of the Northwestern Traction Company, Brazil, N. D., the successor to the Brazil, Devils Lake & Minneapolis Electric Railway, has been scrapped. The company operated 5 miles of standard gage road between Devils Lake and North Chautauqua.

Receivers for a Pennsylvania Line.—R. W. Day and C. R. Bedford have been appointed receivers for the Scranton & Binghamton Railroad, Scranton, Pa., on application made by the Binghamton (N. Y.) Railway following a statement of President A. J. Connell admitting that the company could not meet interest due on June 1, amounting to about $70,000.

Part of Road Reclaimed.—W. H. Foster, Mayor of the city of Elkhart, Ind., has purchased the Jackson Street portion of the St. Joseph Valley Railway, sold under foreclosure in April, and is now operating cars on it, giving a twenty-minute service. It was the purpose of Benjamin Harris & Company, Chicago, Ill., the purchasers at the foreclosure sale, to dispose of the property as junk.

Receiver for New Hampshire Road.—Judge H. H. Blanchard, Springfield, Vt., has been appointed temporary receiver of the Springfield (Vt.) Electric Railway. Last November $100,000 of the company's bonds became due, but were not redeemed. The present is a friendly proceeding and is expected to bring about a reorganization of the company, of which E. C. Crosby, Brattleboro, is president.

Kankakee Company Would Sell.—A petition has been filed by the North Kankakee Electric Light & Railway Company, Kankakee, Ill., to sell its depot property and other facilities to the Chicago & Interurban Traction Company, Chicago, Ill., operating to Kankakee. A petition to purchase the property has been filed with the Illinois Utilities Commission by the Chicago & Interurban Traction Company.

Maine Road Ordered Sold.—A decision by the Public Utilities Commission of Maine authorizing the sale at public auction of the Rockland, South Thomaston & St. George Railway, Rockland, has been announced by S. T. Kimball, recently appointed receiver. The road has not been in operation for five months. The owners claim it has lost money steadily because of automobile competition. The receiver values the property at $50,000. The road is 5.7 miles long.

Additional Mahoning Fives—Lee Higginson & Company, Boston, Mass., Drexel & Company, Reilly, Brock & Company, Graham, Parsons & Company and Montgomery & Company, Philadelphia, Pa., are offering at 94 and interest, to yield 7.65 per cent, an additional block of $600,000 of first and consolidated mortgage 5 per cent bonds of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, due in 1920, making at present outstanding $10,600,000.

Survey of Traffic Will Decide Abandonment.—A careful study is being made of the revenue and expenses of the main line of the Rutland Railway, Light & Power Company, Rutland, Vt., west of West Rutland and the South Belt line operated in the city of Rutland. These two divisions have been operated at a loss for several years, and unless the expense of operation can be materially decreased, or revenue increased, the only solution may be to discontinue the operation and sell the material.

$614,000 Three-Year Notes Authorized.—The Cumberland County Power & Light Company, Portland, Me., which owns all of the common stock of the Lewiston, Augusta & Waterville Street Railway, has been authorized by the Maine Public Utilities Commission to issue not exceeding $614,000 of three-year 7 per cent notes dated June 1, 1918, in exchange for an equal amount of 5 per cent notes of the Lewiston company, due on June 1, the latter secured by the first and refunding 5 per cent bonds to the amount of $858,000.

Pittsburgh-Butler Lease Discounteranced.—The Pennsylvania Public Service Commission has refused the application of the Pittsburgh, Harmony, Butler & Newcastle Street Railway. and the Pittsburgh, Mars & Butler Railway for the lease of the latter company to the former on the ground that approval of the proposed lease "is neither necessary nor proper for the service, safety, accommodation and convenience of the public," and that the rental proposed is excessive, consisting of interest on $900,000 of bonds and certain specified dividends on stock.

Successor Company Organized.—The Northern Cambria Railway has organized as the successor to the properties of the Northern Cambria Street Railway, Patton, Pa., recently sold to satisfy a mortgage. The property will be operated as before, with slight changes in management. Officers and directors of the successor company are: President, W. H. Denlinger, who was also president of the old corporation; Rembrandt Peal, vice-president; James H. Allport, Barnesboro, secretary-treasurer. The directors are F. H. Barker and Attorney P. J. Little, Ebensburg, W. B. Adair, Pittsburgh, and William Eigler, Clearfield, Pa.

No Action Taken on Common Dividend.—The directors of the American Railways, Philadelphia, Pa., on May 24 took no action on the dividend on the common stock. On Dec. 15, 1917, 2 per cent was paid. Out of an issue of $9,460,000 of common stock, $6,429,500 has been pledged to secure an issue of a like amount of collateral trust notes, issued by the National Properties Company, which are entitled to interest at the rate of 4½ per cent from Jan. 1, 1918, to 1920. It is said that the interest on these notes will be paid at the next period regardless of the loss of income through the passing of the dividend on the common stock pledged to secure the notes.

Short Illinois Road Suspends.—The Woodstock & Sycamore Traction Company, which has been operating a railway by gasoline power between Sycamore and Marengo, Ill., via Genoa, for several years, has suspended service. It is expected land occupied by the right-of-way, which was nearly all donated by adjacent property owners, will revert to them. On May 22 a decree of foreclosure was entered in the Circuit Court of DeKalb County, in the case of the Central Trust Company of Illinois against the railroad. The decree orders the sale of the property, rights and franchises of the company. The road was built with the idea in mind of equipping it for operation by electricity.

Bondholders Purchase Northern Electric.—The property of the Northern Electric Railway, Chico, Cal., was purchased at public auction at Sacramento, Cal., on May 28 under foreclosure proceedings, for $1,750,000, by the reorganization committee of bondholders, represented by Walter Mansfield, San Francisco attorney. The price paid was the minimum set by United States District Judge Dooling of San Francisco, when he fixed the date for the sale. The only bid made was by Mr. Mansfield, who with O. K. Cushing and George S. Deitrick, attended the sale as representatives of the reorganization committee. The committee has obtained authority from the State Railroad Commission to issue $5,500,000 of bonds and $5,200,000 of stock, the sale of which is subject to approval by the commission.

Electric Locomotive Costs of New York Central.—According to the annual report of the New York Central Railroad for the calendar year 1917, the company at the end of the year had in service seventy-three electric locomotives, of which fifty-two were owned and twenty-one were held under equipment trusts. The revenue locomotive-miles (electric) during the year were 2,163,024, an increase of 13,248, as compared to 92,085,932 locomotive-miles (steam), a decrease of 1,883,689. The non-revenue locomotive-miles (electric) totaled 11,125, a decrease of 424, while the non-revenue locomotive-miles (steam) amounted to 3,162,241, an increase of 196,717. The cost of repairs per locomotive-mile (electric) was 4.01 cents in 1917 as compared to 3 cents in 1916, while the cost of repairs per locomotive-mile (steam) was 9.86 cents in 1917 and 7.56 cents in 1916.

Indianapolis Security Holders Anxious.—The Association of Indiana Security Holders of the Indianapolis (Ind.) Street Railway, operated under lease by the Indianapolis Traction & Terminal Company, has been formed by the bond and stockholders of the company to look after their interests. J. F. Wild, president of the J. F. Wild State Bank, Indianapolis, was chosen chairman of the organization meeting. A general discussion of the railway situation in Indianapolis was made a part of this meeting. The general purpose of the meeting was to perfect a permanent organization. Higher fares were suggested as a necessary step in the proper adjustment of the situation. A committee composed of Mr. Wild, Robert Elliott and Samuel Reed was appointed to confer with Robert I. Todd, president of the company, with a view of arranging some way out of the embarrassment caused by the recent default in the payment of the license fee due to the city of Indianapolis from the company.

Mortgage for $5,000,000 Authorized.—The Public Service Commission of the Second District of New York has granted an order authorizing the Southern New York Power & Railway Corporation, Cooperstown, N. Y., to execute and deliver to the Equitable Trust Company, New York, as trustee, a mortgage on its property to secure first mortgage ten-year bonds amounting to $5,000,000. An issue of $1,000,000 in bonds is authorized, of which $952,000 shall be exchanged for $1,085,000 first mortgage bonds of the company issued under its former corporate name, the Otsego & Herkimer Railroad, and the bonds thus redeemed to be canceled. Bonds for $48,000, or their proceeds, are to be used for acquiring a like amount of capital stock of the Southern New York Power Company, formerly the Colliers Light, Heat & Power Company, the order also providing that a like amount of bonds shall be canceled. The commission has also canceled authority to execute a mortgage for $10,000,000 and issue 5 per cent bonds under an order granted on Oct. 19, 1916.

Electric Railway Monthly Earnings

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$39,516	*$30,124	$9,392	$6,534	$2,858
1m., Mar., '17	33,753	*20,905	12,848	6,552	6,296
12m., Mar., '18	476,976	*327,068	149,908	78,600	71,308
12m., Mar., '17	407,386	*237,115	170,271	78,553	91,718

COLUMBUS (GA.) ELECTRIC COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$96,195	*$41,609	$54,586	$32,658	$21,928
1m., Mar., '17	87,851	*33,907	53,944	28,350	25,594
12m., Mar., '18	1,139,255	*444,655	694,600	370,623	323,977
12m., Mar., '17	936,494	*362,619	573,875	342,788	231,087

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$215,591	*$139,579	$76,012	$38,608	$37,404
1m., Mar., '17	157,469	*112,719	44,750	36,417	8,333
12m., Mar., '18	2,210,888	*1,452,073	758,815	457,659	301,156
12m., Mar., '17	1,953,072	*1,254,997	698,075	439,695	258,380

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$31,834	*$17,356	$14,478	$4,909	$9,569
1m., Mar., '17	30,497	*19,606	10,891	5,026	5,865
12m., Mar., '18	346,535	*217,564	128,971	60,925	68,046
12m., Mar., '17	334,706	*194,572	140,134	62,948	77,186

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$577,897	*$273,528	$304,368	$216,907	$87,461
1m., Apr., '17	524,053	*244,504	279,549	217,880	61,669
4m., Apr., '18	2,280,554	*1,129,244	1,151,310	869,528	281,782
4m., Apr., '17	2,107,514	*954,778	1,152,736	869,179	283,557

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$3,539,667	*$2,013,570	$1,526,097	$1,180,511	‡§$611,941
1m., Apr., '17	3,521,020	*1,693,020	1,827,000	1,019,545	‡§874,468
10m., Apr., '18	33,683,685	*18,910,561	14,773,124	11,179,186	‡§6,213,721
10m., Apr., '17	33,097,412	*16,058,579	17,038,833	10,019,631	‡§7,615,132

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$2,642,090	$1,634,502	$1,007,588	$814,126	$193,462
1m., Apr., '17	2,456,300	1,382,948	1,073,352	813,746	259,606
10m., Apr., '18	25,060,549	15,132,617	9,927,932	8,125,650	1,802,282
10m., Apr., '17	23,457,395	13,162,273	10,295,122	8,142,214	2,152,908

PHILADELPHIA & WESTERN RAILWAY, UPPER DARBY, PA.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$45,804	$26,958	$18,846	$14,083	$4,762
1m., Apr., '17	45,645	22,683	22,962	12,518	10,444
12m., Apr., '18	583,690	314,664	269,026	162,736	106,290
12m., Apr., '17	529,604	256,999	272,605	150,479	122,126

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$965,911	*$581,508	$384,403	$207,665	$176,738
1m., Mar., '17	768,418	*478,629	289,789	191,724	98,065
12m., Mar., '18	10,023,684	*6,201,638	3,822,046	2,396,774	1,425,272
12m., Mar., '17	8,461,666	*5,206,585	3,255,081	2,234,954	1,020,127

REPUBLIC RAILWAY & LIGHT COMPANY, YOUNGSTOWN, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$463,035	*$329,064	$133,971	$98,424	‡$41,396
1m., Apr., '17	368,125	*250,175	117,950	80,425	‡47,430
12m., Apr., '18	5,297,194	*3,696,383	1,600,811	1,073,563	‡617,501
12m., Apr., '17	4,183,498	*2,565,525	1,617,973	881,749	‡762,344

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$776,967	$555,212	$221,755	$155,560	$66,194
1m., Apr., '17	839,072	534,447	304,625	045,402	159,223
4m., Apr., '18	3,234,357	2,436,302	798,055	621,690	176,365
4m., Apr., '17	3,480,984	2,333,906	1,147,078	580,471	566,607

* Includes taxes. ‡Includes non-operating income. § Includes accruals under rapid transit contracts with city payable from future earnings.

Traffic and Transportation

Milwaukee Fare Five Cents

Commission Decision Places Entire Single-Fare Area on This Basis —Other Rates Undisturbed

On the night of June 1 the Railroad Commission of Wisconsin handed down its decision on the appeal of the Milwaukee Electric Railway & Light Company for an increase in fares. At 10 o'clock it put the decision into the hands of officials of the company, and at midnight the orders of the commission went into effect.

NEW RATE EFFECTIVE JUNE 9

The decision prohibited the sale of tickets after midnight on June 1, and their being honored by the company on its cars after midnight of June 9. It provides that the company shall redeem the tickets on a cash basis from midnight, June 9, to midnight, July 9, at the rate of 4 cents each, and, if more than three are offered for redemption they shall be redeemed at the rate of four for 17 cents, five for 21 cents and six for 25 cents.

While the decision mentions specifically that zone fares, children's fares and suburban fares are not to be disturbed, no mention is made of transfers. In the statement issued by the commission on the increase in fares, it says:

"In substance, this decision places the entire single fare area on a 5-cent basis. Children's fares and zone areas are not disturbed. Rates for suburban traffic within the suburban areas are not changed.

"The commission, to a large extent, has adopted the position of the city attorney as to principles to be used in arriving at a valuation, although the valuation arrived at exceeds the amount claimed by the city.

"In another proceeding, the commission is at this time considering the matter of electric railway service in Milwaukee, which is also brought in issue by the pleadings of these proceedings. It is the fundamental obligation of a public utility to furnish adequate service to the public, and the company is required to give this matter immediate consideration.

"On the whole, the commission finds that an emergency condition exists, which must be met by an increased revenue."

PETITION FILED IN 1915

The order was in response to the company's petition for the adjustment of city and suburban fares filed on Nov. 6, 1915. The commission ascertained that the valuation of the railway, electric and heating utilities of the city company on Jan. 1, 1914, was $26.093,372 and the investment value $26,160,742. The commission also found that the railway investment in the single-fare area, including the property of the traction company therein on Jan. 1, 1917, was $17,660,970, exclusive of material and supplies, for which $500,000 was allowed. The commission excluded items carried by the company into operating expenses for fore-shortened life and charged the same against the depreciation reserve. It estimated depreciation at 3 per cent on depreciable property, with 4 per cent interest on reserve balances. Taking 1916 adjusted operating expenses, and with this allowance for depreciation, the commission estimated that with 1916 revenues and 1918 probable expenses the company would earn 7.24 per cent to 7.6 per cent on the investment with a 5-cent cash fare. The commission made no order respecting the suburban fares, stating this matter was still under investigation. The company estimates the return with a 5-cent fare without any allowance for further increases in costs about 6.75 per cent.

An interview with James D. Mortimer, president of the company, in which he comments on the Milwaukee decision and the general outlook for public utilities, is published on page 1092 of this issue.

I. T. S. Restores Service

The Illinois Traction System announced revised summer passenger schedules effective on Sunday, May 26. The new time card contained changes in train time on all divisions and is considered an improvement over that which has been in effect since last February, when the company was compelled to revise its train service owing to abnormal conditions existing then.

Limited service is restored on the main divisions and in many cases the running time of local trains is shortened. Parlor car service between Peoria, Springfield and St. Louis is restored. The time between Peoria and St. Louis for the two parlor car trains is cut down to six hours. In addition to the parlor car limiteds provision is made for two additional limited trains each day between Springfield and St. Louis.

On the Peoria-Bloomington-Decatur division there will be two limited trains daily in either direction in addition to the local trains, which will run from terminal to terminal without change. A series of limited runs is also provided between Bloomington and Mackinaw Junction making direct connection with trains on the Peoria-St. Louis division.

Through limited service between Springfield, Decatur and Champaign is also provided and the running time of local trains between these points is shortened.

N. J. Fare Argument June 12

Direct Testimony All In, New Jersey Commission Will Hear Oral Argument at Newark

Counsel for the company and for the municipalities opposing the application of the Public Service Railway to the Board of Public Utility Commissioners for permission to charge a 7-cent fare with 2 cents for a first transfer and 1 cent for a second transfer have begun the preparation of their argument on the evidence submitted and it will be heard by the commissioners at Newark on June 12. President Thomas N. McCarter will appear for the railway and both Marshall Van Winkle and George L. Record will be heard for the municipalities opposing the proposed increase.

CASE CONCLUDED ON MAY 30

The original plan of the company called for the presentation of testimony in rebuttal, but this was not followed, and the case was concluded on May 30 with a short cross-examination of Dr. Delos F. Wilcox, public utility and franchise expert, who appeared as the chief witness for the opposition. When the direct testimony of Dr. Wilcox ended, David F. Atkins, electrical engineer, took the stand for cross-examination.

After a brief conference with Commissioner Slocum, Commissioner March set the date for the argument and stated that each side would be given one hour and a half, with two hours as the limit. Mr. Van Winkle will discuss the jurisdictional questions in his argument and Mr. Record will take up the other elements of the case.

The petition for the fare raise was filed with the board by the railway on March 5, and March 14 was fixed as the date for the first hearing. On March 11 the executive committee of the New Jersey League of Municipalities and lawyers representing municipalities met and, after deciding to oppose the application, employed Mr. Van Winkle as chief counsel. Mr Record was retained a few days later as Mr. Van Winkle's associate.

BRIEF REVIEW OF HEARINGS

When the opening hearing was called in Trenton on March 14, Mr. Van Winkle, aided by Corporation Counsel John Milton of Jersey City, secured a delay to March 26, when President McCarter took the stand as the railway's first witness. He was followed on subsequent days at hearings in Newark and in Trenton by other officials of the company and a number of experts. There was then an adjournment while Mr. Van Winkle and Mr. Record, representing the protesting municipalities, prepared for the cross-examination of the company's witnesses.

The presentation of the opposition's case began on May 22 with hearings on May 23 and 24, and it was continued on May 27. The board did not sit on May 28, but it reopened the hearing on May 29.

Will Use Student Trainmen

Washington Railway & Electric Company Issues Circular to High School and College Students

Owing to the great inrush of war workers to Washington, D. C., which has taxed the capacity of the public utilities of the city to the limit, coupled with the difficulty of obtaining labor, the Washington Railway & Electric Company has decided to use student employees. Circulars are now being distributed among the schools and colleges, appealing to the patriotism of the boys. The school authorities, having heard of the success of a similar plan which has been carried out in Denver, are offering their friendly co-operation in this campaign, and a certain degree of success seems already to be assured.

The circular, which explains itself, reads, in part, as follows:

> Do you want to serve your country and help to win the war?
>
> Do you want to take the place of a man who has been drafted and taken from an occupation vital to the prosecution of the war, to offer his life for the cause of democracy?
>
> Do you want to be a substitute for one who, in the opinion of our government, has reached the age at which he has physical resistance enough to stand the strain of actual warfare?
>
> Do you want to do the work of a man who has been called upon to leave his job at home and stand the supreme test of his manhood by facing the guns of the enemy —a test which you yourself may later be called upon to stand, if all do not now strain their every energy to bring this war to a quick conclusion?
>
> The Washington Railway & Electric Company, whose motormen and conductors are being called away to fight in numbers increasing all the time, is, like other public service corporations, in danger of having its man-power sapped by the draft to such an extent that it will not be able to give the service which this city, the center of the vast fighting machine, urgently requires.

> The Washington Railway & Electric Company needs 100 high school boys or college students to take the places of men who are being called upon to fight.
>
> The company offers the same money to boys as it pays to men—31 cents an hour to start.
>
> Instruction for sixty hours is necessary as a preliminary, in a school for street car men and in actual training on the cars.
>
> Other qualifications for this work are the alertness and enthusiasm with which most real American boys on the verge of manhood are endowed.
>
> Desire for patriotic service is a stimulus.
>
> Pleasant and healthful, but above all, useful and necessary, work is the result.
>
> The material reward is that of a mature man.
>
> The moral reward is that of a patriotic citizen.
>
> If you would help, fill in the application form below and mail it to the Washington Railway & Electric Company, Traffic Department, Fourteenth and C Streets, Northwest, Washington, D. C.

The B. C. Advertising Policy

The advertising policy of the British Columbia Electric Railway, Vancouver, B. C., is set down in *The Buzzer*, published by the company, as follows:

"We do not advertise for any other purpose than to sell our service. To spend a larger amount than necessary would be unfair to the public, who have to pay the cost of the service. The papers and magazines used by us for advertising are chosen because they suit our purpose as advertising mediums, and not to hush up any criticisms of this company. On the other hand, we do not advertise in papers which insinuate that they will stir up public clamor if we do not.

"We are not afraid of criticism when it is just. We are willing and anxious for the public to judge for themselves. But publishing garbled reports of affairs and printing underhand, spiteful opinions about this company is just the same as the propaganda of Germany to stir up dissension among the Allies, to pervert public opinion and to prevent the formation of clear-cut, unbiased judgment based on facts.

"Just as Germany is fighting against democracy, these papers are fighting against good public service—your public service. If you want Germany to win, help along its propaganda. If you want these papers to succeed in their personal grudge against this company until the service is affected, support them—buy them and advertise in them."

Railway Voted a Six-Cent Fare

The proposal for an increase in the fare of the Sioux Falls (S. D.) Traction Company to 6 cents, submitted to a vote of the people on May 28, went "over the top" by a vote of 1180 to 894.

The election was conducted in real political style. Large cloth banners mounted on each side of the cars proclaimed that 1917 revenues would not pay 1918 expenses. Appeal was made to the public to vote "yes" for the 6-cent fare. Advertising cards suspended in the center of the cars were also used effectively. Good work in putting the proposition to the public was done by the platform men for a week in advance.

Publicity was given through newspaper talks for five days preceding the election. A special eight-page emergency edition of *On the Cars* was issued and election cards were distributed by employees and workers stationed at the polling places. Special cars were run to the packing houses and carried the men direct to the polls free of charge.

It was noted in the ELECTRIC RAILWAY JOURNAL for May 25, page 1032, that a resolution had been passed by the City Commission to submit the question of a 6-cent fare for the Sioux Falls Traction System to the voters at a special election that had been called for May 28.

This action was the direct result of a strike of the employees of the company about two months ago which resulted in a general tieup of service for two days. The men demanded an increase in wages from 22 to 27 cents an hour. The auditors' report for 1917 showed that the company could not grant the demand without imperiling its solvency. An investigating committee of citizens was named and suggested a 1-cent increase in fare, upon the strength of which report the wage increase was granted.

The company is pleased with the result of the election and with the cordial relation which exists between it and its patrons.

Atlanta Rate Hearing Begun

Commission Adjourns Case to June 12 After Two-Day Session Questioning Company's Officers

The hearing of the petition of the Georgia Railway & Power Company, Atlanta, Ga., for an increase in rates was opened on May 22 before the Railroad Commission of Georgia. Among other advances the company wants a 6-cent fare and 2 cents for a transfer.

The morning session was occupied with the reading of the petition, by J. Prince Webster, rate expert of the commission, and the arguments of Jack J. Spalding, principal attorney for the company, and the reply of W. A. Wimbish, attorney for the citizens' committee which is opposing the proposed increases in rates.

BURDEN OF PROOF ON COMPANY

At the conclusion of the statement by Attorney Wimbish, Chairman Candler of the commission announced that the burden of proof was upon the company to show that the increases which it seeks are justified by the facts in the case.

H. M. Atkinson, chairman of the board of directors for the company, took the stand as the first witness and gave an exhaustive analysis of the reasons advanced which he claimed render these increases absolutely necessary. The afternoon session was consumed by the conclusion of the testimony of Mr. Atkinson and his cross-examination by several of the attorneys representing opposing interests, and the testimony of Preston S. Arkwright, president of the company.

The hearing was continued on May 23 with Mr. Arkwright as the principal witness, but late on that day was adjourned until June 12. This was done upon representation of counsel for the city of Atlanta and the people's committee that they were unable to cross-examine Mr. Arkwright because they had not had access to the books and figures presented by the company. Counsel for the opponents stated that it would be impossible to proceed intelligently until the records of the company were produced for inspection.

COMPANY OBJECTS TO DELAY

Attorneys for the company objected to a request for postponement, and took exception to the statement of Mr. Watkins, of counsel for the people's committee, that the officers had exhibited any aversion to showing their figures. They contended that the company was asking for an increase as an immediate and emergency measure.

Testifying before the commission on May 23 Mr. Arkwright stated that the company's petition for an increase of 33⅓ per cent in all departments is only to meet an emergency and that when the emergency was over the company expected that the commission would again readjust the rates in accordance with the conditions as it found them at that time.

Blanket Increase in Indiana

Commission There Authorizes All Interurban Railways to Charge 2½ Cents a Mile

An order was issued by the Public Service Commission of Indiana on May 30, authorizing all interurban railways not heretofore granted increases in rates of fare to charge 2½ cents a mile instead of 2 cents, and to sell 1000-mile mileage books at the rate of 2 cents a mile effective on June 3. Increases to the 2½-cent rate had already been granted on petition and hearing, to the Union Traction Company of Indiana, Indianapolis & Cincinnati Traction Company, Chicago, South Bend & Northern Indiana Railway and the Marion & Bluffton Traction Company.

The commission regarded it as merely a matter of time until the other interurban electric lines in the State would file petitions for similar increases, and in view of the federal order increasing steam railroad rates to 3 cents a mile, it was deemed expedient to issue a general order covering Indiana.

The commission's order refers to the fact that the interurbans are placed in a perilous position by increased cost of operation, and that in many cases there has been a decrease in travel due to the improvement of the highways and the increased use of passenger automobiles and trucks which are doing a local freight business. The order indicates that if the 2½-cent rate should not prove sufficient after a fair trial, a further advance in passenger fares will be considered by the commission.

Pacific Electric Feels the Need

The Pacific Electric Railway, Los Angeles, Cal., wants to raise passenger rates on its lines radiating from Los Angeles, and reduce the number of trains in the city, in order to meet increased operating expenses, increased cost of materials and increased taxes.

The company has filed an application with the State Railroad Commission for authority to raise rates, and, it is announced, will file an application with the Los Angeles Board of Public Utilities for permission to reduce the number of trains.

In the application to the State Railroad Commission it is pointed out that the road has never paid dividends to stockholders, and permission is sought to raise rates sufficiently at least to enable the company to meet its annual fixed expenses. A schedule of the proposed new rates will be filed later. It is believed that an increase equivalent to 1 cent to 1½ cents per passenger will be necessary.

Though the Pacific Electric Railway is not under government control it planned to increase wages on June 1 of all employees receiving less than $250 a month. This is in line with the policy adopted by the government. In speaking of the proposed increase Paul Shoup, president of the road said:

"The Pacific Electric Railway has not been earning operating expenses, taxes and interest. The increased costs of labor and material for operation and maintenance, the jitney and the use of privately owned automobiles on good roads have been the chief causes contributing to this result. We ask that rates be increased in such amounts, that there will be returned a revenue sufficient to meet the annual fixed charges. Last year 73 per cent of our revenue came from passengers, who averaged 9 cents each. We get less than 1½ cents per mile per passenger, and our commutation rates probably do not exceed two-thirds of a cent per mile per passenger."

Fares Up on Wheeling Suburban

Upon the evidence submitted by the West Virginia Traction & Electric Company, Wheeling, W. Va., in connection with its application to the Public Service Commission of West Virginia to charge 6 cents on its railway lines and to do away with school tickets, the commission recently decided that the petitioner was not receiving a just rate of return on the fair value of that portion of its property devoted to the use of the public; that the fair value of the property for rate-making purposes was aproximately $1,000,000, and that an increase in its present rates from a 5-cent fare to 6 cents for each zone would under present conditions produce a reasonably fair rate of return. It was therefore ordered that the petitioner be authorized to cancel all monthly commutation rates, except school rates, and put into effect the following rates:

PASSENGER RATES

Wheeling to Elm Grove, or intermediate points	6 cents
Wheeling to Triadelphia	12 cents
Wheeling to Roneys Point	18 cents
Wheeling to Valley Grove	24 cents
Wheeling to West Alexander	30 cents

SCHOOL RATES—GOOD ONLY FOR MONTH ISSUED

Wheeling to Elm Grove	$1.40
Wheeling to Triadelphia	2.75
Wheeling to Roneys Point	4.15
Wheeling to Point Mills	4.15
Wheeling to Valley Grove	5.50
Wheeling to West Alexander	6.90
Elm Grove to Wheeling	1.40
Elm Grove to Triadelphia	1.40
Elm Grove to Roneys Point	2.75
Elm Grove to Point Mills	2.75
Elm Grove to Valley Grove	4.15
Elm Grove to West Alexander	5.50

Good only from 7 a.m. to 6 p.m. on school days.

Tickets issued to scholars upon certificates from school principals.

The petitioner was authorized to charge 1 cent for transfers to the Mount de Chantal division. The commission found that objections to the character of the service rendered by the company were sustained by the evidence but said that improvement in service is expected as a result of the increase in rates. The increase in rates is effective until further order of the commission. The company is ordered to keep an accurate account of the revenues derived and expenses incurred by it for a period of one year from June 1, 1918, and at the expiration of that period to file with the commission a detailed statement thereof.

The order of the commission became effective on May 10.

Alive to the Opportunity

Business Men of Southwest Discuss Matter of Truck and Electric Railway Transportation

At the war convention of the Inter-Community League of the Southwest, in Kansas City on April 24 and 25 every discussion of increased agricultural production or of industrial development in Kansas, Missouri and Oklahoma led back to transportation.

While there is considerable hauling of freight by truck in these States, regular service is maintained only over the very small mileage of rock roads. Merchants in small towns on electric railways are, however, in good position, since they are receiving their merchandise by the interurbans. The tendency to keep railroad freight cars off of short haul work is inclining merchants to seek delivery by interurbans to stations from which they can conveniently get goods to their stores by truck.

Comments during the session of the league indicated that there is prospect of development of business by jobbing houses in centers served by interurban electrics.

During the present halt in road improvement, communities are going to investigate their highway plans carefully to determine whether the roads to be improved should not be planned with reference to available interurbans, rather than with reference to long-distance automobile passenger travel. While freight transport by truck is feasible on regular routes, over comparatively short hauls, it is a problem to finance or operate a long route. It was pointed out that the joining of facilities of electric line and rock road would vastly extend high-class service.

The Inter-Community League, at its convention, made plans for getting information on the industrial resources of the three States. The league will maintain a committee, and possibly a traveling representative, to study and advise on industrtial questions, and a definite program of education towards improving the manufacturing resources will be carried on. Industrial commissioners of several railroads addressed the league. They will provide expert help in gaging industrial possibilities, and in arranging to get information that would be required by investors or manufacturers.

City Will Investigate

Tacoma's new City Council plans to investigate the railway service furnished by the Tacoma Railway & Power Company and the Pacific Traction Company. Since the decision of the State Supreme Court confirming cities' powers that were, in a measure, assumed by the Public Service Commission, it is possible that the proposed hearing which the Public Service Commission was to grant on transportation difficulties in Tacoma may be abandoned in favor of one in which the City Council will be the principal representative of the people.

Governor Confident of People

Executive of Tennessee Sees Hope of Relief for Public Utilities if They Prove Their Case

Tom C. Rye, Governor of Tennessee, has replied to T. H. Tutwiler, Memphis, chairman of the committee on public utility conditions for Tennessee, which recently appealed to the Governor to ask the co-operation of the public in helping the concerns to maintain their maximum efficiency in line with President Wilson's request for co-operation. The Governor says that he is convinced that the citizens understand and appreciate the conditions that obtain at present and that they will not withhold any concession necessary for the successful operation of the public utilities. He says in part:

THE GOVERNOR'S LETTER

"I am sure you will agree with me in the statement that the people should be required to pay only just and reasonable rates and charges so as to enable these corporations to render adequate and efficient service to the public and at the same time yield a reasonable return to the owners.

"While it is true that costs have increased to the utilities, I cannot ignore the fact that these corporations are acting and operating under certain franchises, charters and contracts with the cities, towns and people they serve, each limited to the powers conferred and duties imposed by the express terms of their different charters and contracts, and these are, in their nature, purely local.

"The right to change or alter the terms of these contracts belongs exclusively to the people directly interested. Therefore, I would not feel at liberty to assume to advise these interested parties as to what they should or should not do in the premises.

"Judging from my experience with the people, I am constrained to believe that all that is necessary in order to afford these corporations the relief to which they may be justly entitled is a clear presentation of existing facts with reference to each particular corporation so that the people may see and understand the reasonableness and the necessity for the changes asked. And when this is done, I confidently believe that those who are authorized to act will not hesitate to do so, and that relief will be given where the facts that relief will be given in such measure as the facts and circumstances would seem to justify."

The appeal to the Governor was reviewed in the ELECTRIC RAILWAY JOURNAL for June 1, page 1071.

Basis of Toronto Car Order Appeal

In the matter of the appeal of the Toronto (Ont.) Railway from the fine by the Ontario Railway & Municipal Board for not complying with its order to place in operation 100 new cars, the whole question of Provincial authority and power under "the British North America act" is raised.

Among the grounds of appeal may be briefly summarized the following:

That the order is not one which the board could make of its own motion.

That the Ontario Railway Board has no jurisdiction to make such an order, either on its own motion or on application.

That the evidence shows that the company did use its best effort to comply with the order to purchase 100 cars.

That the evidence shows that it was impossible to obtain the cars at the time of the order owing to war conditions.

That the company should not have been ordered to purchase such cars and the order was improperly made.

That the order is against the weight of evidence and contrary to law.

That the Legislative Assembly had no power to enact the railway and municipal board act, and that D. M. McIntyre and Andrew Ingram have not been validly appointed as commissioners under such act for making such orders, and have no jurisdiction to make the order complained of, upon the ground that the appointment of the said commissioners is not within the legislative authority of the Province of Ontario.

Hudson Tunnel Raises Fares

In conformity with general order No. 28, issued by the Director General, United States Railroad Administration, under date of May 25, 1918, there will be a general advance in all passenger fares of the Hudson & Manhattan Railroad, operating under the Hudson River between New York and New Jersey, and effective at 12.01 a.m., on June 10 the following rates of fare will apply on the lines of the company:

Between all stations in New York City (both uptown and downtown) and Jersey City and Hoboken, in either direction, a uniform fare of 10 cents will be collected. Between local stations on Sixth Avenue, New York City, the 5-cent fare will apply. All tunnel fares will be collected in cash, by deposit of the exact amount in the coin boxes at the entrances to stations. Between all stations in New York (both uptown and downtown), Jersey City and Hoboken and Newark, N. J., one-way tickets will be sold at 27 cents and half one-way tickets at 14 cents. Such tickets are valid only for continuous passage, without stop-over, in the direction first presented. Round-trip tickets will be discontinued.

The present charges are 5 cents for downtown passengers and 7 cents for uptown passengers. The Hudson & Manhattan Railroad was taken over by the government for operation by the Federal Railroad Administration on Jan. 1.

The company has announced that all commutation tickets will be honored until and including the date of their expiration.

Transportation News Notes

Bay State Rates Suspended.—The Public Service Commission of Massachusetts on May 31 ordered to be suspended until June 16 proposed changes by the Bay State Street Railway in rates of fares and in commutation and excursion tickets.

Muskegon Wants Six Cents.—The Muskegon Traction & Lighting Company, Muskegon, Mich., has petitioned the City Council for a 6-cent fare. The company is operating without a franchise. It sells twenty-eight workingmen's tickets for $1.

Seven-Cent Unit Proposed.—The Norfolk & Bristol Street Railway, Foxboro, Mass., has notified the Public Service Commission of Massachusetts that it will increase its fare from 6 cents to 7 cents, beginning June 29. The company operates 21 miles of line.

Milwaukee Northern Wants Higher Rates.—Demand for higher rates for interurban and city lines and for freight is presented by the Milwaukee Northern Railway, Cedarburg, Wis., in a petition which it has filed with the Wisconsin Railroad Commission.

Increase in Joint Rates.—The International Railway has filed a change in its tariff schedules affecting joint passenger traffic in connection with the Buffalo, Lockport & Rochester Railway. The new schedule shows increases in one-way and round-trip fares and chartered car rates to all stations.

Six-Cent Fare for White Plains.—The Common Council of White Plains, N. Y., has granted permission to the Westchester Street Railroad to charge a fare of 6 cents. The permit is temporary and will have effect between June 1 and July 31. At the end of the time the company is obliged to show an improvement in service.

Appeal from Six-Cent Order Disallowed.—The motion of the City Counsellor of St. Louis, Mo., for a rehearing of the case in which the Public Service Commission of Missouri recently granted the United Railways, St. Louis, permission to charge a 6-cent fare on lines in St. Louis, for the period of one year beginning June 1, has been overruled by the commission.

Another Road Adopts Six-Cent Unit.—The New Bedford & Onset Street Railway, New Bedford, Mass., on May 29 filed with the Public Service Commission of Massachusetts a new schedule of fares calling for an increase of from 6 cents to 7 cents. The new rates will become effective on June 30. Minor increases in ticket fares are also asked.

Worcester to Charge for Transfers.—The Worcester (Mass.) Consolidated

Street Railway has filed a new tariff with the Public Service Commission of Massachusetts proposing to increase the fare unit on all lines outside of the city of Worcester from 5 cents to 6 cents. Fares in the city of Worcester will be 5 cents, with 1 cent additional for each transfer issued.

Portland Rates Suspended Until Sept. 11.—The Public Utilities Commission of Maine has suspended, until Sept. 11, the establishment of higher fares on the Portland city system operated by the Cumberland County Power & Light Company under lease from the Portland Railroad. The company has now put in all its testimony, but that of the opposition has not entirely been heard.

City Protests Pittsburgh Zones.—The city of Pittsburgh, Pa., has protested to the Public Service Commission of Pennsylvania agaist the system of zone fares proposed by the Pittsburgh Railways. The city contends that the new rates, intended to become effective on June 20, are arbitrary, unreasonable, unjust and discriminatory. It professes to see in the changes an attempt by the receivers to find a ready means of meeting the various fixed and capital charges arising by reason of the present financial structure of the company.

Village Agrees to Fare Advance.—After obtaining an amendment to its franchise, the Hudson River & Eastern Traction Company, Ossining, N. Y., has increased the fare on its lines from 5 cents to 6 cents. The company recently increased the fare to 7 cents, without the permission of the village officials, but following the decision of the Court of Appeals in the so-called Rochester case the company restored the 5-cent fare. Then the company sought permission of the village officials, who acquiesced in an advance of 1 cent.

Trenton Fare Hearing Under Way.—The hearing on the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., for a 6-cent fare over all its lines was set for continuation before the Board of Public Utility Commissioners on June 3. It was planned by the commission to proceed from day to day with the taking of testimony in the case, but Commissioner Slocum announced that because of other important matters pending before the board, it would be impossible to give more than one day of next week to the Trenton case.

Time-tables in Brooklyn Cars.—In accordance with an order of Public Service Commission for the First District of New York, all of the cars on the surface lines of the Brooklyn (N. Y.) Rapid Transit Company are carrying conspicuous placards containing a time-table, with the departure of each car and the time it is due at various points; the number of cars operated on each line, the number of each car, and the headway between cars. This is one of the results of the recent inquiry by the commission into alleged inadequate service in Brooklyn.

Albuquerque Goes to Six Cents.—At their meeting on May 21 the City Commissioners of Albuquerque, N. M., approved the proposal of the City Electric Company to raise railway fares from 5 cents to 6 cents. The commissioners, however, before they acted asked that the people approve the proposed ordinance, and requested the City Electric Company to initiate the legislation by filing with the commissioners the petition required by law, bearing a minimum of 670 signatures of qualified voters. This the company did.

Twin City Wants Fare Conference.—Horace Lowry, president of the Twin City Rapid Transit Company, Minneapolis, Minn., on May 31 sent a formal letter to the City Council asking consideration of the question of higher fares. This was in accord with Mr. Lowry's recent statement, following a presentation of the financial situation confronting the company. The letter does not ask that higher fares be granted. It asks rather that the Council grant a hearing at which the company may present its case in full detail for discussion.

Staggered Hours Being Urged.—The Kansas City (Mo.) Railways is advertising in its cars and in the newspapers to stimulate early shopping and especially early homegoing in order to reduce the traffic at the busy hours. The company is also discussing with managers of industrial plants the staggering of working hours to scatter the traffic morning and evening. City officials may be asked to assist in the attainment of this object although industrial plant managers generally are inclined to enter some sort of an arrangement for the distribution which the company desired.

Fare Raise in Manchester.—The Manchester (N. H.) Street Railway, included in the system of the Manchester Traction, Light & Power Company, increased its fares on May 15 with the approval of the Public Service Commission of New Hampshire. Where 5 cents has been charged heretofore 6 cents is now being charged and where 7 cents was charged heretofore 8 cents is now being charged. No other changes have been made. School children's tickets are being sold at the same price and on the same conditions as heretofore, namely, twenty-five tickets for $1 or six tickets for 25 cents.

Staggered Hours at Fort Worth—Owing to the recent eight-hour decision of the national arbitration board in the packing-house cases, the closing hour at Fort Worth has been 3 p.m. instead of 5 p.m. since May 4. This makes it possible for the Northern Texas Traction Company to handle the afternoon rush business from this source in time to use the same cars elsewhere for the store and office peak. Although the general direction of travel is opposite in direction, the packers moving inbound, the change in hours has brought notable relief to the company at a period of the day during which its facilities are sorely taxed.

Alton Would Charge Seven Cents.—A petition has been filed with the Public Utilities Commission of Illinois by the Alton, Granite & St. Louis Traction Company asking permission to raise fares in Alton from 5 cents to 7 cents, beginning July 1. An additional cent for each transfer also is proposed. Under the proposed schedule the round-trip rate between Alton and St. Louis would be the same as now, but a raise is asked for a single fare. Increases are asked for the monthly commutation books and the $4 books. Increases in the price of commutation books between Alton and East Alton and Wood River are proposed.

Straight Five-Cent Fare for Lynchburg.—The State Corporation Commission of Virginia has authorized the Lynchburg Traction & Light Company, Lynchburg, Va., to discontinue the sale of six tickets for 25 cents and 3⅛-cent school tickets and to charge a straight 5-cent fare. Application for this permission was made to the commission in December last. The case was heard on Feb. 26, was continued and further heard and argued on April 11. Unused tickets are to be redeemed at the price paid for them upon presentation at the office of the company on or after the date on which the new fare tariff goes into effect.

Maryland Road Files New Rates.—The Cumberland & Westernport Electric Railway, Cumberland, Md., on May 30 announced a new schedule of rates of fares which will go into effect on July 1. The change of passenger fares adds 1 cent per zone for each zone of the system above the rate of 5 cents now in force. Instead of paying 55 cents to ride from Cumberland to Westernport an additional 4 cents will be collected. From Cumberland to Frostburg the increase will be 3 cents, etc. The fare from Cumberland to Narrows Park remains the same. The clergy reduced-fare ticket book is increased 50 cents for 100 tickets, but miners riding on regular miners' cars will still be carried at 5 cents per zone.

Zone Fares Increased in Maine.—The Public Utilities Commission of Maine has handed down a decision increasing the zone fares on the Lewiston, Augusta & Waterville Street Railway from 5 cents to 7 cents, the zone boundaries remaining as heretofore. The decision involves 165 miles of track and some twelve cities and towns. On the very few zones on which more than a 5-cent fare had previously been charged, a proportional increase was granted. During its effort to secure higher fares the company carried on an extended publicity campaign to prove the necessity of the increase asked. This campaign was conducted by W. W. Harris, who is associated with Ivy L. Lee in the firm of Lee, Harris & Lee, New York.

I. U. T. Fare Increase Allowed.—The Public Service Commission of Indiana on May 27 issued an order authorizing the Union Traction Company of Indiana to increase its interurban passenger rates from 2 cents to 2½ cents a mile, effective on June 3. Ten cents is established as the minimum fare for a single passenger. The unit of computation is a zone of four-tenths of a mile at 1 cent a unit. This is in keeping with the "penny zone" plan established some time ago. The order will continue as a war emergency measure during the pleasure of the commission, and is intended to maintain the efficient operation of the company, but not to produce sufficient revenue for the payment of any dividends.

Women Only in an Emergency.—The Pacific Electric Railway, Los Angeles, Cal., has stated its attitude with respect to the use of women in train service on its lines. The company says: "There has been considerable discussion as to the employment of women in train and car service, and other departments as well, if the need for help on the electric railways, street and interurban, becomes such as to make their employment imperative. It is possible that the draft needs of the country for army and other war purposes, will bring about a condition where women will have to take up the work ordinarily done by men. If such a condition should arise in Los Angeles the Pacific Electric will give preference in such employment first, to eligible members of families and dependent relatives of the men who have gone to the front, and, second, to family relatives of Pacific Electric employees in active service."

Skip Stop Proposed for Kansas City.—The special committee of the City Council of Kansas City, Mo., to which the skip-stop matter was recently referred, held a recent hearing on the subject at which P. J. Kealy, president of the Kansas City Railways, and Robert B. Woods, city member of the Board of Control, explained the reason for the plan and its advantages. The committee expressed itself in favor of a skip-stop plan, but some of the Aldermen requested protection as far as possible for merchants at the corners where the operation of the plan might reduce traffic. President Kealy said that skip-stop operation would save 15,000 to 18,000 tons of coal a year in Kansas City, and that when the matter finally came up in the form of an ordinance, the fuel administration would probably send a man to urge its adoption. The committee ordered the preparation of an ordinance for the introduction of the skip-stop plan.

Final Argument in Trenton Service Case on June 11.—The cross-examination of H. C. Eddy, chief traffic inspector of the Board of Public Utility Commissioners, and of F. T. Daly, an assistant inspector, was completed on May 27 in connection with the application of the city of Trenton for improved service by the Trenton & Mercer County Traction Corporation. It was agreed that the case should come up on final argument on June 11. George L. Record, special counsel for the city, said he wanted to argue the case orally and Frank S. Katzenbach, for the company, said that if Mr. Record wanted an oral argument, his side was willing. One of the principal points brought out by the company was that the cost of trackage had increased 50 per cent over normal times. Another point was made by Mr. Katzenbach in having Mr. Eddy admit that from a financial angle this was not a very good time to make any radical changes.

Trenton Fare Case Opened.—In testimony before the Board of Public Utility Commissioners of New Jersey on June 3, on the application of the Trenton & Mercer County Traction Corporation for the abolition of six-for-a-quarter tickets and for a 6-cent fare, Rankin Johnson, president of the company, stated that if the increase was granted the company could provide for an increase in the wages of its employees amounting to $20,000 a year and also for a $500,000 expenditure for a plant addition as well as $25,000 for increased depreciation fund. He was still on the stand when adjournment was taken until June 13. It was stated that two days, that day and the next, would be required to complete Mr. Johnson's testimony. A date will then be fixed for the cross-examination by Charles E. Bird, city counsel and George L. Record, special counsel, for the city, and by Martin P. Devlin, representing the labor unions. Frank S. Katzenbach and Edward M. Hunt, represent the company.

New York's Owls May Go.—On June 4 it was announced that John Candler Cobb, Boston, a director of the New York (N. Y.) Railways, had been appointed by the board to investigate and report on the amount and nature of the service which the company can and should give the public under existing conditions. Mr. Cobb said that while he was not prepared to state what the results of the work would be, he could say that his preliminary study indicated that a shutdown of night service would probably enable the company to solve the problem. He said that he wanted everyone engaged in any essential industry that would be seriously interfered with by stopping transportation between 10 p.m. and 6 a.m. to communicate with him at the office of the company. Members of the Public Service Commission commented sarcastically on the proposal to suspend night service by stating that New York was not Boston and that it was a twenty-four hour city. The suggestion of Mr. Cobb was quickly turned to their advantage by the daily newspaper columnists.

From Eight Zones to Seven Zones.—At its regular meeting on May 22 the Railroad Commission of South Carolina granted a postponement of the date upon which the change in passenger fares upon the Augusta-Aiken Railway will become effective. The date for the change from the 40-cent to the 35-cent rate was originally set for June 1. It was changed on May 22 to June 8, in order to comply with the laws requiring thirty days' notice for such changes in rates. The commission has virtually agreed upon the new seven-zone system upon this road, which it is believed will remove all causes for complaint in regard to passenger fares. This move by the commission is undoubtedly made in accordance with its announced purpose to reserve to itself the right to rearrange the zones to meet the demands of travel as they showed themselves during the trial period of three months. The decision in this case was reviewed in the ELECTRIC RAILWAY JOURNAL of April 13, page 726. Eight 5-cent zones have been in effect.

Fare Increase in Oshkosh.—The Railroad Commission of Wisconsin has rendered its decision in the application of the Eastern Wisconsin Electric Company to shorten several of its routes in the city of Oshkosh, and to discontinue the sale of the eight-for-a-quarter workmen's tickets. The decision of the commission, while it authorized the elimination of the eight-for-a-quarter tickets, required the substitution of twenty-five tickets for $1 or twelve tickets for 50 cents, to be good during a certain period in the morning and at night. The shortening of the routes was also authorized as a means of giving a more dependable service, and the application of the company for permission to adopt one-man operation in the city of Oshkosh was also granted. The company has made application to discontinue the operation of its local cars in the city of Neenah, Wis., and has also made application for authority to increase the railway fare between Fond du Lac and North Fond du Lac from 5 cents to 6 cents from 6 a.m. to 12 midnight and from 5 cents to 10 cents from 12 midnight to 6 a.m.

One-Man Cars and Charge for Transfers.—A petition has been filed with the State Public Utilities Commission by the Utah Light & Traction Company, Salt Lake City, Utah, for an order permitting it to use but one operator to perform the duties of motorman and conductor on a car outside of the congested district and to issue only limited or directional transfers, charging 1 cent apiece for them. In its petition the company sets forth that the order is necessary to reduce expenses to meet the new wage schedule of 40 cents an hour paid to employees. On Jan. 1 the company discontinued selling strip tickets at 4 cents each. This was on order of the commission. The city carried this case to the court. Only recently the Supreme Court upheld the commission order. Then came an increase in pay to the men as a result of arbitration, noted in the ELECTRIC RAILWAY JOURNAL of May 25, page 1023. This finding was not without its compensating feature for the company, however, as the board of arbitration urged upon the commission such action as would give prompt and speedy relief to the company through an increase of rates. June 11 has been set for a hearing on the application of the company to charge for transfers.

Personal Mention

J. L. Burkholder has been named general agent of the Illinois Traction System at Decatur, Ill.

F. H. Williams has succeeded H. C. Howard as publicity agent of the Winnipeg (Man.) Electric Railway.

M. A. Tupton has been appointed superintendent of the Shore Line Electric Railway, Western division, which includes New London, Niantic, Chester, Old Saybrook to New Haven.

Harry Hoyt, acting superintendent of the Shore Line Electric Railway, Western division, will become superintendent of the Eastern division, embracing the lines in Norwich, Groton, Stonington, Watch Hill and Weekapaug with headquarters at Westerly.

M. H. Frank has been appointed manager of the Eastern Wisconsin Electric Company at Fond du Lac. Prior to this appointment Mr. Frank was operating engineer of the Galesburg Railway, Lighting & Power Company of Galesburg, Ill., and previous to that time was assistant engineer on the Indiana & Michigan Electric Company at South Bend, Ind.

C. E. Warwick, superintendent of the Vicksburg Light & Traction Company, Vicksburg, Miss., has been appointed railway superintendent of the Eastern Wisconsin Electric Company at Sheboygan, Wis., and has assumed his new duties. Mr. Warwick was connected with the Vicksburg property from August, 1914. Prior to that he was superintendent of the city division of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

E. F. Greenleaf, of the Orleans-Kenner Traction Company, New Orleans, La., has been made general superintendent. Mr. Greenleaf moved to Louisiana twenty-five years ago and located in Gretna. He then joined the J. W. Thompson Sand & Gravel Company, working at Profit Island, and later went with the Midland Bridge Company and constructed many railroad bridges in the State. He started with the Orleans-Kenner line several years ago and was promoted from agent to general agent. He also was largely responsible for building up Felix Park, which is owned and operated by the company.

H. C. Young, who recently was appointed purchasing agent of the International Railway, Buffalo, N. Y., succeeding the late J. C. Sheldon, was by this appointment transferred from the department of bridges and buildings, of which he had been superintendent for five years. Previous to this he was for two years chief engineer of the track department and still earlier he spent four years in the engineering department of the Chicago City Railway. Mr. Young entered the electric railway business from the steam railroad field in which he was engaged on engineering work for about six years. His technical work involved a great deal of contact with the problems connected with the purchase of materials and equipment, and thus furnished admirable training for the varied duties of the purchasing agent of a large railway system.

C. E. Fahrney, newly-elected president of the Iowa Electric Railway Association, has been connected with the railway property at Ottumwa, Iowa, now operated by the Ottumwa Railway & Light Company, for the past twenty-three years, during which time the company has been reorganized and has changed hands several times. Upon graduation from the local high school, he entered the employ of the Ottumwa Electric Railway as storekeeper in 1895. In 1896 this company was placed in the hands of a receiver and he was transferred to the office force, becoming superintendent of transportation in 1896. In 1905 the property was taken under the management of H. M. Byllesby & Company. Mr. Fahrney was made general manager in 1911, which position he still holds. Mr. Fahrney has been vice-president of the Iowa Electric Railway Association for the last two years.

C. E. FAHRNEY

Obituary

W. H. Carnahan, assistant treasurer of the Illinois Traction System, died at his home in Champaign, Ill., on May 17 last. Mr. Carnahan was born in Cincinnati, Ohio, on Sept. 27, 1853, and resided there until 1872, when he removed to Kansas City, Mo. Later he moved to Monticello, Ill. In 1880 he became associated with the firm of J. B. & W. B. McKinley, dealing in Western land, and for several years was located in the State of Nebraska. When W. B. McKinley launched his public utility plans in Illinois which resulted in the organization of the electric railways in that State into the system known as the McKinley lines, Mr. Carnahan returned to Champaign, Ill., and associated himself with the Illinois Traction System as assistant treasurer. This position he held up to the time of his death. He is survived by the widow and seven children.

D. Hayward Ackerson, manager of sales of the Cincinnati Car Company, Cincinnati, Ohio, until January, 1918, when he was commissioned a first lieutenant in the Ordnance Department, died recently following an operation for appendicitis. Mr. Ackerson started to work for the company in the summer of 1905 as an apprentice in the shops, returning in the fall to school. He followed this arrangement until 1909, when he was graduated from the University of Cincinnati. He then entered the car wiring department of the Cincinnati Traction Company. Later he became a draftsman in the office of the master mechanic. In the spring of 1910 Mr. Ackerson entered the service of the Westinghouse Electric & Manufacturing Company, but on May 1, 1914, he resigned from that company to become manager of sales with the Cincinnati Car Company. Mr. Ackerson was only twenty-nine years old.

Capt. Harry A. Bullock, secretary of the New York Municipal Railway Corporation, head of many committees of the Brooklyn (N. Y.) Rapid Transit Company organization, and more recently assistant divisional quartermaster with the United States Army in France, was killed by an aerial bomb on Decoration Day while on duty at division headquarters about 5 miles back from the first line trenches where, on a certain sector, American troops were standing off the German offensive. Capt. Bullock was born in Northampton, Mass, thirty-nine years ago. He was graduated from Amherst College in 1899. He entered the newspaper business shortly afterward, and after working for several years as a reporter on New Haven and Boston newspapers came to New York to join the staff of the New York *Times*. In addition to being secretary of the New York Municipal Railway Corporation, Captain Bullock was in charge of all of the welfare activities of the Brooklyn Rapid Transit Company, and he brought to his tasks not only great talent as an organizer and as a thorough and capable investigator, but great enthusiasm and energy. Before the country became involved in the war he felt that it was his duty to become prepared for assisting it in case of necessity, and took the preliminary training at Plattsburg. Mr. Bullock was a member of the committee on education of the American Electric Railway Association.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Mount Vernon & Camp Humphries Railway, Mount Vernon, Va.**—Incorporated to construct a line from Mount Vernon to Camp Humphries. Capital stock, $50,000. Officers: James R. Caton, president, and John G. Graham, secretary and treasurer, both of Alexandria, Va.

Franchises

Erie, Pa.—A temporary certificate of public convenience has been issued by the Public Service Commission granting the Buffalo & Lake Erie Traction Company permission to construct a loop around East Perry Square, to remain during the period of the war and for six months after its conclusion.

Track and Roadway

Anniston, Ala.—A corporation has been organized with capital stock of $200,000 to construct an electric railway from Anniston to Camp McClellan. The following were elected officers of the company: W. H. McKleroy, president; Dr. J. L. Wikle, vice-president, W. H. Weatherly, treasurer, and L. L. Crump, secretary. As soon as the War Department grants permission to enter the reservation, work on the line is expected to begin. James Mitchell, president of the Alabama Power Company, announced that he would take $50,000 of the stock for his company and offered the use of the company's Noble, Tenth, Moore and Thirteenth Street loops to the new car line. [May 25, 1918.]

Pacific Electric Railway, Los Angeles, Cal.—Work will soon be begun by the Pacific Electric Railway on the reconstruction of its tracks on Franklin Avenue, Hollywood.

Evansville, Ind.—The Public Utilities Company has received permission from the Board of Public Works to extend its Fulton Avenue line from Gavitt Street to a point 150 ft. north of Twenty-eighth Street, where the company will establish a loop in place of the one now on Gavitt Street.

International Railway, Buffalo, N. Y.—Plans are being made by the International Railway for the construction of 8.7 miles of new track in Buffalo this year, to cost approximately $870,000.

Toronto (Ont.) Civic Railway.—Work of laying rails on the Bloor Street viaduct will be proceeded with at once, according to a decision recently reached by the Ontario Railway & Municipal Board. Girder rails now on hand are to be used for this purpose and T-rails will be used temporarily to complete the work. Meanwhile the Pape Avenue line of the Toronto Railway will have to remain undone until more rails are secured.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont.—This company contemplates the construction of a loop on Ferry Avenue and the construction of double tracks on London Street and Ouellette Avenue. The company will also install double curves at the intersection of Ouellette Avenue and Sandwich Street.

Hull (Que.) Electric Company.—The Hull Electric Company will construct an extension to its lines.

Levis County Railway, Levis, Que.—This company reports that it plans to reconstruct its track and ballast the roadbed at a cost of approximately $100,000.

Dallas (Tex.) Railway.—The work of placing new curves and double tracking the electric railway lines at Commerce and Lamar Streets by the Dallas Railway has been finished and as soon as new schedules are arranged and approved by M. N. Baker, Supervisor of Public Utilities, the Oak Cliff cars will be routed as crosstown lines. The cars will cross from Commerce to Elm on Lamar, and will then be routed out Elm Street and Bryan to Munger Place. The City Commission of Dallas, Tex., has awarded the contract for paving of Jefferson Street from Commerce to Young Streets and has issued an order to the company to pave the portion of the street under and between its tracks. The company's share will amount to about $2,663.

Wheeling (W. Va.) Traction Company.—Work has been begun by the Wheeling Traction Company on the rehabilitation of its lines.

Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—Contracts have been awarded by the Pacific Electric Railway to the Wurster Construction Company, Los Angeles, for the construction of its new shops at Torrance, as follows: Car works, 180 ft. x 400 ft.; heavy machine shop, 180 ft. x 450 ft.; forge shop, 150 ft. x 200 ft.; erecting shops, 180 ft. x 450 ft.; paint shop, 180 ft. x 450 ft.; power plant, about 60 ft. x 120 ft., and other structures. The cost of the entire work is estimated at $1,000,000.

Interborough Rapid Transit Company, New York, N. Y.—A new station is being built by the Interborough Rapid Transit Company at 162d Street and Anderson Avenue, The Bronx. The station will consist of a two-story building about 75 ft. x 80 ft., the large central portion being devoted to station purposes, on each side of which will be a good-sized store, capable of being divided into two smaller stores. The building will be fireproof throughout, with ornamental front in harmony with the neighboring buildings.

Montgomery Transit Company, Norristown, Pa.—This company reports that it has under construction a new repair shop at Skippack.

Texas Electric Railway, Dallas, Tex.—A new passenger station and car repair shop will be built by the Texas Electric Railway at Denison, to cost about $10,000.

Power Houses and Substations

Pacific Electric Railway, Los Angeles, Cal.—Plans have been prepared by the Pacific Electric Railway for building a one-story brick substation, about 32 ft. x 50 ft., at Slauson Junction, Slauson and Long Beach Avenues.

Potomac Electric Power Company, Washington, D. C.—Owing to the erection of many additional government buildings in Washington and the establishment around that city of many camps and cantonments, the Potomac Electric Power Company, which is controlled by the Washington Railway & Electric Company, has made a number of extensions to its power system. At the station it installed a 15,000-kw. unit in January, 1917, and has placed an order for another of the same size which is promised for delivery Jan. 5, 1918, and is negotiating for a third generator of the same size. Boiler equipment for this additional power is also being installed. Additional substation equipment has also been purchased, and the company is negotiating with the government to supply steam heat for new buildings near its station.

Manila Electric Railway & Light Company, Manila, P. I.—A report from the Manila Electric Railway & Light Company states that the company plans to construct an extension to its present power plant. The company has recently purchased one 5000-kw. turbine and 10,000 sq.ft. condenser, one 1000-kw. rotary, one 100-kw. M. G. exciter, switchboard, etc., from the Westinghouse Electric & Manufacturing Company and six 6-retort Taylor stokers. The company will soon purchase an economizer and induced-draft fans.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—Work will be begun at once by Stone & Webster on the construction of a concrete power station at 6500 Fourteenth Avenue South, Seattle, to cost about $30,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES . • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Standardizing Catalogs Along Practical Lines

Conference in Chicago Recommends Regular Page Sizes, Weights and Colors of Paper

Following the appointment of a committee on the standardization of catalogs of the National Association of Purchasing Agents, by E. L. McGrew, purchasing agent of the Standard Underground Cable Company of Pittsburgh, Pa., much correspondence was carried on with all the associations in the various lines of catalog preparation and distribution. As a result a conference was held by the committee at the Hotel La Salle, Chicago, Ill., on May 22. Representatives from a number of organizations interested, including the American Institute of Architects, American Association of Heating & Ventilating Engineers, American Association of Mechanical Engineers, National Gas Engine Association, Steel Furniture Manufacturers' Association, American Supply & Machinery Manufacturers, Electrical Manufacturers' Council, catalog manufacturers, representatives from firms engaged in industrial lines using catalogs for the dissemination of information relative to their products, as well as from the National Association of Purchasing Agents.

After addresses were delivered by representatives from all the organizations, some of which had already adopted a standard size or sizes of catalogs, used by their own trades, the conference adopted resolutions in effect as follows: three sizes of catalog pages, namely—6 in. x 9 in., 7½ in. x 10⅝ in. and 8 in. x 11 in. Sizes of book papers—25 in. x 38 in., 32 in. x 44 in. and 33 in. x 46 in. Standard weights of book papers, based on the 25-in. x 38-in. size—40 lb., 45 lb., 50 lb., 60 lb., 70 lb., and 80 lb. Colors of paper—white and natural.

During the evening the standardization of catalogs committee of the National Association of Purchasing Agents held its session, at which it adopted as the standard size for catalogs which will be furnished to purchasing agents, pages measuring 7½ in. x 10⅝ in. These dimensions are of the oblong proportions, which will cut with least waste from the standard 32-in. x 44-in. sheet of paper.

The purchasing agents have, therefore, adopted one standard size of catalog, which is of such proportions that in case it might be found desirable to furnish smaller editions to other trades they could be reproduced from the original wash drawings instead of requiring new ones to be made.

Catalogs are designed to sell goods, it was declared, but are now seldom used for that purpose, on account of their inaccessibility. Therefore the purchasing agents are preparing to issue posters which will advertise the fact that they are backing as a unit the 7½-in. x 10⅝-in. page size, bound in sectional form; and are urging the co-operation of all manufacturers in bringing about this standardization.

Future of Steel Extremely Uncertain

New Freight Rates Likely to Increase Prices—Supply Difficult to Estimate

With the government now taking over 100 per cent of the steel output, and normally at least 80 per cent, manufacturers of electric railway equipment and supplies view the future with considerable apprehension. It is known that a nmber of firms, anticipating their wants, have at least a year's stock of sheet steel. While congratulating themselves on being so fortunate, they say a year, at the best, is only a short time. Before its expiration further requirements must be provided.

The acuteness of the steel supply is further emphasized by a notice to the mills on Monday from the War Industries Board. The board requests manufacturers to furnish the names of all customers, the orders they seek to place, the orders accepted by the companies, and the commodities for which the steel is to be used. Previously the board required a record of all orders taken and shipments made, but the names of individual buyers were not asked. It is further expected that a stricter application of priority rules, to an extent which will mean that all the steel and iron produced by the plants will be at the direction of the government. In fact, on Thursday the government assumes absolute control of the distribution of all manufactured steel products and pig iron.

Another disturbing factor is new freight rates, an advance of 25 per cent, which goes into effect on June 25. This increase will be used by iron and steel makers as an argument that the War Industries Board should not reduce the price of their products for the period after June 30, when the present schedule expires by limitation. On finished goods sold to commercial users the buyer will pay the increased rates. This, of course, swells the costs of the manufacturers of the long list of traction road and power house equipment and accessories. It is this phase of the question which is causing the most concern.

Higher Prices Put on Power Plant Apparatus

Motors, Switchboards, Turbines, Transformers and Generators Are Marked Up 10 Per Cent

Within the past ten days numerous announcements of advances in power-plant equipment have come out from the manufacturers. A general advance of 10 per cent on motors was made in the neighborhood of June 1. One of the leading manufacturing concerns sent the following notice to its agents:

"Effective Saturday noon, May 18, advance net selling price 10 per cent on all lines covered by apparatus, switchboard, turbine and motor price book sheets dated prior to May 16, pending receipt of revised price sheets or discounts."

Another company of prominence made the switchboard advance about the middle of May; but on motors of all sizes, alternating and direct current; transformers, generators and motor-generator sets its new prices went into effect on June 3. Transformers, electric locomotives and some other specialties were made exceptions under the new ruling by the first-named concern.

It is held by the various manufacturers that a steady advance in the cost of material has rendered the increase in finished goods imperative. Further, it is also the opinion of several large producers who adjust their operations strictly on market and general conditions that a mark-up in a couple of months on all lines of electrical supplies should be no cause for special astonishment. The manufacturing situation, for obvious reasons, has been getting more acute within the last few months. It is safe to say, according to authorized statements, that with the still further anticipated scarcity and difficulty of obtaining material, shortage of skilled labor and other drastic contingencies, conditions are speculative and far from stable or certain. Therefore it is hard to tell what may occur.

With possibly one exception, the manufacturers have a standing rule of "price subject to change without notice," applicable to current buying and ordering. This concern stipulates that a leeway of fifteen days be allowed on all acceptance orders. That is to say, when a quotation is submitted the clause provides that it is good for the period designated, no matter if another price be announced in the meantime. For a while this clause was more or less loosely construed, but recently the trade was notified that it would be strictly enforced.

Government Orders Freight Bills Paid in Cash

Regulation Effective July 1—Credit Accommodations Canceled—Modification Sought by Large Shippers

In general order No. 25 the Director General of Railroads places the collections of freight charges practically on a cash basis. The essential parts of the order follow:

> Effective July 1, 1918, the collection of transportation charges, by carriers under federal control, for services rendered, shall be on a cash basis, and effective as of that date; credit accommodations then in existence which may be in conflict with the following regulations shall be canceled.
>
> In cases where the enforcement of this rule with respect to freight will retard prompt forwarding or delivery of the freight or the prompt release of equipment or station facilities, carriers will be permitted to extend credit for a period of not exceeding forty-eight hours after receipt for shipment of a consignment if it be prepaid, or after delivery at destination if it be a collect consignment; provided the consignor, if it be prepaid consignment, or the consignee, if it be collect, file a surety bond either individual or corporate, in an amount satisfactory to the treasurer of the carrier. The form of such bond shall be prescribed by the chief legal office of the individual carrier, conditioned upon and providing for payment of all charges within forty-eight hours after forwarding or delivery of the freight. Upon receipt and acceptance of such bond a carrier may accept and forward prepaid consignments or may deliver collect consignments in advance of payment of all charges thereon to the amount covered by the bond. Failure to pay such charges within the time prescribed will automatically cancel such credit.
>
> Freight consigned to order or to "order notify" shall be delivered only upon surrender to the agent of the carrier of the original bills of lading for such freight, and the payment of the freight charges thereon as herein provided. Provided, however, if such bill of lading be lost or delayed the freight may be delivered in advance of surrender of the bill of lading upon receipt by the carrier's agent of a certified check for an amount equal to 110 per cent of the invoice, or upon receipt of a surety bond either individual or corporate, acceptable to the treasurer of the carrier in an amount for twice the amount of invoice.

A representative committee of traffic managers of large shipping interests in the important industrial centers was in conference with the Railroad Commission in Washington last week with a view to securing a modification of the order. The shippers contended a reasonable time should be allowed for checking and auditing freight bills as to their correctness.

Atlantic Welding Reorganization and Change of Name

Interests controlling the Lincoln Bonding Company of Cleveland have acquired the controlling interest of the Atlantic Welding Company of New York, which company possesses valuable welding and rail-joint patents, including the basic Gailor patents covering the joint structures familiarly known among railway companies.

A contract has been entered into with the Lincoln Bonding Company, which has always manufactured the generators for the Atlantic Welding Company and has always had the same agents as the Atlantic Company, whereby the entire promotion of sales including the soliciting of new royalty contracts and maintenance of all present contracts, will be handled exclusively by the Lincoln Bonding Company.

In order to more closely associate the work of the two companies, the name of the Atlantic Welding Company has been changed to the Lincoln Rail Welding Company. For similar reasons, and to insure better service to the welding company's customers, the manufacturing facilities of the Atlantic Welding Company will be consolidated with those of the Lincoln Bonding Company at Cleveland, and all products will be marketed under the name of the Cleveland company. The New York office will be maintained, but only as a district office.

As the two companies have always had the same agents in the various territories no effect will be noticed by the customers of either company.

Priority of Orders in Allocation of Steel

How Electric Railway Equipment Manufacturers Must Make Application for Requirements

The market situation of iron and steel, and why manufacturers of electric railway cars, general equipment and accessories are speculating on their future supply, are of more than passing importance. Among other matters relating to this much discussed subject is the allotment or allocation of steel and steel products after the requirements of the government and its war allies are filled. The plan is still under discussion by the War Industries Board; but the appended notification, recently furnished by the Priorities Committee, describes what applications—which must be made out on an official form supplied—will be considered and how certificates will be granted:

"Allocation of steel is undertaken by the director of steel supply only with reference to orders placed directly by the government. As to orders not placed directly by the government, when a concern desires steel and cannot place its orders without first receiving a priority certificate a certificate may, on proper showing, be granted. Before making an application the applicant must determine whether the steel company will accept the order if priority is granted, insomuch as the certificate is not designed to compel the steel company to accept the order. In other words, the concern desiring steel should go to its regular source of supply and place its order, subject to the obtaining of priority. If the steel company signifies its willingness to accept the order, if priority is granted, then an application covering the tentative order may be made and will be considered by this committee. Of course, if an order has actually been accepted, priority may be granted thereon, the rating in each case being entirely dependent on the actual need of the steel covered for war work or other work of exceptional importance.

"Save in very exceptional cases, no priority is granted for the replacement or maintenance of stock. Where, however, it is clearly shown that an urgent need exists for the maintenance of the particular stock for use in war work or other work of exceptional importance, priority is sometimes granted. An affidavit and personal guaranty that the material will be used solely for such purposes must be incorporated in the application, and the precise intended use of the materials required must be stated in detail. The application must cover specific orders, as a blanket certificate will not be issued."

Rolling Stock

Boston (Mass.) Elevated Railway has been authorized by the Public Service Commission to purchase 200 center-entrance cars and 100 trailers, referred to last week and in previous numbers of the ELECTRIC RAILWAY JOURNAL. The center-entrance or motor cars are to cost approximately $12,000 and the trailers $5,000 each. It is reported the cars will not be delivered for several months, owing to the heavy demands on the car manufacturing companies.

North Coast Power Company, Vancouver, Wash., is reported as having bought one new one-man car, of the latest type, from the American Car Company, St. Louis, Mo. It is now in service on the Orchard-Sifton line.

Brooklyn (N. Y.) Rapid Transit Company in placing its order for fifty center-entrance trail cars, referred to in the ELECTRIC RAILWAY JOURNAL of May 11, with the Jewett Car Company, Newark, Ohio, supplies the following specifications:

Number of cars ordered	50
Name of road	Brooklyn Rapid Transit Co.
Date order was placed	May 11, 1918
Builder of car body	Jewett Car Co.
Type of car	Trailer, semi-convertible, center-entrance, surface passenger
Seating capacity	61
Weight (total)	Approximately 28,000 lb.
Bolster centers, length	24 ft. 8 in.
Length over bumpers	45 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to roof	11 ft. 3 in.
Body	Semi-steel
Interior trim	Wood and metal
Headlining	Agasote
Roof, arch or monitor	Monitor
Air brakes	Westinghouse
Axles	Carnegie
Couplers	Westinghouse
Curtain fixtures	Curtain Supply Co.
Curtain material	Pantasote
Designation signs	Electric Service Supplies Co.
Door operating mechanism	Consolidated Car Heating Co.
Fare boxes	Vogelsong
Fenders or wheelguards	H-B wheelguards
Hand brakes	Peacock improved
Heaters	Gold Car Heating Co.
Headlights	Dayton No. 1583
Journal boxes	Brill
Registers	International
Sash fixtures	Edwards
Seats, style	H. B. & W. reversible cross and longitudinal
Seating material	Wood
Trucks, type	Brill trailer trucks
Ventilators	Monitor deck type
Wheels (type and size)	22-in.

Seattle (Wash) Municipal Street Railway, by an ordinance recently introduced in the City Council is authorized, through the Board of Public Works, to prepare specifications and advertise for bids for the purchase of six one-man single-truck cars and twenty double-truck cars, for the equipment of the Municipal Elevated Railway now under construction. A bill was also passed providing for the improvement of the Loyal division of the Municipal Railway at a cost of not more than $2500.

Perley A. Thomas Car Works, High Point, N. C., will be the builder of the four steel cars for the Southern Public Utilities Company, mentioned in this department two weeks ago, and not the Southern Car Company. The Perley Thomas company has succeeded to the business and plant of the Southern Car Company.

General Electric Company, Schenectady, N. Y., has received a contract from the city of San Francisco for six 4-ton storage-battery locomotives which will be used in the tunnels being driven on the Hetch Hetchy water supply project. One of these locomotives will be operated in each of six portals, and a charging station will be installed at each of these portals. The contract price was $6,527 each, or a total of $39,162.

Trade Notes

John F. Godfrey, manufacturer of coal handling conveyors, has moved his plant from Elkhart, Ind., to Chicago, Ill.

Moloney Electric Company, St. Louis, Mo., announces that J. Van Buskirk, formerly associated with the Minerallac Company, Chicago, Ill., has just been appointed manager of the Chicago office.

General Electrical Company, Chicago, Ill., has lately opened a large branch with offices and a traveling force in Memphis, Tenn., in the Lotus Building, Jefferson Avenue, near Second Street, where the entire first floor is occupied.

George L. Kippenberger, formerly special sales agent of the St. Louis Car Company, has been appointed assistant to the vice-president. Among other numerous duties, he will give particular attention to the direction of all production activities.

Charles A. McCune has resigned his position as chief engineer of the Commercial Acetylene Company, to become sales engineer with the Page Steel & Wire Company, New York, where his efforts will be devoted to sales and service in connection with Armco welding rods.

McGuire-Cummings Manufacturing Company, Chicago, Ill., announce that William T. Twomey has been elected vice-president of that company. Mr. Twomey is well known in the electric railway field, having been connected with the Cummings interests for several years.

Horne Manufacturing Company, New York, supplied the staffless brakes on the thirty-two new cars of the Richmond Light & Railroad Company, one of which was illustrated and described in the last issue of this paper. The name of another manufacturer was mentioned in the article.

Jeffrey-Dewitt Insulator Company, the new corporate name of what was formerly the Jeffrey-Dewitt Company, manufacturer of the J-D high-tension suspension insulator, will be operating its new plant at Kenova, W. Va., on June 1. Its offices will be in the first National Bank Building, Huntington, W. Va.

New Advertising Literature

Autoscope Products Corporation, New York, N. Y.: Circular describing the Cruban solderless wire terminal.

General Electric Company, Schenectady, N. Y.: Bulletin No. 46,018A, describing and illustrating its type P-8 voltmeter, wattmeter and ammeter.

Laclede-Christy Clay Products Company, St. Louis, Mo.: Illustrated catalog, entitled "The Stoker for the Higher Volatile Coal," describing in detail the company's chain grate stoker.

Combustion Engineering Company, New York, N. Y.: Bulletin C1, describing its Coxe stokers. This booklet is profusely illustrated with actual installations and shows diagrams of several different kinds of boiler settings.

James G. Biddle, Philadelphia, Pa.: Engineering instruments are described in a bulletin that is now being distributed. Some of the instruments are meggers for testing electrical resistance of conductors or insulations, hand tachometers, vibrating reed tachometers, reed frequency meters, portable switchboard instruments and rheostats.

NEW YORK METAL MARKET PRICES

	May 29	June 5
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26½ to 26¾	26¼ to 26¾
Lead, cents per lb	7.65	7.25
Nickel, cents per lb	40	40
Spelter, cents per lb	7½	7½
Tin, Chinese,* cents per lb	$1.00	.90
Aluminum, 98 to 99 per cent., cents per lb	†32.10	†33.00

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* No Straits offering. † Government price in 50-ton lots or more, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	May 29	June 5
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	18	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6
Zinc, cents per lb	*12	5¼
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$50.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 29	June 5
Rubber-covered wire base, New York, cents per lb	27 to 34	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30½ to 36.10	30½ to 30.40
Weatherproof wire (100 lb. lots), cents per lb., Chicago	38.00 to 38.35	35.43 to 38.00
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$67.50	$67.50
T-rails (A. S. C. E. Standard) 500-ton lots, per gross ton		$62.50
T-rails, high (Shanghai), cents per lb	4¼	4¼
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35

	May 29	June 5
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.00
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	10	10½
Turpentine (bbl. lots), New York, cents per gal	53	52½

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* Government price. † These prices are f.o.b. works, with boxing charges extra.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, June 15, 1918 *Number* 24

Let's Confine Attention to Essential Transportation Service

THE chartered car is a good thing in times of peace when a surplus of men and rolling stock is available. It is likely to prove a bad proposition this summer in those communities where the war has brought the need for applying every car-mile possible to war plant transportation. In ordinary times, for example, the chartered car may earn at least as much money as cars in regular service, but this would hardly be the case where properties are clamoring for cars, more cars and still more cars. Thus self-interest and patriotism combine to shelve this class of special service for the time being.

Closely related to the chartered car is park service. Usually the bulk of this is the transportation of women and children during the afternoon at what is really a non-profitable rate of fare since so many children ride free, at half rates or even where no general reduction is customary for pleasure travel. If the runs are so long that the return is made during the evening peak, this class of service becomes a positive detriment to the needs of war-work transportation and ought to be curtailed if not utterly eliminated. One might even go a step further by discouraging excessive pleasure riding on Sundays if it is to private resorts where strong drink is sold, for this means a strain on the patience of overworked car men. In these times with jobs so easy to get, the shrewd operator will not encourage the kind of travel that makes motormen and conductors too tired to show up the following Monday. He will realize that it is both better business and better patriotism to give the best possible regular service, leaving the cultivation of chartered car, park or other auxiliary service to post-bellum days. His task now is to get the biggest possible war-service mileage per car and per man, using any free time for the repair of the one and the recuperation of the other.

Every City Should Adopt the Skip Stop and Save Coal for Next Winter

TO THE AVERAGE citizen, the arrival of warm weather has settled the fuel question, at least so far as any present worry about it is concerned. Actually, this is just the time when there should be great savings because they will count more towards relieving next winter's shortage if made now than later. The National Fuel Administration realizes this, as can be seen from its recent announcement that between 50,000,000 and 60,000,000 tons must be saved by the nation at large if the householders and industrial plants in this country are not to suffer during the coming winter. The only way in which this shortage can be overcome is through the co-operation of every coal user in the country.

Electric railways, as large power users, have an important duty to perform in this campaign. Through the introduction of the skip stop alone the Fuel Administration expects that a saving can be made of 1,000,000 tons of the fifty million which will be required by the nation to get through next winter comfortably. Some fifteen cities were mentioned in our issue of last week as having introduced the skip stop, but this number is insignificant compared with the possibilities, and every company which has not done so ought to take this matter up promptly with its city authorities. In so doing it should have the hearty assistance of every non-war industry in its community, because if there should be any deficiency in fuel next winter it will come out of the quota of these industries and not out of the supply to which the electric railway is entitled. There should surely be an incentive also to the average citizen to support a movement like this which has the double purpose of giving him better transportation this summer and helping to keep his home warm next winter. The local fuel administrator can be counted upon to assist in such a campaign because of the prominence placed by the National Board upon this particular economy. Here is a case where everyone gains.

How Can Boiler Excess Air Be Controlled?

IN THE last mechanical issue, that for May 18, Hartley LeH. Smith, in his article on the boiler plant, mentioned some boiler tests which showed that, regardless of other variables, for a given flue draft the least coal consumption produced the best economy. The tests were fifteen in number and they were run with an overfeed stoker and semi-bituminous coal. The results suggest that there are certain aspects of power generation by combustion of coal which are still not thoroughly understood. Even some men ostensibly acquainted rather intimately with the coal furnace problem do not quite appreciate these. Witness this question. Suppose that a boiler test has been run and has shown about rated capacity but excess of air, say 90 per cent above theoretical requirements. Suppose that it is desired to repeat the test with the stipulation that the steaming rate shall be about the same as in the first test, but that the excess air shall be but about 60 per cent above theoretical requirements. Suppose the boiler to have a furnace with hand-fired grate and forced draft. Now the question is: How can substantially unchanged steaming rate together with reduced excess air be insured?

To say that the answer is simple will not be enough. It isn't simple. The ELECTRIC RAILWAY JOURNAL invites expression of opinion in the matter. We may hint that the crux of the problem is that excess air is not one of the independent variables. It is, in fact, distinctly a dependent variable. The forced-air pressure, the rate of coal firing, the thickness of fire and the flue draft are independent variables. The steaming rate is another dependent variable; it is the capacity of boiler and furnace. Excess air is certainly related to the efficiency. But how can one with confidence so alter the independent variables shown by one test not to be most suitable so that steaming rate may be held approximately constant while the excess air is altered to suit? The subject is open for discussion.

Keeping the Substation in Operation in Wartime

THE labor shortage has hit the electric railway substation a hard blow. As a rule railway operators are young men much needed by Uncle Sam, either as soldiers or workers in manufacturing plants engaged in essential war work. They must be replaced either by older men or by women, unless the substations can be made automatic. If automatic apparatus could be secured quickly, no doubt the installation of this type of control equipment would be many times more rapid than it is. Even with deliveries as slow as at present it would be well to plan the installation of such equipment as soon as it can be obtained, which means ordering at once. In the meantime, and in those cases where the automatic seems not immediately applicable, what is to be done for substation attendance?

The first resource is naturally the ranks of men not eligible for war duty. Such men are apt to be steady and dependable, but lacking in alertness and resourcefulness, that is to say "nerve." Possibly their virtues and defects about balance. They are, however, accustomed to wages higher than are usually allotted to the substation operator. Somehow these men and the railways must get together on a compromise. They will have to be paid a little more but must realize their shortcomings with respect to this particular class of work.

Young women ought to make good operators and on the day shifts there could be no possible objection to their employment. Occasionally there are heavy tasks to be done, such as pulling large direct-current feeder switches, but this heavy work is of short duration. The operator must have the physical strength for such tasks, although great endurance need not invariably accompany it. If women should prove otherwise capable, eventually air or electric power could be applied to heavy switch opening and closing. This matter of women employment must be tried out before we can definitely answer the question "Are women suited to substation operation?"

An ideal arrangement for this difficult situation in some instances would seem to be to make the running of the substation a family affair by turning it over to a man and his wife. They could employ a helper or utilize a young fellow in the family. Their home should be a part of the substation. The work could be divided so that the man could be on duty at times of peak load and could be called in case of any emergency. The woman could take the "off" hours and the helper could relieve either or both as arranged. The amount which could be paid for this service would be attractive to many who might be able to save house rent, and as a war measure at least the plan would be justifiable.

Some Electric Railway Problems the War Labor Board Must Solve

DISCUSSION before the National War Labor Board in Chicago recently when the wage controversies of the Detroit and Cleveland companies were being presented brought out some interesting features of the labor situation as it affects the electric railway industry in the United States during war times. Coming so close upon the award of larger pay to steam road employees and the increase in freight and passenger rates to meet the new costs, the points of difference must have appealed strongly to the members of the board because here were cases in which, even though the demands of the men were just, the financial inability of the companies to meet them was apparent.

Surely, here is a problem for the national authorities if, as Chairman Walsh said, the employees are to receive what is due them, no matter what readjustments or additional legislation may be required to accomplish this result. New precedents are being established every day. Perhaps, then, we may look with confidence to this new board to point a way out of the difficulties surrounding the electric railways in their need for increased revenues.

The employees were not placed in an enviable position by the exhibit of the Detroit company which showed that they do not accept the opportunity to earn the maximum pay. In the month of March, 1918, 59 per cent of the trainmen worked twenty-six or more days, according to this evidence. Those who put in full time drew an amount in wages which should have enabled them to meet the cost of living. The conclusion is plain that those who did not use their opportunity to the utmost were not showing a proper spirit to meet industrial conditions during a time when there is a shortage of labor.

"Hours of service" was another question which engaged the attention of the board, and Chairman Taft evidenced his familiarity with urban railway conditions when he suggested that public demands for service during peak hours might make it necessary to arrange schedules on a basis which gave a wide range of "outside hours" for men working on the cars. The Massachusetts nine-in-eleven-hours law passed several years ago did not correct these conditions and only resulted in an arrangement by which the men were paid extra for hours of duty outside the maximum in the statute.

The Railroad Wage Commission in its recent report met a similar situation fairly when it said: "This, moreover, is not the time, in the judgment of the commission, to make experiments which might lessen the output of that commodity which railroad men produce—tons of freight hauled and numbers of passengers carried. The one thing now imperative is volume of and speed in railroad output." The commission also refused to penalize the employers for too long a work day, "at a time when urgent and serious necessity compels sacrifice from all." The electric railway situation calls for treatment equally as fair, because not only are these companies doing their share to speed up war work, but the circumstances under which they operate cannot be met by shortening the working day of the employees.

A question asked by Chairman Taft during the hearing indicated his opinion that electric railway work is attractive, and one of the reasons mentioned as making such employment inviting is its steadiness. Conductors and motormen who are being lured to other occupations by offers of higher pay should keep this point in mind. The average electric railway is giving fair wages to its employees, and if it cannot compete with the extremely high pay offered in certain war industries it is usually due to financial inability. The reasons for this handicap are apparent to all fair-minded persons, most of all to the employees who continue to collect the same unit of fare which their predecessors collected for several generations. There is only one way out of the dilemma and that is to obtain increased revenue. Organized labor can do its share to impress this on fare-regulating agencies, and meanwhile it should be patient in helping the employing companies to struggle along.

The capable members of the War Labor Board will undoubtedly recognize in these conditions a situation different from that of any other dispute which may come under their jurisdiction. Federal Judge Alschuler recently granted advanced wages to thousands of stock yards employees, and in doing so he made the point that "we are not here met with the ofttimes embarrassing and influential contention that the profits of the industry will not warrant the demanded hours or wages." With the electric railways this contention is "embarrassing and influential" and should have considerable weight with any board called on to add to the burdens of a business which is limited in its prospects of increased revenue. The moral influence of the War Labor Board should go a long way toward overcoming any barriers which may stand in the way of meeting the just demands for improved service, fair wages and adequate return on investment.

Country Needs More Commissioners Like Mr. Straus

OSCAR S. STRAUS, chairman of the Public Service Commission for the First District of New York, has tendered his resignation to Governor Whitman and asked to be released from active duty not later than July 1. At the time of his appointment to fill the vacancy caused by the removal of Edward E. McCall, Mr. Straus refused to accept the post for a full five-year term. Now he desires to lay down the duties for he considers that the major part of the work for which he was appointed has been finished, and he feels that his experience better fits him for other work of importance in this hour of national need.

It must be a source of great gratification to Mr. Straus to be able to look back upon an active life of more than three-score years and seven, with its large amount of important work in the service of the public. Mr. Straus is a conscientious and honest worker and a broad-minded man, the kind needed at the head of regulative bodies. He has won the respect and loyalty not only of his associates and co-workers, but also of the public and the officials of the utilities under his jurisdiction. Governor Whitman showed great sagacity in appointing such a capable man to such a responsible position. Let us hope that he will show equally as good judgment in choosing a successor.

Now more than ever, regulation demands men of high type. The preservation of utilities from the danger of increased costs and fixed rates is a national necessity. The successful prosecution of the war and the general welfare of the people demand the maintenance of the utility industry at the maximum of efficiency. Regulation of utilities to accomplish this end requires men of judgment, men of courage and men of vision. In New York, to a greater degree than elsewhere, such men are needed, for the defects which the courts have found in the regulatory law must be overcome by public education, and no leaders have a greater responsibility for teaching to the public the requirements of justice to utilities than do the members of commissions.

The utility situation in New York State is not of local importance; it has a national bearing. The man who can take up the work where Mr. Straus finds it necessary to stop and can carry it on with success through the coming critical reconstruction period will be serving his country nobly.

Mechanical Engineers Make Plea for Cleaner Coal

NOTABLE among the features of the spring meeting of the American Society of Mechanical Engineers held at Worcester, Mass., June 4 to 7, were the large attendance at the fuel conservation session and the volume of papers and discussion, necessitating a second session in the afternoon. Conspicuous was the emphatic and repeated expression of opinion on the part of fuel consumers that the Fuel Administration should promptly and energetically mete out to the coal producers such sound trouncings as would revive their appreciation of the legitimate longing of coal consumers for coal sufficiently clean to permit the possibility of its burning. The meeting even went to the length of passing a resolution to this effect. Active interest was also aroused in the burning of anthracite screenings mixed with bituminous coal on underfeed stokers, and promising accounts of experience in this line were given. The economic limit was sharply defined as 30 to 35 per cent of anthracite screenings with the greatest possible homogeneity of mixture.

Equally important was the call for engineers to man the forces of the Fuel Administration in its great program of economy in the use of coal. The strong statement was made that every combustion expert in the country will be needed in active service to this end.

Technically there was no feature of the sessions devoted to coal approaching the interest and significance of Henry Kreisinger's address (cut short in presentation as were all others by the inexorably efficient chairman) on the inherent nature of coal combustion. He made the statement that more than 7 lb. of air per pound of coal cannot be made to flow through a fuel bed provided it has an unbroken surface. He remarked that possibly this was news to some of his hearers, and the discussion after the meeting among groups of members showed that this was so. Mr. Kreisinger added to his long list of services to combustion engineers by pointing out the inevitability of large air supply above the fire. This may be provided properly by the furnace designers, or the fire itself will provide it by breaking into holes if the furnace design is such as not to satisfy the fire's thirst for air above its surface. Mr. Kreisinger is an expert in coal combustion of great originality, and the time and place of announcing the latest results of his researches were well chosen.

Concrete Poles Are in the Process of Evolution

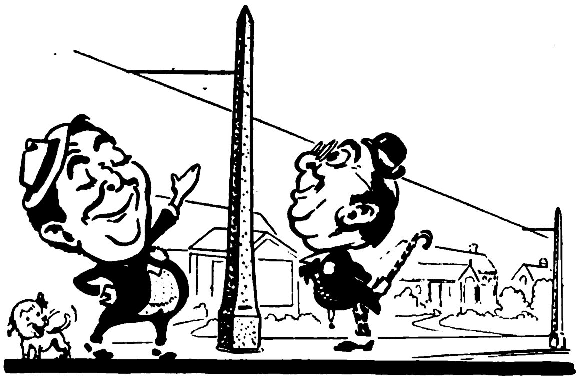
They Possess Certain Intrinsic Virtues But Should Not Be Designed in Imitation of Wood Poles—The Subject Should Be Thoroughly Investigated to Develop the Most Practical and Durable Concrete Pole

By Charles Rufus Harte
Construction Engineer
*The Connecticut Company, New Haven, Conn.

THE possibilities of using concrete as a pole material were first tried out in 1856 in connection with the Panama Railroad, the insects of the Isthmus having proved to be too much for wood. The poles were short and stout, having a length of but 12 ft., tops from 6 to 8 in. in diameter, and butts from 12 to 15 in. across. The iron crossarms were fastened to the poles by means of clamping bands.

The first poles were of plain concrete. It would seem that with the dimensions used they should have served well in a sleet-free section, but they proved not to be satisfactory. Whether the concrete was poor, or monkeys used the wires too freely—a source of serious trouble in the tropics—or from some other cause, the poles were very shortly replaced by others reinforced with a wood core 3 in. square. These behaved but little better than the solid concrete poles, for the core swelled and split the casing of concrete.

From the relative dimensions of the parts of these poles it is quite certain that both the wood and the concrete were expected to take parts of the load. In the case of the concrete-covered poles used at a much later date in Switzerland the wood was full size and the thin concrete shell served merely for protection. Incidentally there seems to be some difference of opinion as to the success of the scheme.



"Made It Myself," Said the Overhead Engineer, "Can You Beat It?"

Steel Reinforcement Made the Concrete Pole Possible

Not until about 1895 was steel used as reinforcement, when concrete poles so reinforced were tried out both here and abroad. Although the experimenters were loud in their praises of the products, it was some time before there were any worth-while results. This was doubtless due to failure to appreciate the faults of the new construction until the poles were made, and a bad attack of "cold feet" on the part of the enthusiasts immediately thereafter.

A few, however, stuck to the problem, and by 1910 the reinforced concrete pole had become a reasonably practicable structure. Credit for this result is due particularly to the Concrete Pole Company of St. Catherines, Ont., which built several hundred for transmission lines in the Welland Canal district; to George A. Cellar, superintendent of telegraph Pennsylvania Lines west of Pittsburgh, one of the earliest in the field; to the United Traction Company, Albany, N. Y.; and to several others. Since 1910 very satisfactory results have been secured, although the development has been chiefly local. A few companies, notably the Cleveland Railway; the Fort Wayne & Wabash Valley Traction Company; the Marseilles Land & Water Company, Marseilles, Ill., the New York State Railways; the Oklahoma Gas & Electric Company and the Welland Canal district companies have used very considerable numbers, while but few other companies seem to have employed concrete poles at all.

The life of a reinforced concrete pole depends on several factors. The concrete itself is practically everlasting as regards decay or corrosion, but it may fail through a mechanical injury. The reinforcement cannot rust so long as it is sealed in the concrete and it is also thus protected from electrolysis. But injury to the covering concrete may expose the metal and permit its destruction by corrosion, while under favorable conditions for such action electrolysis may be set up. The resulting expansion of the steel as it corrodes will split off the protecting material and allow the weather also to take a hand in the destruction.

It was feared by many that moisture would work into the metal and rust it; that frost would spall off the concrete from the reinforcement, leaving it unprotected, and that lightning would shatter the poles, but none of these fears has been realized. Where the concrete has cracked, either from contraction when setting or from mechanical stress, there have been some instances of corrosion as would naturally be expected under the circumstances. Lighting, however, in the rare instances when it has been known to strike, has only slightly chipped the concrete, leaving the pole practically as good as new. In the event of a grass fire, or of a conductor grounding on the pole, there is far less liability to trouble than with wood. A hot fire or a heavy ground may cause spalling of the concrete, but if the injury is not too long neglected the pole can be patched and made as good as new. With a wood pole any loss of material can be made good only by complete replacement, and it is astonishing how smal a bunch of dry grass will serve to set a wood pol going.

In case of failure, reinforced concrete poles do no break off. Wood poles have greater flexibility, and this often relieves a severe load by increasing the sag o the pulling span; but when the ultimate strength i reached they snap, dropping everything. A reinforced concrete pole, because of its greater stiffness, comes more quickly to serious "distress," but although it may be wrecked beyond repair it will only bend. Even if it lets part of the overhead touch the ground it almost invariably holds up part and so keeps the attachments in fairly good shape.

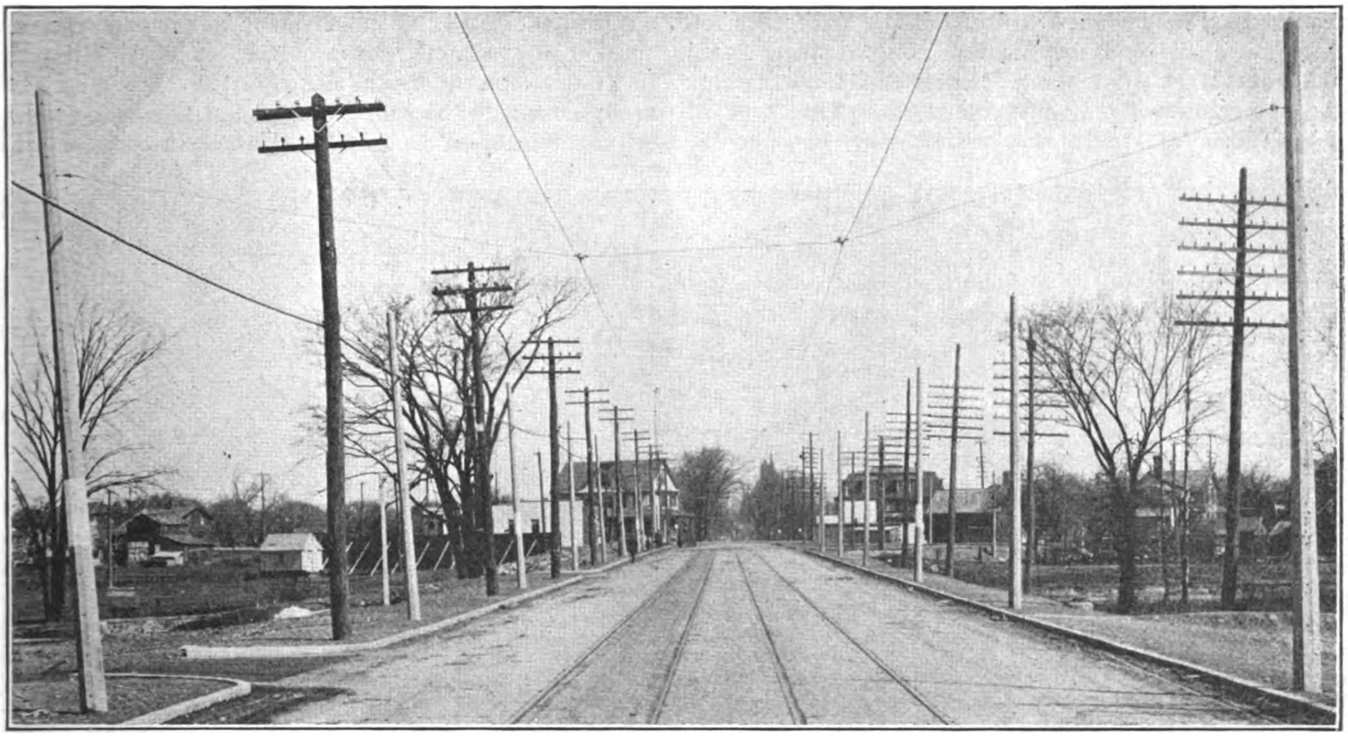
Concrete Poles Can Be Made Attractive in Appearance

Properly treated, a concrete pole is of pleasing appearance, but unfortunately, with a very little neglect in the making it looks very unsightly. Some designs are quite elaborate, as for example the combined light and trolley pole of the Municipal Railway of San Francisco. On the other hand, nothing could be finer than the severe simplicity of the square pole of the same company or that of the Pennsylvania Railroad's Jersey meadows telegraph line, unless it is the standard octagonal pole of the New York State Railways, which latter is not only attractive and substantial but actually costs but little more than the corresponding size in wood.

In several instances where wood poles had been ordered off the streets of certain municipalities the authorities have been so pleased with the appearance of concrete poles that they have permitted their use instead, at a cost much less than that of steel poles, and far less than that of underground construction.

Some Reasons for the Comparative Unpopularity of Concrete Poles

As against these advantages of long life, support of attachments in case of failure of the pole, resistance to fire and good appearance there are several disadvantages inherent in the concrete pole. Good results in making concrete poles require good forms and skilled labor, and unless the number made is large the cost per pole is very apt to be high even for the very simple types. The poles are heavy at best, and require special care and extra labor for handling and erecting, which further adds to the cost, while if molded with holes or gains for attachments, later changes are not readily made and are apt to be costly, and if such provision is not made it is equally difficult to make any attachment at all. These facts, which are particularly evident when a company first begins to make and use concrete poles, are undoubtedly responsible for the dislike by many companies and the consequent failure to use what is quite likely to be one of the important pole materials of the near future.



SPAN WIRE CONSTRUCTION WITH CONCRETE POLES, NEW YORK STATE RAILWAYS, ROCHESTER LINES. THIS COMPANY HAS MANY SUCH POLES IN USE

The theory of the reinforced concrete poles is very simple. Concrete, with permanence, ease of molding and comparative cheapness, lacks only tensile strength to be an excellent pole material. Steel has very high tensile strength and needs only to be properly combined with the concrete to give the desired results.

The practical application, however, is not quite so simple, for if the steel is not properly proportioned to the concrete, and correctly arranged within the concrete body, the strains are not properly distributed between the two and the pole will either be weak or uneconomical. The forms must be sufficiently strong to remain true and yet must allow proper access to the concrete for working so as to secure good surface and freedom from cavities. Furthermore, the reinforcement must be maintained in correct position while the concrete is being placed.

There are many discussions of the theory of pole design. One of the best of these appeared in the 1916 report of the power distribution committee of the American Electric Railway Engineering Association. The design and practice developed for his company by Carl L. Cadle, chief engineer New York State Railways, Rochester lines, and described in the reports of the same committee for 1915 and 1916, seems easily to be the best of the unpatented methods that have as yet been described.

Hollow as Well as Solid Poles Are Available

Of the patented methods there are several which have had practical test. One of the earliest developed is the "Siegwart," in which the concrete with its reinforcement is plastered on a rotating form. This with the aid of a canvas belt wound spirally outside compresses and forms a hollow round pole. This construction is said to be very satisfactory. Another method, that of Otto and Schlosser, involves the use of centrifugal force. In a hollow form are placed the reinforcement, tied into shape and the concrete form is then closed and rotated at high speed, centrifugal force forcing the concrete firmly against the form. This type of pole is also said to be very satisfactory, but like the Siegwart its use is confined largely if not entirely to Europe.

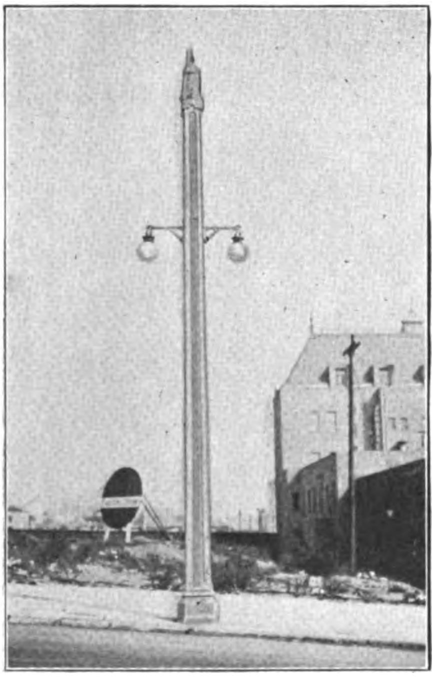
In this country the Jones process employs a series of compression rolls, an inner core and a canvas belt. The reinforcement is woven to shape in a special machine and put over the inner core, and the combination is laid in the canvas belt between the spread rolls. The proper amount of concrete is then dropped in, the rolls are closed to position and the forming is begun. The canvas draws first in one direction, then back, the length being such as to give about two and a half turns to the pole. Whether this pole has been used to any appreciable extent the writer does not know.

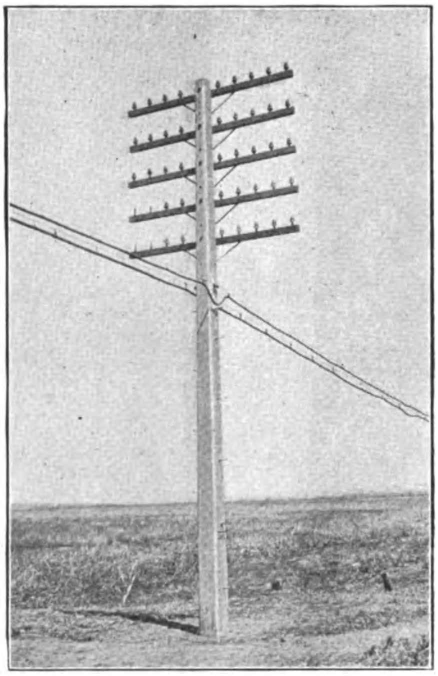
Obviously, after completion the hollow pole is superior to solid poles in the smaller quantity of concrete required and the consequent lightness. But the machine-made types require costly apparatus, and for hand forming the complications of a core have seemed to many experimenters too much of a good thing. F. H. Tidnam of the Oklahoma Gas & Electric Company, has, however, developed a very satisfactory hexagonal hollow-type pole, which is the standard of this company for important lines. This pole is formed in a metal mold, and the collapsible core is removed as soon as the concrete has taken its initial set.

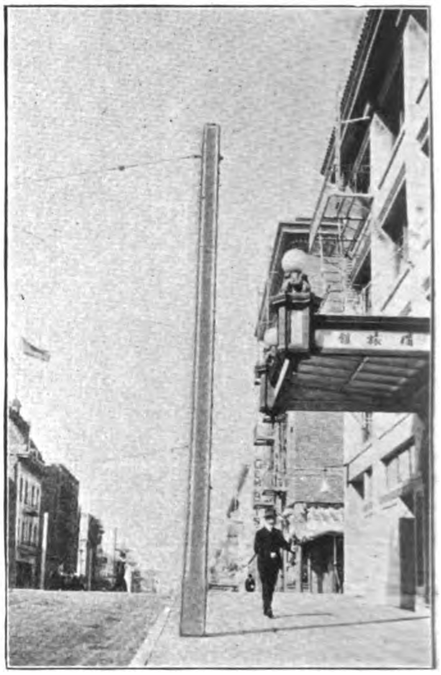
Concrete Poles Cost More Than Wood

The concrete pole to-day is in a very peculiar position. It offers many advantages at any time, but the present shortage of chestnut and the growing importance of other pole woods for purposes which do not allow of substitutes makes its employment particularly attractive. Unfortunately, however, the tendency in regard to its development by the comparatively few who have really gone into the subject in earnest has been to substitute reinforced concrete for wood in substantially the same dimensions rather than to develop a reinforced-concrete support of the most efficient type.

At present, a 30-ft. solid pole, with a breaking strength of about 2500 lb., when it is set 6 ft. in the ground and the load is applied 2 ft. below the top, weighs from 2500 lb. to 3500 lb. The cost ranges from $17.15 in actual cost in quantity, up to $125, the latter figure being a recent bid on a lot of fifty poles exactly like those for which the lower price was paid. Handling, hauling and setting would be about twice as great as for wood poles of equivalent strength. The latter would have to have a ground-line circumference of 43 in. and would be cut down from Class A 35-ft., or Class B 40-ft. poles. Recent quotations on such poles, f. o. b. the same points as the concrete poles


Combined Light and Trolley Pole, Municipal Railway of San Francisco


Pennsylvania Railroad's Telegraph Line Pole on Jersey Meadows


Square Trolley Pole, Municipal Railway of San Francisco

SAMPLES OF SATISFACTORY DESIGNS OF CONCRETE POLES referred to, were $8 each for chestnut, and $16.35 each for Western red cedar, which would weigh about 1000 lb. and 600 lb. respectively.

Hollow-type concrete poles ought to have a weight and a cost not over two-thirds of the corresponding figures for the solid pole of equal capacity, but while the available information indicates such results the writer has not seen sufficiently definite figures to warrant a specific statement.

Concrete Pole Research Is Greatly Needed Now

The entire subject of concrete pole design, manufacture and use is of the greatest importance. It ought to have a most thorough investigation. For anyone to build one or two concrete poles with the expectation of so solving all the questions out of hand is, however, simply a waste of time and money.

Good reinforced concrete poles were built about 1903, and the number has steadily if not rapidly increased ever since. Moreover, many of these are serving their purpose at least fairly well. But the important question is whether or not the work they are doing could not be done just as well by poles of simpler design.

Mathematics and laboratory experiments will point the way, but the determination of how nearly the perfect design can be approached in every-day practice, and just how far short of the performance of the perfect pole the practical article will fall as a result of that difference, can only be found by full size tests. Some of these must be to destruction, and on a sufficiently large number of specimens to eliminate the effect of unusual conditions which might indicate very high or very low values for a single pole.

It is to be hoped that present conditions, which are demanding every possible measure of efficiency, will lead to such thorough investigation of this subject as will develop the practical and economical concrete pole.

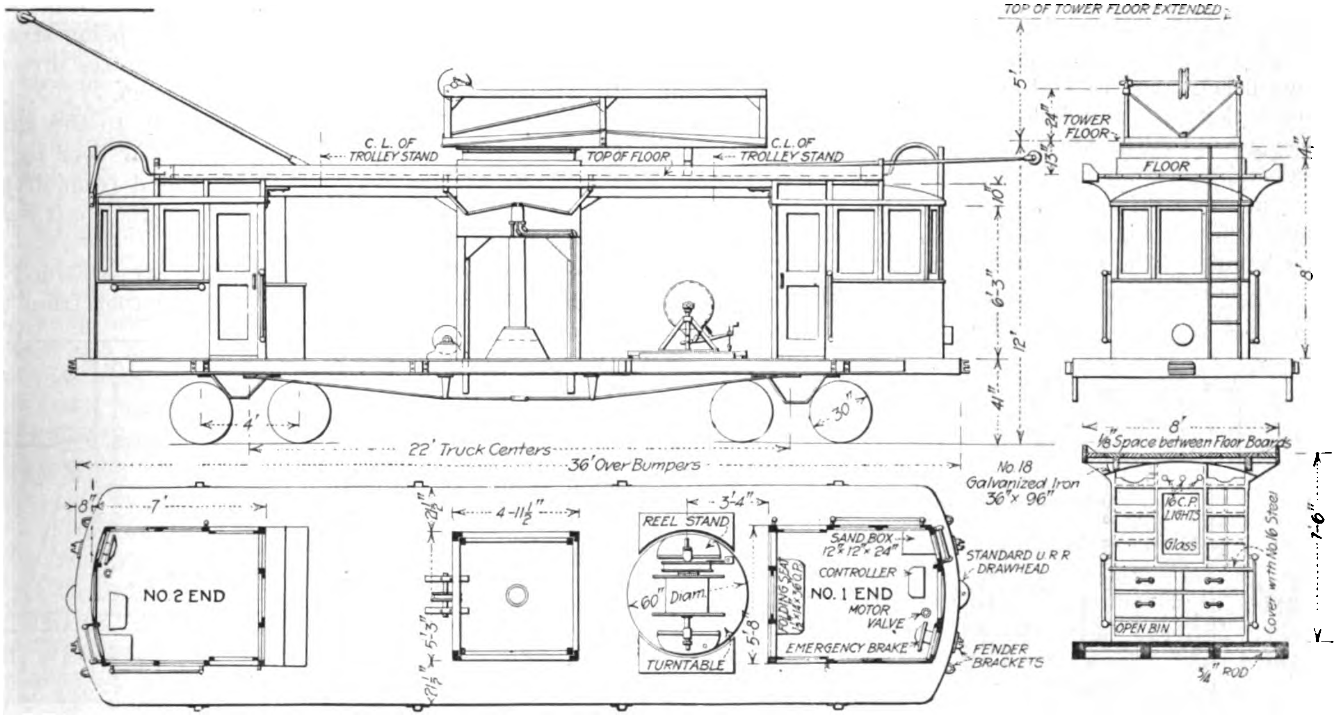
Special Features of San Francisco Tower Car

Pneumatic Hoist Raises Tower Full Length in Eight Seconds and Reel Mount Permits Wire to Be Strung in Either Direction

BY S. L. FOSTER

Chief Electrician, United Railroads of San Francisco

THE United Railroads of San Francisco has developed and for several years has been successfully using a four-motor, high-speed tower car whose equipment involves interesting features for rapid and efficient overhead line work. This car has a closed cab at each end to protect the men in transit from the occasional winds in summer and rains in winter. Otherwise it is open as is permissible in the mild climate prevailing in San Francisco, and so provides ready accessibility.


TOP OF TOWER FLOOR EXTENDED
C. L. OF TROLLEY STAND
TOP OF FLOOR
C. L. OF TROLLEY STAND
5'
24"
TOWER FLOOR
13"
10"
6'-3"
12'
41"
FLOOR
4"
8'
4'
30"
22' Truck Centers
36' Over Bumpers
No. 18 Galvanized Iron 36" x 96"
8'
1/8" Space between Floor Boards
8"
7'
21½"
4-11½"
5'-3"
21½"
3'-4"
REEL STAND
60" Diam.
TURNTABLE
5'-8"
NO 2 END
SAND BOX 12" x 12" x 24"
CONTROLLER
NO. 1 END
MOTOR VALVE
EMERGENCY BRAKE
FOLDING SEAT
STANDARD U R R DRAWHEAD
FENDER BRACKETS
16 C.P. LIGHTS
Glass
OPEN BIN
Cover with No. 16 Steel
1'-6"
¾" ROD

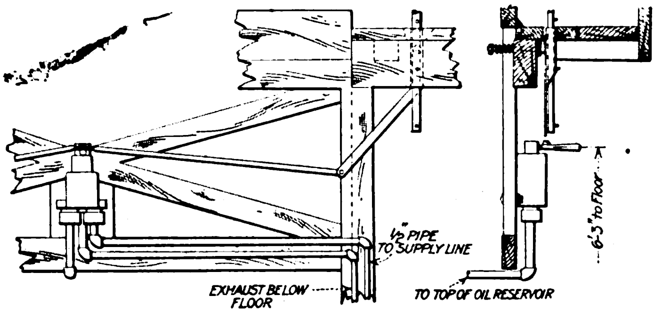
GENERAL ARRANGEMENT OF TOWER CAR, SAN FRANCISCO

Besides the varied assortment of equipment usually found on tower cars, the two features most productive of labor saving are the pneumatic hoist for the tower and the turntable-supported, brake-equipped mount for the reel of trolley wire.

The compressed air for the tower hoist is admitted above an oil reservoir communicating with the bottom of a single, central, 7-in. x 6-in. brass-ram cylinder. Any oil leakage occurring around the ram piston is provided for by a supplementary oil reservoir installed so that it may be periodically drained into the main tank. This leakage while appreciable at first soon became practically negligible.

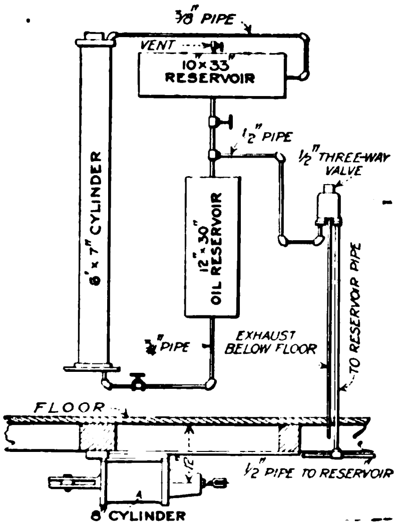
The actuating device for this pneumatic oil hoist is an ordinary engineer's three-way valve situated in the center of one side of the tower frame 6 ft. 3 in. above the floor of the car. The valve is thus readily accessible to anyone on the main platform of the car. When all hands are aloft this air valve may be operated from the top of the tower, as the handle of the valve is connected by two links to two hinged sockets at either end of the tower. Into either of these sockets a 6-ft. 10-in. cylindrical insulated staff can be inserted from the tower platform and the valve thus moved as desired.

To prevent possible injury to the removable slender staff by being struck with the swinging leaf of the tower these sockets are slotted for their full length and the staff is made adjustable by being provided with studs or pins along its length on one side at 1-ft. intervals thus permitting the staff to be operated or left set in the sockets at any height desired. It can thus be dropped so that its top is below the level of the swinging leaf and hauled up again when needed.

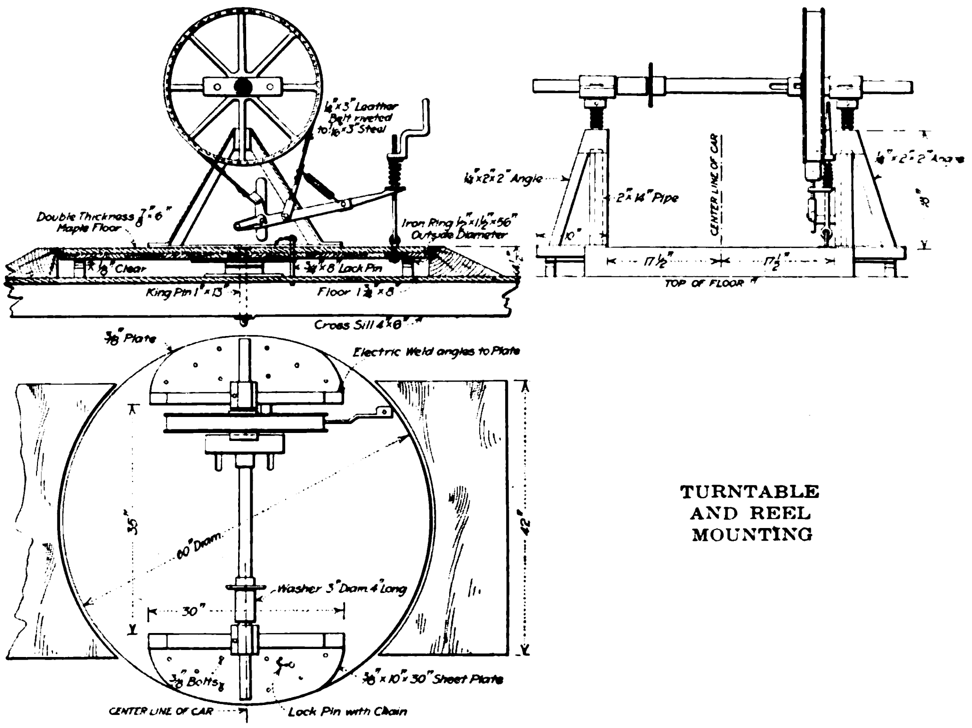

1/2" PIPE TO SUPPLY LINE
EXHAUST BELOW FLOOR
TO TOP OF OIL RESERVOIR
6'-3" to Floor

MECHANISM FOR OPERATING AIR VALVE FROM TOWER PLATFORM

Flat steel springs are included in the arrangement of links between valve and socket so as always to restore the handle of the valve to the exact "holding" position after the man above has secured the action he desires.


3/8" PIPE
VENT
10"×33" RESERVOIR
1/2" PIPE
1/2" THREE-WAY VALVE
6'×7" CYLINDER
12"×30" OIL RESERVOIR
3/4" PIPE
EXHAUST BELOW FLOOR
TO RESERVOIR PIPE
FLOOR
1/2" PIPE TO RESERVOIR
8" CYLINDER

PNEUMATIC HOIST PIPING


1/4"×3" Leather Belt riveted to 1/16"×3" Steel
Double Thickness 7/8"×6" Maple Floor
Iron Ring 1/2"×1 1/2"×56" Outside Diameter
1/8" Clear
3/4"×8 Lock Pin
King Pin 1"×13"
Floor 1 3/4"×8
Cross Sill 4"×8"
1/4"×2"×2" Angle
2"×14" Pipe
CENTER LINE OF CAR
10"
17 1/2"
17 1/2"
TOP OF FLOOR
3/8" Plate
Electric Weld angles to Plate
35"
42"
60" Diam.
Washer 3" Diam. 4" Long
30"
3/8" Bolts
3/8"×10"×30" Sheet Plate
CENTER LINE OF CAR
Lock Pin with Chain

TURNTABLE AND REEL MOUNTING

The tower can be raised its full height by this equipment in eight seconds. It remains practically rigid where set without further locking or chaining.

The reel of trolley wire is supported by a 2-in. steel shaft with ends resting in hinged bearings of two standard adjustable reel jacks. The complete apparatus is mounted on a circular ball-bearing turntable 5 ft. in diameter. An adjustable band brake is keyed to the supporting shaft, the whole being readily removable by loosening one bolt.

When changing from an empty to a full reel, the turntable combination is given a quarter turn and the empty reel is lowered by the reel jack screws until its flanges rest on the floor of the turntable when it is rolled off the car to a reel storage platform.

The shaft is then transferred from the empty to a full reel which is rolled into position on the turntable between the reel jacks and raised to its proper location. The combination is then given a quarter turn back and is ready for paying out the trolley wire.

This paying out requires no attention after the brake has once been set to give the exact amount of friction to secure the wire tension desired by the linemen on top.

By means of this arrangement and a large wooden sheave just above the floor of the car on the opposite side of the tower, it is possible to string trolley wire out in either direction. The wire passes under the ram cylinder and then upward when being strung out over the reel mount end of the car roof. When being strung out over the opposite end of the car it passes directly upward from the reel to the tower platform.

The reel jacks are bolted permanently to the turntable. The latter is held rigidly to the car floor by its center pin and the reel shaft is prevented from lifting out of the jacks by the bolted top caps of the shaft bearings on top of these jacks.

Permanent outside vertical ladders are provided at each end of the car for climbing to the roof from the floor. A hinged, collapsible pole jenny and a complete set of hole-digging and pole-raising tools are suspended from heavy hooks out of the way and yet within easy reach along the edge of the roof under the extension ladders. Other working conveniences are a bench vise, charcoal bin and forge on the floor, rows of material bins along and under the roof, drawers, hooks, etc.

Keeping Power Plant Oil in Good Condition

Oil Disintegrates in Service—After Wise Selection the Problem Is So to Treat the Oil that It Will Be Available Without Waste for Reuse

By Hartley LeH. Smith

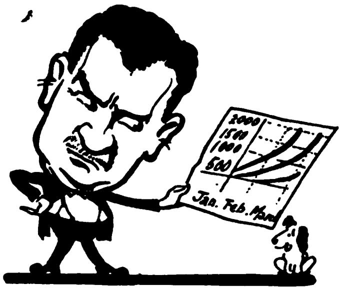
Chief of Testing Bureau
Brooklyn Rapid Transit System

THE following discussion of oil in steam turbine power stations aims to bring forward for examination some of the aspects of turbine lubrication which among many engineers to-day are regarded as problematical. My hope is that a certain amount of discussion may result which, for myself as for others, will clear up in a measure some of the points on which many of us are seeking further light.

Oil Does Deteriorate in Service

It has become very common of late in the literature of turbine lubrication to find the frankest sort of reference to the formation of oxidation products in turbine oil which has circulated more or less continuously for a considerable time, whatever may be the particular type of circulation and oil filtration.

This frank reference to oil disintegration in continued service is rather recent. Not long ago the writer met oil salesmen who professed never even to have heard of such a thing. While confessing themselves entirely mystified as to the nature and cause of such action these salesmen were yet able to express entire confidence that their own oil would not disintegrate. And it is only a few years ago that some turbine designers were ready to let it appear that they at least looked a little askance at some oils and more favorably on others. Now the basis of their likes and dislikes appears to be that in one plant conditions more favorable to growth of oxidation or polymerization products threw the onus of blame upon the oil in use, rather than upon the local plant-operating conditions.



Careful Analysis Discloses Why So Much Oil Is Necessary

Of a truth all oils in continuous turbine lubrication service will form such oxidation products. What the operating engineers want to know are the facts regarding the specific liability of a given oil so to deteriorate, and the plant equipment and operating features which stimulate or alleviate the inherent tendency of the oil to further such growth within itself.

Oils Become Acid as They Deteriorate

The oxidation or polymerization products always produce an acid condition in the oil, in fact such products are measured quantitatively in terms of some relatively simple organic acid. Perhaps the acid most commonly employed for this reference purpose is oleic acid. And yet oil has sometimes been condemned as improperly refined because after long service it had this distinct acid reaction.

Naturally when the acidity of the oil in service has reached considerable proportions there is danger that the oil will do what any acid circulating in a turbine would do, namely, cause corrosion. Before discussing this matter, however, it is important to mention an accompaniment of this acidity, that is the formation of "muck." One of the live questions of to-day is as to the extent to which the oxidation products and the muck are one and the same thing.

"Muck" Is the Cause of Much Trouble in Oil

In many turbine plants the mere creation of such acidity as that described above seems immediately to cause that most common of chemical actions, the attack of acid upon metal with the production of salts. These salts, which may exist in a turbine oiling system, have quite different properties with respect to different metals. For instance, when these acid products act upon zinc the resulting precipitate seems to be particularly voluminous.

To whatever extent, then, oxidation products essentially form muck the impurities in the oil are greatly increased when it comes into contact with metallic zinc, as for example in galvanized oil piping. Such piping should, therefore, not be used in turbine oil circulating systems.

In any case the muck itself is a detriment to lubrication. If the plant engineers are not watchful or are unsuspicious of the possible presence of muck, actual trouble may result. Some very large turbines in important power plants have had not only "near shutdowns" but have suffered the complete burning out of bearings from this cause. Such accidents, happily, rarely occur more than once.

What Shall Be Done with Run-Down Oil?

Now as to remedies, it is wise not to become discouraged too easily. The writer was informed some time ago that in a very large power station where bearing trouble had been experienced the engineers finally realized that unavoidable leakage and evaporation are not the only causes of oil consumption. They established an old-age limit for oil. When the oil reaches the age limit it is simply relieved from further duty, and the burden put upon new, fresh oil.

Such extreme procedure seems to the writer hardly to be justifiable. I believe that there are two lines of attack for the problem. In the first place, one of the most important facts connected with the whole subject of oil muck and its elimination from a turbine oil circulating system seems to be that certain features of such a system which tend most effectively to rid the oil of water have a most perverse effect in hindering the elimination of muck from the system.

The subject of water in turbine oil has received much attention of late years. Among the features of importance are the property of the oil by which it forms an emulsion with water, and the relative ease or difficulty with which an emulsion once formed may be broken up and the water separated from the oil. The United States Bureau of Standards has come forward with notable contributions to the subject. In the equipment provided in power plants for cleaning and filtering oil it is very common to find apparatus for heating the oil about to be filtered, thereby rendering the separation of water much more rapid and complete.

Temperature Is an Essential Element in the Precipitation Problem

Unfortuately the deliberate heating of turbine oil in a filtering system interferes with the extremely important function of filtering, barring of course the separation of mere dirt and metallic particles. The acid oxidation products are in fact prevented from being separated by such heating. These products have a solubility in the oil which varies with the oil temperature. At high temperature the muck goes into solution, and as the oil cools the oxidation products are precipitated out as muck.

This variable solubility with changing temperature is the feature which perhaps more than any other makes the oxidation effect a very serious problem in turbine lubrication. While the oil is circulating in the bearings it becomes hot, and the high temperature favors the formation of the oxidation products with the accompanying increasing acidity. So long as the oil remains hot the oxidation products largely remain in solution.

Muck Interferes with the Operation of the Cooler

In the oil circulating system the oil which is bearing the lubrication burden at one moment is a moment later relieved and at rest in the oil cooler. As it is cooled, however, the acid oxidation products are precipitated. They settle out, fouling the cooling surfaces and reducing the heat transmission through the coils or tubes to the cooling water. Now if the oil-cooling process is interfered with, the oil returns to the bearings at a temperature already high, and it becomes hotter there than it otherwise would.

High temperature is without doubt an important factor in the formation of oxidation products, and consequently more muck is precipitated in the cooler. There is thus a vicious cycle of operations. It would be much worse but for the fact that as the oil heats its viscosity decreases and the bearing friction is thus reduced. Therefore the power loss in the bearings is reduced, since this loss in a bearing is proportional to the product of friction force and speed. With reduction of power loss in the bearings the oil is heated at a lower rate. The temperature reached is, however, much higher than it would be if the heat transmission surfaces in the cooler were clean.

The precipitation of oxidation products in the cooler and their separation from the oil after precipitation are by no means so complete as to render the oil leaving the cooler for the bearings practically free from them. These products contaminate the oil entering the bearings and beyond question increase its coefficient of friction. They are, however, taken up again into solution as the oil heats in the bearings, so that there is at least some compensation.

The Oil Reservoir Pockets Are Favorite Retreats for Muck

Nor does all of the precipitation of muck occur in the cooler. Much of it occurs in the pockets of the oil reservoir space, the temperature there being much lower than that of the bearings themselves. In these pockets the precipitate has the best chance of all to settle out, and when considerable time elapses between cleanings the extent and nature of the deposits are sometimes surprising. They are sometimes in the form of soft muck, often gummy and at times even approaching the consistency of pitch.

There is undoubtedly some danger that with such accumulations the distribution of oil to all parts of the bearings needing it may be interfered with. On the other hand, it is easy to exaggerate this danger. In the first place the high temperature of the oil in the bearings keeps the oxidation products very largely in solution where the oil is doing actual lubrication service. Then again the precipitation of these products, where such does occur, is small in relation to the quantity of oil in which it occurs, while the particles of solid matter come down in a state of very fine subdivision. Accumulations occur, therefore, generally only where circulation is very slow and where the oil is losing heat by radiation and conduction.

"Rejuvenating" Oil After Partial Disintegration

The very finely subdivided state of the precipitated matter must be kept in mind in devising means for dealing with the whole matter. As has already been mentioned, the oxidation products, due to their acid nature, may produce salts of metals which are themselves insoluble. These as solids have much to do in determining the quantity and form of the so-called muck. This is notably the case with the zinc salts which are apt to result from the use of galvanized piping. Without zinc, however, the precipitate is far from flocculent and its separation from the oil with reduction of acidity is a problem of importance in many a power plant to-day.

Unfortunately the filtering of power station oil is done largely with apparatus developed fundamentally to meet the requirements of engine oil filtration and modified in no really important and essential features to meet the turbine oil filtration problems of to-day. This lack of adaptation is indeed not strange if I am correct in arguing that only recently has the real nature of turbine oil filtration problems been correctly understood.

Turbine Oil Cannot Be Treated Like Engine Oil

There are two items in the problem which did not exist when the principles and practice of engine oil filtration were developed. The oil in engine circulating systems was contaminated by water and dirt. The water did not generally emulsify with the oil, or at any rate the emulsions were not particularly tenacious. The separation of the water from the oil was rather easy. The heating coils frequently used in engine oil filters separated the water from the oil even in difficult cases. The separation of dirt from engine oil was, of course, a filtration problem of the simplest sort. So simple was it that many an engine oil filter was merely a crudely improvised collection of canvas bags, with not always the closest attention to eliminating leakage paths.

The separation of water from turbine oil was early recognized as of far greater difficulty. Persistent emulsions were not uncommon and the characteristic behavior of individual turbine oils in this respect began to be closely studied. Much was done in the quantitative measurement of demulsibility, and in this the United States Bureau of Standards took a leading part.

As previously mentioned the two essentials of turbine oil "rejuvenation" for continued lubrication service are (1) the solubility of the acid oxidation products in hot oil, and (2) the finely subdivided nature of these products when precipitated in cool oil. It follows that the filters must not be set to filtering hot oil. It may, however, be necessary to use heat to break up the water-oil emulsions, although even this necessity is questionable. It is quite essential that effective cooling shall be provided previous to filtration.

It may be well to mention in passing that the entire oil contents of a turbine, which is taken out of service for the purpose of cleaning and renewing its oil supply, should be run out of the reservoir as soon as the turbine has come to a standstill, thus insuring the minimum precipitation in the pockets or in the oil grooves and the maximum quantity of acid oxidation products carried out of the turbine in solution in the warm oil. If this is not done the oil will cool in the idle turbine and a certain amount of precipitation will occur.

The Filter Press Might Be Used with Turbine Oil

When provision had been made for cooling the oil in the proper place and thereby bringing the precipitation under intelligent control, there still remains the task of removing the fine precipitate, which cannot be done with bag filters. One hope in this direction is the filter press. For many years this device has been successfully used in many processes of manufacture and refining. Its use in power plants has been practically unknown until very recently. So far as the writer knows, F. R. McLean was the first to propose it for the clarification of turbine oil from precipitated acid oxidation products. For this purpose it is very attractive. It is not expensive, and is very compact. It has great filtering capacity and flexibility. The effectiveness of its filtering may be made anything that is desired. In the numerous manufacturing and refining processes in which it has long been used its place is quite unchallenged. Its future in steam turbine power plant service seems very bright.

The Whole Matter in a Nutshell

Summing up this whole matter, it may be said that the problems of turbine lubrication are problems of the durability of the lubricant. Water emulsions do no permanent harm to the oil but they are highly objectionable until broken up. The tendency of oils to emulsify and the measurement of their demulsibility have been studied extensively. The tendency of turbine oils to form oxidation products in service has been studied also, perhaps most actively by the oil men themselves. The progress so far made is uncertain and the field is unquestionably very difficult. Probably the oil men have learned more than they have told the rest of us. Some progress is also being made in tests which might be called "accelerated acid oxidation product test," but standardization of such tests seems so far a goal quite unapproached.

Short Pennsylvania Meeting

THE annual meeting of the Pennsylvania Street Railway Association was held in the Hotel Adelphia, Philadelphia, Pa., on June 7. About thirty members were present. In opening the meeting the president, Thomas A. Wright, vice-president and general manager Wilkes-Barre Railway, explained that in view of the war and the present abnormal conditions only a short session would be held for the transaction of business and the discussion of certain vital points.

After the report of the treasurer the nominating committee presented the following names for the ensuing year: President, Gordon Campbell, president York Railways; vice-president, T. B. Donnelly, claim agent West Penn Railways; secretary-treasurer, Henry M. Stine; executive committee, the president and the vice-president, and C. L. S. Tingley, second vice-president American Railways; C. B. Fairchild, executive assistant Philadelphia Rapid Transit Company; Thomas A. Wright, vice-president and general manager Wilkes-Barre Railway, and Thomas Cooper, Westinghouse Electric & Manufacturing Company. The nominees were unanimously elected.

After the election the meeting was addressed by Charles E. Morrison, representing the Utilities Mutual Insurance Company of New York. Mr. Morrison briefly traced the work of this company since the compensation act became operative in New York in 1914, and he said that the members are now receiving in dividends, with the approval of the State Insurance Department, 40 per cent of the premiums for the first year's business. In 1917 the company paid less than 10 per cent of the premiums for accidents, and in the last three and a half years the actual cash disbursements for accidents were 14.5 per cent of the premiums paid in. The average operating cost for this period was 18.5 per cent, making a total of 33 per cent. Mr. Morrison said that his company has under consideration the writing of business in Pennsylvania.

A motion was then carried to the effect that the president should appoint a committee to study the question of insurance and report to the association. The remainder of the meeting was devoted to a general discussion of the fuel situation and the need for and means of securing increased revenues. A committee composed of Messrs. Wright, Heindle and Fairchild was appointed to attend a meeting called by the Fuel Administration for June 12 in Philadelphia to discuss the use of coal by utilities. An informal dinner was served in the evening.

Current and Power Curves Show Results to Be Expected of Motors

By C. W. Squier
Electrical Engineer

The Writer Describes How Current and Power Input Graphs Are Derived From the Speed-time and Motor Characteristic Curves

HAVING determined the speed-time curve, as outlined in my article in the May 18 issue, the curves for current and power input are readily obtained. By referring to the characteristic curves of the motor given in connection with the previous article it is seen that with the same voltage the speed is always the same for any definite current value. With the series-parallel method of control, now universally used with direct-current railway motors, the motors are first connected in series and then in parallel when two-motor equipments are used. With four-motor equipments the most common practice is to connect the motors in groups with two motors permanently in parallel. These groups are connected first in series and then in parallel. With the two-motor equipment we are considering, from the start until the motors are connected in parallel the car current is equal to the current per motor, which is 90 amp., the current necessary to give an acceleration of 1½ m.p.h.p.s. With the motors connected in parallel, the car current will be double the current per motor, or 180 amp. This is shown graphically in Fig. 1.

To determine the point in the speed curve at which the transition from series to parallel takes place, we use the relation between speed and terminal voltage as discussed in the article referred to above. This change will be found to take place at a speed of 4½ m.p.h.

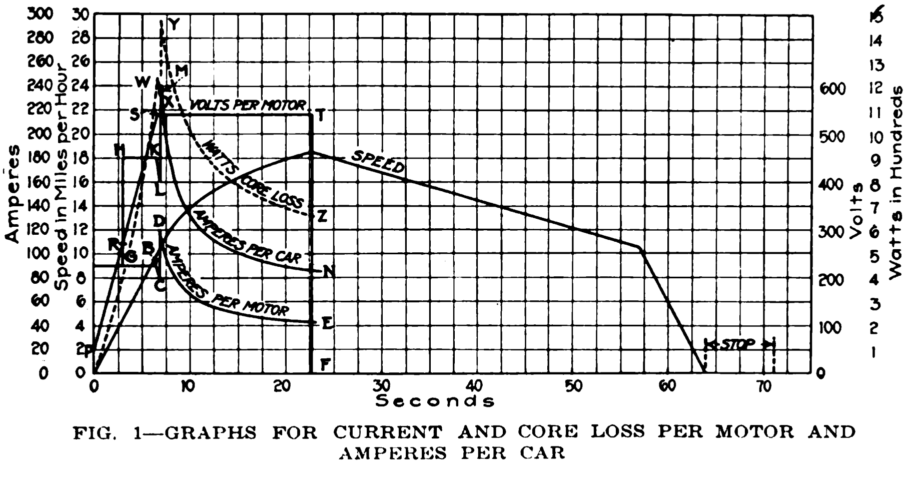


FIG. 1—GRAPHS FOR CURRENT AND CORE LOSS PER MOTOR AND AMPERES PER CAR

In order to plot the part of the current curve after the starting resistance is all cut out, it is only necessary to plot the current value corresponding to any speed at the instant that this speed is reached, as shown by the speed-time curve. In the case we are considering the current per motor is 90 amp. up to a speed of 9.9 m.p.h. At 10.35 m.p.h. the current with full field has fallen to 80 amp. and the change to tapped field is made. This increases the current per motor to 120 amp. From this point on the current values corresponding to the various speeds, as shown in the following table, are plotted. When a speed of 18½ m.p.h. is reached power is shut off and the current falls to zero.

SPEED, CURRENT AND POWER CONSUMPTION

M.p.h.	Seconds	Amperes per Motor	Amperes per Car	(Amperes)² per Motor	Watts per Car at 540 v.
4.5	3.0	90	90	8,100	48,600
9.9	6.6	90	180	8,100	97,200
10.35	6.93	80	160	6,400	86,400
10.35	6.93	120	240	14,400	129,600
11	7.29	106	212	11,236	114.480
12	8.00	88	176	7,744	95,040
13	8.97	74	148	5,476	79,920
14	10.29	64	128	4.096	69,120
15	12.01	57	114	3,249	61,560
16	14.23	52	104	2,704	56,160
17	17.09	47.5	95	2,256	51,300
18	20.70	44.5	89	1,980	48,060
19	25.41	42	84	1,764	45,360
20	31.78	39	78	1,521	42,120

The average current taken by the car is found by dividing the area of the car-current curve in ampere-seconds by the time for the run, including the duration of stop in seconds. In Fig. 1, the graph *OAGHKLMNF* shows the current taken by the car. Each cross-section square with reference to this curve is equal to 20 × 2½ = 50 amp.-sec. When measured with a planimeter this curve was found to have an area of 55.9 squares, hence the average current per car for this run is (55.9 × 50) ÷ 71.2 = 39.25 amp. The average current per motor, obtained from the graph *OABCDEF* in a similar manner, is 21.5 amp. The heating of railway motors in service is caused by internal copper, iron and brush losses. These losses vary in intensity and in distribution with different types of motors and classes of service. To determine whether a motor has sufficient capacity for a particular service, a curve should be plotted from the squares of the various current values and from this the square-root-of-the-mean-square current should be obtained. This should not exceed the rated continuous current of the motor for the average voltage found. For convenience the motor characteristic curves furnished by manufacturers usually give the continuous rating in amperes at half, three-fourths and full voltages. With modern self-ventilated motors this root-mean-square current practically determines the temperature of the motor, since the increased speed that goes with higher core losses also causes a better circulation of air through the motor and causes the dissipation of more heat.

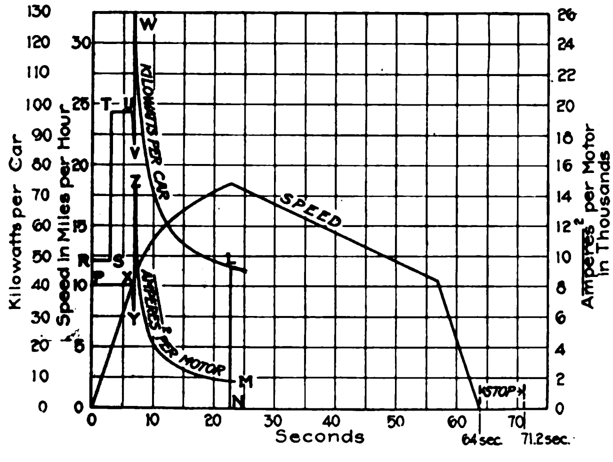
In Fig. 2 the graph *OPXYZMN* has been plotted from the squares of the instantaneous current values. The area under this graph, which can be conveniently measured with a planimeter, is 11.06 squares, equivalent to 110,600 (ampere)²-seconds. The mean-square current is found by dividing this area in (ampere)²-seconds by the time for the complete run, including the duration of stop in seconds or 110,600 ÷ 71.2 = 1553. Then by taking the square root of this mean-square value we have 39.4 amp. for the square-root-of-the-mean-square current. The continuous current rating of this motor is 40.5 amp., so that we find this motor has sufficient capacity for the given service. The average voltage for each motor is found from the curve *OPRSTF* to be 470. The voltage curve is constructed by drawing a line through *R* (270 volts at 3 seconds and *S* (540 volts at 6.6 seconds) and then using the average line voltage of 540 for the remainder of the time that power is on. The area of this curve is 85.54 squares or 10,692.5 volt-seconds, which divided by 22.75 seconds, the time that power is on, gives 470 volts as the average that is applied to each motor during the run.

Accurate operating data are essential in choosing motors

Core Losses Are Determined by Tests

Fig. 3 shows graphs for the iron and core losses for this motor. These losses depend on both the current and the voltage. They follow no simple law as do the copper losses, which are proportional to the square of the current.

Owing to the great mass of metal in its frame, a railway motor has considerable heat storage capacity. When the temperature of the windings is rising that of the frame must also be increased, and when cooling the entire mass must cool off nearly simultaneously. The actual temperature of the different parts may, of course, be widely different but due to this action of storing heat, the temperature of the windings does not fluctuate rapidly in accordance with the instantaneous losses, but rises at a fairly uniform rate depending on the average value of these losses. The average core loss for any typical run may be obtained by plotting the curve *OWXYZF* as shown in Fig. 1, giving the core loss in the motor corresponding to the instantaneous values of voltage and current. To illustrate the method of plotting this curve, let us find the point on the core-loss curve at ten seconds after the start of the run. From the curves showing current and volts per motor it is found that at the ten-second point there are 66 amp. and 540 volts per motor. Then from the graphs shown in Fig. 3, we find the core loss corresponding to this current and voltage to be 1020 watts. This value plotted at the ten-second point in Fig. 1 will be the desired point in the core-loss curve. The average core loss for the run is then obtained by dividing the area under this curve in watt-seconds by the total time for the run, including stop, or 71.2 seconds. This gives 245 watts as the average core loss. The power-input curve is constructed from the car-current curve by multiplying the various current values by the average line voltage. In the table preceding, I have tabulated the various power values in watts corresponding to different current values, and in Fig. 2 the curve *ORSTUVWLN* shows this graphically. By measuring the area under this curve and by computing the values as described previously we find that 0.42 kw.-hr. is taken by the car for this run.



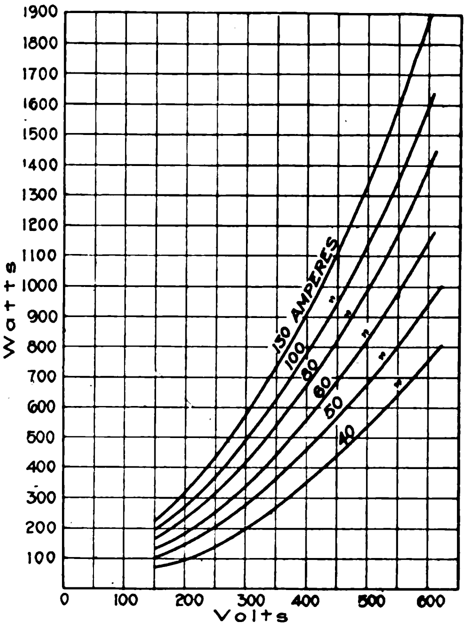


FIG. 2.—GRAPHS SHOWING HEATING CURRENT PER MOTOR AND KILOWATTS PER CAR. FIG. 3.—GRAPHS INDICATING THE CORE LOSSES IN MOTOR

In considering various types of motors for operation in the same service with cars of the same weight, a comparison can be made directly from the results shown while performing the various typical runs representing average service requirements. When it is desired to compare equipments on the same cars, or on cars weighing nearly the same but operating at different schedule speeds, such a comparison as the preceding would probably be misleading and unfair to the equipments under consideration, since the above average values are dependent on the speed at which the car travels. A fair basis of comparison in such cases is found in the values expressed in killowatt-hours per car-mile. The present figure of 0.42 kw.hr. was for a run 1200 ft. long made in 71.2 seconds, hence the energy input is (0.42 × 5280) ÷ 1200 = 1.848 kw.-hr. per car-mile.

When it is desired to compare the performance of equipments on cars with considerable differences in weight, the units of watt-hours per ton mile should be used as a basis of comparison. This unit takes into consideration the difference in weight as well as any difference in schedule speed. The weight of the car with equipment and load which we are considering is 23.56 tons and (1.848 × 1000) ÷ 23.56 gives 78.4 watt-hours per ton-mile as the energy consumption.

In making comparisons all the associated conditions and the quantities affecting them should be carefully considered and taken into account and a unit for comparison chosen which will be fair to the equipment being considered and not be misleading as to the results that may be expected.

Changes in New Boston Cars

A NUMBER of changes in detail from previous designs are being made by the Boston Elevated Railway in the 200 new center-entrance motor cars which it is expecting to purchase. At first the company advertised for bids for cars exactly like those now in use in the East Boston tunnel, in which every feasible use was made of fireproof material. A study of these bids from manufacturers has shown, however, that on account of war conditions the work would be considerably expedited by a reduction in the metal used.

The stationary sash on both sides of the car, *i.e.*, the sash next to the center doors and upper stationary sash are to be of the same construction as in the trailer cars now standardized in the company's service, eliminating the fireproof or metal covering. The sash in use in the center-entrance motor cars is at present a wood sash with metal covering. It is the intention of the company to retain the metal covering on movable sashes only. In the new cars no headlining in the upper deck and hoods will be used, so that the construction will be roof sheathing on the ribs with no lining whatever, as in many of the semi-convertible cars now used by the company. The ingot iron covering is to be eliminated from the entire under side of the car, and in place of it, it is planned to install sheet-iron between the car floor and the motors, resistors and other electrical equipment for protection against flashes.

The center-entrance cars now in use in East Boston are now so equipped as to permit operation in trains of two or more cars. The type of car which it is proposed to purchase is intended to operate in trains of not more than two cars.

The new cars are to be built with the floors 1 in. higher above the top of the rail, to allow more space for the installation of motors and other equipment. It is the intention to have the distance from the top of the rail to the center compartment (first step) 15 in. in height as in the present cars. The additional rise will be on the step from the center of the car toward the ends. This step in the present cars is 9⅛ in. In a letter to the commission asking for authority to purchase the new cars President Brush pointed out that the foregoing modifications in the installation of fireproof metallic work will expedite the completion of the cars.

Reclaiming Car Axles by Welding

By R. H. Parsons

General Foreman Third Avenue Railway, New York

AS THE PRICE of car axles has increased about 250 per cent in the last three years and as deliveries are so uncertain, the purchase of new ones to replace those broken or worn in service is a hardship, and a good reason for devising some method of reclaiming them. Some companies have had good results with blacksmith welding, but the use of the electric arc-welding process is a simpler operation. As a break in an axle occurs usually just outside the wheel, it leaves a piece long enough to work upon and sufficient material so that only the best of the remainder need be used.

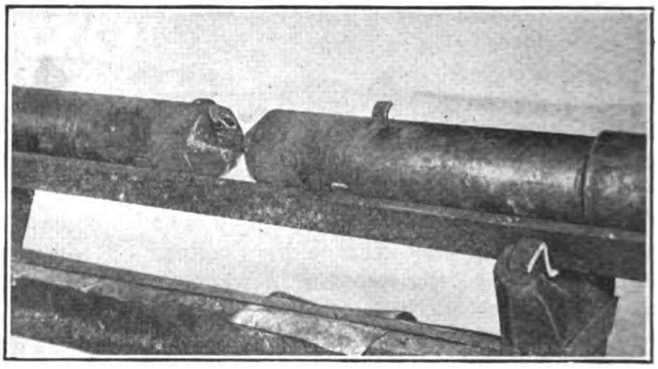


FIG. 1—TWO AXLE ENDS IN POSITION FOR WELDING

The axle is burned off with the electric arc about 5 in. or 6 in. inside the wheel fit so that perfectly "live" metal only is utilized. When the two axles are burned to a V-shape as shown in Fig. 1, they are butted together by laying them in an angle iron resting on a horse. After this they are welded with the carbon electrode, using cold rolled steel as a filler.

The angle keeps the axles straight until welded sufficiently to hold their position, after which the angle is removed and the filling in is completed on the horse, as indicated in Fig. 2.

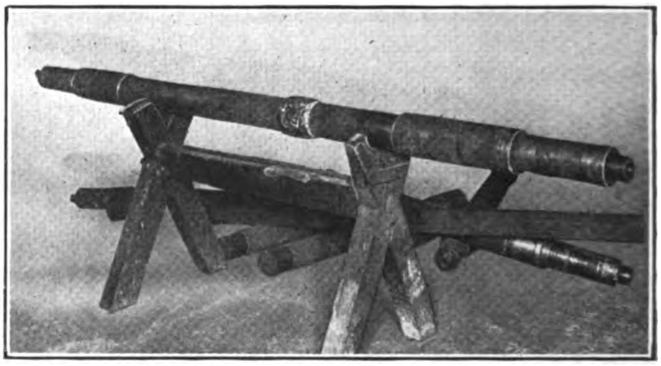


FIG. 2—AXLE WELDED AND READY TO BE TURNED TO SHAPE

The shaft is then ready to be sent to the machine shop where it can be sawed or cut in a lathe to length and turned preparatory to mounting. The welded portion is nearly in the center of the axle and is scarcely touched with the tool, and good "live" metal is thus left for the wheel fit and journal. A good welder can prepare and weld two 4-in. axles per day, so the total cost of a finished, reclaimed axle is only about one-third that of a new one.

Keeping the Track Special Work in Repair

There Is a Field for the Special Work Repair Shop, but in General It Should Be Used Only for Minor Repairs or Emergency Jobs

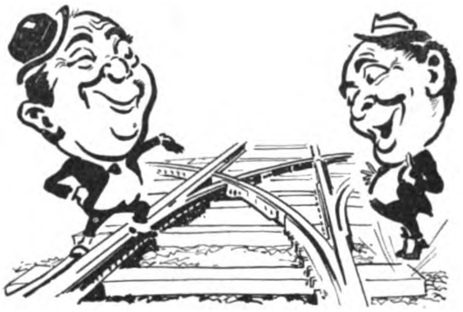
By R. C. Cram

Assistant Engineer, Department of Way and Structure, Brooklyn Rapid Transit System

THE work of the way department begins to reach its fullest extent at this season of the year. The maintenance program is usually divided into at least three phases, *viz.:* (1) Reconstruction of tangent track; (2) overhaul and rehabilitation of tangent track, and (3) repair and renewal of special work. It is the purpose of this article to discuss the way department shop in its relation to this program.

Inquiry may first be directed toward the question of the need for such shops and it may be stated at the outset that no matter how small the railway may be, its way department has need at times for shop facilities, if only for tool sharpening in connection with the first two items of the program previously mentioned. With respect to the third item there is more chance for a wide divergence of opinion as to what shop facilities may be desirable.

The majority of the electric railways are comparatively small in individual mileage, as indicated by statistics which show that most of them operate 50 miles or less of single track. Way departments of roads of this size have little need for shop facilities except for tool sharpening. In most cases this need is supplied by such equipment as may be found in their mechanical department shops, the work being done under shop orders originated by the way department. In some instances it is possible that this sort of work is done by outside shops under the purchasing agent's orders.



"No, we didn't make this layout, but our little way shop will help us to keep it going another two years."

Small Shops Are All Right for Tool Sharpening, Etc.

The volume of shop work on tools incidental to track maintenance increases greatly when the mileage of single track approaches 100, especially if the road is situated largely in cities. A considerable amount of work is in constant demand, and it will generally be found advisable for the way department to have a shop equipped for tool sharpening for its own use. In making this statement, the advantages gained by having the work done in one general shop under other jurisdiction are not forgotten. These advantages are so often offset by delays due to the fact that the way department work is apt to be considered more as a "side line," if done by other departments, and the general shop will not readily lend itself to the execution of rush orders.

The simpler forms of shops are maintained as a rule for tool sharpening, although they can readily expand their activities to include the manufacture and repair of minor parts and fittings of roadway machinery and track construction. These shops do not require a large outlay for housing, site or equipment. The last named, in its simplest form, includes an anvil and forge, blacksmith tools, drill press, emery grinder, power hacksaw, Cleveland plate upsetting machine, and occasionally other simple machine tools for special purposes.

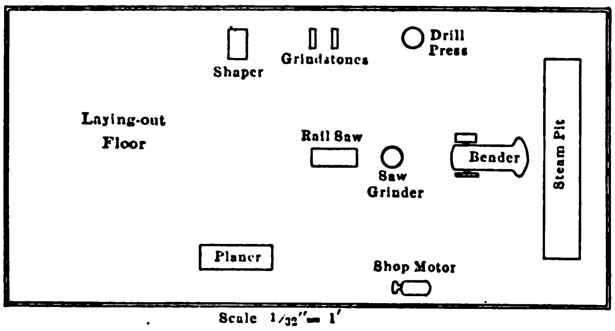
The repair and renewal of special work is a branch of track maintenance which is quite distinct as one of the most important functions of the way department. As the mileage of the system increases it is found that the number of special work layouts increases almost in direct proportion, and the layouts themselves are apt to become more complicated, particularly on city properties. Furthermore, the maintenance of electric railway special work, where confined to city streets, is thought to be somewhat more difficult than similar work on steam roads, not even excepting the renewal of such involved work as double slip switches with interlocking, such as are found in large terminal yards of steam roads. In contrast with steam road practice, the larger electric roads often undertake the manufacture of special work to quite an extent, while the steam roads do little or no work of this nature. The principal reason for this difference in practice probably lies in the characteristic differences in the general type of tracks. That of the steam road is usually of low T-rail and the switches and frogs are of a comparatively simple type, largely standardized as to lengths and angles and other details at least for each railroad system. This permits the purchase of repair parts as stock in advance of needs without unduly burdening the road with a large sum of money tied up in this material. The simplicity of the steam road type of construction also tends to a lessening of the stock needed and, as castings are not required for most of the work in general use, there is a consequent lessening in time required to fabricate parts. These factors not only reduce costs but also assist in securing material in a hurry from manufacturers, in emergencies.

Quick Repairs Must Sometimes Be Made

Tendencies toward failures can be seen more readily in open steam road tracks, and steps may be taken in time to have parts on hand before ultimate failure is reached. In electric railway work in streets, many of the frogs, switches, etc., are special, fitting only one location; they are usually made of deep girder rails and of a type requiring castings which may become defective and fail without giving any visible warning because the defects are apt to be hidden by pavement.

It is practically impossible for any street railway, having a large amount of complicated special work, to keep on hand even one replacement part for every different part to be found in its tracks. There would be too much money carried in idle stock. As a result the electric roads keep but small stocks of repair parts on hand. When sudden breakage occurs they must rely upon the manufacturers for rush service, which is sometimes difficult to secure and which even when obtained is often set at naught by shipping delays.

It is to offset such troubles that many of the larger systems have found it advisable to maintain shop facilities under control of the way department, which may be used to meet emergencies with a minimum of delay. In addition to emergency service these shops are utilized to fabricate various forms of temporary track layouts and special connections which are needed from time to time for rerouting cars during sewer construction or reconstruction of tracks. Such shops also make repairs to portable crossovers; they repair second-hand pieces to render them suitable for further service, and fabricate odd pieces which can be installed for the purpose of piecing out the life of some large layout until it becomes time to renew the entire job.



LAYOUT OF SMALL SPECIAL WORK REPAIR SHOP

It is not to be assumed from the foregoing statement of work undertaken by way department shops that their operations can always be profitably extended to the work of manufacturing repair parts of special work. There must be a sufficient amount of work in hand at all times to keep the shop busy, if this feature is to be carried on economically.

When Is a Road Justified in Having a Special Work Shop?

The question arises as to what measure of the volume of work may be used as a guide in determining whether the work should be undertaken. In this respect it appears that the number of special work layouts in service is perhaps the best gage. Information as to the average number of layouts per mile of track operated is very meager. In 1911 the committee on way matters of the American Electric Railway Engineering Association gathered some data on this subject, but did not feel justified in publishing an analysis of the statistics because only about 20 per cent of the association membership furnished adequate replies on the data sheets. Nevertheless, taking the information furnished as a guide, it appears that those companies which reported special work shop facilities had an average of 1.3 layouts per mile of single track.

The average number of layouts maintained by those companies reporting shops operated for the repair of special work was 474. The lowest number was 110, while the highest was 1035. At the same time two companies, one having 1600 layouts and one 1400, reported no special work shops. It will thus be seen that there is a great range in practice of the companies in the matter of maintaining way department special work shops, and the data indicate that there is no general tendency to engage in the manufacture of special work in complete layouts.

$400,000 Spent Per Year on Special Work Repairs and Renewals

Minor repairs, as distinct from complete renewals of layouts, comprise the major portion of the work made up in such shops. As a gage in determining the advisability of maintaining them it may be of interest to note that one company which maintains approximately 1050 layouts spends about $400,000 per year on special work repairs and complete renewals, and about 15 per cent of this is for minor repair parts, most of which are fabricated in its own shop.

Aside from the report of the way committee for 1911 there is comparatively little published information available concerning this subject. Even the files of the ELECTRIC RAILWAY JOURNAL fail to show more than one article, which appeared in the issue of May 22, 1915. From these two sources and from data obtained elsewhere it is learned that the following tools, in addition to those previously enumerated as necessary for tool sharpening in a small shop, may be considered as constituting the principal equipment needed in those shops which undertake special work repairs: Rail bender, rail saw, rail saw grinder, switch and frog planer, punch and shear (combined), spring hammer and lathe. These machines are preferably operated by direct-connected electric motors.

In addition to the equipment enumerated, several companies which operate their own shops have found it advisable to install small foundry cupolas which, with proper accessories, are used for the small castings in special work. In two instances at least arrangements are made with outside foundries to make castings for special work which has been fabricated in the company shops. One company utilizes the cupola which it maintains for the cast welding of joints to good advantage in this field.

A Small Shop for $7,500

Practically all of the way department shops which engage in the repair of special work are the outgrowth from comparatively small shops first used only for tool sharpening and other light shop work. There are but few shops which were primarily designed to undertake such work and for this reason it is thought advisable to omit plans of existing shops from this article.

The JOURNAL article previously referred to presented a plan or layout of such a shop designed to carry on a reasonably large amount of work and this plan is reproduced in the accompanying figure. It was stated that a shop of the size indicated (50 ft. x 100 ft.) should not cost more than $7,500, completely equipped with the tools shown and with the necessary small tools, as well as an overhead or telferage system.

Attention was also directed to the possibilities of lowering the first cost quoted by the purchase of second-hand machinery. The article further stated that such a shop could be operated with one foreman and fifteen men at a cost of $35.50 per day. (It should be remembered that these costs were for 1915.)

Experience Is a Factor in Special Work Repair Costs

Table I presents a set of labor and material costs for work turned out by the force of men referred to, and the following facts should be borne in mind in examining the tables:

"A comparison of the costs of various kinds of work turned out by men of this class over a period of three years is interesting. In this comparison fluctuations in the prices of material are not taken into consideration, it being assumed that the prices do not change. Where the cost is the same a like amount of material has been used, but where it is not the difference is due to using the material to better advantage or changing the construction slightly without sacrifice of strength."

Further, as to the work undertaken, it should be noted that none of these shops attempts to manufacture tongue switches as they have no facilities for so doing. They are, however, equipped to prepare curves, and to fabricate bolted frogs, girder rail mates, split switch points, plain switch tongues, hard center plates and special compromise plates made from bar steel.

TABLE I—SHOWING TENDENCY OF EXPERIENCE TO REDUCE COST IN SPECIAL WORK SHOP OPERATION

Bending 9-In. Rail, per Foot

	Guard	Tram
First year	$0.1281	$0.1106
Second year	.1051	.0962
Third year	.0732	.0654

Bending 7-In. Rail, per Foot

	Guard	Tram
First year	$0.1004	$0.0902
Second year	.092	.084
Third year	.0712	.0621

9-In. Frogs

	Labor	Material	Total
First year	$18.90	$39.07	$57.97
Second year	17.95	39.07	57.02
Third year	17.57	36.45	54.02

9-In. Mates

	Labor	Material	Total
First year	$22.64	$36.52	$59.16
Second year	20.32	36.52	56.84
Third year	16.03	32.98	49.01

9-In. Double-Track Crossings

	Labor	Material	Total
First year	$185.12	$294.35	$479.47
Second year	172.35	294.35	466.70
Third year	165.05	294.35	469.40

9-In. Crossover: Exclusive of Switch Castings

	Labor	Material	Total
First year	$79.96	$428.20	$508.16
Second year	78.25	428.20	506.45
Third year	74.75	431.30	506.05

Arc Welder Comes in Handy in Special Work Shop

Within the last two years or so the arc welder has been added to the shop equipment in several shops to good advantage. It is possible to make up frogs and mates with all parts welded together instead of being assembled with bolts, and the cost of the work is reduced by the welding method of assembly. Welded frogs and mates of this type have been in service sufficiently long to prove that they are as serviceable as those of the bolted type and in some cases they will outlast bolted frogs under similar service. The arc welder is also used to build up floors in welded and bolted frogs, so as to provide a flange bearing surface which in turn tends to prolong the life of the special work.

What One Large Shop Did in a Year

Tables II and III are presented to indicate the labor cost of operating a special work shop on a system which maintains about 1050 layouts. It is interesting to note that the total labor cost was at the rate of a trifle more than $10 per layout per year. This labor expenditure provided for the bending and drilling and cutting of 16,000 lineal feet of curved rail; it included the fabrication of forty-four plain bolted frogs, fourteen mates, six single frame 9-in. bolted crossings, one three-way frog and mate combined, nine sets of split switch points, twenty-nine crossover repair frogs, seventeen repair mates, two 7-in. crossovers complete except tongue switches, and 1364 pairs of compromise and plain joint plates made from bar steel stock.

The Best Shops Have Their Limitations

In considering special work shop undertakings by the railways, it must not be forgotten that these shops owe their existence largely to the need for emergency repairs and for tool work. They are not generally organized to undertake the complete construction of large complicated layouts having heavy castings. For this class of work they cannot hope to compete in cost with a well-organized commercial plant having thoroughly experienced workmen, able supervision and purchasing departments equipped for most careful buying. Careful computation of costs for such shops as are managed by the railways indicates that when all the overhead charges, such as those for light, heat, power, rental of buildings and site, clerical work, engineering and compensation insurance are added to the labor and material costs, together with the necessary investment in facilities for very heavy machine work and for steel, iron and manganese foundry work, the manufacturer still has the best of the argument as the most economical producer of new special work having heavy castings made up in large and intricate layouts. Furthermore, a railway shop organized for this sort of work would hardly prove economical unless it could find a need for complete renewal of several hundred layouts each year.

TABLE II—LABOR COSTS FOR 1914 OF A SPECIAL WORK SHOP WHICH CARES FOR ABOUT 1050 LAYOUTS

Labor Costs of Special Work Shop—1914

January	$942.19	July	$956.26
February	908.34	August	921.37
March	915.69	September	945.28
April	968.86	October	965.10
May	1,040.32	November	937.18
June	995.20	December	890.05
Total			$11,385.84

TABLE III—ITEMIZED LIST OF EXPENDITURES FOR LABOR IN SHOP COVERED BY TABLE II.

Cut, bend and drill rail for renewals	$1,436.42
Cut, bend and drill rail for repairs	570.83
Make frogs	973.83
Make mates	518.26
Make crossings and repair parts	295.85
Make combination pieces	46.50
Make crossover repair parts	934.69
Make turnout repair parts	216.81
Make T-rail frogs, switches, etc	56.81
Make hard centers	247.59
Cutting and drilling Bessemer steel plates	1,793.60
Make split switch joints	74.48
Make and repair derailers	28.42
Repair steam switches and crossovers, O. M. S	179.58
Repair portable crossovers	995.98
Make anti-straddlers and parts	105.95
Make and repair slip and expansion joints	202.00
Overhaul and repair O. M. S. special work	612.52
Make guard rail	15.10
Cut, drill and straighten rail	220.03
Make tools	628.34
Make and shape bender blocks	98.78
Overhaul machinery	168.35
Moving and handling material on dock and in shop	695.00
Cleaning up, watchman and miscellaneous work	270.12
Total	$11,385.84

In conclusion it may be said that where the conditions do warrant the maintenance of a way department repair shop, the following advantages may be attained. They are enumerated after consideration of advice received from several engineers of roads which have such shops at their command:

1. Built-up work of a really high-grade character can be produced at a cost of about 50 per cent of the ordinary prices of such work when obtained from manufacturers.
2. The manufacture of parts can be undertaken and executed in a very short time, thus providing against emergencies of almost every description.
3. The short time required to turn out work makes it possible to withhold replacement expense until immediate action is necessary.
4. It becomes unnecessary to carry large and expensive stocks of the various repair parts.
5. The remodeling and repair of old special work may be undertaken and valuable material can thus be saved for further service, preventing undue haste toward the scrap heap.
6. The reconstruction work may be executed in accord with a prearranged schedule and without the hold-up so often experienced while waiting for arrival of much-needed special work from a manufacturer.
7. The embargoes and shipping delays now experienced are rendered almost void of their vexing features.

An Unusually Difficult Special Work Job*

A Complicated Layout Installed at a Busy Intersection in Washington, D. C., Involving Only Slight Interference With Traffic

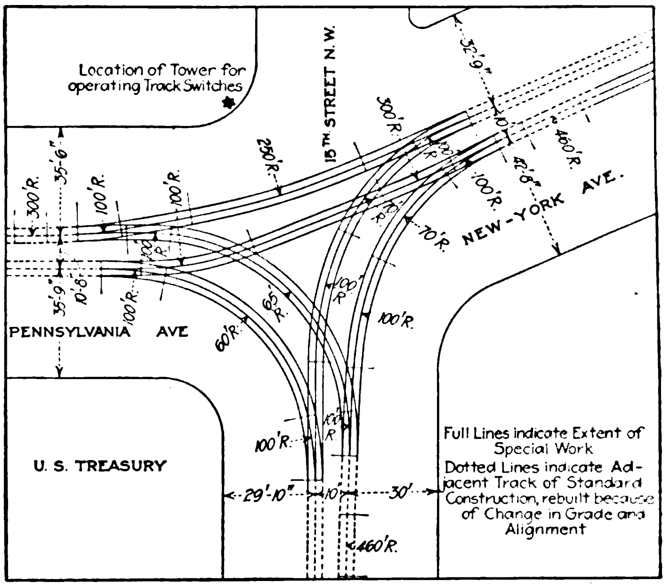
BY H. P. HUNTTING
Engineer of Way Capital Traction Company

THE Capital Traction Company has recently completed the installation of a double-track three-part Y special-work layout on its lines at Fifteenth Street and New York Avenue, N. W., under the most difficult conditions that its engineers have ever encountered in a job of this type. The intersection is at the most congested traffic point in Washington and is the "throat" of the company's system. On account of its prominent location and the seriousness of interruption to the enormous public traffic at this point every effort was exerted to complete the installation as quickly and smoothly as possible.

The work, a plan of which is shown herewith, consisted of installing two new double-track connected branch-offs, to permit the operation of cars direct from Pennsylvania Avenue to New York Avenue; the complete renewal of the double-track branch-off from Fifteenth Street to Pennsylvania Avenue and New York Avenue, and the reconstruction of short lengths of tangent track at the exterior ends of the branch-offs, the latter work being necessary to take care of the change in grade and alignment. The total length of track installed was a little more than one-fifth of a mile. This layout is one of the three most complicated in Washington; the other two being at Delaware Avenue and C Street, N. E., and Ninth and G Streets, N. W.

The entire track layout was of the underground conduit type of construction, in use throughout Washington, which requires much more work and presents more problems than the surface construction used in most cities. Coincident with this work, a system for operating the track switches from a tower on the northwest corner of Fifteenth Street and New York Avenue was installed.

Preceding the actual installation of the layout there were two preliminary surveys. One was made by the special work manufacturers and the other by the company's engineer. From the data obtained in these surveys, a general plan was prepared and submitted to the District Commissioners for approval. The layout was designed to give clearance throughout between cars passing on parallel tracks. In order to obtain this it was necessary to use a long-radius reverse curve on one track at each end before reaching the branch-off. This rather detracts from the general appearance of the layout in the street, but does not affect its easy riding quality appreciably. These reverse curves were used because the centers between tangent tracks on Fifteenth Street and New York Avenue are only 10 ft., whereas the company's standard track center distance is 10 ft. 8 in. Although obstructions at this location were rather numerous, they were fortunately all deep enough to be out of the way with the exception of the old cable-road vault now used as a feeder cable manhole by the company. It was found necessary to lower part of the roof of this vault to permit construction of the new track between Pennsylvania and New York Avenues.


Location of Tower for operating Track Switches
15TH STREET N.W.
NEW-YORK AVE.
PENNSYLVANIA AVE
U. S. TREASURY
32'-9"
10'
40'-8"
460'R.
300'R.
250'R.
100'R.
70'R.
65'R.
60'R.
35'-6"
35'-9"
10'-8"
300'R.
100'R.
29'-10"
10'
30'
460'R.
Full Lines indicate Extent of Special Work
Dotted Lines indicate Adjacent Track of Standard Construction, rebuilt because of Change in Grade and Alignment

PLAN OF TRACK LAYOUT INSTALLED AT FIFTEENTH STREET AND NEW YORK AVENUE, WASHINGTON, D. C.

As it was practically impossible to do any staking out on this job except on Sundays on account of the heavy street traffic, this part of the work was started about a month ahead of the completion of the special work layout. In addition to staking out the survey points on the line of track and the location of yokes it was necessary to offset all points, so that after excavation was started it would be possible to obtain the accurate location of the new track. The setting of approximately 550 points, including offsets, was required.

In the meantime, upon completion of the fabrication of the layout it was set up on the yokes in the yard of the manufacturer, the Lorain Steel Company, exactly as it was to be placed in the street and the correctness of line and dimensions checked by its inspectors, while the company's representative checked the general alignment and gage of surface work, and the workmanship and finish of all castings.

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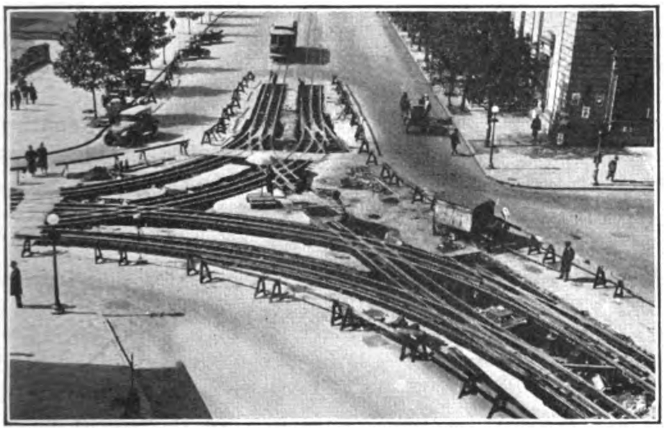
*Abstract of paper presented before American Electric Railway Association Company Section No. 8.

The real difficulties began with the actual work of installation. An attempt was made to do excavation work at night when there was little or no traffic, but the force showed a strong dislike to night work and would not come out regularly. Progress was somewhat facilitated by beginning work at daybreak and working as large a force as could be secured on Sundays. It was at first thought that bridges could be installed for vehicular traffic but this did not prove to be practicable. During the office trips the congestion at this point was considerably increased and it was necessary practically to suspend work during those periods. The work was also retarded to a large extent by inability to secure adequate and competent labor.

The installation work was started on Sept. 10, the excavation and the setting up of the surface work prior to placing it in the street being the first job. The special work had to be assembled near by in order to fabricate the conductor rail and to obtain measurements for cutting the existing track to fit the new work. The use of a vacant lot was obtained and the layout was set up there.



SPECIAL WORK LAYOUT AFTER COMPLETION OF WORK REQUIRING CHANGE AT NIGHT

The actual installation had to be made when the cars were not in operation and on account of the difference in alignment between the new layout and the old it was necessary to have the first night's work include the installation of the Fifteenth Street branch-offs and the tangent track at the south end and to swing part of the old curves over to meet the new work. Considering the inefficiency of the force, it was a big task to be done in one night.

Cars were rather badly tied up next morning, all lines being delayed until 5.30 o'clock, when the eastbound cars from Georgetown were put through half an hour late. The line was not cleared in all directions until 8.50 when the Fourteenth Street southbound cars were put through, three and one-half hours late. An additional handicap on the work was imposed by inability to bring the surface work from the lot to the job until night, after traffic had died down, and this preliminary work tended to sap the energy of the workmen and created some confusion. On this property all special work has to be moved by hand after it has been hauled to the job, as the small amount of this work which the company has does not warrant the purchase of any expensive hoisting machinery.

The installation of the Pennsylvania Avenue branch-offs, made the following week, involved a full night's work but was finished without any appreciable delay to car service. The New York Avenue branch-offs were installed during two separate nights because of the inability to get the necessary excavation completed in time to make the entire installation on the following Friday night, on which night it is found most advantageous to make track changes. The photograph reproduced on this page shows the condition of the work after the installation of the tracks which it was necessary to change at night.

After the installation of the new steel work it was surfaced and lined, its grade was checked by the District engineers and the lower parts of the yokes were concreted to hold the work in place while the forms for the tube concrete and the tube concrete itself were being installed. The work on forms for the tube concrete was the slowest part of the job as special forms had to be made for all the branch-offs and curve crossings and only workmen possessing experience and skill could be used on this sort of work. Considerable additional excavation was required to make room for the forms, ducts for jumper cables around cutouts and switch-operating cables had to be installed, sumps for track drains had to be dug, manholes for switch-operating mechanisms had to be constructed, the roof of the cable vault had to be lowered, etc. The paving was installed by the District and completed with the exception of the adjacent roadway on Dec. 7, finishing the job practically in three months after starting.

The installation of this work was very expensive, as the following summary of costs will indicate:

Installation of double-track three-part Y (784.28 ft. of single track):	
Labor	$10,537.46
Material	38,511.59
Hauling	916.89
Paving, labor and material	1,516.31
Underground obstructions	170.15
Total	$51,652.40
Renewal of tangent track exterior to special work (303½ ft. of single track):	
Total—labor, material and paving	4,272.62
Installation of switch operating layout:	
Total, excluding cost of switch tower	2,217.83
Gross total	$58,142.85
Credit from steel removed	1,903.66
Net Total	$56,239.19

Transformer Repaired in Record Time

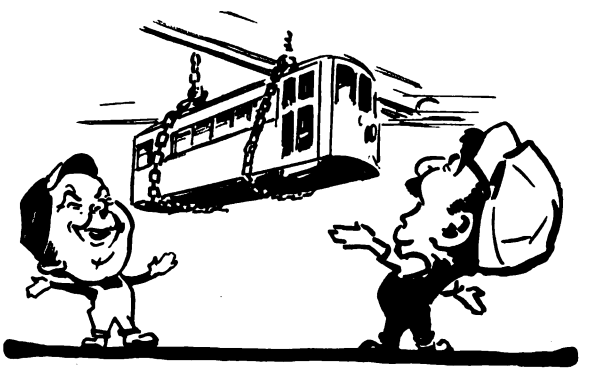
A 1100-kva. transformer in the Quincy Street substation of the United Railways of St. Louis short-circuited during the night time recently and the station was put out of commission. The transformer was dismantled, the coils removed, repaired and again installed in the transformer and the laminations relaid by hand. This work was entirely finished and the transformer returned to service in five days. When it is considered that this transformer weighed 15 tons and there were 50,000 laminations to be taken apart and relaid, the size of the task can be appreciated.

How the Underframe Contributes to the Durability of the Car Body

By Norman Litchfield

Steel Sills, Bolsters, Cross-bearers and Anti-telescoping Buffers All Play Essential Parts in Making the Modern Car Shock and Vibration Proof

WITH the advent of the double-truck car in railroading it became necessary in body design to provide some means of transmitting the loads carried by the series of longitudinal sills forming the floor framing of the ordinary wooden car body to one central point over the center of the truck so that the latter could be able to pivot on its axis when rounding curves. The most convenient and simplest method of accomplishing this was by the use of a cantilever structure composed of two flat iron plates stretched transversely under the sills and separated at the center by castings, the general design being as shown in Fig. 1. As soon as the electric motor began to be applied to passenger car trucks for suburban and rapid transit service the necessity of providing sufficient space for the motor, coupled with the desire to keep the car body as low as possible for ease of access and on account of existing overhead clearances, made it necessary to build the bolster around the sills instead of entirely beneath them (see Fig. 2).



"No Danger of Straining the Body with an Underframe Like That!"

These designs held sway for several years and, in fact, are in general use to-day although they have several disadvantages which will be discussed later in more detail. These disadvantages have led to their being generally superseded by more efficiently designed structures which have become possible through the development of the steel car.

The newer design may be termed the cover-plate-and-diaphragm structure which now is in general use for all kinds of cross-bearers, whether they be the body bolsters or the intermediate transverse members originally known as "needle beams."

The design rests upon the principle that a girder consists in its elements of top and bottom members, properly proportioned to withstand the tensile and compressive stresses, and a connecting web to resist the shear. The web does not need to be continuous and consequently can be built in sections between the sills, while the cover plates pass over and under the sills. In some cases where the stresses are clearly defined the compression-chord cover plate may be omitted, reliance being placed upon the fit of the diaphragms against the sills to transmit the compressive strains. A typical design is shown in Fig. 3.

For the proper design of the bolster structure it is necessary as in all the other structures to make some analysis of the strains set up by the loading. Under ordinary conditions, with the car standing level and having the proper clearance at the side bearings, the body bolster is essentially a true cantilever with an equal load applied at each end through the side sills. This is transmitted through the body bolster structure to the center plate. The moment diagram for this condition is shown in Fig. 4, the loads used being those found in the analysis of the side structure given in the earlier article.

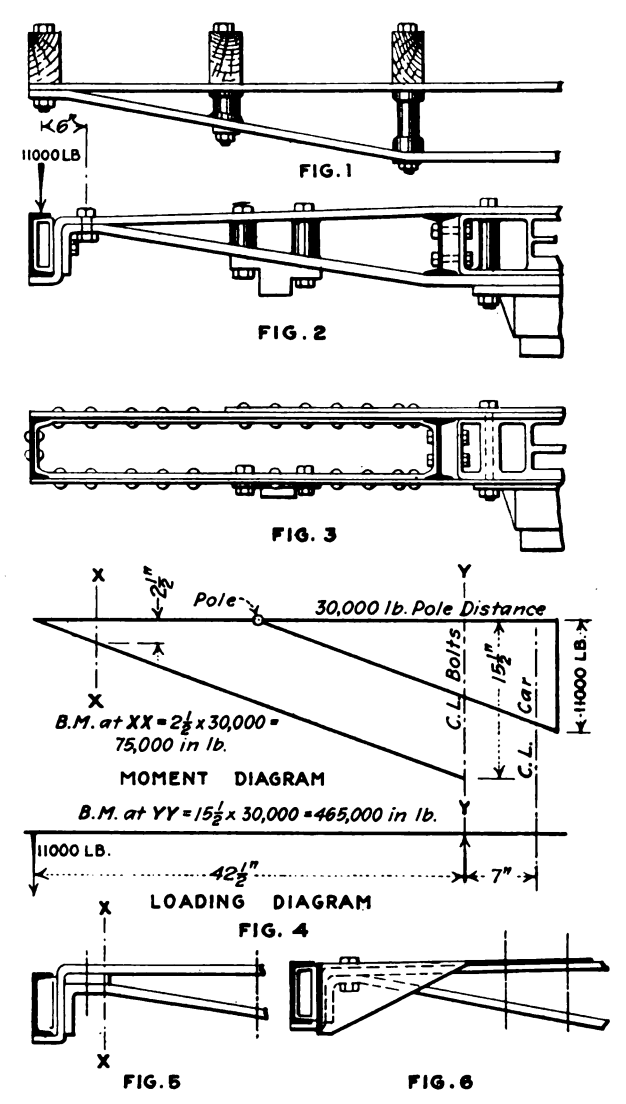
Applying this moment diagram to the style of bolster shown in Fig. 2, it will be seen that while the structure is sufficiently strong at the center it is weak at the ends. This weakness is due to its construction at three points where the plates have been placed flat together to permit the application of the bolts or rivets which tie the plates together and take the longitudinal shear. Where it has been desirable for local reasons, such as maintenance of exact location of side bearings so as to permit interchange of trucks, to perpetuate this general character of bolster design some improvement has been made by the insertion of a filler piece between the upper and lower plates as shown in Fig. 5. As there are many bolsters still in service in which it is not feasible to insert a filler piece as indicated, attention may be called to the fact that resource may be had to a pressing or gusset placed on top of and riveted to the top plate and flanged out sideways against the side sill and bolted or riveted thereto (see Fig. 6).

The second condition which must be considered is that which occurs when the car body has tipped so that it rests equally on the center plate and one of the side bearings.

Whenever a car is rounding a curve at high speed the effect of centrifugal force is to take weight off the center plate and to transfer it to one side bearing. The car is at the point of tipping over when all of the weight has been transferred to the outside rail, and proper consideration must be given in the design to cover the condition.

The final case to be considered is one which is more applicable to service cars than to passenger cars, namely that occurring when the car is jacked up under the side sills with the load in the car.

All of the foregoing discussion takes into consideration only the vertical loads coming from the body structure, the passengers and the equipment. In addition to these there is the fore-and-aft thrust caused by the acceleration of the car by the motors and the retardation by the brakes. The effects of both of these are intensified by the fact that the accelerating and retarding forces are applied at the point of contact between the body and the truck center plates. This point is located at a considerable distance below the neutral axis of the bolster structure, thereby causing a twisting action the intensity of which may be estimated by assuming that the car is being retarded up to the slipping point of the wheels on the rails. This retarding force multiplied by the distance between the contact point of the center plates and the neutral axis of the bolster gives the turning or twisting moment which the bolster has to resist. The usual flat plate construction, such as outlined in Fig. 1 is, in general, sufficiently strong in itself not to show any bad effects from this twist. But plate construction, such as narrow that considerable difficulty is experienced in the connections of the bolster to the sills which show wear and a tendency to loosen, and in wooden cars there is a tendency to break the sills. The matter is still further complicated on cars designed for train operation, and in which the drawbar swivels about the king pin, for in this case to the strains already enumerated is added that coming from the pulling and pushing action between different cars. This condition is, of course, most severe when a train of cars is hauled by a locomotive, but is by no means absent in trains consisting of motor cars. Here it is due to different accelerating rates of the motors with varying sizes of wheels, different designs of motors, irregular action of brakes, etc., so that in any event this effect of the buffing strains must be given attention if the design of the bolster is to prove satisfactory.



STRUCTURAL DETAILS OF BOLSTERS, AND MOMENT AND SHEAR DIAGRAMS FOR BOLSTERS

Where the bolster is built around the sills the effect is less pronounced than where the bolster is entirely beneath them, and the cast fillers usually employed can conveniently be extended fore-and-aft along the center sills and fastened securely to them so as to present a broad base to resist the turning moments resulting both from the braking and buffing strains.

It is in the resisting of these secondary twisting and shearing loads that, as a general thing, the old plate type bolster is least efficient due to its loose-jointed construction. On the other hand it is a simple matter to build bolsters of the more modern diaphragm type with sufficient width of cover plates and with diaphragms properly fitted and riveted to the cover plates and sills to overcome any tendency of trouble from this source.

Another feature which cannot be overlooked is that of the deflection of the bolster under load. With the small side-bearing clearances ordinarily used in electric passenger car service it takes but little deflection of the bolster to bring the latter down solid on the side bearing, thus causing difficulty in the swiveling of the truck on curves. Here again the flat-plate bolster has not the desirable qualities of stiffness that the bolster of the diaphragm design possesses. For all of the foregoing reasons, therefore, the latter has come into general favor, and the old style remains only in cases where certain local conditions are controlling. In the design illustrated it will be noted that the webs of the bolster are shown rigidly attached to the side sills. There has been some criticism of this feature by designers who have felt that the twisting action of the body over uneven track is such as to make it desirable to approximate the trunnion joint of a bridge support. They have therefore built the ends of the bolster in the form of a sort of chair on which the side frame rests loosely. This arrangement however is not at present as largely used as the rigid connection. The transverse members of the floor framing have gone through a process of evolution similar to the bolsters. As before pointed out it is customary in cars which depend chiefly on the side structure to carry the load to use center sills of a section which in itself is not strong enough to carry their own portion of the load from bolster to bolster without undue deflection. They therefore have to be propped up by cross-pieces so that the excess load is transmitted to the side frames. This was accomplished at first by the use of wooden beams underneath the wooden center and other sills. These beams also formed the base for the longitudinal truss-rod queen posts, and were generally known as "needle beams." Where a simple beam was not strong enough it was reinforced by transverse truss rods.

The adoption of steel members for underframes permitted a simplification in the design of these cross-bearers just as it did in side frames as bolsters. Some cars were built with cross-bearers of rolled structural shapes running continuous from side sill to side sill. As this necessitated cutting the center sills, if all members were to be kept at the same level, which is desirable for several reasons, this construction soon gave place to the cover plate and diaphragm type similar to the bolster construction already described. The latter is now very generally used throughout steel-car construction, both passenger and freight.

A type of cross-bearer intermediate between the old needle beam and the diaphragm type was an ingenious truss construction utilizing a diagonal brace from the belt rail to the center sill. Thus this member, with the corresponding window post and floor support, virtually formed a cantilever arm from the side girder. As this diagonal member extended well out into the center of the car the construction was available only where cross-seats were used with a narrow aisle between. When the possibilities of the diaphragm construction became evident the truss construction was superseded.

Attention has already been called to the heavy strains that are imposed on the floor framing members by buffing shocks, either by the drawbar through its spring gear or directly by the end sill in collisions. To tie the center and end sills together securely, and so to distribute the end loads more or less equally among all sills, it is quite general to use a flat plate some 20 in. wide riveted to the bottom flanges of the end and longitudinal sills. This plate is known as the anti-telescoping plate, its worth having been shown in many instances in actual service.

For ordinary light or semi-heavy service, where the use of a spring buffing device is not considered necessary or desirable, two opinions have held as to the proper design of end construction of floor frames. One rests on the theory that the bumper should act as a cushion and, therefore, a wooden timber is utilized for this purpose. The other is based on the desirability of as far as possible maintaining the alignment of the subframes of the colliding cars by the use of anti-climbing devices on the front faces of the buffers, which are constructed of steel and rigidly connected to the sills. In this case allowance is made for the final absorption of end shock by the crippling locally of the buffer member between the center sills, and in cases of severe shock the crippling of the center sills at a point close to the end construction where this action will do the least damage.

One more feature remains to be considered in the design of floor frame, namely, that of lateral stiffening. As a rule, wooden floor frames were bound together with cross-tie rods running beside the transverse timbers fitted between the sills. They were braced diagonally by tie rods and generally provided with turnbuckles. Steel construction permits the elimination of these various truss rods, the riveting of the cross-pieces to the sills together with suitable gussets tying the main members securely together. The anti-telescoping plates already referred to provide additional side bracing which is still further augmented by steel floor plates at platforms and monolithic floor construction laid on corrugated or special section steel.

The simplification which the use of steel permits in construction is shown by the many points already enumerated, and simple study of the relative strength of given sections will indicate the reduction in weight which its use permits as against all-wood construction.

A Local Symptom of a General Disease

In Describing St. Louis Situation, Engineer Says Electric Railway Industry Throughout the Country Is in a Bad Condition

C. E. SMITH, consulting engineer, in a recent address before the Engineers' Club of St. Louis, Mo., said that during the last six months of 1917 he had received the impression that St. Louis was considerably agitated over its electric railway situation, but that not until his recent trip to Washington did he realize how general is the agitation of this sort. In fact, he said the condition in St. Louis is merely a local symptom of a general disease. On the one hand, electric railway investments are in a bad way, and, on the other, the public is in a bad way for proper service. In his opinion, the situation must be handled in a big way or the trouble will not be overcome and the communities interested will be severely injured. Continuing, Mr. Smith said:

"Unfortunately the public has not yet fully realized the relation between rates and the cost of service, and in the consideration of new franchises it has demanded the right to specify the quality and the quantity of service without making proper provision to meet the expense. Under the theory of service at cost the companies and the public should both realize that their interests are mutual.

"If service of the quality and the quantity demanded by the public costs more than 5 cents, the public should cheerfully pay the proper price. If it costs less than 5 cents, the public should have the benefit of reduced fares. If an arbitrary limit of 5 cents is imposed, however, the public should be satisfied with such a quality and a quantity of service as 5 cents will pay for. If the service is neither sufficient nor satisfactory, the public has the alternative of suffering the unsatisfactory service for the benefit of the lower rate, or of paying the higher rate for satisfactory service."

In the course of his remarks, Mr. Smith presented a résumé of the company's problems and of the negotiations that led up to the present ordinance now awaiting the company's acceptance. He included a summary of the new ordinance and also of the franchises in Chicago, Cleveland and Kansas City.

College Test Car Busy on the Shore Line

The test car belonging to the electric railway department of the Worcester Polytechnic Institute is making a detailed test of track conditions on the Shore Line Electric Railway of Connecticut. The 200 miles of track belonging to this system will be covered thoroughly, and sources of power waste, mechanical defects in track and line, etc., will be investigated. The car is in charge of faculty members of the electrical engineering department of the institute.

Selecting Lightning Arrester Types to Suit Requirements

By Q. A. Brackett

Engineering Department,
Westinghouse Electric & Manufacturing Company

The Author Discusses the Applicability of the Electrolytic, Multipath and Condenser Types to Several Classes of Service and Gives Some Suggestions for Their Installation and Maintenance

IN ELECTRIC RAILWAY work the lightning arrester is often a rather neglected part of the equipment, yet it is one which may prevent expensive repairs. There are various types of railway arresters and these offer varying amounts of protection. There are likewise very different operating conditions in different parts of the country which bear directly on the type of arrester that should be used and the amount of attention that it should receive.

In most large cities where there are many steel buildings and overhead wires, lightning conditions are not very severe, but the number of cars to be protected is very large. In such cases a comparatively cheap type of arrester could be used. On interurban lines, especially those located in mountainous regions or districts in the natural path of storms, a higher grade of arrester with greater protective power will be required, and it will be more important to give the arresters frequent and careful inspection to insure their being in condition to give the best results.

The experience of this company has shown that the electrolytic, multipath and condenser types all have their places in electric railway service. In power houses and substations arresters should be provided for the protection of the generators and rotaries. As the number required is small and the value of the apparatus to be protected is high, only the very best grade of arresters should be used. This means that in general all such equipment should be protected by electrolytic arresters of the same large capacity that are used for the protection of large alternating-current systems. The condenser arrester can also be used with excellent results for the protection of station apparatus, especially where two are used in parallel. The Westinghouse "MP" or multipath type of railway arrester consists of a molded carborundum block in series with a small spark gap, all inclosed in a weatherproof galvanized iron box. The carborundum block has very high resistance up to a certain critical voltage above which it breaks down into a multitude of series and parallel spark gaps having little or no resistance. After the high voltage passes, the discharge is quenched by the subdivision of the current into many minute series and parallel arcs, which individually have insufficient voltage to maintain themselves. The cooling effect of the great mass of the block, in intimate contact with the arcs, also aids greatly in stopping the flow of current. When the discharge has been stopped the block regains its high resistance. The great advantage of this arrester is its rugged simplicity and its corresponding low cost. It is at present limited to 750 volts direct current, but it is particularly suitable to urban railway systems where the number of cars is very large and the lightning troubles small. On account of its rugged nature, with no moving or delicate parts, it requires no maintenance or inspection, except to see that the circuit is complete to and from the arrester. This low maintenance expense also makes it particularly suited to large installations.

For interurban lines and installations that are exposed to severe lightning conditions, it is desirable to use an arrester of greater protective power than the multipath type. Very effective protection can be obtained from the condenser type. This arrester can be mounted in any position on a car or pole and has no liquid to spill or moving parts to get out of order. It is unaffected by heat or cold and requires no attention

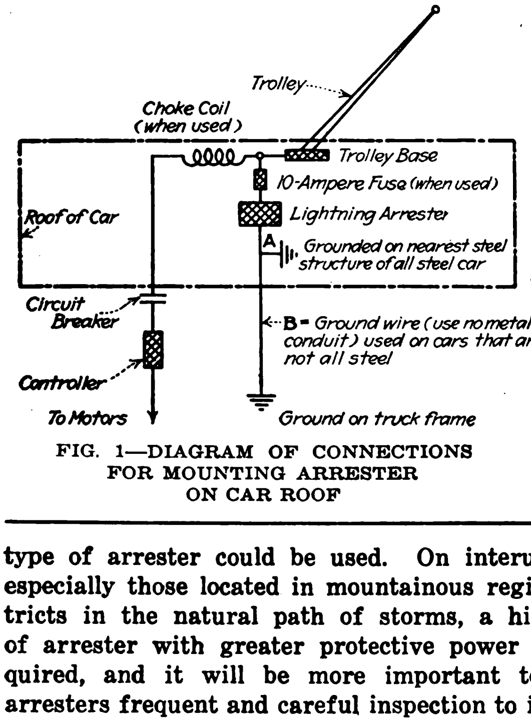

Trolley
Choke Coil (when used)
Trolley Base
10-Ampere Fuse (when used)
Lightning Arrester
Roof of Car
A
Grounded on nearest steel structure of all steel car
Circuit Breaker
B = Ground wire (use no metal conduit) used on cars that are not all steel
Controller
To Motors
Ground on truck frame

FIG. 1—DIAGRAM OF CONNECTIONS FOR MOUNTING ARRESTER ON CAR ROOF

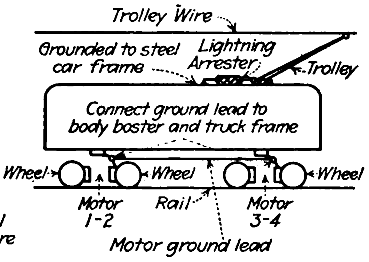

Trolley Wire
Grounded to steel car frame
Lightning Arrester
Trolley
Connect ground lead to body boster and truck frame
Wheel
Wheel
Wheel
Motor 1-2
Rail
Motor 3-4
Motor ground lead

FIG. 2—METHOD OF MOUNTING AND GROUNDING ARRESTER ON ALL-STEEL CAR BODY

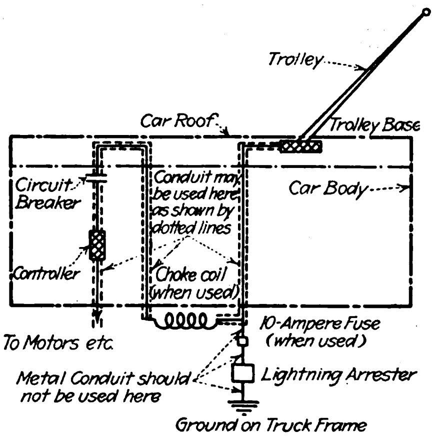

Trolley
Car Roof
Trolley Base
Circuit Breaker
Conduit may be used here as shown by dotted lines
Car Body
Controller
Choke coil (when used)
To Motors etc.
10-Ampere Fuse (when used)
Metal Conduit should not be used here
Lightning Arrester
Ground on Truck Frame

FIG. 3—DIAGRAM OF CONNECTIONS FOR MOUNTING ARRESTER UNDERNEATH CAR

or maintenance except to keep the leads to and from the arrester intact. It consists essentially of a high insulation condenser in a molded composition case, inclosed in an iron box of rugged design. The condenser unit is easily renewed although this is rarely necessary. This arrester was originally designed for the higher voltage direct-current lines and it has been very successful where much trouble had been experienced with other types of arresters because of the viciousness of the power arcs that had to be broken. It is equally effective, however, at lower voltages. It is connected between line and ground, either with or without a series spark gap. When no gap is used, the arrester has the advantage of starting to give protection instantly, without the rise of voltage or time lag usually required to break down a spark gap. This makes it particularly valuable for the protection of old or weak insulation. The protective effect depends on the fact that the impedance of a condenser is lower, the higher the frequency. The frequency of lightning is so high that the condenser used offers practically a short-circuit to ground for the surge, yet all the time it allows none of the direct current to escape, and so has no power arc to break following the discharge. It is a valve that automatically selects the lightning only, and passes it freely to ground without permitting the escape of any dynamic power whatever.

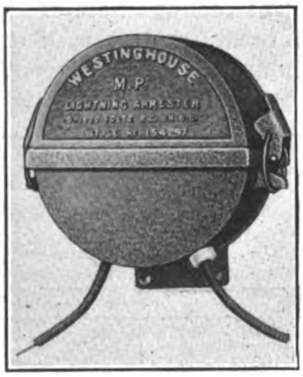


FIG. 4—MULTIPATH TYPE CAR ARRESTER

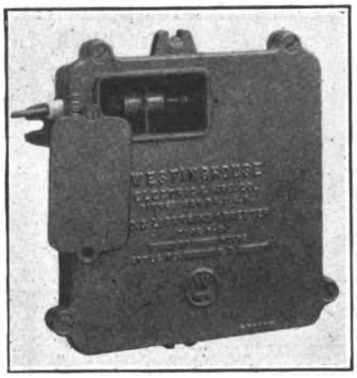


FIG. 5—CONDENSER TYPE ARRESTER

Where dependence is placed on low-priced arresters it is very necessary that they should be properly installed. During past years arresters have usually been mounted underneath the car, but recently there has been a growing tendency to locate them on the roof. On all-steel cars with the arrester in this location the ground connection can be made directly to the roof, but unless an absolutely continuous circuit through the body of the car to the trucks is assured it will always be desirable to run a separate copper lead from the ground side of the arrester to the trucks. Even in the case of wooden cars the location of this device close to the trolley base on the roof is preferable from a protection standpoint if it is of a type which can be so mounted. When the arresters are mounted underneath the car the leads to and from them should be as straight as possible and should not be inclosed in metal conduit. Wooden conduit may be used when desired. Excellent recommendations regarding arrester installation on cars are given in the report of the arrester committee of the American Electric Railway Engineering Association.

When a choke coil is used care should always be taken to see that the arrester is connected to the line between the trolley and the choke coil so advantage may be taken of the piling up of voltage that will occur at the trolley end of the choke coil when a surge occurs.

The leads to and from the arrester should be not less than No. 6 B. & S. gage. This is not so much from the standpoint of conductivity as because a small lead may become broken due to continual vibration or corrosion and thus leave the car without protection until the break is discovered. On the other hand, there is always the possibility of a surge that is too heavy for the small arresters used in this class of service and that the arrester will, therefore, burn up. In such a case the heavy leads recommended above will prevent the arrester from burning itself free and the line will remain short-circuited. For this reason a fairly heavy fuse in series with the arrester is sometimes recommended. There is, however, danger of the fuse being open and the arrester disconnected without its being noticed, unless very frequent inspection is carried out. For that reason the majority of operating companies seem to prefer to use no fuse, but instead to compel the car crew, in case of trouble, to pull down the trolley and cut the leads free from the arrester.

In any case frequent inspection of the arresters and their connections should be made. In general, inspection after each storm and at the times of regular car inspection should be ample.

POLE ARRESTERS GIVE ADDITIONAL PROTECTION TO EQUIPMENT AGAINST LIGHTNING

In addition to the car arresters, lightning protection is obtained from arresters distributed along the line. These arresters are mounted on poles spaced approximately five per mile and should also be installed at points where the feeders tap onto the trolley wire. These arresters must be suitable for outdoor mounting on poles where they can withstand all conditions of weather with comparatively infrequent inspection. The same danger of an arrester failing and grounding the line exists in the case of pole-line arresters, but there is not the same possibility of quickly disconnecting it that there is in the case of the car arresters. It is, therefore, very desirable that all pole-line arresters be so arranged that they can burn themselves free in case of failure, as otherwise it may be necessary to send a repair crew over the whole line to search for the ground. A standard outdoor fuse can be used in the circuit, but it is cheaper and generally sufficiently satisfactory to use a short length of small-diameter copper wire somewhere in the line or ground lead which, in case of failure of the arrester, will burn in two and hang down in some conspicuous manner so that the motorman of a passing car will notice it and report it on his return.

The ground connection for pole-line arresters should be made by driving an iron pipe 5 or 6 ft. into the ground and connecting the ground lead to it. Except for the short length of small wire mentioned above for use as a fuse, the ground lead should be of substantial size so as to make sure that it will not corrode or break in two. The ground around the iron pipe when installed and yearly thereafter should be thoroughly saturated with salt water until a resistance of less than 30 ohms is obtained. Where there is no fear that serious electrolysis will occur it is desirable to connect these grounds also to the rails, thereby providing a more effective ground for both the car and pole-line arresters. Where this might result in objectionable electrolysis this same connection may be made by a small fixed spark gap connected between the rails and the pipe ground. This gap should be made as small as possible.

All the arresters described in this article are particularly suited for railway work in their proper applications, the electrolytic for station use, because of its high protective power in large sizes where maintenance questions are unimportant; the condenser and multipath types for car and pole-line use, in accordance with the severity of the conditions and the investment warranted.

Women Conductors in Kansas City, Kenosha and Camden

The Kansas City Railways Put on Five Women Conductors on May 21—Kenosha Conductors Strike With Men But Are Now Sorry—Some in New Jersey Also

The Kansas City Railways Company on the morning of May 21, 1918, introduced women conductors to Kansas City. Eight women were put to work on the cars, each assisted on this first day by experienced older employees, five on the Rockhill and three on the Troost Avenue line. These lines are both comparatively short; they run through the best residence districts and both lines lead into the same division carhouse, at Forty-eighth and Harrison. On Saturday, May 25, the women were sent out alone.

SERVICE IS FIRST

Beginning this morning the young women who have completed training will commence their service to the public.

You have seen them for the past week as they received their platform instruction. If their work is as good regularly as their trial performance we are sure the public will appreciate their services.

The use of women as collectors is a war measure and at present offers the only means of maintaining service. They are being used on Troost Avenue trailers. Their pay is the same as men's. They are not or will not be used to displace men, but are only added to enable us to get out the trailers. The alarming labor shortage has caused the government to issue its new draft regulations, which mean work or fight for every man in the draft age not now engaged in what the regulations term a war useful occupation. The rearrangement of our industrial system to meet the needs of the war programme will further drain the available supply of labor.

Because of the increasing shortage of men, in spite of every effort to obtain applications, we are now short over 200 trainmen. We are hopeful that an increase in the fare will enable us to pay a wage that will meet the competition of other industries and so hold our employees.

Due to this shortage, it is becoming more and more difficult to get out all the cars and give the service required by the Public Service Commission.

We are sure the public will appreciate the efforts of these young women, pioneers in a new occupation, to give it service. On their behalf we bespeak for them the courtesy of the public as well as our employees.

The Kansas City Railways Company

May 25, 1918

ADVERTISEMENT CARRIED IN KANSAS CITY PAPERS ANNOUNCING THE PLAN

The company does not intend to supplant men with women, except as it is unable to procure the men. These women were employed some three months ago when the service was down about 7 per cent. At that time the unions offered several objections. The women were in most cases retained in the employ of the company, the men having withdrawn their objections on the assurances that the employment of women was to improve service and not to lower wages. The women conductors receive the same wages as the men employed. The company will use them for the present only between the hours of 9 a.m. and 5.30 p.m., thus giving them only daylight runs. Rooms have been provided for the women near the carhouse at Forty-eighth and Harrison with a matron in charge. The women are making excellent conductors, being accurate, rapid, honest, and

WOMAN CONDUCTOR UNDER INSTRUCTION—THE FIVE WOMEN CONDUCTORS EMPLOYED IN KANSAS CITY having the faculty of tending strictly to business. The patrons seem pleased and the new conductors are meeting with every courtesy from the public.

Women Conductors in Kenosha on Strike

An interesting feature of the use of women conductors in Kenosha is that they are now on strike. The strike was not initiated by the women but they were drawn into it through a request of all of the employees for as high wages as are paid in Milwaukee and Racine where the railway systems are under the same management as in Kenosha. The increase asked was 10 cents an hour. The employing company, Wisconsin Gas & Electric Company, replied that the employees were entitled to the increase asked, but the company was unable to grant the increase because of inadequate revenues. The strike has been most orderly so far and the women seem disappointed that their new jobs have been discontinued. Service has not been resumed, the company waiting for action by the Council and Railroad Commission. The company has forty-four train employees, consisting of twenty-four women conductors and sixteen motormen on regular runs, and an extra board of two each. Eight single-truck cars are run regularly over five lines with a trackage of 7½ miles. On account of high operating costs and jitney competition, the company claims it cannot at this time afford to meet the increases which are suggested by the men and women.

WOMAN CONDUCTOR IN KENOSHA

Women were started as conductors on Dec. 20, 1917. The breaking-in period takes about a week on the car with a brief instruction course from the superintendent. The women range in age from twenty-five to thirty-five years. Twenty of them are married or widows, and six are single. Nine are the wives of employees. No male conductors are employed and no motorwomen by the company.

The motormen work nine hours a day, and on account of the laws of Wisconsin, the women conductors work in six-hour shifts as follows: 6 a.m. to noon, noon to 6 p.m. and 6 p.m. to midnight. Occasionally they get in twenty or thirty minutes overtime. If a woman conductor misses her run and the extras are all working, a regular works three hours on the open run, and as it is a six-hour shift it takes two conductors to finish the run. The rules, regulations, discipline and rate of pay per hour are the same as for the male employees. A bill was introduced in the last Legislature to prohibit the employment of women on street cars except from 8 a.m. to 5 p.m. but it was not passed. The Industrial Commission of Wisconsin has ruled that women conductors shall work only from 7 a.m. to 6 p.m. This will effectively eliminate them if the order remains unchanged, because they cannot be used during the rush-hour periods.

The women have been working without uniforms except a khaki cap with badge and a strap belt which holds the change carrier. They had ordered uniforms of khaki and were to pay $21 for them when the strike came. The women were in charge of a woman assistant superintendent. The cars are of the pay-as-you-enter type with a non-registering fare box of the company's own design and make.

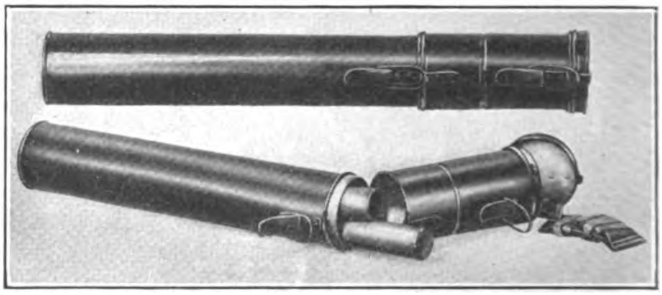
The women conductors report for duty and finish their platform work at the company's office. They are not allowed to go to the carhouse. The motormen run the cars to and from the carhouse which is only three blocks from the office. Public opinion in Kenosha has approved the use of women on the cars.

Experience on Public Service

The Public Service Railway of New Jersey has had thirty-four women working for some time as conductors on its Southern division, with headquarters at Camden, and eight on its lines at Elizabeth. They have not been extended to other parts of the system yet, although the management sees no reason why they should not serve acceptably, and the company has trained some for use in Newark. There are matrons at each depot from which women conductors run and a minimum age limit of twenty-five years has been established.

Definite Location of Torpedo and Fuse Holder Prevents Delays

To AVOID the bad practice, unfortunately found to prevail on many interurban lines, of carrying fuses of torpedos under car seats or in some indefinite place where there is likely to be considerable delay in obtaining them for use, a holder specially adapted to the requirements has been invented by M. F. Flatley, now master mechanic of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa. This holder as shown in the accompanying photograph, is a galvanized-iron tube 3 in. in diameter and 23 in. long, made with two compartments hinged together and with a hinged cover over the top. The bottom section is long enough to contain fuses of the standard length and the top section large enough to contain five or six torpedoes. Clip locks hold the two sections and the cover tightly closed and make the holder practically water-tight. Instead of putting the holder under a seat or in some inconvenient place, it is mounted in spring clips in the rear vestibule of the car so that when equipment is needed for the protection of a train, the conductor can grab up the tube and a flag and is then supplied with all the necessities with no loss of time. Patent has been applied for on this combination holder.



FUSE AND TORPEDO HOLDER FOR INTERURBAN CARS

Dipping and Baking Railway Motors Will Decrease Troubles

The Writer Describes the Apparatus Which Is Necessary for the Proper Dipping and Baking of Railway Motors and the Precautions That Should Be Taken to Secure the Best Results

By J. V. DOBSON
Railway Engineering Department, Westinghouse Electric & Manufacturing Company

INTERRUPTED schedules in last winter's urban and interurban service force us to the question, "How can we best avoid another such epidemic of trouble?" Another winter may not be so severe; snowstorms may not affect the same localities as last year; the experience, however bids us to be alert in guarding against another such trial.

Where the dipping and baking process has been practiced, such precaution has been found to be very effective in eliminating the kind of trouble experienced because of the snow and water of last winter. The cost of rewinding armatures and fields as the result of last winter's severe snow conditions would far exceed the cost of dipping and baking outfits for the railroad shops of the whole country.

The dipping and baking treatment, when properly done, provides the best means for preventing insulation troubles caused by dirt and water in motors in service. This treatment, improperly given, is worse than none.

Applying a dipping and baking treatment after the motors have been in service will give renewed life to the insulation. It will close up cracks and pores, and will present a smooth, clean surface that is not readily harmed by dirt and moisture. Not the coils alone, but the whole piece, either armature or field, should be so treated.

The advantages of dipping and baking the complete piece are:

1. The coils are held in place in the slot securely and, therefore, are less subject to individual vibration.
2. All cracks between the coils are filled up, preventing the deposit of dirt or moisture.
3. Loose laminations are sealed and vibration prevented.
4. A coating which prevents rust is formed over the iron. On motors not so treated, it has been found that rust, which is a good conductor of electricity, is sometimes blown or thrown into the windings.
5. A smooth, dense surface layer is produced on the coils and on creepage surfaces.
6. The insulation of any coil which has been bruised in handling, during winding or assembling, is restored to good condition.
7. Any insulation on the field coils which is cracked by the strain of assembly will be sealed by the treating process.
8. The glossy covering produced will prevent the admission of water where the field coils are connected and taped.

One disadvantage in dipping and baking lies in the fact that it is more difficult to replace a coil. This, on the other hand, involves a counter advantage. The tightness which makes it difficult to remove also makes it proof against vibration, and seals it against moisture. A time-worn saying which holds good in some cases applies here, namely, "Make it difficult to repair and, when so doing, eliminate the need for repair."

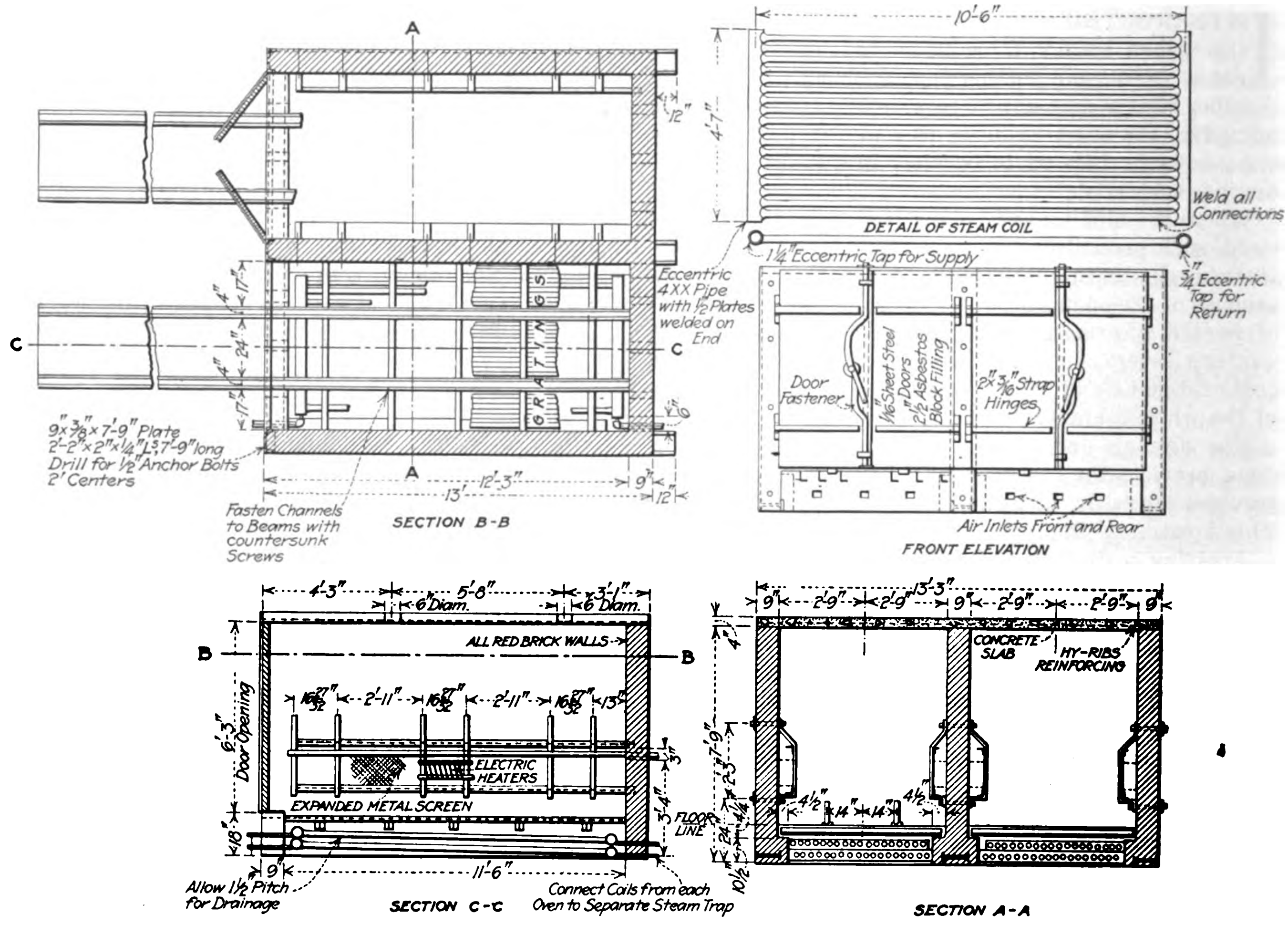
Having shown the advantage of dipping and baking, it is my purpose to describe the design and building of a dipping and baking outfit that can readily be installed at any motor repair shop, with comparatively small expense. One outfit, of average size to fit the needs of a usual railway repair shop, will here be described.

HOW A BAKING OVEN OF AVERAGE SIZE AND CAPACITY MAY BE CONSTRUCTED

What constitutes a dipping and baking outfit? It is neither a complicated nor expensive outfit to build. There are, however, certain necessary precautions in its design, and in its operation afterward, that should be observed.

The oven shown has walls of red brick and a roof of concrete slabs. The end doors, hinged and opening outward, are of sheet steel covered with asbestos. Door fasteners are provided. These should be arranged so as to permit opening from both the inside and outside—this is a "safety-first" measure. Tracks, as shown, are provided for running loaded trucks into the oven. These tracks are on a floor directly over the heating pipes, which occupy a chamber across the bottom of the oven. This arrangement gives the best results and insures a more nearly uniform temperature. Ventilating holes are placed at the top and inlet holes at the bottom. The size of the holes should be such as to give frequent changes of air in the oven. This is an important consideration, for vapor and volatile gases are driven off from the apparatus during heating, and unless these escape the heated air becomes wet and the baking process is rendered ineffective. Although not essential, a recording thermometer is advisable, because by its use a very close check can be made of the temperature of the oven at all times. In any case, when the oven is installed and before it is placed in service, very careful temperature readings should be taken at various heights to make sure that the temperature throughout the oven is uniform. Successful results can only be obtained by baking at a uniform temperature.

In more detail the steam coil shown consists of eighteen 1½-in. standard steel pipes, welded at each end into a 4-in. steel pipe. This method of construction has been found to be most satisfactory because it eliminates the use of threaded joints. There is always a risk of leakage of steam at each threaded joint. Considerable precaution should be taken to prevent any steam leaks whatever in the oven. The pipes are set to drain at the inclination of 1 in. in 10 feet. The steam intake and outlet pipe is placed eccentrically in the 4-in. pipes to prevent the trapping of condensation. Electric heaters may be installed on the walls of the oven. These are to be used as auxiliaries, or at times when the steam is not available, and are not absolutely necessary.


A
C
C
B
B
A
12"
4'-7"
4"
17"
24"
4"
17"
GRATINGS
6"
9"×3/8"×7'-9" Plate
2'-2"×2"×1/4" L's 7'-9" long
Drill for 1/2" Anchor Bolts
2' Centers
12'-3"
13'
9"
12"
Fasten Channels to Beams with countersunk Screws
SECTION B-B
Eccentric 4XX Pipe with 1/2 Plates welded on End
10'-6"
4'-7"
Weld all Connections
DETAIL OF STEAM COIL
1 1/4" Eccentric Tap for Supply
3/4" Eccentric Tap for Return
Door Fastener
1/16" Sheet Steel Doors 2 1/2" Asbestos Block Filling
2"×3/16" Strap Hinges
Air Inlets Front and Rear
FRONT ELEVATION
4'-3"
5'-8"
3'-1"
6" Diam.
6 Diam.
ALL RED BRICK WALLS
6'-3" Door Opening
16 27/32"
2'-11"
16 27/32"
2'-11"
16 27/32"
13"
3"
ELECTRIC HEATERS
EXPANDED METAL SCREEN
18"
3'-4"
FLOOR LINE
9"
11'-6"
Allow 1 1/2" Pitch for Drainage
SECTION C-C
Connect Coils from each Oven to Separate Steam Trap
13'-3"
9"
2'-9"
2'-9"
9"
2'-9"
2'-9"
9"
4"
7'-9"
2'-3"
4 1/4"
24"
10 1/2"
CONCRETE SLAB
HY-RIBS REINFORCING
4 1/2"
14"
14"
4 1/2"
SECTION A-A

DETAILS OF A BAKING OVEN

Other ovens, of a less permanent nature, can be constructed. For example: I have seen a boxcar removed from its wheels, doors made at each end, walls lined with asbestos and pipes installed along the side near the bottom. It made a very satisfactory baking oven. A rectangular box of wood 2 in. thick, lined with asbestos and provided with heating elements can be well utilized. It is, however, quite evident that a well-designed oven of sufficient capacity and with adequate means of handling the apparatus will give the best results, but at a little higher first cost of installation.

For some installations electric heaters may be cheaper and more convenient than steam heating. Discarded car heaters have been found to work quite satisfactorily. When such heaters are used they should be placed on the bottom of the oven, as in the manner herein described for steam heaters.

Most dipping and baking compounds require benzine to dilute them. It is therefore advisable to place the dipping tank in a shed or outhouse, apart from the main shop, where fires or sparks may be excluded, and where, should a fire occur, it is so remote from the main shop that the main building is not endangered. The size of the dipping tank, of course, is dependent on the size of the motors that are to be dipped.

The tank can very easily be made of sheet metal of a thickness sufficient to retain the dipping compound without buckling. It should be made water-tight by welding the edges. Some tanks have been equipped with covers that are released in case of fire by the melting of a fusible wire, thus releasing a latch and dropping the cover, which quickly smothers the flame. Where large tanks are used with heavy covers, it is somewhat more convenient to make the cover removable altogether. Should a fire occur, a valve is immediately opened, and in a very short time the dipping compound is emptied into the cistern.

It is necessary, of course, to provide means for handling the apparatus. This, however, can be modified to fit the conditions of the particular shop. It should be pointed out that an electric hoist is not as safe as an air or chain hoist in the vicinity of the dipping tank. Whatever vaporization of the benzine takes place ascends above the tank and produces an explosive mixture. A slight spark from the motor may be the means of igniting such a mixture. An approximate cost of this dipping and baking outfit, equipped, would be $1,200.

All oil, grease and dirt should be removed from the apparatus before it is dipped. This can best be done by blowing it with clean, dry compressed air. In the event of an accumulation of grease or oil in large quantities, this can easily be removed by scrubbing the surface of the apparatus with a cloth wet with benzine or gasoline.

The piece should then be heated for approximately six to eight hours in the oven in order to drive off all moisture, and to open up the pores in the insulation. This heating should be continued until the apparatus has reached a temperature of about 100 deg. C. It is then removed from the oven and taken to the dipping tank. If by that time its temperature has not dropped to between 40 deg. and 60 deg. C. it should be allowed to stand until that temperature is reached. If dipped at a temperature above this, quick evaporation of the benzine occurs. It will be realized that benzine is very volatile and that it has a lower boiling point than water.

An oil-proof and moisture-proof baking and insulating varnish should be used, and care should be exercised to use it at the following specific gravity: 0.850, at 15 deg. C.; 0.846, at 20 deg. C.; 0.840, at 25 deg. C.; 0.840, at 30 deg. C. Use benzine to thin the liquid.

The dipping should not be done with the temperature of the liquid below 15 deg. C., as varnish at that temperature becomes too hard and is not homogeneous.

Dip both the armatures and fields in a vertical position. Armatures should be dipped with commutator end down, so that all of the windings are totally immersed. They should remain in this position for twenty or thirty minutes, or until all signs of bubbling cease. Dip the fields and frame with pinion end down, so that the varnish will not cover the brush-holder pads.

ENTIRE MOTOR FRAME SHOULD BE DIPPED

In connection with the dipping of the fields, very much better results are obtained if the whole piece is dipped, rather than by treating the coils individually. The reason for this is that the connections to the coils are made after the coils have been bolted in place in the frame. This bolting has a tendency to distort the insulation and may cause cracks, so that if the whole piece is dipped these cracks are filled up and a smooth surface is obtained. Then, too, the joints themselves are covered with a glossy, smooth surface which prevents water from getting in at this point and creeping down between the insulation and the copper, thereby making the insulation "spongy." It will, of course, be necessary to clean the frame, both inside and outside, before such dipping is done. Some may prefer to dip the field coils separately, which is much better than not treating them at all, but it is not so good as dipping the whole field.

Another reason in favor of dipping the whole field is that the painting of the inside of the frame can thereby be eliminated. This painting, which is done to prevent rust and condensation, has become the regular practice in some repair shops. Dipping is very much quicker and more effective than the painting. The secret of effective dipping is to get the insulation well saturated with the varnish and to fill up all the air pockets and cracks. The apparatus should remain in the tank until it is certain that all bubbling has ceased. If this is not done, baking will cause the gases and the air to expand in the air pockets, breaking through the insulation and leaving small pin holes through which moisture can easily enter.

Drain both the armatures and the fields in a vertical position. This is in order that all of the surplus varnish may drip off and may not settle in pockets where, during the baking process, it will not bake out properly. This draining is an important consideration in dipping armatures, because if it is not done properly very serious unbalancing may occur. It is essential that the balance of the armatures should be just as good after dipping as before. After the apparatus has drained for some time the varnish should be removed from all polished or wearing surfaces. This can easily be done by rubbing with a rag, wet with benzine.

BAKING SHOULD NOT BE HURRIED

Place the armatures and fields in a vertical position in the oven and bake at 95 deg. C. between the limits of a minimum temperature of 90 deg. and a maximum of 105 deg. C. Baking vertically, as in draining, is to prevent the deposit of varnish in pockets which would cause improper drying and unbalancing.

Bake until dry. This is one of the first essentials for successful treatment and one that is most likely to be slighted because of the time involved in the baking oven. Too many are prone to rush the baking period. This is accompanied by unsatisfactory results. The best way to determine if the baking is sufficient is to break off the strings that form at the bottom of the apparatus. If these are baked through then it is a good indication that the baking has progressed far enough. An approximate baking period for armatures and fields of 15-in. to 20-in. diameter will be sixty hours at 90 deg. C. The result of the baking should be a smooth and glossy surface without cracks and with all openings sealed up.

It is possible to reduce the baking period by increasing the temperature. If this is done, extreme precaution should be observed to see that the temperature does not go above 130 deg. C., since injury to the insulation may otherwise occur. If steam heat is used in temperatures above the boiling point of water, saturated or superheated steam is necessary. For a general application, a longer baking period at a lower temperature is to be recommended.

PROPER PRECAUTIONS INSURE EFFICIENT RESULTS

In building the oven:

1. Place heating elements at the bottom of oven.
2. If steam is used provide against any possible leak in the oven.
3. Arrange the heating pipes so that the condensation will drain away.
4. Provide for the ventilation of the oven.
5. Provide a thermometer, a recording thermometer preferably, so that the temperature of the oven may be known.
6. Safety first.

In building the tank:

1. Avoid having the tank near sparks or fires.
2. Do not use an electric hoist above the tank because a spark is liable to ignite the gases.
3. Provide a cover to prevent the evaporation of the solvent and to keep out dirt at such times when the tank is not in use.
4. Provide for drainage; a rack directly above the tank and draining into it is very satisfactory.

In dipping and baking:

1. Improper treatment is worse than no treatment.
2. Cleanliness is necessary. Remove dirt and grease.
3. Use a dipping and baking insulating varnish; in other words, use good varnish in the treatment.
4. Observe the specific gravity and temperature of the varnish.
5. Dip until thoroughly saturated.
6. Bake until dry.
7. Make sure that the temperature is uniform in the oven and that it is the correct temperature.
8. Do not exceed 130 deg. C. at any time, else injury to the insulation may result.
9. Do not interrupt the baking period.
10. Remove the varnish from all polished or wearing surfaces, armature bearings, commutator, brush-holder pads, or housing seats.
11. Do not smoke.

Specifications for Cedar Poles

AT ITS last convention the Western Red Cedar Association adopted standard specifications for Western red cedar poles 4 in. and 20 ft., and larger. One of the principal changes made is the fact that the association now grants a minimum measurement at the extreme butt on poles 35 ft. in length and longer. The complete specifications as revised on April 30, 1918, follow:

1. *Live Timber:* All poles must be manufactured from live growing cedar timber.

2. *Manufacture:* All poles must be peeled, knots trimmed close and butts and tops sawed square.

3. *Variation in Length:* Poles may be 6 in. longer or 3 in. shorter than length specified.

4. *Knots:* Knots are not a defect, if sound, trimmed smoothly and do not plainly impair the strength of the pole.

5. *Discoloration:* Discoloration is not a defect.

6. *Miscellaneous Defects:* No poles shall contain sap rot, woodpecker holes, plugged holes or evidence of having been eaten by ants.

7. *Rot:* Tops of poles must be free from rot. Butt rot in center, including small ring rot, shall not exceed 10 per cent of the area of the butt. Butt rot of a character which impairs the strength of the pole above the ground line is a defect.

8. *Cat Faces:* Sound cat faces are not a defect if no part of the cat face shows on the upper one-fifth of the length of the pole or within 2 ft. above or 1 ft. below the ground line.

9. *Dead or Dry Streaks:* A sound dead or dry streak is not a defect if it does not cover more than 25 per cent of the surface of the pole at any one point.

10. *Minimum Measurements:* (a) The tops of all poles shall have a minimum circumference measurement as shown in table No. 1. (b) The extreme butt of all poles shall have a minimum measurement as shown in table No. 2. (c) Poles having a decided swell or flare at the butt shall have a sufficiently larger measurement at butt to insure a reasonable measurement at the ground line.

11. *Short Kinks:* Short kinks are not permitted.

12. *Reverse Sweep:* Reverse sweep and two-way sweep, meaning a sweep in two planes, is permitted, provided a straight line drawn from the center of pole at top to center of pole at ground line does not leave the pole at any point.

13. *One-Way Sweep:* One-way sweep is permitted provided it does not exceed maximum shown in table No. 3.

14. *Method of Measuring Sweep:* That part of the pole below the ground line not to be taken into consideration. Tightly stretch a tape line from point at the ground line (see paragraph 15) on the side of the pole where the sweep is greatest to the upper surface at the top of the pole, and, having so done, measure widest point from tape to surface of pole and if, for illustration, upon a 30-ft. pole the widest point does not exceed 4 in., this pole shall be accepted.

TABLE I. MINIMUM TOP MEASUREMENT

Top Designation, In.	Circumference, In.	Top Designation In.	Circumference In.
4	12	8	25
5	15	9	28
6	18½	10	31
7	22		

TABLE II.

Poles 35 ft. and longer shall have a minimum circumference measurement at extreme butt as follows:

Length, Ft.	7-In. Top, In.	8-In. Top, In.	9-In. Top, In.	10-In. Top, In.	Length, Ft.	8-In. Top, In.	9-In. Top, In.	10-In. Top, In.
35	33	36	39	42	65	45	48	51
40	34	37	40	44	70	47	50	53
45	..	39	42	45	75	48	51	54
50	..	41	44	47	80	50	53	56
55	..	42	45	48	85	51	54	57
60	..	44	47	50	90	52	55	58

TABLE III.

Length of Pole, Ft.	Maximum Sweep Between Top and Ground Line, In.	Length of Pole, Ft.	Maximum Sweep Between Top and Ground Line, In.
20	3	60	9
25	3½	65	10
30	4	70	10½
35	5	75	11
40	5½	80	12
45	6	85	13
50	7	90	14
55	8		

15. *Explanation of Term "Ground Line":* The term "ground line" as used in these specifications shall mean a point on the pole a distance of 4 ft. on 20-ft., 5 ft. on 25-ft. and 30-ft., and 6 ft. on 35-ft. and longer poles from the extreme butt.

Connecticut Company's Power-Saving Campaign Produces Results

IN COMMON with many other electric railways the Connecticut Company, has had in operation for some time an energetic campaign for reducing power consumption on its cars. The platform men are carefully instructed as to proper handling of controllers and brakes and their work is systematically checked. The Arthur "power-saving recorder" is generally used on the system in checking the performance of the men. Through the courtesy of L. S. Storrs, president of the Connecticut Company, it is possible to give the comparative figures of energy consumption on all divisions of the property for the month of April in 1917 and 1918. These are as follows:

RESULTS OF CAMPAIGN FOR ENERGY-SAVING (TRACTION ONLY)
CONNECTICUT COMPANY

Division	Kilowatt-Hours per Car-Mile 1917	1918	Per Cent. Decrease
New Haven	3.240	2.876	11.23
Waterbury	4.378	4.093	6.51
Hartford	3.831	3.167	17.33
New Britain	3.305	3.114	5.78
Bridgeport	4.024	3.186	20.83
Meriden	3.157	2.575	18.44
Middletown	4.542	3.524	22.41
Stamford	3.844	3.266	15.04
Norwalk	3.140	2.499	20.41
Torrington	2.008	1.688	15.94
Derby	3.933	3.711	5.64

The company credits the above very creditable showing to the energy-saving campaign as a whole, the use of the checking device being one element, but an important element, of this campaign.

To protect the health of workers and others in this country at a time when the labor of every man possible is needed, Secretary McAdoo has directed that the United States Public Health Service give anti-typhoid inoculations without charge to all who apply to any of its hospitals or field offices.

Interurban Car Built for Hospital Service at Chicago

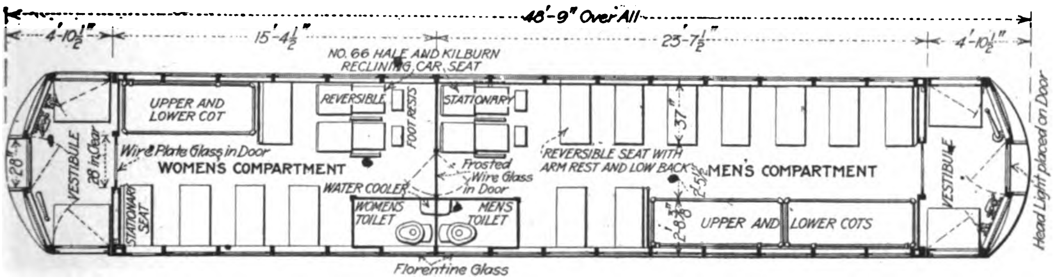
Separate Compartments Are Provided for Men and Women With All Conveniences for Comfort While in Transit

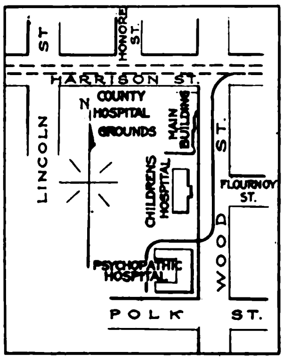
A HOSPITAL car, built for Cook County, has just been turned out of the West Shops of the Chicago Surface Lines. This car will be used in transporting patients from the Psychopathic Hospital in Chicago to the State institutions at Dunning and near Kankakee, Ill., and will be operated by the street railway companies. It was built for the purpose of giving patients as much comfort as possible while in transit, as well as allowing them more privacy than the ordinary cars afford. It also does away with unnecessary transferring from one vehicle to another. It is likely that arrangements will be made later to operate the car over the tracks of the Aurora, Elgin & Chicago road to the State institution at Elgin. A single-track connection has been built recently from the line on Harrison Street into the grounds of the Psychopathic Hospital. This permits operating the car directly to the hospital and facilitates the loading and unloading of patients.

The car has the general appearance of the standard cars of the Chicago Surface Lines. It also resembles an interurban car in equipment and has Pullman type trapdoors and platform. It is divided into two compartments, one for men and one for women. The former seats twenty persons and includes two reclining chairs for semi-invalid patients, while two upper and lower level folding berths are provided for other patients. Regulation Pullman curtains inclose these berths. The women's compartment has ten regular seats, two reclining chairs and one double berth. There is a Duner flush toilet in each compartment.

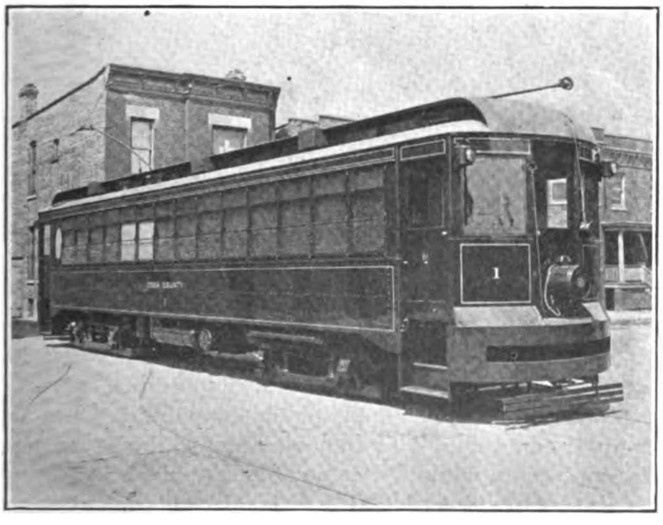
The supporting framework for the folding berths is constructed of white enameled pipe. This gives a very clean and sanitary appearance to the berths and at the same time provides a construction that is strong and easy to install. The details of this framework are shown in an accompanying illustration.

The windows have heavy screens inside, as well as the usual screens outside, and the doors and upper sash of each window are glazed with wired plate glass. These precautions were taken to safeguard the patients against broken glass. The seats, furnished by the Hale & Kilburn Company, are covered with dark-green leather.

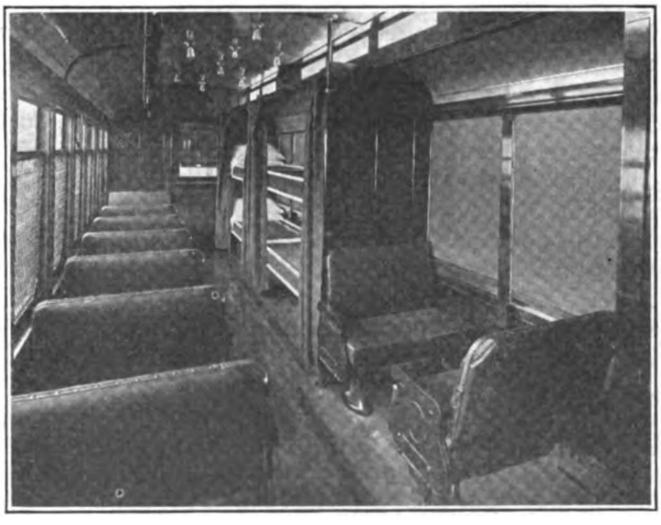

48'-9" Over All
4'-10½"
15'-4½"
23'-7½"
4'-10½"
NO. 66 HALE AND KILBURN RECLINING CAR SEAT
UPPER AND LOWER COT
REVERSIBLE
FOOT RESTS
STATIONARY
37"
28"
VESTIBULE
28 in Clear
Wire Plate Glass in Door
WOMENS COMPARTMENT
Frosted Wire Glass in Door
REVERSIBLE SEAT WITH ARM REST AND LOW BACK
MENS COMPARTMENT
25½"
WATER COOLER
WOMENS TOILET
MENS TOILET
STATIONARY SEAT
2'-8⅞"
UPPER AND LOWER COTS
VESTIBULE
Head Light placed on Door
Florentine Glass


ST
HONORE ST.
HARRISON ST.
N
COUNTY HOSPITAL GROUNDS
MAIN BUILDING
LINCOLN
CHILDRENS HOSPITAL
ST.
FLOURNOY ST.
WOOD
PSYCHOPATHIC HOSPITAL
POLK ST.

GENERAL ARRANGEMENT OF HOSPITAL CAR, CHICAGO SURFACE LINES. AT RIGHT, SINGLE-TRACK CONNECTION FOR ENTERING GROUNDS OF PSYCHOPATHIC HOSPITAL



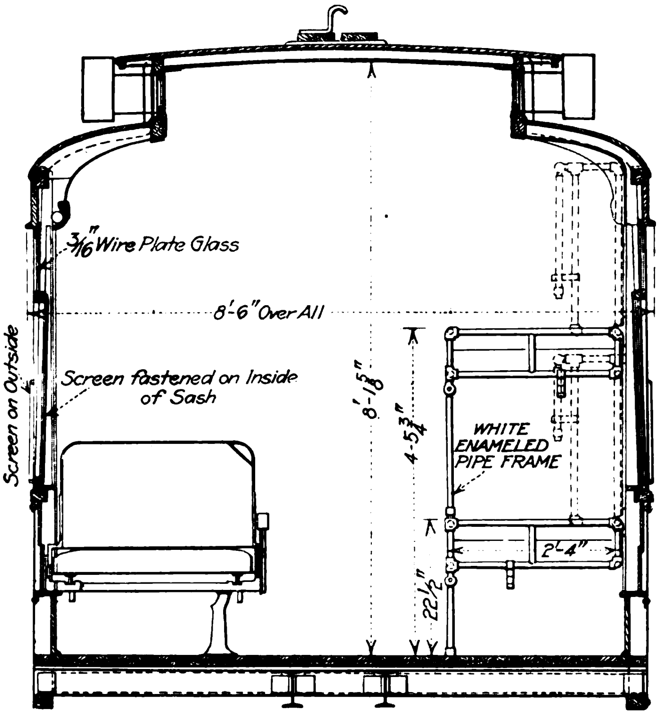
EXTERIOR OF CAR WITH WIRED-GLASS WINDOWS AND PROTECTING SCREENS



INTERIOR OF CAR SHOWING POSITION OF BERTHS AND RECLINING SEATS

The Ohio Brass Company furnished a lighting system so arranged that the marker lights and an emergency light in each compartment will burn when the trolley leaves the wire. These markers and emergency lights are operated from a storage battery.

The car has an arc headlight provided with dimmers for city use. The Pantasote curtains and fixtures were furnished by the Railway Supply & Curtain Company. The Consolidated Car Heating Company provided the heaters, which have sufficient capacity to raise the temperature of the car to 65 deg. with an outside temperature of 10 deg. Railway Utility Company's thermostatic control is provided. The ventilating system is of the exhaust type, also provided by the Railway Utility Company. O. M. Edwards trapdoors are used on each end of the car, and both vestibules are arranged with end doors so that invalid patients can be carried in or out on a stretcher. Water tanks for the toilet can be filled from a hose connection at the side of the car under the sill, an overflow being provided at the roof.



SECTION OF CAR SHOWING FRAMEWORK FOR SUPPORTING BERTHS

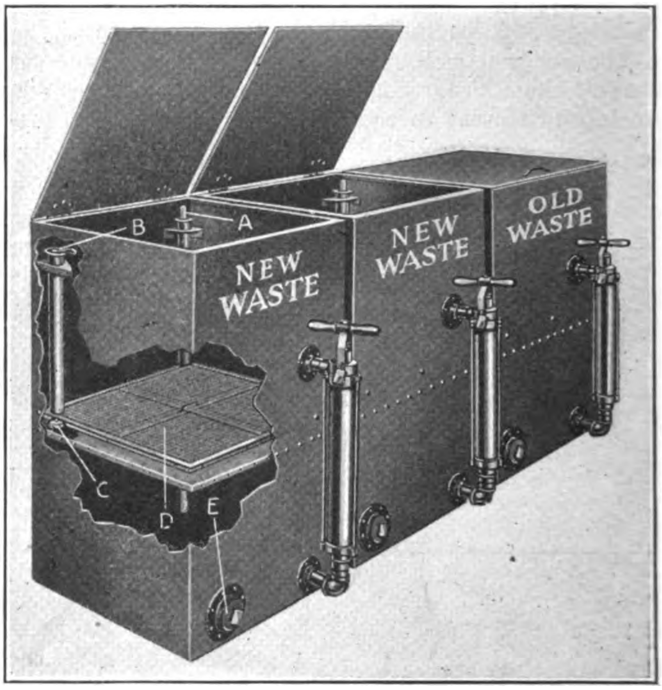
The wheels have a 3-in. tread with a ¾-in. flange. They are of the A.E.R.A. interurban standard and may be used on the city tracks as well as those of the Chicago & Interurban Traction Company on trips to and from Kankakee. The trucks are of the M.C.B. type furnished by the McGuire-Cummings Manufacturing Company. The car is equipped with four GE-210 motors, with a gear ratio of 24: 63. This is the same as the motor equipment and gear ratio of the Kankakee interurban cars. It has General Electric P.C. control, and a G.E. CP-27 air compressor.

The car is painted with the Surface Lines standard green, trimmed with red on the outside, while the interior is finished in cherry with headlining of birch veneer and sheet steel grained to match the birch. The floor is of maple, varnished. The car has a steel underframe and sides, and a double bumper at each end to meet the different levels of city and interurban cars. H.B. fenders are used. The plan and section give the principal dimensions. The complete weight of the car is 61,000 lb.

Increased Car Mileage Per Packing Results from Efficient Saturation of Waste

A FURTHER development has been made in the journal waste saturation equipment of the Milwaukee Tank Works so that mileages of 10,000 and even 15,000 between packings are said to be by no means uncommon. It is reported that one large railway has arranged to run its cars 20,000 miles between refillings of the journal boxes.

The new equipment is shown in the accompanying cut. The oil is kept in the lower compartment and the waste to be saturated is placed on the screen *D*. The oil is then drawn from the lower compartment by means of the pump and the waste is completely submerged. After the waste has remained in this condition for from eighteen to twenty-four hours, the handle *B* is turned and the oil drains down through the screen and back to the lower compartment through the valve *C*. After the waste has drained for about twenty-four hours it is said to be perfectly saturated but free from surplus oil. The gage stick *A* shows the quantity of oil in the lower compartment, and the opening *E* is for cleaning or inspection.



EQUIPMENT TO PROVIDE PROPER SATURATION OF JOURNAL WASTE

These tanks are of the Milwaukee "Kant-Leek" construction, of heavy metal, closely riveted and hard soldered. All upper compartments have removable screens, dustproof covers and improved train valves. The two compartments shown at the left are for the saturation of new waste, while that shown at the right is for resaturation of old waste. Thus the oil from the old waste is kept separate from that used with the new, which has been found of great advantage.

LETTERS TO THE EDITORS

E. H. McHenry's Contribution to Single-Phase Development

WATERBURY, CONN., June 5, 1918.

To The Editors:

As I opened the June 1 issue of the ELECTRIC RAILWAY JOURNAL and on page 1043 noted the portal view of the southern end of Little Hell Gate bridge, with its overhead catenary construction, and the caption at the head of the article, "11,000-Volt Overhead on the New York Connecting Railroad," a flood of memories came over me. Notwithstanding the intensely interesting nature of the problems of hydroelectric development and power conservation here in Connecticut which occupy me now, my twelve years with the New Haven Railroad left an eradicable impress.

The fundamentals of the single-phase system and its single contact wire etched themselves deeply into my mind as I studied their constructive applicability. It was clear to me in the early days that a single contact line with 25-cycle power provided the most flexible and economical means of producing traction in any form of speed-torque arrangement that the exigencies of the case demanded. From this single wire could be produced the split-phase power of constant-speed characteristics, the single phase offering the variable speed movement, and a rectifier or motor-generator furnishing direct current if a case for this could be made out. As developments have gone on I have found no reason to change my conclusion relative to the superiority of the single-phase system over that of the direct-current system, notwithstanding the later higher reaches in voltage that have been secured with the direct current.

However, my purpose in writing is not to review the arguments in favor of single-phase traction but rather to point out how the pictures of the New York Connecting Railroad electrification reflect the genius of E. H. McHenry, both as to imagination and practical applications, for as in so many of the other standards, the designers here have adopted his scheme of contact wire in the use of a clip-suspended wire hung from and parallel to the conductor immediately above it.

I have in my possession five mussy little sheets of yellow paper which contain memoranda and sketches prepared by Mr. McHenry probably in the latter part of 1907. This was just prior to the authorization of the board of directors of the New Haven road which granted us $50,000 for an experimental line of four-track catenary construction, there having been granted also at the same time an appropriation to cover an experimental electric freight engine. I recall that it was with these little yellow sheets in hand that I discussed with my chief draftsman the catenary drawings later developed in connection with the New Haven electrification. The final plans worked out and applied on the New Haven conformed very closely to those covered by the original memoranda.

Among the advantages noted by Mr. McHenry at the time with regard to this form of construction were these: Lateral stability of catenary at center spans; lateral stability of conductor and running wire at bents; elimination of strain and pin insulators; grounding of main catenary system; removal of main cables and insulators from position over track centers; elimination of pull-offs on light curves; reduction of weight and cost; increased flexibility and adjustability; substitution of cross catenary for fixed spans, and lightning protection.

To him belongs the credit of the elimination of pull-offs on curved catenary construction, for it was he who suggested the graceful catenary support by means of which the contact wire has been made to conform closely to the curvature of the track while still maintaining a constant vertical distance from it. In these memoranda Mr. McHenry suggested the substitution of cross catenary for fixed spans. We originally intended to use this plan but for certain reasons later decided against it.

In connection with the application of the catenary supports to curved track came the problem of designing a hanger to keep the two closely adjacent and parallel wires in a plane vertical with each other. I was fortunate enough to apply the whiffletree scheme of support in this case. This support, by the way, was the only device patented by me out of the large number produced in connection with the New Haven electrification. I was gratified to note in this same article that the New York Connecting Railroad's consulting engineers, Gibbs & Hill, used Mr. McHenry's form of catenary support on curves and the hanger above mentioned.

One of the traits pronouncedly developed in Mr. McHenry is to give rather than to take credit. While his partner I would have hesitated to write the above, but the case is different now as Philadelphia, where Mr. McHenry resides, is a long way from Waterbury and should he hear about this I shall still have a fighting chance. W. S. MURRAY.

There Is a Great Opportunity Now to Stimulate Standardization

INDIANAPOLIS TRACTION & TERMINAL COMPANY

INDIANAPOLIS, IND., May 29, 1918.

To the Editors:

I have been greatly interested in the discussion on track spiral standardization which has been going on recently in the columns of the ELECTRIC RAILWAY JOURNAL. Aside from the technical aspects of the question there is one which might well be emphasized at the present time. This is that now is an excellent time to get rid of certain faulty engineering habits. Part at least of the bad habits in designing that have become rather prevalent are due to the desire of the engineer to impress his personality on his designs. The result has been a lot of individuality in these designs, tending away from standardization and involving unnecessary expense. The exigencies of war time have forced us to consider every imaginable economy, and the cheapening of special work is a possibility in this line. Let us therefore give up some of our pet hobbies, if necessary, and join in the movement for simplification.

It ought to be possible to order a track spiral, for example, from any manufacturer by the same number, and a few standard sizes should suffice.

THOMAS B. MCMATH, Chief Engineer.

Simplicity in Track Spiral Standards Is Desirable

BOARD OF SUPERVISING ENGINEERS,
CHICAGO TRACTION

CHICAGO, ILL., May 29, 1918.

To the Editors:

In connection with the discussion which has been going on for some weeks in the columns of the ELECTRIC RAILWAY JOURNAL on the subject of track spiral standardization, there are several points which I believe should have due consideration. The principle of standardization is the correct one wherever conditions are such as to make it practicable. For example, a few rail sections which could be rolled at a lower price per ton due to the use of acceptable standard sections, would certainly be preferable to the present multiplicity of sections.

A reduction in the number of standard spirals, or more properly, easement curves, should conduce to economy in the manufacture of special work and hence to a decrease in selling price.

At the same time it must be remembered that simplicity is a very desirable feature in any standards that may be proposed. The number of circular arcs making up the easement curves should be as small as possible. It is not necessary or possible to have a theoretically true spiral which changes its curvature at every point. The fact is that any curve which looks smooth to the eye, one free from "kinks" or sudden changes in curvature, will guide a car with comfort to the passengers and little jar to the equipment.

Mr. Angerer's views on this subject appeal to me as reasonable. While he writes from the standpoint of the manufacturer, he has the welfare of the railway in mind also. He would be the last man in this field to recommend anything but what he believes to coincide with the best practice from the operating side. Hence his suggestion that fewer and longer arcs be used than those listed in Mr. Ryder's article should be given great weight.

In Chicago we use Pennsylvania Steel Company's spirals on ordinary curves and standard switch spirals of the general character illustrated in the accompanying drawings. Fig. 1 shows standard easement spirals Nos. 4, 5 and 6. These are used on inside curves with track centers or 10 ft. 2 in. or more and are, in fact, the most generally used by us. Table I contains the elements for the curves of Fig. 1. Fig. 2 is a typical branch-off used by us for inside clearance curves with

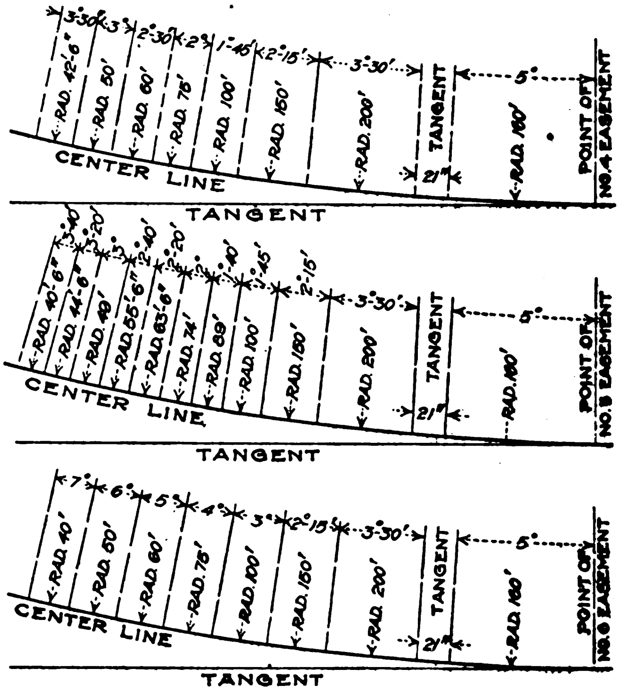


FIG. 1—STANDARD EASEMENT CURVES, CHICAGO SURFACE LINES

TABLE I—STANDARD EASEMENTS, CHICAGO SURFACE LINES
(See Fig. I)

(For significance of Symbols, See Fig. 2)

Elements of Easement No. 4

Radius	Total Angle	X	Y	O G	G S
160 ft., 0 in.	5° 00'	0.600	13.740	....	......
....	....	0.752	15.483	....	......
200 ft., 0 in.	8° 30'	2.171	27.471	197.646	—1.743
150 ft., 0 in.	10° 45'	3.140	33.187	148.195	5.647
100 ft., 0 in.	12° 30'	3.741	36.108	99.073	14.974
75 ft., 0 in.	14° 30'	4.333	38.574	74.665	20.385
60 ft., 0 in.	17° 00'	5.016	40.994	60.143	24.140
50 ft., 0 in.	20° 00'	5.808	43.360	50.580	27.064
42 ft., 6 in.	23° 30'	6.716	45.637	43.533	29.629

Elements of Easement No. 5

Radius	Total Angle	X	V	O G	G S
160 ft., 0 in.	5° 00'	0.600	13.740	....	......
....	....	0.752	15.483	....	......
200 ft., 0 in.	8° 30'	2.171	27.471	197.646	—1.743
150 ft., 0 in.	10° 45'	3.140	33.187	148.195	5.647
100 ft., 0 in.	12° 30'	3.741	36.108	99.073	14.974
89 ft., 0 in.	14° 10'	4.323	38.559	88.334	17.354
74 ft., 0 in.	16° 10'	4.977	40.974	73.790	21.025
63 ft., 6 in.	18° 30'	5.719	43.351	63.705	23.949
55 ft., 6 in.	21° 10'	6.558	45.678	56.118	26.487
49 ft., 0 in.	24° 10'	7.499	47.931	50.057	28.834
44 ft., 6 in.	27° 30'	8.567	50.138	45.951	30.677
40 ft., 6 in.	31° 10'	9.763	52.265	42.403	32.524

Elements of Easement No. 6

Radius	Total Angle	X	Y	O G	G S
160 ft., 0 in.	5° 00'	0.600	13.740	....	......
....	....	0.752	15.483	....	......
200 ft., 0 in.	8° 30'	2.171	27.471	197.646	—1.743
150 ft., 0 in.	10° 45'	3.140	33.187	148.195	5.647
100 ft., 0 in.	13° 45'	4.225	38.183	99.073	14.974
75 ft., 0 in.	17° 45'	5.601	43.063	74.789	20.916
60 ft., 0 in.	22° 45'	7.342	47.781	60.503	25.489
50 ft., 0 in.	28° 45'	9.509	52.273	51.281	29.356
40 ft., 0 in.	35° 45'	11.962	56.160	42.514	34.166

TABLE II. STANDARD SPIRALS, CHICAGO SURFACE LINES
(Used in making up the branch-off shown in Fig. 2)

Elements of Spiral No. 2

Inside Radius	Total Angle	X	Y	O G	G S
297.646	0° 30'	0.011	2.597	....	....
147.646	1° 30'	0.056	5.173	147.652	1.309
97.646	3° 0'	0.157	7.728	97.669	2.618
72.646	5° 0'	0.333	10.258	72.703	3.926
57.646	7° 30'	0.607	12.758	57.760	5.234
47.646	10° 30'	0.997	15.222	47.845	6.539
40.146	14° 0'	1.517	17.618	40.471	7.906
35.146	18° 0'	2,194	19.976	35.619	9.115

Elements of Spiral No. 2½

Inside Radius	Total Angle	X	Y	O G	G S
441.646	0° 20'	0.007	2.569	....	....
219.645	1° 0'	0.038	5.125	219.649	1.292
145.646	2° 0'	0.104	7.666	145.661	2.583
108.646	3° 20'	0.222	10.191	108.683	3.874
86.646	5° 0'	0.405	12.705	86.722	5.154
71.646	7° 0'	0.666	15.191	71.778	6.461
61.146	9° 20'	1.020	17.656	61.356	7.740
53.146	12° 0'	1.478	20.087	53.462	9.038
46.646	15° 0'	2.048	22.461	47.105	10.389
42.146	18° 20'	2.751	24.810	42.757	11.554
38.146	22° 0'	3.592	27.101	38.960	12.812

Elements of Spiral No. 3

Inside Radius	Total Angle	X	Y	O G	G S
297.646	1° 0'	0.046	5.195	....	....
147.646	3° 0'	0.226	10.345	147.669	2.618
97.646	6° 0'	0.626	15.442	97.737	5.235
72.646	10° 0'	1.332	20.462	72.874	7.848
57.646	15° 0'	2.421	25.373	58.102	10.452
47.646	21° 0'	3.962	30.115	48.443	13.041
37.646	28° 0'	5.867	34.298	39.107	16.624

9-ft. 8½-in. track centers. This curve is made up to use Pennsylvania standard spirals Nos. 2, 2½ and 3, the elements of which are given in table II. It may be interesting to note that between the 5 deg. of 160-ft. radius curve and the spiral we use a stretch of tangent track. This, we think, gives us a more durable switch point and mate and there is no discomfort in taking the curve over such a piece of special work. We make all double-track curves in Chicago clearance curves as we feel that the saving in time of the cars in rounding curves more than compensates for any extra expense of installation. In some cases it has been necessary to cut a little off from the sidewalk at the corner, but never enough seriously to narrow the walk. GEORGE WESTON, Engineer for Board.

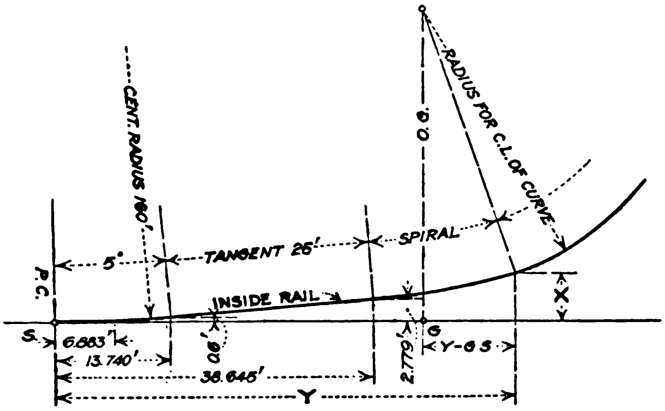


FIG. 2—TYPICAL BRANCH-OFF, CHICAGO SURFACE LINES

AMERICAN ASSOCIATION NEWS

War Board Holds Busy Session

Interurban Rates, Transportation of Draft Men to Cantonments and Other Topics Discussed

AT a meeting of the American Electric Railway War Board held in Washington on June 7 considerable progress in a number of matters of interest to electric railways was reported. The full board was in attendance with the exception of Chairman McCarter, who was detained in Newark. Secretary Burritt and Messrs. Faber and Hill were also present.

Mr. Faber reported in detail upon the increase in steam railroad rates which had recently been announced and upon the effect which this increase would probably have upon the electric roads. He described the reasons for the letter sent by the War Board on May 31 to the interurban railways, mentioned on page 1100 of the issue of this paper for last week, and explained that the United States Railroad Administration hoped that the electric railways would take immediate steps to bring their rates to a parity with the new government rates and to make the new rates effective simultaneously therewith, although he explained that it was realized that there might be cases where local conditions made such an increase undesirable. Mr. Faber also spoke of correspondence which the board had had with the Railroad Administration on the subject of commutation rates, on which the advance on the steam railroads has been less in proportion than on other passenger rates. He reported that the Electric Railway War Board was working in close touch with the Railroad Administration and that pleasant relations existed between the staffs of both organizations. The War Board adopted a resolution thanking Mr. Faber for his work in this matter.

The results were also reported of the conference recently held in Washington between the traffic representatives of a number of the principal interurban electric railway lines in Ohio, Indiana, Illinois, Michigan and Wisconsin and the government to determine what proportion of the transportation required to cantonments by the men concerned in the present draft could be handled in those states by the interurban electric railways. On account of the congestion on the steam railroads, the government had indicated that it would be glad to have the electric lines take over all of this traffic which they are able to handle. If no through electric routes are available, the government's suggestion is that the electric lines will be used to convenient junction points with steam railroads, provided the facilities of the electric lines are adequate to afford the services required for the entire movements and provided the steam trains later used do not originate at the same points as the electric trains.

The War Board has been requested by the official in charge of draftees for information pertaining to the ability of electric lines to handle movements, prior to the issuance of government orders. Preliminary reports of this kind from the roads affected are now in the hands of the War Board and are being checked up for final submission to the government, F. W. Shappert, traffic and industrial agent Chicago, North Shore & Milwaukee Electric Railroad, who had been in attendance at the conference, explained to the War Board how the estimate by the different roads had been made up. In all cases the estimates were based on the use of the most natural routes for traffic.

Mr. Faber reported to the board that he had called the attention of Provost Marshal General Crowder to the waste of man power through the operation of jitneys. With jitneys twelve men are required to transport the same number of passengers whom two men on an electric car can transport seated.

Mr. Gadsden reported on conferences which he had had with Addis M. Whitney, of the Public Utility Conservation Division of the War Industries Board, in the interests of further coöperation. He also reported on correspondence with the Railroad Administration in regard to the suspension of operation of the Kenosha Electric Line. The stoppage in that city had been reported to the Railroad Administration by the mayor of Kenosha, but the War Board had pointed out to the administration that the fundamental cause was that the company had not received permission to increase its rates.

Mr. Faber reported conferences with the Fuel Administration on the subject of the skip stop and other fuel conservation matters.

The board is sending out a call for subscriptions to those companies which did not subscribe at the first call. It is hoped that there will be a prompt response.

The offices of the board on the ninth floor of the Munsey Building have been changed to other rooms better adapted to the purposes of the board, but on the same floor of the same building. The next meeting of the board is scheduled for Friday, July 12.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

New Jersey Strike Settled

Men and Company Agree to Abide by the Findings of the War Labor Board

The strike of motormen and conductors of the Public Service Railway, Newark, N. J., which for two days practically tied up the system of the company in northern New Jersey, was called off on the afternoon of June 7. The Federal Labor Board will arbitrate the differences between the men and the company.

The action of the men followed a report of their committee which earlier in the day had conferred with city, federal and company officials, at which it was suggested that their differences be submitted to the War Labor Board at Washington and that the men return to work at the wage scale offered by the company pending a settlement by the board.

The company, through President Thomas N. McCarter, agreed to stand by the board's award, and the men, through their decision, likewise agree to abide by the board's finding.

Representatives of the company and of the trainmen appeared on June 9 before former President William H. Taft of the National War Labor Board in Newark for the purpose of discussing the grievances of the men. B. L. Worden of the Submarine Boat Company, a member of the War Labor Board, and John J. S. Rogers, federal mediator for the Department of Labor, sat with former President Taft. Thomas N. McCarter, president of the Public Service Railway, with the vice-president and counsel of the company, spoke for the corporation.

Mr. Taft said that there were two ways by which the grievances might be heard. One was to submit the case to the full board, and the second was to submit it directly to the railway section. The latter method, he said, would save time. The employees were willing to take the short cut. President McCarter said that he would have to consult his board of directors before accepting either plan. The two sides were told that the board would sit at Washington on June 24.

The trainmen, in their complaint to the board, make these stipulations:

"A wage of 45 cents an hour, with 60 cents an hour for overtime, the question of pay for the men during the probationary period to be left to the Labor Board. Ten hours to be considered a day and the day's work to be finished during eleven consecutive hours. The start of the day to be reckoned from the time the men are ordered to report for work.

"A minimum wage of $20 a week for all extra men regularly answering roll-calls. No mandatory call to duty for men engaged on the cars after 10 p.m. until a twelve hours' rest period has elapsed."

Chicago Men Appeal to Washington

Employees of the Chicago Elevated Railways and the Chicago Surface Lines who recently were refused a wage increase of 15 cents an hour, have taken an appeal to the National War Labor Board at Washington. It is understood that the board has asked the companies whether they care to join in submitting the case to arbitration, but no announcement has been made as to their position on this point. Both companies are operating under agreements with the men, which do not expire until June, 1920.

Letting Down the Bars

The Interborough Rapid Transit Company and the New York Railways have raised the age limit of employees from forty-five to fifty-five years, in an effort to fill the gaps caused by the draft and the inducement of higher pay offered by the federal government and munition manufacturers. If this fails then women will be employed on the subway and elevated lines of the Interborough as ticket sellers and ticket choppers, and the men now filling these places will serve as guards. The selecting of younger men now serving as ticket sellers and choppers and fitting them for train service is now going on and their places are being filled with men of more advanced age.

The Detroit (Mich.) United Railway also has many positions for motorman or conductor open at the present time. That company has announced that it is ready to employ as conductors men as old as fifty-five or sixty years, providing they are alert, of good hearing and good eyesight. They must, of course, be able to speak English. In an announcement which it has just made the Detroit United Railway says:

"The position of conductor is one that a man of middle age can handle very nicely. The duties are comparatively light, in fact so much so that the work could be done by women.

"Many men from fifty to sixty years of age possibly consider that they are too old to apply for work on the street cars, that they would not be accepted because of their age. We wish to make it as plain as possible that this is a mistaken idea.

"Men of this age, as well as younger men, are desired."

Boston Men Ask Sixty Cents

Seek a Conference With Officers of Boston Elevated Over Question of Adequate Wages

The trainmen in the employ of the Boston (Mass.) Elevated Railway have asked for 60 cents an hour for blue uniformed men and for proportionate increases for employees in other branches of service. In a communication to Matthew C. Brush, president of the company, the men said in part:

"We have an agreement with your company which we intend to keep as far as it is humanly possible. Unfortunately, circumstances have arisen over which neither our members nor ourselves have any control. We neither want nor are threatening a strike. It is borne in upon us, however, every day that our members can no longer live upon the wage which they are now receiving, nor can they be kept at their present employment with the very attractive wages that are offered for less difficult, arduous and responsible work.

"A tremendous feeling of unrest is abroad among our people, with the result that unless something is done immediately, and of a very substantial character, you will not be able to keep these men in your employ.

"In view of the fact that the Legislature of the State has recently passed for your company a 'service at cost' plan, we do not believe that either the government or any other set of persons has a right to ask our men to make any greater sacrifices than they have already made.

"We therefore respectfully suggest under all the circumstances that the men engaged in transportation service should receive an increase to 60 cents an hour, and that the wages of all other employees who are members of our organization should be increased.

"We would like to have you arrange a conference so that we can deal with this emergency."

Subway Construction Work Stops

All work on the new subways stopped on June 10 when between 5000 and 6000 men engaged in all kinds of construction work on the new rapid transit lines in New York went on strike because they were unable to get the increased scale of wages which they demanded from the contractors, many of whom say they are on the verge of bankruptcy. Both James B. Walker, secretary of the Public Service Commission, and Matthew A. McConville, of the Allied Subway Workers' Union, laid the blame for the strike at the door of the Board of Estimate.

A Distinction with a Difference

There is no connection between the functions of the new Labor Policies Board and the National War Labor Board, of which William H. Taft and Frank P. Walsh are joint chairmen. The latter was created by an executive order of the President, and is in a sense the last court of appeal in labor disputes even when one of the parties in disagreement in some other branch or board of the federal government itself.

In all cases where the enunciated principles of the War Labor Board are involved it has authority to take jurisdiction. Its work is sometimes judicial and sometimes legislative, chiefly the former. It acts in effect as a legislative body when the enunciation of a new principle to govern industrial relations is in contemplation. Its findings are final and binding in all disputes between employers and employees where its principles of adjustments are in any way involved.

The Labor Policies Board will devote itself to administrative work. It will determine and develop policies for a unified labor administration. It will bring together and co-ordinate into one consistent policy the various and frequently inconsistent methods of important governmental departments in dealing with labor problems that affect production, always excepting disagreements between employers and employees, as the government departments represented on the Labor Policies Board are themselves among the large employers of labor.

Resolutions on Captain Bullock

Details of the death in France of Capt. Harry A. Bullock, formerly of the Brooklyn Rapid Transit System, have been received. Captain Bullock, who was an assistant divisional quartermaster, had conceived the idea of utilizing empty and thoroughly cleansed gasoline tanks for transporting drinking water to the men in the front line trenches. While working out the details of this plan with several American and French army officers four of the party, including Captain Bullock, were killed by a bomb dropped from a German aeroplane.

Resolutions of regret on Captain Bullock's death were adopted on June 10 by the Brooklyn Institution of Safety, of which he was secretary and executive manager from the time of its organization to that of his enlistment. These resolutions said, in part:

"Captain Bullock's engaging personality and unselfish devotion to the purpose for which the institution was formed endeared him to all who came into contact with him and we feel that his loss is that of a personal friend. He was patriotic to the core. Anticipating the present conflict, he prepared himself at Plattsburg before it came upon us, to serve his country if it should need his assistance, and when this occurred, he promptly abandoned his life work to enlist in defense of our liberties, a cause in which his experience and ability enabled him to render valuable service.

"In doing this he gave his life nobly and ungrudgingly. The people of this city, and particularly those of Brooklyn, will cherish and revere his memory, and his example will prove an inspiration to our youth who will emulate it and who will demonstrate that he did not die in vain."

Pacific Electric Raises Wages

Despite its difficult financial position, the Pacific Electric Railway, Los Angeles, Cal., as of June 1, has put into effect wage increases up to 43 per cent as compared with the wage scale of December, 1915. In making these increases the company has followed the recommendations of the National Railway Wage Commission as modified by Director-General McAdoo, whereby the largest percentage of increase goes to the lowest paid men. Thus men who received 25 cents an hour in December, 1915, are now getting 35½ cents.

In discussing this subject on June 4 at a meeting of the Pacific Club, Paul Shoup, president of the Pacific Electric Railway, said to 1500 of his men in humorous vein that "personally, I hardly know whether I would rather be a freight motorman or president of the company." Mr. Shoup said the railway would need $60,000 more a month in revenue to offset the increase in wages.

In discussing the question of the attempt to have Pacific Electric employees enter the Brotherhood of Railway Trainmen, Mr. Shoup declared his belief that during the war all matters affecting organization should be laid aside.

There is a belief in many quarters that the present attempt to unionize the Pacific Electric Railway is fostered by steam railroad men who have been displaced or demoted because of the government's elimination of duplicate service. These men prefer to stay in California rather than accept the government's offer to work East.

Short Strike in East St. Louis

Three hundred and seventy-five motormen and conductors of the East St. Louis & Suburban Railway, East St. Louis, Ill., struck for higher wages on June 4.

The conductors and motormen on the local lines of the company have been receiving 31 cents an hour, and the men on interurban runs 33 cents an hour, under an agreement into which the employees' union entered with the company on May 1, 1917, and which was to continue until May 1, 1919. They are now demanding 38 cents for city men, and 43 cents for interurban men, the increase to go into effect immediately. Before the agreement of May 1, 1917, was made the men were getting 27 and 28 cents an hour.

The day following the strike an agreement was reached under which the differences will be submitted to the National War Labor Board. The finding of the board is to be effective from June 1, 1918.

News Notes

Ohio Men Strike.—Thirty motormen and conductors on the Youngstown & Ohio River Railroad, Leetonia, Ohio, on June 6 struck for an increase of 5 cents an hour in wages. It is claimed they violated their contract in taking this step. They were receiving from 35 cents to 40 cents an hour, depending upon the length of time they had been in service.

Increase in Wages in Bloomington.—The Bloomington & Normal Railway & Light Company, Bloomington, Ill., has increased the wages of its employees approximately 3½ cents an hour. A nine-hour day has been placed into effect as far as possible. An arbitration clause has been placed in the contract which carried the increase. An open-shop policy will be maintained by the company.

Increase in Wages in Des Moines.—At the time that the fare increase was announced by the Des Moines (Iowa) City Railway, referred to elsewhere in this issue, Emil G. Schmidt, president of the company, also announced an increase in wages to the trainmen effective from June 1. The new scale is 30 cents an hour the first six months instead of 28 cents; 33 cents the second six months and 36 cents thereafter.

Labor Hearing in Washington on June 24—Press dispatches from Washington appearing in the daily papers on June 14 too late to be confirmed from official sources by this paper said that June 24 had been set by the War Labor Board for hearing in Washington wage controversies between electric railways and their employees, about a dozen of which are pending. The dispatches indicated that Messrs. Taft and Walsh will preside at the hearing and that from it a definite policy will probably be formulated to govern the relations between the men and the companies.

Bay State Men Accept Increase.—The trainmen in the employ of the Bay State Street Railway, Boston, Mass., have voted to accept the voluntary increase of 5 cents an hour granted to them by the management. The original demand was for an increase of 10 cents an hour over the existing maximum of 35½ cents an hour. In accepting the increase the members reserve the right to request higher wages as soon as the new board of control takes charge of the affairs of the company. The advance of 5 cents an hour brings the maximum of the Bay State carmen to 40½ cents a hour.

New Members of Engineering Foundation Board.—At the regular meeting of the trustees of United Engineering Society held on May 23, the following men were elected to the Engineering

Foundation Board: Calvert Townley of Westinghouse Electric & Manufacturing Company, New York, N. Y., succeeding Gano Dunn. The following are additional members: Silas H. Woodard, consulting engineer, M. Am. Soc. C. E.; Dr. Joseph W. Richards, professor of metallurgy, Lehigh University, South Bethlehem, Pa.; Dr. David S. Jacobus, advisory engineer, Babcock & Wilcox Company, New York; H. Hobart Porter of Sanderson & Porter, consulting engineers, New York.

Abortive Attempt at Strike.—About fifty employees of the Union Railway, one of the companies of the Third Avenue System, operating in the Borough of the Bronx, New York, went on strike on June 7, alleging that forty men had been discharged by the company for attempting to organize the men. The company regarded the matter as merely a disaffection involving a very small percentage of its employees. The men who went out, however, were prompt to take advantage of the present war labor situation to advance their own ends and appealed to the Department of Labor at Washington in the hope of obtaining some degree of recognition from the company. In this they were unsuccessful. Only recently an increase of 2 cents an hour as well as a bonus of $1 for first-year men working six days a week was authorized to become effective on July 1.

Federal Power to Regulate Rates.—In an opinion dated June 1, William L. Ransom, counsel Public Service Commission for the First District of New York, expresses the conviction that the national power exercised for the attainment of National objects in war-time emergency is paramount. He believes, however, that under the recent federal railroad act the Interstate Commerce Commission has no general power over interstate rates and that the regulation, review and revision of intrastate rate initiated by the Director General for ordinary intrastate commerce rest still with the state tribunals. If the rate provisions of the new law were to be upheld as a measure of taxation, the fixation of rates by the government would not be confined to those applicable to interstate commerce but could extend to intrastate transportation. Mr. Ransom, however, does not believe that Congress intended to delegate a taxing power in the form of a rate-fixing power.

Another Wage Increase in Camden.—The Public Service Railway has announced another increase for motormen and conductors employed on the Camden divisions. This is the second advance within a very short time. The new rates, which will prevail while the war conditions last, are 30 cents an hour for the first six months, covering period of learning; 35 cents an hour after first six months, and 40 cents an hour after five years. On June 1 of this year the company granted an increase of 2 cents to its conductors and motormen. Thomas N. McCarter, president of the company, announced that the company had decided to put into effect as of June 15 special rates of compensation to motormen and conductors, including women conductors. A minimum wage of $17.50 is assured every trainman who answers all rollcalls and performs such duties as may be assigned. To all persons entering the employ of the company for the first time an extra payment of $10 will be made upon completion of thirty days actual service. The Camden men were not involved in the recent strike.

Strike Threatens in Trenton.—The motormen and conductors in the employ of the Trenton & Mercer County Traction Corporation, Trenton, N. J., held a special meeting on June 10 and adopted a resolution demanding a flat rate of 40 cents an hour. The men also want time and a half for all overtime for all employees who do platform work. The company had previously offered the men a sliding scale to become effective July 1, calling for 30 cents an hour for conductors and motormen in the employ of the company six months; 35 cents an hour for those in the service four and one-half years, and 40 cents an hour for those employed five years and over. At the present time the wage scale is 31 cents an hour. The union has notified the company that unless the flat rate of 40 cents an hour is put into effect by June 14 the men will walk out. Rankin Johnson, president of the company, says that the flat rate of 40 cents an hour would mean an increase of $80,000 a year, and he does not see how the request can be granted. The company recently guaranteed a flat wage of $17.50 a week to "extra" trainmen, providing they make all the rollcalls.

New Common User Suits in San Francisco.—The United Railroads will enter suit against the city and county of San Francisco, Cal., for an amount aggregating several million dollars for damages that will ensue from the building of four tracks on Market Street. Suit for $865,250 damages already has been filed as compensation for the loss of value that the company says that it has sustained due to the construction of tracks on Market Street from Church Street to Van Ness Avenue. A claim has been filed with the Board of Supervisors for $288,500 damages the company says it suffered through the blanketing of its lower Market Street lines by the Municipal Railroad and by interference with its service caused by excavations made when the municipal tracks were installed. The new suit will be for damages due to depreciation of franchise value, loss by reason of interference with its service during the construction period and loss of revenue from the time the new line is operated until 1929, the date that the franchise expires. The contention of the United Railroads in all these suits is that the city has no right either to grant a franchise to another company or to build tracks and operate a competing line for more than five blocks on Market Street.

Franchise Relief Proposal Submitted.—A definite proposition has been made by the city of Seattle, Wash., to the Puget Sound Traction, Light & Power Company, stating terms under which the city might be willing to grant a suspension of certain franchise obligations during the period of the war. The city stipulates interchange of transfers with municipal lines, common user privilege on Third Avenue from Pine Street to Yesler Way; interchange of cars with the municipal railway in time of emergency; exchange of electric power up to 10,000 kw. in cases of emergency; and improved service on the city lines. The company has also been asked to increase its service by at least seventy cars. The company will consider the matter carefully and submit a definite proposition upon the return of President A. W. Leonard from Boston, where he has gone to confer with Stone & Webster, operators of the property. The Public Service Commission on May 22 dismissed the application of the company for an order relieving it of its franchise obligations, stating that the points of law involved had been decided favorable to the city's contention in the Tacoma 6-cent fare case, decided by the Supreme Court on April 27. The action before the commission was begun by the company on July 24, 1915.

Programs of Meetings

Central Electric Railway Association

The summer meeting of the Central Electric Railway Association will be held at The Breakers, Cedar Point, Ohio, on July 10 and 11.

Southwestern Electrical & Gas Association

At a meeting of the quarterly conference committee of the Southwestern Electric & Gas Association, held at the office of the Houston Lighting & Power Company, Houston, Tex., July 19 was selected for the first quarterly conference and Dallas was named as the city in which it was to be held.

It was determined to devote the morning of July 19 to separate meetings of the street and interurban railway, light and power and the gas sections under the chairmen, at which matters particularly pertaining to the business of each section will be discussed, the matters for discussion being outlined in an address by each one of the chairmen. The afternoon will be devoted to a joint meeting of all the sections to discuss matters generally affecting the three sections. These matters will be brought before the meeting in a report from the secretary. The principal subjects of this report are to be fuel, labor, increase of rates and fares and legislation, municipal, state and national.

All meetings will be executive meetings and no reports will be made of the meetings unless specially ordered by the association.

Financial and Corporate

Northern Electric Finance

Properties Transferred After Sale to Bondholders Organized as Northern Electric Railroad

On May 27 the California Railroad Commission announced that the corporation to be organized for the purpose of acquiring the Northern Electric Railway properties had the authority of the commission to issue $5,500,000 of bonds and $5,200,000 of stock. The authorization permitted the new corporation to proceed with the new reorganization plans for the several lines operating electric railroads between Sacramento and Chico, Sacramento and Colusa, Sacramento and Woodland, and also the branch line from Vacaville to Suisun. These companies include the following, which will be consolidated into a single owning company: Northern Electric Railway (main line), Sacramento to Chico via Marysville; Sacramento & Woodland Railroad, branch Sacramento to Woodland; Northern Electric Railway, Marysville and Colusa branch, Marysville to Colusa; Sacramento Terminal Company, belt line around Sacramento.

The Railroad Commission announces that the new corporation is to have an authorized stock issue of $5,200,000, divided into $1,902,200 of 6 per cent non-cumulative first preferred, $957,800 of 6 per cent non-cumulative second preferred and $2,340,000 of common. In addition, the new corporation is to have an authorized 5 per cent twenty-year bond issue of $5,500,000, divided into $2,012,400 of Class "A," $951,200 of Class "B," $1,268,200 of Class "C" and $1,268,200 of Class "D" bonds. The interest on Class "A" bonds is to be a fixed charge on and after July 1, 1917; on Class "B" bonds on and after July 1, 1919; on Class "C" on and after July 1, 1922, and on Class "D" on and after July 1, 1927. Because of the delay in putting the amended reorganization plan into effect, Class "A" bonds will bear interest from July 1, 1918. Interest on money paid in for Class "A" bonds prior to July 1, 1918, will be paid by interest checks. All classes of bonds are to be on an equal footing as to lien and security.

The commission concluded that reorganization expense should be amortized so as to be paid over a number of years and not become a permanent capital expenditure. The plan of reorganization to be followed up under the authority of the commission provides for a board of fifteen directors of which twelve will be selected by the bondholders and three by the stockholders.

On the day following this announcement by the commission the Northern Electric Railway was sold under foreclosure proceedings by United States Commissioner Francis Krull for $1,750,000, which was fixed by the United States District Court as a minimum upset price. The only bidders were the bondholders represented by attorneys for the reorganization committee.

In the course of a hearing before the Railroad Commission on this case, A. S. Kibbe, an expert for the reorganization committee, testified that during the incumbency of Receiver Coghlan, and up to March 3, 1918, $377,497 had been expended in new construction, extensions and improvements. He gave the operating revenue of the company in 1917 as $1,100,000. After deducting operating expenses and taxes, the net earnings for 1917 available for bond interest, etc., were $200,252.

P. E. Deficit Passes $6,000,000

According to the report of the Pacific Electric Railway, Los Angeles, Cal., for the calendar year 1917, just filed with the California Railroad Commission, the net deficit from operation, after some depreciation allowance, was $855,116. This brings the total deficit up to $6,170,453, or double the deficit of 1915.

The funded debt is $67,717,962, including a $9,000,000 long-term loan from the Southern Pacific Company. The company places the value of its road and equipment at $81,375,592 and its investments at $9,621,393.

The income statement for 1917 follows:

Operating revenue	$9,267,130
Operating expenses	6,257,982
Net operating revenue	$3,009,148
Non-operating income	65,730
Gross income	$3,074,879
Deductions:	
Rentals	$ 44,562
Taxes on railway operation	518,836
Interest on funded debt	2,830,787
Interest on unfunded debt	468,610
Miscellaneous deductions	97,200
Total deductions	$3,959,995
Deficit for year	$ 885,116
Debit balance on Dec. 31, 1916	5,122,430
Miscellaneous additions, 1917	151,714
Miscellaneous deductions, 1917	314,711
Deficit, Dec. 31, 1917	$6,170,543

Short-term Notes at 8 Per Cent

Both Bonbright & Company, Inc., New York, N. Y., and H. M. Byllesby & Company, Inc., Chicago, Ill., are offering a new issue of $200,000 of Ottumwa Railway & Light Company bond-secured 7 per cent gold notes dated June 1, 1918, due Dec. 1, 1920, at 97¾ to yield 8 per cent. The proceeds are to reimburse the company for outlays on additions and improvements. The notes are secured by deposit of 150 per cent of general mortgage 6 per cent bonds.

Providing for Shipbuilders

Shipping Board to Finance New $20,000 Oakland Electric Line—Railroad to Furnish Materials

The Emergency Transportation Company has been formed to construct and operate an electric railway in Oakland, Cal., connecting the plant of the Moore & Scott Iron Works shipbuilding plant with the San Francisco-Oakland Terminal Railways on Eighth Street, eight blocks away. W. R. Alberger, vice-president and general manager of the Key Route electric system, is president of the new corporation.

The new line will be a single-track one, for the use of the 6000 men employed in the shipyards. Under the plan agreed upon, the United States Shipping Board will furnish the funds and will control the line, while the materials will be furnished by the local electric railway. According to the application filed with the California Railroad Commission, the total cost of construction will be $20,000.

The City of Oakland has authorized the construction of the line and the commission has approved the scheme of financing. This provides for the issuance of 5 per cent promissory notes from time to time to the Shipping Board. These notes will become payable ninety days after the termination of the war. They will be secured by deposit of the company's stock.

The San Francisco-Oakland Terminal Railways will purchase at $100 (par) 101 shares of stock in the Emergency Transportation Company. This stock will be paid for chiefly in materials. For example, steel rails now valued at $100 a ton can be delivered under this agreement to the Emergency Transportation Company by the traction company for about $30 a ton.

American Power & Light Gross Rises 10 Per Cent

The gross earnings of the operating subsidiaries of the American Power & Light Company, New York, N. Y., for 1917 aggregated $11,389,659, as compared with $10,344,895 for 1916, an increase of $1,044,764 or 10 per cent. The net earnings at $4,762,414 represented an increase of $44,660, or a little less than 1 per cent. The small net, of course, reflected the heavy increase in operating costs and taxes. The gross earnings of the Pacific Power & Light Company, which supplies electric railway service to two communities and interurban service to three communities in Washington and Oregon, totaled $1,647,401 in 1917, as compared to $1,461,821 in the year preceding. Of the 1917 amount $155,966, or 9 per cent, represented railway earnings.

In the case of the Southwestern Power & Light Company, which furnishes electric railway service to one community in Texas, the railway earnings at $43,251 represented 1 per cent of the total gross, which increased from $4,193,265 in 1916 to $4,677,378 in 1917.

New York Bankers Balk at Utility Loans

Allege that Requirement for Bank Indorsement of These Loans is Unsound—Rate Need is Crux of Situation—Private Offering of Notes at 7¾ Per Cent

More than a dozen of the most prominent financiers in New York City at an informal conference at the Sub-Treasury on June 12 informed the War Finance Corporation that they do not purpose to lend their indorsement to the obligations of public utilities desiring loans from the War Finance Corporation until the earning power of such companies has been substantially increased. The bankers asserted that the provision of the act calling for virtual bank indorsements of loans is objectionable on the ground of unsound banking, for it calls on the banks to carry contingent liabilities which it is not proper for them to assume.

In brief, the bankers suggested that unless the war finance corporation act is amended the usefulness of the corporation will probably be limited to the making of direct advances to utilities as provided for in Section 9, which authorizes such direct loans "in exceptional cases." Another suggestion was that the public utility companies take steps to obtain permission to increase their rates so that their revenue may be increased and their credit standing bettered to the point where bankers will be more likely to undertake to finance them.

THE BANKERS PRESENT

The meeting was called to learn the views of bankers on the subject of carrying out the provisions of the act relative to the indirect financing of war industries through banks. The bankers who attended the conference formed a most representative group. Those present were: J. P. Morgan; Francis L. Hine, president First National Bank; James N. Wallace, president Central Trust Company; Jerome J. Hanauer of Kuhn, Loeb & Company; Walter E. Frew, president Corn Exchange Bank; Gates W. McGarrah, president Mechanics & Metals National Bank; Charles E. Mitchell, president National City Company; Charles H. Sabin, president Guaranty Trust Company; Albert H. Wiggin, chairman Chase National Bank; Thomas W. Lamont of J. P. Morgan & Company; Frederick Strauss of J. & W. Seligman & Company, and Seward Prosser, president Bankers Trust Company.

The War Finance Corporation was represented by W. P. G. Harding, governor of the Federal Reserve Board and managing director of the corporation, and by other directors, including Clifford M. Leonard, Angus McLean and Eugene Meyer, Jr.

NO DEFINITE CONCLUSION REACHED

At the conclusion of the meeting Mr. Harding gave out the following statement:

"A meeting of the board of directors of the War Finance Corporation has been held at the Sub-Treasury. A number of prominent bankers were present for the purpose of discussing the operations of the corporation in connection with the financial institutions of the country. The discussion of any specific cases was merely incidental to the discussion of the general principles involved. No definite conclusions were reached, and the board of directors of the corporation has no announcement to make at this time."

Mr. Harding stated that the meeting had not been called primarily to discuss the public utility situation, for which reason utility investment bankers had not been allowed a chance to participate in the discussion. He added, however, that the recent 7-per cent direct loan to the United Railways of St. Louis was really made to test what rate of interest would be proper for loans. In the case of the St. Louis company the character of the securities offered for collateral was excellent and the board realized that there would be no risk in making the six-months' loan. The collateral included $800,000 of Liberty Bonds.

Relative to proposals to amend the war finance corporation act, Mr. Harding said:

"No definite steps have been taken so far to amend the act. We thought it better to get more acquainted with the provisions of the act and learn the attitude of the bankers before making recommendations to Congress for any radical amendments."

Mr. Harding stated that the board still has under advisement the application of the Brooklyn Rapid Transit Company for a loan because of the maturity of $57,735,000 of notes on July 1. He added that the board has many applications before it, but that the volume has been reduced by the elimination of many which the board does not believe come within the terms of the act. It has been stated from other sources that applications numbering about 196 and aggregating $200,000,000 had been filed with the board.

OTHER BANKS ARE CONSIDERING AID FOR UTILITIES

Since the announcement of the War Finance Corporation on May 28 that its resources are intended to be loaned directly to war industries only in exceptional cases and upon adequate security, bankers throughout the country have had put before them the question of providing financial aid for utilities. Meetings have been held in Boston, Philadelphia, Chicago and other cities.

One outgrowth of these meetings is a proposal to get all financial institutions of the country into an organization to finance the utilities and to secure for them such an increase in revenues as is necessary to stabilize their credit. While no definite plan has yet been outlined, such an organization might be along the lines of the memorable gold and cotton pools of 1914, when financial institutions acted in unity to supply gold to stabilize the exchange situation and to provide for the financial relief of Southern cotton growers.

Two other plans under discussion by banks are: (1) amendment of the war finance corporation act to provide, in unquestioned terms, for the relief of utilities, and (2) government control during the period of the war. There is a difference of opinion among bankers, it is said, as to the expediency of government control. One effect of such control, as illustrated in the case of the railroads, would undoubtedly be a sweeping increase in rates commensurate with the increased cost of operation. The crux of the public-utility problem is the rate situation. With a proper rate structure, the credit basis of utilities would be such that they could dispose of new securities to take care of maturing obligations.

WARBURG EMPHISIZES NEED

The pressing need of utilities was emphasized by another man of national importance when Paul M. Warburg, vice-governor Federal Reserve Board, spoke before the National Conference on War Economy in New York on June 6 as follows:

"The drastic shrinkage in the value of public utility investments and the impairment of the credit of these corporations is a source of grave danger to the general financial situation at this time. It would be a serious menace to the ability of the government to finance the war if public service corporations should be forced to go into receivers' hands because of conditions for which they are not responsible.

"The President, in his letter to Secretary McAdoo on Feb. 19, 1918, expressed his profound concern over the situation, stating at the same time that he hoped state and municipal administrations would make every effort to deal with these corporations in a spirit of liberality.

"All that it is proper for me to do, therefore, is to emphasize the public interest in the protection of the credit of these corporations and in the preservation of their ability to perform their important functions.

"It is gratifying to note that a number of leading municipalties, after a careful study of this problem, have since decided to make such equitable adjustments as to enable their public service companies to weather the storm. It is hoped that their example will be emulated throughout the entire country."

SEATTLE OFFERINGS AT 7¾ PER CENT

An offering by private bankers which is of especial interest at this time is announced by Harris, Forbes & Company for a large group of representative dealers and bankers in the case of the Puget Sound Traction, Light &

Power Company, Seattle, Wash. For the purpose of providing funds for the retirement at par and interest on Aug. 1, 1918, of its 6 per cent bonds maturing on Feb. 1, 1919, and covering the cost of additions recently made to the property, this company has authorized a new issue of $12,250,000 of 7 per cent mortgage gold notes due on June 1, 1921.

These notes are secured by a first mortgage on part, and a direct mortgage on most of the balance of the property, subject to various underlying bonds, no more of which can be issued. They are followed by more than $34,900,000 of preferred and common stocks, and additional notes can be issued for only 75 per cent of the cost of construction and improvements, if net earnings are at least one and three-fourth times the interest charges on all bonds and notes outstanding and proposed. Provision is made for an annual sinking fund, which with the sinking funds on underlying bonds will amount to at least $560,000 each year in 1919 and 1920.

The issue is being offered at 98 and interest to yield 7¾ per cent. The company agrees to pay any normal federal income tax to an amount not exceeding 2 per cent. The notes are in coupon form, registerable as to principal, and of $500 and $1000 denominations. They are callable in whole or in part, upon thirty days' notice, at 102 in 1918, 101 in 1919 and 100 in 1920.

War Business Helps Long Island

A large additional passenger business during the calendar year 1917 was created by the location of army camps along the lines of the Long Island Railroad, New York, N. Y. The total number of soldiers handled was 751,215, requiring 1557 train movements, to say nothing of the traffic of visitors to and from the camps. The total operating revenues at $17,286,178 represented an increase of $2,314,340 or 15.56 per cent over 1916. The number of passengers increased 4,993,306 or 10.90 per cent. The commutation travel showed an increase of 7.3 per cent notwithstanding a small loss on the North Shore and Atlantic divisions, where certain extensions of the city rapid transit system have drawn traffic from the company's lines.

The operating expenses for 1917 totaled $11,960,534, an increase of $2,033,327 or 20.4 per cent. The increase was due to the increased cost of labor and materials, and the increased service to army camps. The taxes amounted to $944,293, an increase of $65,246 or 7.42 per cent. After the deduction of interest, the result for the year was a surplus of $869,300. This was an increase of $627,829 for the last year.

Upon the army cantonment at Yaphank the company expended $219,063 for facilities within the camp, besides about $60,000 at other points for passing tracks, telephone and signal systems and the like.

Electric Railway Relief Urged

Mr. Gadsden Tells the Ways and Means Committee of the House of Representatives That In Six Months the Net Income of the Railway Industry Will Vanish

That the financial condition of electric railways is such as to warrant their being placed in a segregated class under any new revenue legislation was the opinion expressed on June 11 by P. H. Gadsden, resident Washington member Electric Railway War Board, before the committee on ways and means of the House of Representatives. Mr. Gadsden averred that within six months the net income of the industry will reach the vanishing point unless relief comes.

NET INCOME LOSS 59 PER CENT

Two phases of the utility situation, the speaker said, must constantly be borne in mind: The decrease in net revenue, and the necessity of financing maturing obligations. Without adequate revenue the refinancing cannot be accomplished. Mr. Gadsden presented the accompanying income statement of 103 electric railways for the three months ended Mar. 31, 1918, as compared with the similar period in 1917. This shows a gain of 2.1 per cent in operating revenues, but a loss of 59.7 per cent in net income. The data were secured by the Electric Railway War Board.

INCOME STATEMENT OF 103 ELECTRIC RAILWAYS FOR THREE MONTHS ENDED MARCH 31, 1917 AND 1918

	1918	1917	Increase	
			Amount	Per cent
Total operating revenues	$61,734,670	$60,456,333	$1,278,337	2.1
Total operating expenses	43,799,663	39,691,302	4,180,361	10.6
Net operating revenue	$17,935,007	$20,837,031	*$2,902,024	*13.9
Net revenue from auxiliary operations	$ 2,508,086	$ 2,271,199	$ 236,887	10.4
Taxes	4,637,648	4,267,641	370,007	8.7
Nonoperating income	1,136,499	956,071	180,428	18.9
Gross income	$16,941,947	$19,796,660	*$2,854,713	*14.4
Deductions from gross income	14,713,512	14,269,320	444,192	3.1
Net income	$ 2,228,435	$5,527,340	*$3,298,905	*59.7

*Decrease

The relief which the revenue authorities can grant Mr. Gadsden asserted, is to put electric railways and other utilities in a segregated class on the basis of reduced taxation. The point made was that it would not be so wise to impose a 6 per cent or larger income tax as it would to leave the little remaining net income in the hands of the companies in order to keep the breath of solvency in them and help provide the additional facilities now demanded. The electric railways have shown the worst revenue decreases of all utility groups and are on the brink of bankruptcy. Relief from the present excessive taxation burdens would show the sympathy of Congress and would help the companies to secure adequate rates.

THE FINANCING PROBLEM

In regard to the second fundamental point in the present situation, Mr. Gadsden said that utility representatives had been disappointed in the recent direct-loan rulings of the War Finance Corporation, for they had hoped that the public utilities would have the same rights before the corporation as the steam railroads. But relief must be sought in the first instance through banking channels. Utilities are now trying to work out their salvation in this way.

Representative Rainey raised the question of a moratorium for maturing indebtedness, but Mr. Gadsden expressed his views on this subject as follows:

"We have given this, naturally, the most serious consideration. A general moratorium for all securities in the market is one thing, but a special moratorium would involve discrimination and cause people to think that public utility securities are worthless. To our mind that would mean death, not only now but hereafter. It would permanently impress upon the securities of public utilities the fact that when a great crisis of national emergency arose they broke down."

SHOULD THE NATION TAKE OVER THE UTILITIES?

When asked whether the situation would not be better if the electric railways had been included under the federal steam railroad act, Mr. Gadsden said:

"We are very much inclined to think so now. We made no effort to be included at that time. We believed that we could get our rates increased and work out our own salvation, and that it was better to try to help ourselves than to lie down. The situation is getting worse, and the most effective way to meet it would be for the government to take us over. Of course, there are a great many companies not in need of any such assistance. The electric railway industry undoubtedly is.

"There will have to be some drastic treatment, but as to whether or not the situation should be presented to the Director of Railroads of the committee on interstate and foreign commerce, which could frame an amendment placing electric railway properties within the purview of the railroad legislation, we doubt the propriety of our making such representations. It is well enough for us to discuss this subject before a committee, but we question whether the other plan would put us in the proper light before the people of the country. We are attacking each phase of the problem as it comes up. Each committee has a problem for consideration, and we are appearing before some committee or tribunal and spending our days and months trying to bring this problem home to the people of the United States, because it has got to be handled in a serious, statesmanlike way. Otherwise this great industry is going by the board."

Financial News Notes

Hearing on June 20 on Abandonment.—Acting on the petition of the Cincinnati, Milford & Loveland Traction Company, Cincinnati, Ohio, for permission to abandon its road, the Ohio Utilities Commission has announced that it will hold a hearing on the petition in Cincinnati on June 20.

Business Men May Save Line.—To prevent the junking of the Consolidated Street Railway, which connects Cottonwood Falls and Strong City, Kan., business men of Cottonwood Falls are considering a plan to buy the line. The company recently asked permission of the Public Utilities Commission to discontinue the line.

Another Offer of Sale Made.—The Board of Control of London, Ont., on May 23 received from George B. Wood, Toronto, president of the London & Lake Erie Traction Company, an offer to sell to the city for $300,000 the line from London to the top of the hill in the city of St. Thomas, together with two-thirds of the rolling stock. The company had previously asked $450,000 for the whole road to Port Stanley. A summary of the valuation and report by Sir Adam Beck, chairman of the Hydroelectric Power Commission of Ontario, to the City Council was published in the ELECTRIC RAILWAY JOURNAL of May 25, page 1021.

May Ask for Railway Merger at Dayton.—There are rumors that the special committee appointed to investigate the electric railway situation at Dayton, Ohio, will recommend the amalgamation of the six railways as a means of improving transportation facilities. The roads operating in Dayton are the City Railway, the Peoples' Railway, the Oakwood Street Railway, the Dayton Street Railway, the Ohio Electric Railway and the Dayton, Springfield & Xenia Railway. The committee consists of J. F. Ohmer, representing the manufacturers; J. L. McKitrick, of the Central Labor Union, and Frank Wright, representing the business interests generally.

$2,151,000 of Refunding Bonds Authorized.—Permission has been granted by the Public Service Commission of the Second District of New York to the Albany Southern Railroad, Hudson, N. Y., to issue $2,151,000 of first refunding mortgage thirty-year 6 per cent bonds. Of the bonds $1,451,000 are to be used to exchange a like amount of first mortgage thirty-year 5 per cent bonds now outstanding. The company also is empowered to pledge $700,000 of 6 per cent bonds as security for $550,000 of three-year notes, which are to be sold at not less than 96 and the proceeds used to reimburse the treasury, to discharge floating liabilities outstanding on June 30 last and to pay for proposed new construction work amounting to $190,683.

New Stock Issue for Des Moines.—Shareholders of the Des Moines (Iowa) City Railway have voted to amend the articles of incorporation so that the authorized capital stock, now consisting of $3,000,000 of common and $250,000 of 6 per cent non-cumulative preferred (all the preferred and $1,055,000 of common being outstanding), shall be increased to $4,500,000, to include $3,000,000 of common as at present; $1,500,000 of 7 per cent preferred stock in $100 shares. These new preferred shares will be cumulative from May 1, 1918, with preference also as to assets in case of liquidation and will carry the same voting powers as the common. They will be callable, all or any part, on any dividend date at 107½ and dividends, at the option of the company.

Twin City Common Dividend Passed.—The directors of the Twin City Rapid Transit Company, Minneapolis, Minn., on June 3 passed the dividend on the common stock for the second quarter of 1918. The company had paid 6 per cent on the common stock from 1909 to 1918. At the former quarterly meeting the dividend was reduced and the payment for the first quarter made at the rate of 1 per cent for the period, or 4 per cent annually. Horace Lowry, president of the company, issued a brief statement to the effect that in consequence of the continued decrease in the company's earnings, the steadily increased cost of operation and greatly lessened net returns, the company finds it impossible to continue paying dividends on its common stock.

Kewanee Deficit Increases.—The total operating revenues of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., for the fiscal year ended April 30, 1918, amounting to $82,142, show an increase of $4,466 or 5.8 per cent compared with those of the preceding year. City revenue increased $3,782 or 9.4 per cent, and interurban revenue $701 or 1.9 per cent. The operating expenses at $71,960 increased $9,406 or 15.0 per cent, more than offsetting the increase in revenue. In connection with higher interest charges the increased expense resulted in a deficit of $16,358, as compared with a deficit of $10,551 for the preceding year. Application to the Illinois Public Utilities Commission for authority to charge higher rates of fare was made on July 31, 1917, but although the commission held two hearings on the matter in November, no decision has yet been rendered.

Merger Offers a Way Out.—Richard Sachse, chief engineer of the California State Railroad Commission, recommended the consolidation of the transbay interurban system on May 24 when he took the witness stand to make a statement on the consolidation scheme worked out by the commission's engineers in the transbay ferry rate case which was on trial before the commission. In reviewing the transbay transportation situation Mr. Sachse stated that he believed that if the San Francisco-Oakland Terminal Railways and Southern Pacific Company did not favor the consolidation plan the commission could recommend it to the railroad administration as the best solution of the transbay transportation problem. In determining the rates Mr. Sachse recommended that the commission adopt as the rate base the valuation for the lines necessary to serve the territory, which his department has fixed at $22,065,000 as a fair basis for computing the rates.

Electric Railway Monthly Earnings

AURORA, ELGIN & CHICAGO RAILROAD, AURORA, ILL.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Mar., '18	$168,693	*$138,511	$30,182	$36,093	†$5,9111
1m., Mar., '17	163,197	*123,232	39,965	36,036	3,929
3m., Mar., '18	439,408	*410,158	29,250	107,399	†78,149
3m., Mar., '17	469,516	*352,564	116,952	107,447	9,505

NEW YORK (N. Y.) RAILWAYS

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$983,452	*$751,509	$231,943	$284,487	‡$15,393
1m., Apr., '17	1,033,608	*784,799	248,809	283,808	‡12,740
10m., Apr., '18	9,967,978	*7,649,583	2,318,395	2,832,702	‡9,055
10m., Apr., '17	9,389,814	*7,547,977	1,841,837	2,820,195	‡451,531

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
12m., Apr., '18	$6,610,538	$4,230,471	$2,380,117	$1,021,657	$1,358,460
12m., Apr., '17	5,672,188	3,168,587	2,508,601	928,034	1,580,567

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1 m., Apr., '18	$218,862	*$134,603	$84,259	$40,490	$43,769
1 m., Apr., '17	201,591	* 130,576	71,015	40,714	30,301
12m., Apr., '18	2,488,835	*1,604,642	884,193	489,375	394,818
12 m., Apr., '17	2,423,840	*1,511,622	912,218	501,198	411,020

* Includes taxes. † Deficit. ‡ Includes non-operating income.

Traffic and Transportation

Commission Sees Fare Need

It Cannot Act, However, on Account of Court Decisions—City Line in Serious Straits

The Public Service Commission for the Second District of New York has sent to patrons of the Buffalo & Lake Erie Traction Company a review of conditions revealed in the investigation of the petition of George Bullock, as receiver of the company, for permission to increase the rate of fare.

Commissioner Barhite conducted several hearings, and then followed the decision of the Court of Appeals holding that the Public Service Commission has no jurisdiction to determine rates where such rates are fixed by franchises granted by a city, town or village. The road is restricted by franchise rates in some of the cities, villages and townships through which the line passes. Thus the decision of the Court of Appeals takes away from the Public Service Commission jurisdiction to increase or decrease the fare in all of the places where the railroad has entered into an agreement not to charge more than a certain amount. On portions of the road where there is no such agreement the commission still has jurisdiction.

WHY THE COMMISSION CAN'T ACT

Under the conditions it is obviously impossible for the commission to make a rate which will be equitable as between patrons of different portions of the road. If the commission finds that the condition of the finances of the road are such that a raise in rates as asked will be necessary and is favored by the commission, it is impossible to make a just and fair rate or one which will not be discriminatory.

Steps taken by the receiver to abandon certain parts of the road were followed by a request that the commission make a report stating the condition of the road's finances and for such facts and figures as might be necessary for a determination whether or not the road is entitled to an increased fare.

The commission says in part:

"An examination of the annual reports of the road for several years past shows that the income of the road has not been sufficient to pay expenses of operation. From July 1, 1912, to June 30, 1912, the net deficit was $257,037; July 1, 1913, to June 30, 1914, the net deficit was $269,802; July 1, 1914, to June 30, 1915, the net deficit was $278,613; July 1, 1915, to June 30, 1916, the net deficit was $178,767; Jan. 1, 1917, to Dec. 31, 1917 the net deficit was $153,014.

"The receiver in his application for an increase of rates does not ask for anything with which to pay dividends. If the railroad is able financially to pay dividends it should not be in the hands of a receiver. The receiver has expressed himself as willing to use any excess in fare over the present rate solely for the payment of such interest as must be paid on bonds and receiver's certificates and to better the equipment and service of the road. The employees of the road are demanding more pay and are very patiently awaiting the outcome of the proceedings.

DUNKIRK LINE IN SERIOUS SHAPE

"In the opinion of the commission the receiver must have more income if he is to continue to operate the road and give proper service. The commission is also of the opinion that the only source from which additional revenue may be had is from increased rates. In view of the limitations upon its power made by the Court of Appeals the commission cannot make the decision to which it thinks the receiver is entitled. That can be done only in case the various cities, villages, and townships shall remove the restrictions as to rate of fare in the franchise granted by them. Whether the restrictions are to be removed rests solely with the local authorities. The Public Service Commission has no authority over this matter and expresses no opinion as to the proper course to be taken.

"With regard to the Dunkirk Street Railway the figures show that the road is operated at a great loss. The net loss from the figures available appear to be at least $25,000 a year. It is a serious question whether the receiver should not be permitted to abandon the road.

"This opinion has no legal effect and is given solely at the request of the patrons of the road to be used by them in forming their judgment as to what shall be done."

Cut-Rate Tickets Eliminated

Partial emergency relief has already been granted the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., through the efforts of the city officials and local chambers of commerce of Aurora and Elgin, who made a trip to Springfield, Ill., and entreated the commission in behalf of the railway. The commission was so impressed with this unusual procedure that without waiting to take action on the application of the company for increased fares, it issued an order for the withdrawal of six-for-a-quarter tickets in Aurora, and of six-for-a-quarter and seven-for-a-quarter tickets in Elgin, effective on June 10. A straight 5-cent fare is now in effect in these cities. A hearing on the application of the railway for increased fares will be held before the commission during the week ending June 22.

Cleveland Fears Fare Raise

City Greatly Concerned Over Failure of Model Franchise to Work Successfully in War Time

Mayor Harry L. Davis has advised the City Council of Cleveland, Ohio, to confer with the Cleveland Railway in an effort to secure its consent to one or more of four propositions which he has formulated to prevent an increase in the rate of fare as a result of the expected increase in the wages of motormen and conductors. Mayor Davis argued that something should be done to obviate the necessity of amending the Tayler franchise, if a material wage increase is granted, as the maximum rate of fare provided for the franchise will not cover the additional amount required for operating expenses. The Mayor's proposals follow:

OUTLINE OF MAYOR'S PROPOSAL

Agree to a stock dividend reduction from 6 per cent, as guaranteed by the Tayler franchise, to 4 per cent.

Co-operate with the city in securing federal action to regulate opening and closing hours of factories and stores in order to distribute the rush-hour congestion over a longer period.

Restrict extensions and improvements and make every effort to have the present equipment suffice during the war.

Postpone for the period of the war charging off suspense accounts—deficits in maintenance and operating accounts now payable to the company at the rate of $100,000 per month.

Mayor Davis argues that conditions are unusual at the present time and that the public should not be asked to stand the entire weight thrown upon the road by the increase in expenses brought about by the war.

J. J. Stanley, president of the Cleveland Railway, presented a letter to the City Council on the evening of June 10, in which he refused to accede to Mayor Harry L. Davis' request that the dividends be reduced during the war period in order that the rate of fare may not be increased. He said that the rate of return on the investment was so low that he could not ask stockholders to consent to a reduction.

MR. STANLEY IN PARTIAL AGREEMENT

Neither was he willing to waive payments on the suspense accounts accumulated from the deficits of other years. The other two suggestions made by the Mayor were acceptable. They were that hours for closing stores and factories be regulated in such a way as to distribute the rush-hour load and that improvements be restricted to absolute necessities during the war.

It is said that the Mayor will reply to the letter and urge that his suggestions be accepted for the period of the war. President Stanley said in his letter that the guarantee by the city of a return of 6 per cent on the investment was the only thing that made this possible. It would not be right now to reduce it.

Experience of Others Helpful

Dallas Officials Tour Cities of the Middle West in Quest of Operating Kinks Applicable in Texas City

Much information that will be valuable in assisting in the solution of the traction problems of Dallas, Tex., was gathered by M. N. Baker, Supervisor of Public Utilities of that city, and Richard Meriwether, general manager of the Dallas Railway, who have returned from a tour of a number of cities of the Middle West that have electric railway systems of recognized efficiency. Questions particularly studied by Messrs. Baker and Meriwether related to elimination of belt lines and the installation of a radial system of car lines, safety zones and traffic regulations in general that may be made to apply to conditions in Dallas.

The information gathered will be placed before John A. Beeler, traffic expert, who is now making a survey of traffic conditions in Dallas with a view to recommending changes that will solve the many perplexing transportation problems and give the maximum of service at a minimum of cost.

On his return to Dallas Mr. Baker made a statement in part as follows:

"While the cities we visited exhibited a marked variance in the standards of efficiency maintained by their railway systems, we were able in nearly every instance to trace these variations to one cause, namely, the presence or the absence, as the case might be, of a spirit of co-operation between the municipality and the utility. We find that it has been the experience of these cities that where the relation between the city and the traction company has been one of co-operation and mutual support, the best results have always been obtained in the upbuilding of both the city and the street railway system, while on the other hand a spirit of antagonism and strife between the two (which was noticeable in two of the cities we visited) has invariably resulted in retarding the progress of both.

KANSAS CITY AN ACE

"This is strikingly illustrated at Kansas City, where, through a policy of close co-operation, that city has built up one of the best railways in the entire country. Municipal participation in the earnings of the company, through 'partnership franchise,' has everywhere been a notable factor in the promotion of this co-operative spirit, which has contributed so much to the high state of development and efficiency of the railway services in Kansas City, Chicago and Cleveland.

"Among the interesting features of the street railway systems we investigated are the following:

"*Safety Zones.*—It is a universal practice in Northern cities to set aside certain spaces near the downtown street intersections known as safety zones, where the loading and unloading of cars can be accomplished with safety and dispatch, free from any interference by vehicular traffic. These zones are marked by conspicuous upright iron signs, placed near the tracks and connected by iron chains.

"*Skip Stops.*—The skip-stop system is rapidly being adopted throughout the country, at the request of the government as a fuel conservation measure. It benefits the public by speeding up the running time of cars; it reduces the service cost to the utility, and it contributes directly to the cause of winning the war by the enormous saving in fuel which it accomplishes, it being estimated that each stop eliminated means an equivalent saving of three-fourths of a pound of coal.

"*Employment of Traffic Specialists.*—The employment of a traffic engineer to help solve the traffic problems in Dallas is fully in line with the latest practices of other cities, and is vindicated by the results they have obtained, especially in the cities of Washington, Kansas City, Cleveland, Milwaukee, Chicago and Toledo.

MILWAUKEE POINTS THE WAY

"*Milwaukee's Profit-Sharing Plan.*—One of the most interesting features of railway organization that came under our observation—a new departure of much significance as showing the trend of the times—was the profit-sharing plan operated by the Milwaukee Electric Railway & Light Company. The company first established a table of normal operating expense per car-mile and the normal operating revenue per car-mile. Then, as an inducement to the trainmen to develop themselves as 'salesmen of service,' the company voluntarily agreed to pay them a bonus of 25 per cent of all profits received by the company over and above these fixed standards of expense and revenue. The trainmen have organized an employees' savings and loan association, into which they deposit their savings derived from their share of the company's profits, and they have been able to save many thousands of dollars in this way. The result has been to improve the service to the public, increase the schedule speed of the cars, and to make both the company and the employees more prosperous and also more interested in each other's welfare.

GOOD PUBLIC RELATIONS ESSENTIAL

"As a result of my observations in the North, I am more than ever convinced that the success and efficiency of any traction system is ultimately determined by the character of the relations existing between the utility and the city, their mutual regard for each other's interests, and their willingness to co-operate each with the other. The people of Dallas now have a proprietary interest in the local traction system under the new franchise, and there is no reason or incentive lacking for making our transportation system the best there is in the country, through a policy of proper supervision, liberal co-operation and unstinted support."

The knowledge of some of these innovations, gained at first hand in the cities visited by Messrs. Baker and Meriwether, is expected to prove an invaluable aid in helping the local Dallas management put into effect with a minimum of opposition such changes as may be decided upon as advantageous for adoption in that city.

Newspaper Fare Referendum

The Railroad Commission of Wisconsin, in its fare order of June 1, 1918, evidently intended that the city lines of the Milwaukee Electric Railway & Light Company should not continue making up losses on the nine suburban lines. The city lines are by that order, reviewed in the ELECTRIC RAILWAY JOURNAL for June 8, limited to a bare 7½ per cent interest return on their value as fixed by the commission.

The suburban lines are operating at a heavy and steadily increasing loss. For the year ended March 31, 1918, this loss was as follows:

7½ per cent interest on investment..	$118,500
Operating expenses over gross revenue	12,950
Total loss for twelve months..	$131,450

The company says that with the higher wage scale effective on May 1, 1918, the loss for the next twelve months will be $25,000 more, or $156,450, unless fares are raised or service heavily cut—or abandoned—to reduce expenses.

In order to learn what the railway patrons of Milwaukee city and suburbs think ought to be done in this matter the company has decided to conduct a referendum and is asking its patrons through paid ads in the newspapers to cross out one of the two propositions below which they do not indorse, and send the clipping on the back of a post card or inclosed in an envelope to the commission.

1.—We believe Milwaukee's city car lines should be allowed to earn enough to make up losses on suburban lines.

2.—We believe fares on Milwaukee's suburban car lines should be high enough to pay the whole cost of operating these lines, including a 7½ per cent rate of interest on their value fixed by the commission.

Six Cents Now in St. Louis

The 6-cent fare was put into effect on June 1 on the lines of the United Railways, St. Louis, Mo. The advance from 5 cents was made in accordance with the decision rendered by the Public Service Commission of Missouri, to which reference has been made at length previously in the ELECTRIC RAILWAY JOURNAL. Other cities, towns and villages have gone over to a 6-cent fare, but they have not measured up to St. Louis in size. There about 1,000,000 people changed their habits over night, for paying 5 cents on the cars is often all more or less of a habit.

There was some confusion, but considering the magnitude of the change things went pretty well. The cars carried placards warning everybody to get ready for the change. The women were especially forgetful. Some of them were even so far out of touch with the times that they wanted the whole thing explained to them. There were many funny incidents, some grotesque and a few bordering on the serious. It was a field day for the newspaper humorists and cartoonists, and the history of the change is writ large in the local papers. The company fortified itself in advance with eleven tons of pennies for making change.

On June 2, Bruce Cameron, superintendent of transportation of the company, said:

"We were very much surprised at the smoothness with which the new system was introduced. Most of the passengers had the correct change. When they did not have it, we supplied it. Everybody was cheerful and paid the increased fare without murmuring, except a few, who remonstrated, but paid it anyway. A good many used tickets, and we anticipate that the use of tickets will greatly increase. We had a little trouble with the boxes choking up, due to the conductors failing to empty them often enough, but we do not think that will occur again. There was no delay in the operation of the cars."

St. Louis County residents continued to ride for a nickel, because the increase allowed by the commission does not extend to the county lines, but an extra fare inside the limits costs the regulation 6 cents.

Columbus Would Charge Five Cents

The Columbus Railway, Power & Light Company, Columbus, Ohio, made formal application to the City Council on June 3 for an increase in the rate of fare from eight tickets for a quarter to straight 5 cents, with free transfers, as in the past. In return the company agrees to raise the wages of employees and make such extensions and improvements as are warranted by the decisions of the War Finance Corporation, when application is made for the loan of funds for such purposes.

The motormen and conductors are now receiving from 24 to 31 cents an hour, according to the length of time they have been in the company's service, and it is proposed to make an increase of 6 cents an hour. This would bring the schedule up to a basis of 30 cents to 37 cents an hour. The communication to the Council indicates that the men should have more money for their work and states that many of them have gone to other industries.

Application had already been made to the War Finance Corporation for a loan, but since that time conditions have been made that renders it uncertain as to what amount can be secured, if any.

Following the presentation of this communication Councilman Nailor introduced a resolution providing for a hearing on the matter.

Transfer Charge Refused in New York

Commission Rules That Under Law It Could Grant Only Fragmentary Relief—Advises Companies to Seek Municipal Aid

The Public Service Commission for the First District of New York on June 6 announced that the several electric railways in New York City which a year ago applied for permission to charge 2 cents for transfers should apply to the municipal authorities for changes in their franchise grants. The opinion states that under the recent Rochester decision of the Court of Appeals the commission cannot legally grant a transfer charge on any other than a fragmentary basis and that under the circumstances the results would probably be disastrous to the companies.

The decision was rendered in the case of the Third Avenue Railway, but according to the commission's remarks it is in part plainly applicable to the cases of the New York Railways and the Brooklyn Rapid Transit Company. The commission feels that the revenue needs of the companies should be carefully examined, but it commends the whole matter of the most advisable procedure for relief to the consideration of the companies and the municipal authorities. For the present the hearings in the several cases are held subject to call, until the companies announce their future course.

Partial Transfer Charge is No Relief

The commission's finding follows in part:

"It is evident that the law of the proceeding, as now confirmed and clarified by the Rochester decision, leaves the commission with only a fractional and fragmentary power to deal with the revenue situation of this system through the expedient of a charge for transfers. At a multitude of the most pivotal points where passengers transfer, the commission could not, if it would, in the absence of municipal consent, empower the company to do otherwise than accord a transfer privilege without additional charge. At some points—a number of them important points—the commission would evidently be in position to make a 2-cent charge for transfers effective, in its discretion, upon an adequate showing of facts and probable operating consequences.

"The result, if the commission were to exercise its full discretion and permit a charge for transfers wherever legally possible, would be a disjointed and confusing situation—free transfers given at many points, 2 cents demanded at many others, with always the possibility that payment would be exacted or attempted at many points where none should be, and with the traveling public never certain whether at a given point it had a right to a transfer without additional payment.

"Surface railroad traffic would be diverted from its normal and most direct routes to longer hauls over routes for which transfers could be had without payment, and a large degree of confusion to the public and loss to the companies would be the almost inevitable result. Granted that the establishment of a universal charge of 2 cents for transfers would serve in large measure to solve the acute financial situation of which the Third Avenue System now complains, it is by no means sure that there would be favorable financial results from the hit-and-miss promulgation of such a charge.

"It does not seem that there is any way of dealing with this fare, transfer and revenue situation on the Third Avenue surface lines, without the consent and co-operative action of the municipal authorities, which would not have the effect of driving away traffic and decreasing revenues. The surface lines of this and the other systems of the city are destined to face increasing difficulties in holding their business and commanding their share of the traffic; the installation of such a piecemeal charge as the existent legal limitations leave within the commission's power would bring disaster.

Must Deal With the City

"By these companies' own choice, the local municipality has both a power and a responsibility, and no resort to a fragmentary plan of charging for transfers should avail to enable these companies now to avoid dealing with the municipality as to the terms and conditions on which a modification as to fares will be permitted. The city may be unqualifiedly willing that an increased fare on all surface and rapid transit lines shall be temporarily charged; it may be willing to consent to such an increase in return for terms and concessions of present or future public advantage, or it may not be willing to release the companies from their contract obligations at all. The matter of terms rests with the municipality, because the companies wanted the franchise so much that they bargained on the subject of fares and agreed to be ever bound by a 5-cent limitation, at the city's option. When the franchise limitations no longer stand in the way, the companies may come to the commission for the fixation of a reasonable and adequate rate, notwithstanding statutory barriers.

"The petitioners and any other transportation companies which feel now the 'pinch' of rising costs, ought to consider whether, instead of coming forward at this time with an application for a radical and lasting readjustment in existing transfer systems and bases of fares, they ought not to confine themselves to frank, direct requests for emergency relief, carefully limited to the duration of the war.

"If transportation service is to be continued on any efficient or endurable basis, during the war and afterwards, the proper public authorities must squarely face and act upon their responsibility for conserving the corporate income of essential utilities, even through the granting, where necessary, of proper applications for emergency relief during the war period.

"An application for a temporary increase in rates for the purpose only of eliminating present deficits in operating revenue and restoring an obviously moderate return commonly earned in recent normal times, could ordinarily be determined without resort to property appraisals at a time when unit prices are unprecedently high and the cost of the requisite appraisal alone might approximate the yearly increase in revenue requested."

Objections to Zones Heard

A hearing was held at Pittsburgh on June 8 before W. D. B. Ainey, Chairman Public Service Commission of Pennsylvania, on the protest filed by the city against the fare schedule of the Pittsburgh Railways effective on June 20 which provides for an initial 5-cent zone in the business district of Pittsburgh with 2 cents in zones within restricted limits outside of that district.

Fred L. Franks, engineer of the City Transit Commission and witness for the city, suggested an alternative to the zone plan as proposed by the railway, but this was characterized by the attorney for the receivers as highly impracticable. The proposed zone system was also opposed by E. K. Morse, City Transit Commissioner. He said that, for one thing, the 5-cent zone as planned to be established by the company would stop two blocks short of practically the most important transfer point in the city. He was not opposed to the zone system as a system, but considered that the proposal of the company contained glaring inequalities.

After the company announced that it had closed its case, Commissioner Ainey addressed himself to the attorneys of the company saying that they had not made out a good case for the reintroduction of a double fare at night. This statement was generally construed as a notice to the railway that the commission would not allow it to re-establish the 10-cent night fare.

As an alternative to the 5 and 2-cent zones, it has been proposed that the fare be made 6¾ cents for all passengers through the sale of fifteen tickets for $1.

Trenton Service Case Concluded

Attack, defense and counter attack with the Trenton & Mercer County Traction Corporation, Trenton, N. J., the battle ground, featured the oral argument before the State Board of Public Utility Commissioners on June 11 in the application of the city of Trenton for improved railway service. Frank S. Katzenbach, Jr., who appeared for the company, in his review of the testimony submitted in the long-drawn-out case, declared that the company could not be charged with failure to give safe, adequate and reasonable service, while George L. Record, who as special counsel for the city, appeared with City Counsel Charles E. Bird, argued that the evidence had shown a breaking down in the system in the way of service. Martin P. Devlin, representing the labor unions, declared that the company has failed in its duty towards the people. The utility commissioners reserved decision.

Mr. Katzenbach raised a legal question relating to the commission's power in the present application to issue an order binding the leased lines making up the system controlled by the Trenton & Mercer County Traction Corporation. He argued that as the leased companies had not been made parties to the proceedings any order for improvements could not be carried out by the corporation without the consent of the leased companies. Another point he made was that if the city would meet the company's proposition as to street pavement the extension of the West State Street line to Trenton Junction would in all likelihood be agreed to by the company. He thought the company should be met by the city entirely in a spirit of fairness.

Transportation News Notes

Even in Sunny California.—The Stockton (Cal.) Electric Railroad has filed with the State Railroad Commission of California an application for permission to charge a 6-cent fare in Stockton.

Portland Case Set for June 18.—Arthur S. Benson, clerk of the Supreme Court of Oregon, announced on May 22 that the case of the city of Portland against the Public Service Commission of Oregon, known as the 6-cent fare case, has been set for hearing on June 18.

Kansas City Decision Expected by July 1.—David E. Blair, a member of the Public Service Commission of Missouri, is reported to have said that it is probable the commission will report before July 1 its findings on the Kansas City Railways application for an increase in fares.

Would Increase San Diego Fare.—The San Diego (Cal.) Electric Railway has applied to the State Railroad Commission for permission to raise fares. The application says that the company has paid no dividends since 1914 and that its surplus is rapidly being absorbed by expenses.

W. B. & A. Wants Three Cents a Mile.—The Washington, Baltimore & Annapolis Railroad applied to the Interstate Commerce Commission on June 15 for permission to raise its fares to 3 cents a mile, in conformity with the rate on steam roads, and to cancel all special and excursion rates.

Canadian Fare Cases Reviewed.—The *Canadian Railway & Marine World* for June, 1918, contains a review of sixteen cases in which increased fares are an issue on Canadian electric railways. Some of the more important of these cases have already been reviewed in the ELECTRIC RAILWAY JOURNAL.

Experiment with One-Man Cars Postponed.—The Public Utilities Commission of Utah at the request of the employees of the Utah Light & Traction Company suggested that the experiment with one-man operation be postponed until after the hearing on June 11 on the application of the company to charge 1 cent each for transfers.

Automobile Versus the Street Car.—Owing to the increasing number of accidents between automobiles and the cars of the Rhode Island Company, Providence, R. I., this company has issued an eleven-page circular asking the cooperation of drivers of gasoline-propelled vehicles. The material and illustrations in the pamphlet make it very clear that careless driving is the great automobile crime.

Fare Increase Proposed for Des Moines.—The Des Moines (Iowa) City Railway without waiting for permission from the City Council to increase fares will refuse to sell six tickets for a quarter. According to an announcement which has just been made the company will refuse to supply further orders of tickets and will await the injunction suit rather than placing the matter before the City Council.

Many Advanced Tariffs Filed.—There are fifty-nine utility companies in Pennsylvania which have filed with the Public Service Commission tariffs showing increases in their rates and fares on or about July 1. Among these are nineteen electric companies, ten electric railways, nine natural gas, six artificial gas, seven telephone, three water and one ferry, steam, sewage, baggage transfer and pipe line companies.

Municipal Line Would Increase Freight Rates.—Thomas F. Murphine, superintendent of Public Utilities of Seattle, Wash., has presented to the City Council a communication requesting that freight rates on the municipal railway to Lake Burien be increased. The rate schedule now in use was adopted three years ago. It had as its basis a schedule that had been in effect for ten years.

Men Join in Fare Plea.—Hearings have begun on the appeal of the Stark Electric Railroad, Alliance, Ohio, to the City Council for permission to increase its fares in that city. The union of employees has addressed the City Council in behalf of the company. The men "respectfully ask and implore you favorably to consider an ordinance allowing the Stark Electric Railway the privilege of increasing fares on city lines."

Would Increase Fares to Eight Cents.—The Northern Cambria Street Railway, Patton, Pa., has filed notice with the Public Service Commission of Pennsylvania of its intention to increase fares from 5 cents to 8 cents. The property of the company was sold under foreclosure recently to the representatives of the bondholders. An account of the sale of the road under foreclosure was published in the ELECTRIC RAILWAY JOURNAL for May 11, page 933.

Skip Stops in San Diego.—By order of the United States Fuel Administration the skip-stop system has been placed in effect on route 1 of the San Diego (Cal.) Electric Railway between Fir Street and Mission Cliff Gardens, and between Twelfth and Market and Sixteenth and N Streets. On route No. 11 the plan is in operation between Park Boulevard Junction and Kensington Park. In as short a time as possible the system will also be placed in operation on routes numbers 5, 6 and 8.

City Commission Doubtful of Authority.—The City Commission of Battle Creek, Mich., has decided that it cannot legally grant the 6-cent fare requested by the Michigan Railway without first submitting the question to the people. As an alternative it is said the railway could decide to live up to the exact terms of the franchise which the commission has refused to amend. This would mean a straight 5-cent fare, with no transfer privileges, twenty minute service, and a 15-cent fare to the lake.

Grand Rapids Wants Six Cents.—The Grand Rapids (Mich.) Railway has petitioned the City Commission for permission to increase its passenger fares to 6 cents. The request has been referred to a special committee appointed by Mayor Gallmeyer. The application was presented on June 3. It was republished in full in the Grand Rapids papers over the signature of Benjamin S. Hanchett, president and general manager of the company, for the information of patrons of the company and the general public.

New Round-Trip Seattle-Tacoma Rates.—The Puget Sound Electric Company, Seattle, Wash., has filed with the Public Service Commission a new tariff for its round-trip passenger rates between Seattle and Tacoma and Seattle and Puyallup over its electric interurban lines. The new rate will be $1.50 for the round trip instead of $1.35 as at present, and include 11-cent war tax. This is an increase of 14 cents to the company and 1 cent for the government. The new rates are to become effective on June 24.

For Hire Jitneys Restrained.—In a recent decision the Supreme Court of Washington held that the Puget Sound Traction, Light & Power Company is entitled to an injunction against "for hire" jitneys operating under a Bellingham ordinance. The court held that the Bellingham city ordinance, which purports to give the jitneys authority to operate, is in violation of the State law, and that the temporary injunction should be kept in force until such time as the defendants comply with the bonding statute.

I. T. S. Would Cancel All Special Rates.—The Illinois Traction System has petitioned the Public Utilities Commission of Illinois for permission to cancel all thirty-day and special round-trip rates and commutation tickets. The company's petition cites the fact that it has had to stand increases in wages, cost of coal and all other materials in like proportion to the steam railways. It contends that only partial relief is requested, as it is not asking an increase in the present one-way passenger fare, which is based on 2 cents per mile.

Seven-Cent Fare for Wilmington.—An order permitting the Wilmington & Philadelphia Traction Company, Wilmington, Del., to increase its fares from 5 to 7 cents, effective from June 10, was made by the Public Utility Commission on June 5. Called upon by the City Council to explain its action the commission stated that the company is required to sell four tickets for a quarter. It is asserted that the report of an expert shows that the company is losing money and that if the city of Wilmington had not come to the aid of the company the government would probably take over the lines and charge such fares as it saw fit.

Tuscaloosa Wants a Six-Cent Fare.—The Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., has asked permission to increase its rates on gas, electricity and electric railway fare. A committee of five representative citizens will be named to investigate the financial conditions confronting the company and to make such recommendations as the committee may deem advisable. The company wants a 6-cent fare. According to I. W. Ross, vice-president and manager of the company, the deficit of the company for 1917 was $32,000. Mr. Ross frankly stated that the first three months of 1918 convinced him that the deficit for the present year would be much greater than for the last year.

Women Conductors in Baltimore.—In an announcement made on June 5 the United Railways & Electric Company, Baltimore, Md., informed the public that it would place women conductors on some of its cars as soon as they could be recruited and trained. T. A. Cross, president of the company, in his statement, pointed out the growing difficulty of filling vacancies caused by men withdrawn for service in the army and navy and in munition and arms plants, and the necessity of calling upon women to fill these jobs. No men will be displaced. Women will be used only in such positions as are made vacant by men who leave. The women will be paid the same wages as men. Rest rooms and other conveniences will be provided. Women will be put in service only on prepayment vestibuled cars.

Increase in Tunnel Fare Postponed.—Announcement was made on June 8 from Washington that pending investigation no increase was to be made in passenger fares on the Hudson & Manhattan Railroad connecting Manhattan and the New Jersey shore. When announcement was made on June 6 that the Hudson tube fare would be increased to 10 cents for a single ride there was prompt criticism of the action in New York and New Jersey. The proposed increase was referred to in the ELECTRIC RAILWAY JOURNAL for June 8, page 1115. The increase was to have gone into effect on June 10. The determination to countermand the previous notice advising the public of an increase was announced late on June 8 by Wilbur C. Fisk, president of the Hudson & Manhattan Railroad, in the following statement: "We have been advised by the assistant director of the division of traffic that the Director General has decided that for the present no change should be made in the rates of fare of the Hudson & Manhattan Railroad, and that the subject will receive immediate careful study. Therefore, our tariffs covering the increased rate of fares have been withdrawn and there will be no change either in the rate of fare or in the method of collection until and when further orders are received from the Director General."

New Publications

Corporation Accounting

By R. J. Bennett, C. P. A. Ronald Press Company, 20 Vesey Street, New York, N. Y. 563 pages. Cloth, $3.

This new manual by Mr. Bennett covers in an excellent way the features of corporation law which the accountant should understand, and it presents in full detail the accounting technique of maintaining corporate accounts and records and preparing statements. The book is replete with practical points arising in all sorts of corporate situations, and illustrative entries, problems and exhibits are many.

Corporate Organization and Management

By Thomas Conyngton. Ronald Press Company, 20 Vesey Street, New York, N. Y. 778 pages. Cloth, $5.

This volume is a non-technical, practical and compact manual of corporation law and procedure for business men, corporation officials and attorneys. While business law is naturally affected by the continual changing of state laws, Mr. Conyngton's book gives as thorough and as up-to-date treatment of the subject as could be desired. It covers all phases of corporate organization and management, and is amply supplied with citations, precedents and working forms. The book is a revision of the author's "Corporate Organization" and "Corporate Management," superseding these widely-used works.

M. C. Brush to Turn Over Boston "L" to State

This Article Outlines the Stages of Mr. Brush's Career Which Led Logically to the Presidency of the Boston Elevated and to His Advocacy of the New Plan of Management

After two very strenuous and fruitful years in the presidency of the Boston Elevated Railway, Matthew C. Brush is about to turn the management of the system over to the commonwealth of Massachusetts which will manage it for at least ten years through five trustees. In thus arranging with the Legislature for the preservation of this important property during the crucial period which will exist until the public is willing to pay to private managers a reasonable price for electric railway transportation, Mr. Brush has accomplished the most important work in his transportation career. Through this accomplishment the rights of the investors will be conserved and the public will be furnished with the transportation which it desires. Mr. Brush will tender his resignation of the presidency to the trustees immediately upon their appointment in order that they may have a free hand in selecting their own executives. Obviously under the new scheme, which he advocated so ardently in the best interests of all concerned, he could not have the freedom of action which would be necessary to enable him to carry out his own ideas as to what is best for the further development of the property.

Mr. Brush has crowded so much of achievement into the seventeen years since he graduated from the Massachusetts Institute of Technology that a brief review of his career, summarizing in part what has appeared in previous issues of the ELECTRIC RAILWAY JOURNAL, cannot but prove stimulating to other ambitious young men who are planning for the future. It should also prove a worth-while object lesson to the industry as a whole.

Mr. Brush's career divides itself into three periods. The first of these was that in which he was acquiring a technical education and along with it experience in meeting people and in laying foundations for his later work in trying to furnish good transportation service. The second period was a short one spent in the mechanical departments of steam railroads in the West, where problems in maintenance of equipment and in management of men were studied. The third period, covering the past fourteen years, consisted in applying the previously acquired experience to the operating problems of electric railways.

Throughout his life Mr. Brush has had to work hard for what he got, and with very little outside assistance he put himself through the Armour Institute of Technology and the Massachusetts Institute of Technology, graduating from the former in 1897 and the latter in 1901. During his student days he worked at various capacities on the passenger boats operating on the Great Lakes, finally becoming purser on an important boat plying between Buffalo and Duluth. Here he learned important lessons in public relations, and also made many firm friends who were later of great assistance to him.

After graduation from "Tech" in 1901 he was employed in the Union Pacific repair shops at Omaha, Neb., becoming successively machinist, foreman and roundhouse foreman. Later he was with the Chicago, Rock Island & Pacific Railroad as general foreman in charge of roundhouses and shops of the company in western Kansas. All of this was accomplished in the space of two years.

M. C. BRUSH

In 1903 Mr. Brush began his service with electric railways, spending the best part of six years with the Boston Suburban Electric Company, whose service he entered in 1903 as assistant to the president. He was soon afterward elected vice-president. The year 1909-1910 he spent as general manager of the Buffalo & Lake Erie Traction Company. His connection with the Boston Elevated Railway dates back to the fall of 1910 when he was made assistant to the vice-president. In 1912 he became second vice-president and later received a virtual promotion when the two vice-presidents of the company were equalized in authority. He was elected to the presidency of the Boston Elevated Railway in 1916.

While with the Boston Suburban Mr. Brush had to struggle with the financial problems of the company and among these was that of securing greater income. He advocated the 6-cent fare. He was successful in improving greatly the financial status of the company, as well as establishing friendly relations with the public. The welfare of his employees also deeply concerned him, and he later was able to apply his ideas along this line in a broad way on the Boston Elevated System.

What Mr. Brush has done for the Boston Elevated Railway is fresh in the minds of the readers of this paper so that all that need be said now is that he has built up a compact organization, has made the public feel its interest in the welfare of the property and has secured a hearing for his progressive and comprehensive convictions as to how pressing problems of electric railway transportation must be solved. In 1914 after serving as vice-president for several years and as acting president for part of one year he became president of the American Electric Railway Transportation & Traffic Association, holding this position for one year. In 1917 he was elected to the board of directors of the Second National Bank, Boston, an honor which he very highly prized.

From what has been said it will be evident that Mr. Brush's career has been characterized by consistency and definiteness of purpose. Everything that he has done has contributed to his progress and to preparation for large executive responsibilities. He recognizes this fact and endeavors to impress upon those about him the importance of the doctrine outlined in his recent address to the Rhode Island Company Section of the American Electric Railway Association. Above all Mr. Brush attributes his success to his practice of forming and keeping friendships by showing a willingness to serve those with whom he comes in contact. While a purser on the Great Lakes he attracted the attention of passengers, among whom were several noted capitalists, by the way in which he addressed them and looked after their comforts during the voyage. A distinct influence upon his future work resulted from associations formed during these college-purser days.

Mr. Brush is but forty years of age and has been a general manager since he was not more than three years out of college. His career has been a brilliant one and should form a fitting preparation for even larger responsibilities than those he has just laid down. During his two years as president of the Boston Elevated Railway he has had the double task of supervising the operation of an enormous property under unprecedented difficulties, and on the other hand of dealing with the public in a comprehensive way and bringing to fruition a plan for insuring continuity of transportation service with justice to all concerned while the whole electric railway situation is confused. His work at Boston particularly has illustrated the progressive spirit which must animate the whole industry if it is to accomplish its best work.

Personal Mention

L. L. Campbell has been appointed assistant general auditor of the Illinois Traction System, Champaign, Ill., to succeed George R. McComb, recently appointed assistant treasurer.

H. E. Johnson has been appointed auditor of disbursements of the Illinois Traction System, Champaign, Ill., to succeed L. L. Campbell, who has become assistant general auditor of the company.

D. H. Shapiro has been appointed private secretary to Frank R. Coates, president of the Toledo Railways & Light Company, Toledo, Ohio. He succeeds A. H. Stocksteil, who is now secretary of the Doherty Men's Club, Washington, D. C.

C. R. McMahon has been appointed master mechanic of the Des Moines City Railway and the Inter-Urban Railway, Des Moines, Iowa. He was formerly connected with the Utah Light & Traction Company, Salt Lake City, Utah.

E. B. Smith, formerly with the Arkansas Valley Railway Light & Power Company, Pueblo, Col., has been appointed auditor of the Muskogee Gas & Electric Company, Muskogee, Okla., succeeding J. H. Schmidt, who has recently resigned to enter business for himself.

Charles T. Doerr, purchasing agent of the Birmingham Railway, Light & Power Company, has resigned to accept an assignment as local purchasing agent, stationed in Birmingham, Ala., for the Air Nitrates Corporation, agents for the United States government in the construction and operation of the nitrate plants at Sheffield, Ala.

L. G. Mann, secretary to P. S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, Ga., and a short time ago elected assistant secretary of the company, has been called to the Naval Reserve. Mr. Mann volunteered for the service some time ago and was accepted, but he continued his duties while waiting to be called for service.

Isaac W. Gross has resigned from the motive power department of the New York (N. Y.) Railways to become New York manager of the General Devices & Fittings Company. He became connected with the New York Railways immediately after his graduation from Harvard University in 1911 with the degree of electrical engineer. At the time of his resignation from the railway, and some years prior, he was in charge of all electrical investigations. He also had charge of all the electrical testing in the department and general company illumination.

George R. McComb has been appointed assistant treasurer of the Illinois Traction System, Champaign, Ill., to succeed W. H. Carnahan, deceased. Mr. McComb entered public utility work in 1901, when he took charge of the office of the Consumer's Heat & Electric Company, Bloomington, Ill. In 1905, when this company and a competing company were acquired by the Illinois Traction Company and consolidated he retained charge of the office of the combined property. In 1909 he was transferred to Champaign, where he has held various positions in the general accounting department of the Illinois Traction System to the present.

Darton L. Babcock has joined the auditing department of the J. G. White Management Corporation, New York, N. Y. After spending several years in the service of banking institutions in Binghamton, N. Y., and New York City, Mr. Babcock entered the public utility field as an accountant. In 1915 he became connected with A. B. Leach & Company, New York City, being placed in charge of their accounting and financial routine. In 1916 he was appointed manager of the Cincinnati office of W. E. Hutton & Company, stock brokers, from whose employ he resigned to join the staff of the J. G. White Management Corporation.

F. L. Hinman, who for the past five years has been master mechanic of the New York State Railways, Syracuse lines, today severs his connection with that company to become associated with the United States Ordnance Department with headquarters at Watervliet Arsenal, Watervliet, N. Y. Mr. Hinman has had a very consistent career in electric railway work covering a period of fifteen years. He has had large plans for equipment maintenance on the Syracuse lines, and has exercised ingenuity in devising ways and means for cutting down costs. The articles which he has contributed to this paper from time to time indicate the direction in which his chief interests lie. He has also co-operated in the preparation of articles to which his name was not attached. He has been particularly successful in his relations with the numerous mechanics under him by his constant endeavor to assist them in making the most of themselves. Beginning as apprentice in the Syracuse Rapid Transit Company shops, he was successively a general mechanical shop and power-house assistant with the Auburn & Syracuse Electric Railway, at Auburn, and storeroom clerk, storekeeper, chief clerk to chief engineer W. J. Harvie, general mechanical foreman and finally master mechanic with the Rapid Transit Company and its successor, the New York State Railways, at Syracuse. This experience should have fitted him admirably for the mechanical and stores phases of ordnance work.

Oscar S. Straus, chairman of the Public Service Commission for the First District of New York, has notified Governor Whitman that he desires to retire from his office not later than July 1, next. Mr. Straus became chairman of the commission on Dec. 20, 1915. He refused to accept the place for the full five-year term, and it was understood that he would retire at the expiration of two years. He explained then that the work he had been called upon to do was finished, but his objections were overcome, and the Governor obtained from him a promise to remain for a while longer. The commission, since he has been its chairman, has been entirely reorganized, both regarding its personnel and its methods of doing business. The most important of the new rapid transit lines are in operation, and on July 1 or a short time thereafter the two lines on Seventh Avenue and Lexington Avenue will probably be running. During his tenure of office as chairman, Mr. Straus has taken a prominent part in the settlement of many labor disputes and has worked indefatigably to bring about the early completion of the new dual system of rapid transit. Mr. Straus was born in 1850. He was graduated from Columbia University in 1871. Later he practiced corporation law for a time. Then he began a career in diplomatic and public life, during which he was honored by appointment to foreign diplomatic posts by three Presidents and served under another in the cabinet. In 1912 he was the nominee of the progressives for Governor of New York State.

Obituary

Charles F. Freeman, aged sixty-three years, former president of the Rapid Transit Street Railway, Dallas, Tex., known as the South Belt Line, died at a sanitarium in Dallas on May 30. Mr. Freeman helped to organize the Rapid Transit Company and was president of the company up to the time the property was sold to Stone & Webster.

Alfred R. Miller, treasurer of the Canadian Westinghouse Company, Hamilton, Ont., is dead. Mr. Miller entered the service of the Canadian Westinghouse Company, as bill clerk in 1897, was promoted consecutively to head bookkeeper in 1903, acting assistant treasurer in 1904 and assistant treasurer in 1907. He has been treasurer of the company since 1917.

Nils M. Thorsson, assistant purchasing agent of the Chicago (Ill.) Surface Lines since 1914, died on June 6 at the age of fifty-one years. For twenty-five years previous to 1914 Mr. Thorsson was employed by the Chicago Railways, a predecessor of the present system, in the purchasing department, part of the time as purchasing agent of that company.

Arthur B. Hicks, for five years special agent for the Puget Sound Traction, Light & Power Company, Seattle, Wash., in the detection of crimes against the company's property, died in Seattle on May 24 from spinal meningitis. Mr. Hicks was born in Rose, La., forty-two years ago. He had been in the employ of the Stone & Webster interests, in various capacities, for more than fifteen years.

C. W. D. Miller died at his home in Oakland, Cal., on May 31. Mr. Miller, A. H. Pomeroy and A. W. Bishop organized the Berea (Ohio) Street Railway. Later this company was succeeded by the Cleveland & Berea Street Railway, which is credited with constructing the first interurban railway in the country. The line connected Cleveland and Berea and formed the basis of what is now the Cleveland, Southwestern & Columbus Railway. The original company also built lines at Sandusky and Mount Clemens, Mich. In 1896 Mr. Miller's health compelled him to give up his business in Ohio and he moved to Santa Barbara, Cal., where he purchased a local railway operated by mules and afterward arranged for the change in the motive power to electricity.

Charles Harvey Hile, secretary of the New England Street Railway Club and editor of its official publication, the *Street Railway Bulletin*, since Oct. 25, 1917, died at his home in Boston, Mass., on June 4, at the age of fifty-four. Mr. Hile was best known for his connection with the Boston Elevated Railway over a period of about twenty years, where he ultimately became assistant to the vice-president and then chief of maintenance. He was graduated in 1892 from the Pennsylvania State College, taking the mechanical engineering course, and later took a post-graduate course in electric railway engineering at the University of Wisconsin. He saw service in the organization of the Philadelphia Traction Company before going to Boston. In 1910-1911 he was president of the New England Street Railway Club. During the past few years Mr. Hile's health has been precarious, and about a year ago he spent a protracted leave of absence at Washington, D. C., in hopes of regaining it. His kindly personality, breadth of technical knowledge, and wide acquaintance with men in the electric railway field in New England combined to render his appointment as secretary of the club last year peculiarly fortunate. During the short period of his secretaryship he did much to improve the appearance and make-up of the club paper and to stimulate the interest of the membership in public relations. Mr. Hile had a host of friends in engineering and electric railway circles who feel his passing to be a personal loss. Representatives of the ELECTRIC RAILWAY JOURNAL bear tribute to his cordial co-operation in all matters affecting club publicity. The impress of his quiet but constructive work will be felt for a long time in the affairs of the club.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Recent Incorporation

***Foster Traction Company, Elkhart, Ind.**—Incorporated at Indianapolis to operate the line of the St. Joseph Valley Traction Company. Capital stock, $10,000. Directors: W. H. Foster, William E. Wider, Marion E. Brady, Eugene Atkins and Joseph Kies

Franchises

Oakland, Cal.—The city of Oakland has authorized the construction by the Emergency Transportation Company of a line connecting the plant of the Moore & Scott Iron Works shipbuilding plant with the San Francisco-Oakland Terminal Railways on Eighth Street. The line will be single track, for the use of the 6000 men employed in the shipyards. Under the plan agreed upon, the United States Shipping Board will furnish the funds and will control the line, while the materials will be furnished by the San Francisco-Oakland Terminal Railways. The total cost of construction will be $20,000. W. R. Alberger, vice-president and general manager of the San Francisco-Oakland Terminal Railways, is president of the Emergency Transportation Company. [May 18, '18.]

Dallas, Tex.—The Dallas Railway has received a franchise from the City Council to construct new track on Jefferson Street from Commerce Street to Young Street.

Track and Roadway

Little Rock Railway & Electric Company, Little Rock, Ark.—This company reports that it expects to construct 1 mile of track, material for which has been purchased.

British Columbia Electric Railway, Vancouver, B. C.—Work has recently been completed by the British Columbia Electric Railway on the rehabilitation of its line from New Westminster to Chilliwack, which was badly damaged by storms and floods during the past winter.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway is constructing about 6500 ft. of second track on its line between Long Beach and Wilmington. This line is approximately 7 miles long and connects Long Beach and San Pedro harbors. Double-tracking is taking place on that portion of the line most needed, while the balance of the single track line will be improved with the installation of a three-position all-electric automatic block signal layout. This improvement is being made in the interest of moving with dispatch large numbers of laborers employed in shipbuilding plants located at Long Beach and Los Angeles harbors and to facilitate the movement of freight trains without interruption to passenger schedules. The company recently placed in operation 3030 ft. of second track on its Gardena-San Pedro line at Los Angeles harbor to facilitate more expeditious dispatching of passenger trains handling some 4000 employees engaged in the Los Angeles Shipbuilding & Drydock Company's plant, and to increase facilities for more adequately handling carload shipment of construction material for various industries located in the West Basin of the Los Angeles harbor. The company also recently completed and placed in operation approximately 15,000 ft. of second track on its Los Angeles-San Bernardino line. This line accommodates some of the heaviest running schedules of any line on the system.

Ocean Shore Railroad, San Francisco, Cal.—This company reports that it will install a Nachod highway crossing signal.

Gary (Ind.) Street Railway.—An extension will probably be built by the Gary Street Railway on East Fifth Avenue to the Aetna guncotton plant, 2 miles east of Broadway.

Louisville (Ky.) Railway.—A report from the Louisville Railway states that the company plans to reconstruct about 3 miles of single track during this season.

Attleboro, Mass.—A bill has been signed by Governor McCall permitting the city of Attleboro to purchase and operate portions of the defunct Taunton & Pawtucket Street Railway within the city limits. Work will be begun at once repairing the road from Attleboro to Briggs Corner.

Boston (Mass.) Elevated Railway.—Operation has been begun on the extension of the Boston Elevated Railway from Summer Street extension to the South Boston Fish Pier.

Duluth (Minn.) Street Railway.—Plans are being made by the Duluth Street Railway to extend its lines from South Superior to Oliver.

Independence, Mo.—The city of Independence, Mo., by private subscription of business men, is arranging for the location of an electric line from Independence to Sugar Creek, the latter being a small industrial settlement with a cement plant and refinery about a mile and a half from Independence. About $13,000 of the estimated total of $50,000 for the construction of the line has been subscribed. The Kansas City Railways Company will construct and operate the line. A preliminary survey has been made.

Portsmouth, Dover & York Street Railway, Dover, N. H.—The Public Utilities Commission of Maine has rendered a decision declaring that the Great Works bridge in the town of South Berwick is unsafe for street railway use and that repairs must be made. The materials for such repairs are to be furnished and the labor performed by the Portsmouth, Dover & York Street Railway.

Public Service Railway, Newark, N. J.—A contract has been awarded by the Public Service Railway to the Eastern Construction Company, Brooklyn, N. Y., for the construction of an extension on Chestnut Street, Newark, a distance of about ½ mile.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—Extensive repairs are being made by the New Jersey & Pennsylvania Traction Company to its bridges across the Delaware River at Calhoun Street. New planking is also being laid between the tracks crossing the structure.

International Railway, Buffalo, N. Y.—Operation has been begun by the International Railway on its new fast service line from Buffalo through Tonawanda, North Tonawanda, Gratwick and La Salle to Niagara Falls.

Interborough Rapid Transit Company, New York, N. Y.—The opening of the new Seventh and Lexington Avenue subways has been postponed until about July 15. Recently the Publice Service Commission for the First District of New York announced that the lines would be opened to the public on June 15, but complications have made it necessary to set the date forward at least a month. One of the most important changes that will take place in the operation of the subway system when these two new lines start running will be the diverting of travel from the Grand Central subway express station to the new Times Square subway express station. Broadway trains will then cease running across Forty-second Street to the Grand Central Station. They will proceed down Seventh Avenue past the Pennsylvania Station, and uptown trains to be had at Fulton Street, Astor Place, Thirty-third Street, or any of the subway stations south of Grand Central will not cross over to Times Square, but will curve into and proceed up Lexington Avenue.

Union Railway, New York, N. Y.—The franchise committee of the Board of Estimate has denied the application of the Union Railway for permission to give up the construction of a trolley line to connect the present Union Railway line with the Dyckman Street Ferry. The committee requested that the work on the new line be completed within six months. The new line is to begin at the 207th Street bridge, extend to Nagle Avenue, thence south to Dyckman Street and west to the ferry.

Sandwich, Windsor & Amherstburg Railway, Windsor, Ont.—This company proposes to divert about 3 miles of its line through the property of the Canada Steel Company, near Ojibway, Ont., by moving the line back about ½ mile. It also plans to lay a second track on a portion of this diverted line during the summer.

Philadelphia, Pa.—The committee on street railways of the City Councils of Philadelphia has reported favorably on an ordinance authorizing the Philadelphia Railways to construct an extension from its southwestern trolley line to the Hog Island shipbuilding plant. The Emergency Fleet Corporation will finance the extension and be reimbursed by the company later.

Hull (Que.) Electric Company.—Work has been begun by the Hull Electric Company on the double-tracking and paving of its line on Montcalm Street from Aylmer Road to Montclair Avenue and the Chelsea Road, about 1½ miles.

Dallas, Tex.—The Texas Electric Railway, the Dallas Railway Company and the Northern Texas Traction Company have ordered a carload of standard steel ties from the Standard Steel Tie Company of Dallas, and will make a thorough test of these ties under local conditions.

Dallas (Tex.) Railway.—The City Commission of Dallas has issued an order directing the paving of Beacon Street from Columbia to Tremont. Of the cost, the Dallas Railway must pay $4,834 and the city and property owners the balance.

***Orange, Tex.**—Announcement has been made by officials of the Chamber of Commerce of Orange that negotiations are under way and are near consummation which will insure a street railway system for Orange. It is understood that the Stone & Webster Corporation is considering installing car lines in Orange to serve the shipyards and other industries.

Seattle (Wash.) Municipal Street Railway.—The Board of Public Works of the city of Seattle will come to a decision in the near future as to the clearances to be allowed steam railway tracks over which the elevated structure of the Seattle Municipal Street Railway will pass in the industrial district. The question is in the hands of a special committee of the board, consisting of Thomas F. Murphine, superintendent of utilities, City Engineer Dimock and Charles R. Case, superintendent of streets. Railroad men and engineers, including W. E. Weeks, safety appliance engineer, employed by the government railway administration, argue strongly for a 9-ft. clearance. Such a clearance would add about $16,000 to the cost of the elevated line. The clearance plan at present calls for a clearance of 8 ft. on straight line and 80 ft. 6 in. on curves.

Power Houses and Substations

Los Angeles (Cal.) Railway.—The Los Angeles Railway has just ordered two General Electric and two Westinghouse 1500-kw. commutating pole, self-starting rotary converters, together with the necessary 50 cycle, 15,000-volt oil-insulated, self-cooled transformers. These machines will replace equipments intended for stand-by service.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—It is reported that the Wilmington & Philadelphia Traction Company will apply to the War Finance Corporation for a loan to assist in the installation of two new boilers and also for the installation of a rotary converter in the company's plant, as recommended by the Public Utilities Commission.

Manhattan City & Interurban Railway, Manhattan, Kan.—A report from the Manhattan City & Interurban Railway states that it expects to purchase a second-hand 200-kw. rotary converter.

Kansas City (Mo.) Railways.—A contract has been awarded by the Kansas City Railways to L. Breitag & Son Construction Company, Kansas City, for the construction of a new substation, 43 ft. x 82 ft., at a cost of $25,000.

Portland Railway, Light & Power Company, Portland, Ore.—Projects of the Portland Railway, Light & Power Company to increase the power facilities in Portland by development of water rights on the Clackamas River, involving an expenditure of $1,550,000, have been approved by John R. Lewis, state engineer. One of the projects approved is for the appropriation of 667 second-feet of water, together with the waters of the Clackamas River for development of 10,000 hp. The proposed plans will involve the construction of a flume 4 miles long, with a power plant, to cost about $1,250,000. Another application calls for the construction of the Timony Meadows reservoir on Oak Creek in Clackamas County of 40,400 acre-feet of water. This project includes the construction of a dam 80 ft. high and 440 ft. long, to cost about $300,000. These projects were started by the company several years ago and later dropped.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesboro, Pa.—Construction has been begun by the Chambersburg, Greencastle & Waynesboro Street Railway of a large new steel tower to be located near the new building of the company just completed in East Main Street. The tower will be fed from Security, Md.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—A permit has been granted to the Puget Sound Traction, Light & Power Company for the erection of a reinforced concrete smokestack, 225 ft. high, to cost about $15,000.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Southeastern Roads Not Buying Much

Spotty Purchases Bring Totals Lower Than Previous Year—Operating Costs Increased

A survey of the street railway field covering the Southeast, together with information obtained from manufacturers, indicates that practically no large apparatus is being bought. A few inquiries are in circulation for the exchange of old car equipment for new, but it is not expected that any transactions along this line will be consummated now, as the occasion is not propitious even though the new equipment would effect operating economies. While the volume of sales for maintenance and upkeep materials covering the entire section remains comparatively steady, hand-to-mouth and spotty buying has tended to force the total to lower levels than those reached during the same period last year.

Not a few companies have reached their capacities and little or no reserve remains, which certainly leaves narrow margins to work on when the present factory and transportation conditions are taken into consideration. There are a number of properties that would like to install additional generating capacity and order new rolling stock, but in most of these instances earnings are not sufficient, and relief in the way of increased fares is coming slowly. The utilities are hedged around with numerous difficulties such as a scarcity of money with accompanying high rates of interest; increasing cost of materials and labor, the latter hard to secure; increasing operating ratios where the margins are growing less each day.

From data secured up to and including February, 1918, on operating revenues and expenses covering the so-called Southern district, south of the Potomac and east of the Mississippi, operating ratios have increased 4.33 per cent over the same period in 1917.

Although the Capital Issues Committee has advanced funds to several utilities so far, the tendency toward decreased net revenues does not look encouraging for any great measure of financial relief from this quarter, in view of the fact that the committee requires a strong financial report before lending the necessary funds.

The labor item is especially acute at cantonment centers and coastal cities where new shipyards are being located. Ordinarily unskilled labor at these points was plentiful at $1.50 per day, but it is almost impossible to get workmen now for $2.50 per day. This condition is to be expected when shipyards will pay 40 to 60 cents per hour for the same class of workmen. It has been reported that there have been times when schedules were curtailed owing to the shortage of platform crews, combined with the lack of shopmen and inspectors.

Production of Bituminous and Anthracite Coal

Improved Transportation Conditions Result in Increase of Weekly Output —Efforts for Clean Fuel

For the week ending June 8 the production of bituminous coal showed a decrease, for the period closing June 1 of 1,025,000 net tons or 8.7 per cent. The output of soft coal (including lignite and coal made into coke) is estimated at 10,774,000 net tons as compared with 11,779,000 net tons during the week of May 25, according to estimates furnished by the United States Geological Survey. The operators reporting produced 77 per cent of total production or 92 per cent of total rail shipments. These 5072 mines were operated to 75.8 per cent of their present capacity, while the mines reporting for the week ended May 18 were operated at 76 per cent. It will be noted that the increase in production for the week ended May 25 compared with the week of the 18th amounted to 0.7 per cent, whereas the per cent of present capacity as reported by the operators decreased 0.2 per cent. In all fields increased production is attributed mainly to improved transportation conditions.

The Federal Fuel Administration has just issued regulations governing the preparation of bituminous coal. Anthracite coal has been inspected for a long time and is being carefully prepared to insure good fuel. Certain shippers of "snow bird" coal from the anthracite region have been stopped by the local administrators, greatly to the satisfaction of the anthracite industry, for the anthracite operators are insistent for clean coal for the consuming public. In every contract between operators and miners, as agreed to and upheld by the United Mine Workers, there is a penalty on miners who load impurities with coal that could reasonably be kept out.

It would take a miracle to get 100 per cent perfect production of anthracite and this the Fuel Administration is aware of and fully recognizes without undue comment. Anthracite compares well in preparation with any other product of large consumption.

Pressure of Conditions in Small Tool Market

Cogent Remarks by a Leading Manufacturer—Distribution of Products on an Even Basis

At the convention in Cleveland, Ohio. on May 15, 16 and 17 of the Supply & Machinery Industry Manufacturers, several interesting addresses were delivered. One of the prominent manufacturers in the small tool field, Richard T. Law, sales manager of the Standard Tool Company, Cleveland, in speaking on the war situation called attention to certain prevailing conditions by saying:

"If the increased demand for small tools had been uniform it would have been a comparatively simple problem, but it wasn't. On some sizes the demand has remained about the same, on others the demand has increased 400 and 500 times. When you stop to consider that the machinery we use is not to be found in the open market, but must be made in our own shop, you have some idea of the magnitude of the work.

"Some sizes we carry in stock, others we have orders ahead for fourteen months. Formerly we kept 30,000 sizes and kinds of tools in stock, but not so to-day. So anticipate your needs as much as possible. It is well to be cautious for the future is obscure. This is not a good time to speculate. The products should be distributed evenly and where they will do the most good. The war industries and government are coming in for large amounts. Do not wait until you are out for a thing before ordering. It is the man who has kept ordering small orders month after month and has had the goods gradually dribbling through all the time that is selling the small tools to-day."

Railway Motor Market Conditions

Regular Sizes Easier to Obtain on Short Delivery—Accumulated Stock Reports—Price Changes

With the buying of electric railway equipment generally estimated on a minimum scale, the supposition was indulged in that a stock of railway motors had been gradually accumulating. This led to a special inquiry on the part of the ELECTRIC RAILWAY JOURNAL, with diverse results. One of the companies which manufactures this class of equipment stated, through the chief of its railway department, that the stock of railway motors is nil. No accumulation had been attempted during the lull in buying, other work of more immediate and pressing importance being given attention. Each order for railway motors was special, and its acceptance, completion and shipment was subject to individual treatment at the factory. Deliveries could not be promised under six or eight months, unless a priority order was forthcoming.

Another company of equal reputation stated it was surprising how many railway motors were being bought. A number of traction companies were rapidly discarding their old equipment, replacing it with improved devices, especially in motors.

Deliveries of motors of 40 hp., the same company declared, could be made out of stock in from six to eight weeks, which would be considered a hurry order. Special motors could not be shipped under a year. This company has a large if not a greater accumulation of motors on hand at present than in normal times.

Within a year prices on railway motors have advanced from time to time. Since the war the figures have gone up 75 per cent. During the last six weeks an increase of 10 per cent was made by one manufacturer. This is supposed to be about as high as this class of equipment will go, but manufacturers who were consulted were not altogether positive as to what may occur in the future, considering the position of steel and other essential material. Another 10 per cent price increase was announced by all the principal motor manufacturers.

Women Employees in a Railway Supplies Plant

Skilled Men Desert Posts for Higher Wages—Acute Conditions Relieved by Female Substitutes

It is doubtful whether any one place has been so disrupted by labor troubles and shortage as Philadelphia, Pa. The belief is that every industry has been made to feel what the loss of skilled workmen means. In Philadelphia, however, and its tributary territory, so many important war industrial enterprises—publicly or privately owned and conducted—of great magnitude, needing thousands of employees, that every other manufacturing concern has had its factory staff drawn upon. The draft almost crippled some plants and others are kept in operation only by the employment of women.

Of course, this is no innovation. Other firms elsewhere have gradually been taking on women operatives more or less to their advantage. The Electric Service Supplies Company, Philadelphia, whose transactions prior to the war with traction roads and power houses was 85 per cent of its business and is still 35 per cent, which is considered very satisfactory, has had a peculiar experience. The company has an unusually attractive plant from the point of air, light, perfect ventilation and location. Before the great shipyards, munition plants, powder mills and other war activities were in full swing the company had a corps of skilled machinists and metal workers equal to that of any plant in the electrical field.

When the Hog Island and other shipyards in the vicinity were offering unheard-of wages, the men deserted almost in a body. A few returned who had been rejected as not measuring up to the high standard of competency established by the ship workers. One of the munition plants in the neighborhood seeking high grade steel workers and machinists kept the Electric Company figuring how it could retain a few, at least, of the men actually needed by meeting any reasonable advance in wages.

Even common, unskilled labor, retained for physical work only, is receiving from $3 to $3.50 a day. At that men are hard to get and hold.

With all its trouble and determination to keep the plant operating at 100 per cent efficiency, in the meantime having received a number of large government contracts, the company displayed no rancor toward its old employees. It started in to fill the gap by employing women. A few weeks ago a number of girls were engaged for light work. Everything in the way of proper surroundings was provided. A special matron was employed to look after the physical well-being and comfort of the women. Rest rooms were set aside and equipped, as they are necessary and desirable. Careful instructions were given by competent men and in a remarkably short time the girls were found to be more adaptable and efficient than the men who had preceded them. While learning a fair wage is paid to the women, and when competent to assume the task, workmen's full compensation is accorded. This alone greatly pleases the female operatives.

Much to the company's surprise it found the new workers more conscientious and painstaking than men. More real interest is shown in the tasks allotted. Their usefulness is gradually being extended, stamping machines are being operated and other work assigned them in which women's natural deftness and intelligence is peculiarly fitted.

Their skill and the general results are reported as very satisfactory and gratifying. The conduct and appearance of the men about the plant has also undergone a transition with the presence of the girls. The improved deportment of the men is also a source of gratification. With this agreeable experience, the company is making arrangements to employ a large number of women in every department where their physical capacity will not be overtaxed.

This testimony to the worth of women in manufacturing plants is supported by the declaration of other firms in the electrical line elsewhere. Not only in Philadelphia, but in many other communities the labor situation continues tense and is growing worse.

Rolling Stock

Nipissing Central Railway, North Cobalt, Ont., Canada, expects to purchase one snowplow.

Manhattan City & Interurban Railway, Manhattan, Kan., is in the market for second-hand airbrake equipment.

Pacific Electric Railway, Los Angeles, Cal., controlled by the Southern Pacific Company, has ordered twenty safety cars from the American Car Company, with delivery in August.

Boston (Mass.) Elevated Railway has placed an order for six double-truck sweepers with the Russell Car & Snow Flow Company, Ridgway, Pa. Delivery is to be made in the fall.

Gary (Ind.) Street Railway, reported as being reorganized from the Gary & Interurban Railroad Company, is said to be contemplating the purchase of ten new cars for city service. Recently the company acquired six double-truck center-entrance cars—two motors and four trailers—of all-steel construction.

Richmond Light & Railroad Company, New Brighton, S. I., N. Y., is making preparations for buying twenty new cars of the closed type. Specifications are now being prepared and the order will be placed by the United States Shipping Board, Emergency Fleet Cor-for serving the shipyard on Staten Island is considered inadequate for the extraordinary service required. Twelve open cars are now used, this number soon to be increased to twenty.

Inter-Urban Railway, Des Moines, Iowa, has a 70-ton electric locomotive on order with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. This road's new locomotive equipment now includes two from the Westinghouse Company of 60-tons and 70-tons weight respectively, and one General Electric locomotive of 55 tons.

Boston (Mass.) Elevated Railway furnishes the following partial specifications for the 200 motor and 100 trail-cars under consideration, as previously mentioned in this paper.

Number of cars under consideration	200 motors, 100 trailers
Name of road	Boston Elevated Railway
Type of car	Center entrance passenger
Seating capacity	Motor 58-60; Trailer, 62
Weight (total)	Motor 44,000 lb.; Trailer 26,000 lb.
Bolster centers, length	24 ft. 0 in.
Length over bumpers; motor	48 ft. 9½ in.
Trailer	48 ft. 2½ in.
Width over all	8 ft. 8⅝ in.
Height, rail to trolley base	11 ft. 6½ in.
Body	Semi-steel
Interior trim	"Aero" metal-sash trim bronze
Headlining	Agasote
Roof, arch or monitor	Monitor
Couplers	Tomlinson
Designation signs	Hunter-Keystone
Door-operating mechanism	Pneumatic
Fare boxes	International Register Co.
Trolley catchers	Q. P. Signal Co.
Wheels (type and size)	25 in. steel

New Advertising Literature

Computer Manufacturing Company, San Francisco, Cal.: Folder, illustrated, describing the Ross precision computer, which multiplies and divides numbers instantly.

Combustion Engineering Corporation, New York, N. Y.: Bulletin C1, illustrating various installations of the method and operation of the "Coxe Stoker," the title of the pamphlet.

Wheeler Condenser & Engineering Company, Carteret, N. J.: Bulletin showing the Wheeler-Balcke cooling tower in numerous designs and capacities varying from a few thousand gallons per hour to nearly a million gallons per hour. Several pages are also devoted to the Wheeler-Barnard forced-draft cooling tower. The booklet is well illustrated with actual installations.

O. M. Edwards Company, Syracuse, N. Y.: Catalog H on trapdoors and fixtures. Illustrates different types of the Edwards all-metal trapdoor for steam and electric railway cars, including a new type of adjusting bracket and plug for trapdoors by which a very fine adjustment of the spring on these doors is obtained. The trapdoor lock, design H, is also shown. Views are given of several electric cars equipped with these doors.

G. & W. Electric Specialty Company, Chicago, Ill.: Catalog describing and illustrating its several distribution specialties. In this bulletin series cut-outs, filling compounds, ground-pipe caps and points, primary cut-outs and fuses, line disconnectors, cable and conduit hangers, outlet hoods, potheads, subway cut-outs, distribution boxes, switching boxes, spice boxes and tap boxes are described.

Ford, Bacon & Davis, New York, N. Y.: Illustrated description of Strawberry Dam on the south fork of the Stanislaus River, Cal., belonging to the Sierra & San Francisco Power Company. The structure is said to be the largest of its type in the West, namely a granite rock-filled dam, sealed with a reinforced-concrete apron and concrete toe wall to bed rock. The structure was designed and the construction supervised by Ford, Bacon & Davis.

Drew Electric & Manufacturing Company, Indianapolis, Ind.: A complete and comprehensive catalog describing and illustrating its overhead line material and electric railway specialties. It is known as catalog No. 18 and contains specifications and photographs of splices, trolley frogs, trolley crossings, adjustable crossings, section insulators, approachers, triple-beam insulators, pole brackets, line suspensions, feed-in hangers, insulated hangers, cap-and-cone hangers, globe strain insulators, giant strain insulators, standard insulated bolts, porcelain strain insulators, etc. It also contains various accessories used on electric railways. High voltage porcelain insulators are extensively treated and diagrams are given illustrating construction and sizes. Glass insulators are also described and illustrated.

Trade Notes

Railway Improvement Company, New York, N. Y., announces that it has received an additional order for eleven Eico coasting recorders from Stone & Webster for the Houghton (Mich.) County Traction Company.

The Parr Terminals Company, Wilfred N. Ball, engineer, 225 First National Bank, Oakland, Cal., desires manufacturers, jobbers and distributers to send him catalogs and other data on electrical materials or equipment used in the construction of piers, warehouses, industrial buildings, belt line railways and street work, cargo handling equipment; general shipyard and machinery equipment.

Liberty Steel Products Company, Inc., New York, with offices in the Woolworth Building, announces the appointment of J. W. Weinland, formerly manager of the brake-beam department of the American Steel Foundries, as district manager in charge of the Western sales office which has been opened at 1901-1903 McCormick Building, Chicago. The company also announces that S. W. Midgley has been appointed a special representative in the Western railroad sales department of the company. Mr. Midgley has been connected with railroad supplies during the last sixteen years in the sales departments of the National Car Coupler Company, Curtain Supply Company and Acme Supply Company.

NEW YORK METAL MARKET PRICES

	June 5	June 12
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26¼ to 26½	26¼
Lead, cents per lb	7¼	7.25
Nickel, cents per lb	40	40
Spelter, cents per lb	7½	7.62½
Tin, Chinese,* cents per lb	.90	.92
Aluminum, 98 to 99 per cent., cents per lb	†33.00	†32.00

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* No Straits offering. † Government price in 50-ton lots or more, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	June 5	June 12
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	19	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6	6¼
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	June 5	June 12
Rubber-covered wire base, New York, cents per lb	27 to 34	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	30¼ to 30.40	34¼ to 37.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.43 to 38.00	35.43 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$67.50	$67.50
T-rails (A. S. C. E. Standard) 500-ton lots, per gross ton	$62.50	$62.50
T-rails, high (Shanghai), cents per lb	4½	4½
Rails, girder (grooved), cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.00	$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.00	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	10	10½
Turpentine (bbl. lots), New York, cents per gal	52½	51½

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* Government price. † These prices are f.o.b. works, with boxing charge extra.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

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The Supplement This Week Shows Our Marines

WE ARE PUBLISHING this week our third patriotic supplement, the subject being "Our Marines," who have been upholding American ideas in France during the past two weeks and adding to their illustrious record for bravery. The purpose of these supplements is to remind those at home of what our boys are doing and enduring abroad in their fight for civilization. If this is kept in mind there should be no danger of lack of support through profiteering on the part of employers or slacking on the part of employees.

The popularity of the previous patriotic supplements issued by this paper is shown by requests for additional copies which have come from all parts of the country—indeed, of the world. Thus one railway company in the Central States asked for as many as fifty copies of the last poster to put up in its depots, and through the head of a municipal department in an Australian city our first poster is being reproduced in that distant country to stimulate enlistment. The poster this week is by the same artist as the others and was drawn especially for the McGraw-Hill Company, Inc.

A Twelve o'Clock Railway in a Nine o'Clock Town

"I'M a Twelve o'Clock Fellow in a Nine o'Clock Town" ought to be the official song of the Norfolk division of the Virginia Railway & Power Company. Elsewhere in this issue we discuss some of the extraordinary and heroic measures which this company has undertaken to give the government all the transportation and power it needs for the great military work in Norfolk, Portsmouth and vicinity. The article does not discuss service in Norfolk itself, and with good reason, for service in Norfolk is no better than municipal regulations in a narrow-streeted town permit. These regulations, unfortunately, do not embody the fundamental mode of relief for a village with the population of a city—namely—the adoption of one-way operation for all traffic. If Philadelphia, Providence and San Francisco recognize the value of the one-way traffic idea, Norfolk certainly need have no fear as to rash pioneering. To be sure. a few favored property owners and business men will emit wails of anguish because half the traffic is taken off of their street, but the pain will prove temporary because they will soon see that more people will come down to shop and play if they have a reasonably clear space in which to move about. In Norfolk, conditions of congestion are so aggravated that it would be sheer folly to put on more cars for the simple reason that even the present schedules cannot be operated satisfactorily.

This situation was pointed out by the operating company long before the present phenomenal increase in population. Its plea was ignored then, and it is ignored now when not a minute should be lost in the completion of the great war projects in this section. In fact, unless the municipality rises to the occasion by instituting an immediate traffic survey to check, not oppose, the suggestions of the company, it may find the long arm of the federal government stretching Norfolkward, and Uncle Sam's arm is peculiarly elastic these days.

Practical Line Analysis a Good Reason for Zoning

IT WAS our recent privilege to look over a traffic study made in a town of 50,000 people with a view to proving the need, at a forthcoming hearing before the state commission, for a higher rate of fare. Quite a surprise was sprung upon the management when its expert produced statistics of travel not by lines but by fractions of lines. Here, for example, was a line 4 miles long on the first 2½ miles of which 70 per cent of the traffic originated, whereas the remaining, outer, 1½ miles produced only 30 per cent. Two things immediately became obvious: First, that many short riders would walk if they had to pay more than 2 cents a mile; second, that the long riders were getting too much service at an absurdly low rate of fare. This condition proved so prevalent that the company has already decided not to ask for a flat increase in fare but simply to put all the facts before the commission that the latter may decide whether real relief can be obtained in better ways than by the driving off of short riders.

Welfare Work Being Revived to Hold Platform Men

FOLLOWING a period of discouragement because it did not prove a sure cure for resignations and strikes, welfare work seems to be coming to the front again. Out of a score of properties visited recently about one-half had recently opened "at-cost" restaurants, and in some in the busier war centers sleeping quarters for unmarried men had been leased or built. Quite plainly such practices are dictated primarily by the acute shortage of labor and the high cost of living, but they have in them greater possibilities than saving a dollar or two a week for the platform man. No restaurant, no shower bath, no pool table, no punching bag, no anything will keep men in the service unless there is enough humanity behind these things to promote loyalty—love for the job and love for the boss of the job. The soldier and sailor who are willing to lay down their lives are not doing it for pay but for loyalty. Many a railway man to-day is sticking to the platform despite the temptation of other work because he has learned to love his work under a management which takes a truly personal interest in him. Therefore, we earnestly beseech all managers who are installing or improving these facilities to continue to give their personal attention. The men will soon discover and immediately resent any attempt to put such important connecting links in the hands of a patronizing or indifferent subaltern.

Progress Being Made but Exact Date of Millennium Still Uncertain

ABNORMAL circumstances sometimes bring unusual results. Here in the United States we struggled for years to find a way to pull down that costly bugaboo—the rush-hour peak. Nothing would make a bend in it. And the fellow on the street figured the wonderful profits that seemed to exist in those hours of heavy travel. Various city and state supervising bodies insisted on showing the railway operators "how to make more money" by ordering still more cars to push up the peak. True, a few railway managers here and there were lucky enough to get the co-operation of business men who opened and closed their plants earlier so as to spread the peak and thus distribute the existing facilities of transportation to better advantage. But these cases were rare, and when reports of them were made at annual conventions, the other delegates only marveled that individuals could be so considerate, and they thought the situation too good to last. Then came the great war and the adoption of measures of economy in all lines of industry. Uncle Sam was a man of broad vision and promptly recommended skip-stop and other coal saving changes in operation, which led to some good results. At the seat of government in Washington, a strong appeal was made to those who could help to better the local service by closing stores and offices at different hours. Action of this kind is slow in making itself felt because it runs counter to that most inflexible law—habit, but there is hope that Washington will lead the way in this most important reform.

And now comes a brother manager from Cardiff, Wales, who has asked the press to inform women intent on shopping and not engaged in war work, that unless they could manage to do their buying in reasonable hours, they would be excluded from the cars altogether. He even suggests that it might be necessary for women to produce certificates to show that their business entitled them to ride in the cars.

We do not know whether to recommend this drastic measure to railway men in this country. In the first place, it is likely that a large proportion of the women patrons of our car lines would produce their knitting bags as evidence that they are engaged in war work and thus entitled to certificates of exemption. To speak seriously, there are many things being done now that would have been deemed impossible before the war. It may not be too much to expect that some authority will decree that cars during the working hours be reserved for working people. The millennium may be at hand.

Skip-Stop Principle of Small Cars Staves Off Jitney Competition

THROUGHOUT the land almost every electric railway is working on the skip stop. It's not so easy, however, for those who have jitney competition to do much skip-stopping when the jitney is ready to stop at the doorstep of the passenger. These roads rightly feel that literal obedience to the suggestions along these lines of the Fuel Administrator would cause them heavy losses of patronage so long as the gasoline engine—usually old and inefficient—could go merrily on its career of wasting man-power as well as fuel.

To many of these railways the small, one-man lightweight car has come as a solution. Through its very size it embodies that diminution of stops that must be fixed arbitrarily in the case of larger car operation. The best that can be hoped for by the national skip-stop program is a cut of one-third, and this is practically what the one-man car does because it carries say thirty-two passengers to the larger car's forty-eight. To be sure, the grand total of stops made by all the cars may be greater than before, but the cars that make them will be averaging 1 cent instead of 2 cents for power per car-mile. Hence there still will be a great saving in the use of fuel without the least inconvenience to the passengers or the loss of any of their patronage.

Show That Electricity Saves Gasoline

ONE way to take a cold bath is to plunge in boldly all at once; another way is to inch in gingerly—toes, ankles, knees and waist until the neck strikes water with a shiver and a b-r-r-r-r! The latter style of natatorial dissipation describes pretty fairly the way we have plunged into certain activities relative to the war. A good example is the conservation of that gasoline which is so badly needed at the battlefront where the use of the more efficient railroad is impossible.

Despite the repeated warnings of so competent an authority as Mr. Bedford of the Standard Oil Company, pleasure automobiles are still crowding our highways and are being used for joy rides literally by the million. Alarmed undoubtedly by the prospect of further curtailment in output, the automobile interests are now turning to the auto-truck, using its splendid emergency work "over there" as a specious argument for its unlimited use "over here."

From the very beginning of the war, the European belligerents made prohibitive the use of gasoline for non-war or important business purposes. So the ancient hack and ox-wain have reappeared in astonishing numbers. In America such a reversion would hardly be necessary. The elimination of jitneys and the retirement of private machines would, in many cities, lead to the use of good electric cars now idle. There is always also the possibility of the skip stop and higher rates of braking and acceleration for increasing passenger service without increasing cars or fuel requirements. As for auto-trucks, we have previously declared how wasteful they are in every respect in any district now supplied with electric railway facilities.

It is not human nature to expose one's own frailties, so we should not expect the automobile and auto-truck interests to dwell upon the dark side of the shield. The job of preaching that gasoline should not be used extravagantly wherever other transport means are at hand is distinctly up to the electric railway man. Certainly patriotism and self-interest could not harmonize better.

N. E. L. A. Gets Right Down to Business

IF WE HAD not believed before in the value of national association conventions in war time, last week's gathering of the National Electric Light Association at Atlantic City would have converted us. The position of the ELECTRIC RAILWAY JOURNAL in this matter is, however, well known and it is not proposed at this time to rehearse the arguments pro and con.

The meeting at Atlantic City was characterized by consistency and concentration of purpose. The war has forced many and perplexing problems upon the electric lighting industry. These involve the labor supply, fuel questions, operating methods which shall insure continuous and satisfactory service under adverse conditions, financing, and many other kindred topics which stress the mind and vex the spirit of the public utility operator to-day. Such matters as these naturally provided the material for discussion at the Atlantic City convention. The abstract of the proceedings printed in this week's issue is intended to reflect the spirit of the meeting rather than exhaustively to report the letter of the discussion.

There are two important functions which are performed, with others, by a war-time convention properly planned and held. On the one hand it enables the organization which it represents to see itself in perspective. At the same time it demonstrates to the public and particularly to the government the nature, extent and operating conditions of its organization. It is very important at this time for our federal government to know the public utilities better. As the war progresses the government will assume more and more of control and responsibility in the utility field. It is obvious that a convention like that of the electric light and power interests, which are second only in importance to electric railways among the utilities, will serve to bring the government and these utilities closer together.

The National Electric Light Association is leading its industry in the movement for conservation. Its convention was marked by simplicity; no unnecessary expense has been incurred by its committees; it has reduced the size of its monthly bulletin for the purpose of saving paper; and through its committees it is bringing to the attention of its clientele valuable information which will enable central station companies to maintain good service economically.

The N. E. L. A. convention ought to be of great value to the electric railway industry, in preparing for the October convention. Compared with the usual attendance, the N. E. L. A. convention was a small one, but the influential people were there and that is what counts in these times. By the same token we may assume an attendance of proportionate size and the same representative character at our October convention. On account of the small attendance at Atlantic City it was possible to incorporate the section meetings, usually held separately, into the general program. This proved to be an effective plan, under the circumstances, in that it insured adequate attendance at the section meetings and also very effectively brought the work of the sections to the attention of the whole convention.

The electric lighting and electric railway industries are so closely related that somehow it ought to be possible to carry over the spirit of the June convention to that which is to be held in October. Can we not somehow so absorb the spirit of the former that when our own meeting convenes in October we can start off where the electric light people ended? This war-time spirit ought to be cumulative, and if everyone goes to Atlantic City in October with the determination that the convention is in some way to bring the end of the war a little nearer, the success of the convention is insured in advance.

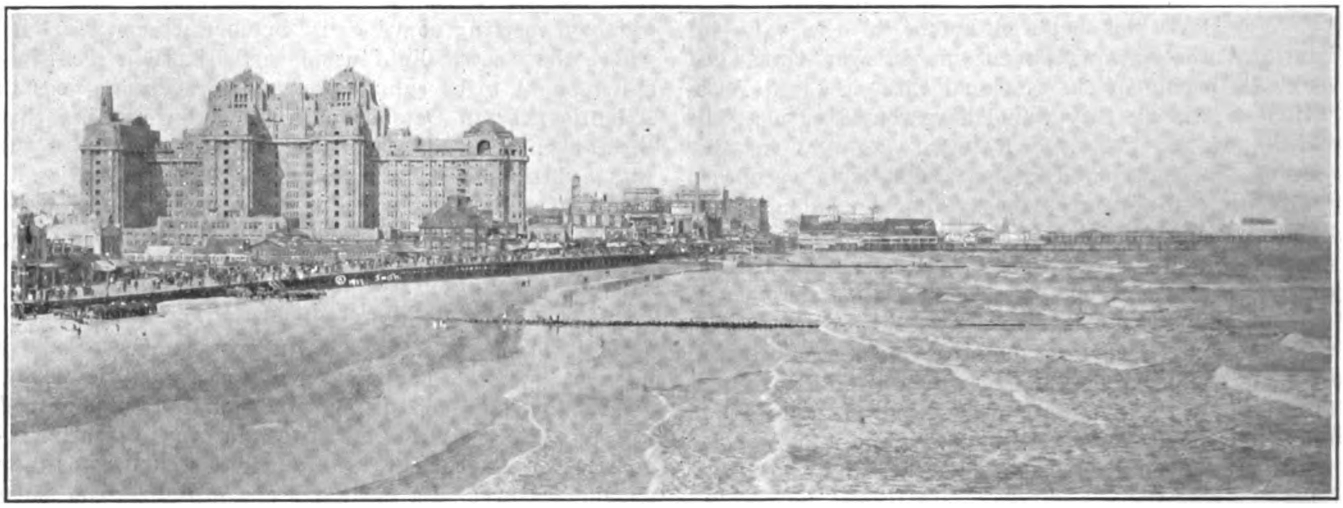
The War Finance Bill in Its Present Shape Is Unsatisfactory

THE practical results of the war finance act have been a great disappointment to the utilities. The original purpose of the act was generally understood to be to help the public utilities and other essential industries to take care of issues of their securities as they should mature. In ordinary circumstances no such assistance would be necessary. Indeed such loans could probably still be negotiated in the former way, even at current interest rates, if it was not for the flotation of government bonds. But the government asks to be regarded in the loan market as a preferred customer. It says, and properly, to bankers and others who otherwise would absorb refunding utility issues, that their first duty is to the government. Take and help float government loans at 4 and 4¼ per cent—so many railway men understood the purpose of the war finance bill to be—and the government will assist in caring for your maturing utility issues at a high, though not exorbitant, interest rate. The utilities hoped that such assistance would be direct, under Section 9 of the war finance corporation act, but under the present ruling it must in most cases be indirect through the banks, under Section 7. The formation of a corporation by banking interests to handle utility financing has been suggested, but this plan has barely passed the proposal stage. As yet many bankers seem reluctant to aid the utilities, because of the lessened earning power of such enterprises, and thus the expressed purpose of the lawmakers has been largely negatived.

There is every reason why the government should intervene in favor of the electric roads, because with both their income and expenditure controlled, they cannot help themselves. But entirely independent of equitable grounds, business policy should dictate prompt relief as a war measure. Unless it is afforded, receiverships in a great many cases are bound to result, with widespread injury to credit because of the extent to which utility bonds are held for investment, as well as with injurious effects on service which is necessary to war workers. In other words, an amendment to the war finance bill or a reinterpretation of it so as to afford direct relief to utilities is justified on both ethical and practical grounds. The government should step in, both to lend credit and to assist in increasing rates that the roads shall be more nearly self-supporting.

The Fuel Problem and the N. E. L. A.

National Electric Light Association Held Two-Day Convention Last Week at Atlantic City for the Discussion of War-time Questions—Principles Covered Apply to Electric Railways Also



HEADQUARTERS OF THE N. E. L. A. CONVENTION AT ATLANTIC CITY, JUNE 13 AND 14

A WIN-THE-WAR Convention was held by the National Electric Light Association at the Hotel Traymore, Atlantic City, on June 13 and 14. The sessions were held in a hall within the hotel. The attendance, which was about 300, was very representative. The keynote of the convention was that of patriotic service of men and companies. This thought was expressed in resolutions presented on Thursday afternoon by the committee on the president's address, Samuel Insull, chairman, which said in part, in referring to the war:

"With a realizing sense of the stupendous sacrifices involved, but with an abiding faith in the ultimate result, we pledge all that we have and all that we are to the holy cause."

THURSDAY SESSION

The presidential address of John W. Lieb not only discussed the work of the year but presented also a strong outline of our national ideals and unswerving purpose in the war. Defining the electrical industry as including electric railway, telephone and telegraph, electric light and power systems, and manufacturers on whose output these enterprises depend, Mr. Lieb said that this industry employs 920,000 men, represents $10,750,000,000 of invested capital and has an annual output of $2,675,000,000. Of these totals, the electric light and power industry represents 125,000 men, $3,000,000,000 invested capital and annual business of $575,000,000. He urged the central stations to pay especial attention to the linking up of regional systems so as to save fuel and increase reliability and economy of operation. He also advocated the further development of water powers as well as the advancement of the clock to be operative all the year instead of during a limited spring and summer season.

The secretary reported, among other war economies, that the monthly bulletin of the association had been reduced materially in size.

The membership committee reported a total membership as of June 10, 1918, of 11,440, divided as follows: Class A, 1083; class B, 9013; class C, 93; class D, 253; class E, 954; foreign, 44. This is a decrease of 3392 for the eleven months ended May 31, 1918, principally in class B and class E, due in large part to enlistments in military service.

The afternoon session was devoted to the reports of the national committees on gas and electric service, and public utility conditions and to the public policies committee, with a symposium on labor problems of the hour. In reporting for the national committee on public utility conditions, P. H. Gadsden pointed out that not only operating expenses are higher than ever before, but $250,000,000 in public utility securities will mature during 1919, and enormous investments are required to provide the increased service demanded by war industries. To provide the additional station and substation equipment alone, nearly $200,000,000 will be required in 1918. The serious part of the situation is that ordinary channels of financing are not open, owing to the war conditions. Between 600 and 700 rate increases have been allowed since Jan. 1, 1918, and it is hoped others will be secured. Mr. Gadsden said the committee was convinced that the federal government has the right to fix rates of public utilities which will enable them to exist in time of war. Whether it can be induced to do so remains to be seen.

At the annual dinner on Thursday evening addresses were made by P. B. Noyes, director conservation division, Fuel Administration; Samuel Insull, Dr. S. S. Wheeler, Arthur Williams and W. W. Freeman. Mr. Insull, in his address, said he wished to sound a note of optimism. While he admitted that the wording of the law creating commissions in some states is somewhat ambiguous so far as authority to increase rates is concerned, most commissions have authority to increase insufficient rates, and, so far as the electric light and power business is concerned, he hardly thought the industry had cause to complain about their decisions. It was reported that of the 460 applications made for increased rates in 1917, upwards of 400 decisions were given favorable to increases, and there are but few cases presented to commissions during the first half of 1918 where some relief has not been granted. A more serious trouble, in the speaker's opinion, is that of the refunding of maturing securities and the placing of new securities for necessary capital expenditures made during the war. But in his opinion, if the companies are diligent in the presentation of their situation to the authorities, they are bound to get relief.

The session on Friday was devoted largely to engineering topics. A feature of the convention was that the section meetings, usually held independently, were a part of the regular sessions. At the electrical vehicle section, a paper entitled "The Electric Vehicle as a War Measure" was presented by James H. McGraw, a member of the executive committee of the section.

On Friday afternoon W. F. Wells, vice-president and general manager Edison Electric Illuminating Company of Brooklyn, was elected president for the ensuing year.

The War and the Labor Problem

The Utilities, Confronted with Labor Shortage, Must Learn to Get Along with Less Labor and to Utilize Labor Normally Unavailable for Their Work

THREE phases of the labor situation occupied the attention of the Atlantic City meeting. These were the supply of labor to keep the utilities in operation, the distribution of skilled and unskilled labor among the industries and the utilization of the working capacity of soldiers returned from the front no longer fit for military service.

In the first connection E. S. Mansfield, Edison Illuminating Company, Boston, Mass., told how young women are being trained and used as substation operators on that property. Their employment for this purpose was the outgrowth of satisfactory experience in utilizing women in other classes of work where they replaced men, who had left the company for war work. Some months ago a class of eighteen girls was put under instruction for substation work. At first theoretical and book instruction was given but it was found later that what they needed was actual operation under instruction. They were, therefore, put through a regular course of closing switches and telephoning, load dispatching, receiving messages and checking them, etc., always under guidance. They were also examined as to their progress both orally and in writing.

Of the entire class fifteen were assigned to the Thirteenth Station, Rosedale, and they are now operating there, three on a shift of eight hours each, three shifts per day, six days per week. They are still supervised by a man attendant who insures co-operation, but eventually this supervision will be omitted. The girls are paid during instruction, at the same rate as the men, starting at about $15.40 per week. Eventually the use of the young women will be extended to other substations and it is quite possible that in time they will become the main dependents for substation operation. Among the qualifications considered for this work were originality, self-confidence, and quickness of thought to act in emergencies.

GETTING TOGETHER ON THE LABOR QUESTION

At the meeting considerable interest was manifested also in what has come to be known as the "Rochester plan" of co-operation in labor supply. Rochester is a center of war munitions manufacture, and about a year ago the Chamber of Commerce undertook the formation of a central employment bureau for the purpose of furnishing workers for the war plants with minimum interference with other industries. By assessing a reasonable tax upon the establishments which would be benefited in proportion to the proposed benefit, a considerable fund was raised, and a superintendent with the necessary assistants was employed. Back of the bureau was a representative executive committee recruited from the ranks of leading business men.

At first a campaign of advertising in the surrounding territory provided a reasonable supply of men, but later it had been found necessary to provide for training unskilled workers for special tasks. In addition the ranks of workers for the munitions plants were filled by drafts made on other manufacturers. In the matter of wages it was early recognized that good wages must be paid in order to make working conditions attractive, and the wage data of the region were studied in order to insure reasonable equality of payment for similar service. At the same time figures of living costs were gathered, but the impracticability of raising wages in proportion to increases in cost of living was recognized. In explaining the Rochester plan James C. Hutchings, Rochester, N. Y., pointed out that to raise wages in proportion to increased cost of living means that a man shall have every comfort and luxury in war time that he enjoyed previously. It is obvious, said he, that we cannot hope to win this war and yet live as well as we lived three years ago. Eventually we may have one man out of six of the 36,000,000 active wage earners in the country prior to the war engaged in destruction at the front. Those behind the lines must make a sacrifice for the good of the work at the front.

REHABILITATING THE DISABLED SOLDIER

The third aspect of the labor situation discussed at the meeting related to the employment of crippled soldiers. D. H. McDougall, secretary Canadian Electrical Association, explained what had been done in Canada along this line. There the work appears to be well organized and a systematic effort is made to enable returned soldiers to enter occupations to which they are fitted, while at the same time provision is made for training them for their new duties if necessary. It seems that there is great danger that returned soldiers may not feel inclined to go back to work, but rather to eke out an existence on their pensions. It is made clear to them in Canada that any compensation which they may receive for work done will not in any way interfere with their pensions.

The employment of returned soldiers fit for work and not suffering from disability is in the hands of the Provincial Soldiers' Aid Commission. There is also a new commission known as the Department of Soldiers' Civil Re-establishment. The latter made an industrial survey of trades and occupations with a view to fitting the returned soldier into the industrial machinery with minimum risk of disappointment. A large number of occupations were studied with reference to the physical and mental requirements of workers.

VOCATIONAL TRAINING COMPULSORY

It was found that once a man had received his discharge there was difficulty in reaching him. Now a man must show that he has been interviewed by the industrial re-educational officer before a discharge is granted. Canada has adopted compulsory vocational training under discipline if a man is not able physically to resume his former employment. After discharge and perhaps in receipt of a pension, a man is allowed pay and certain expense money while undergoing vocational training. This amounts with his pension to about $50 per month, as a minimum, while the total payment may run up to $100 per month.

With special reference to men who have been blinded in the war, the considerable effort that is being made in their behalf in the allied countries was described by Dr. S. S. Wheeler, president of the Crocker-Wheeler Company, Ampere, N. J. Dr. Wheeler's own company has successfully employed blind men in winding coils for electrical machines, and he has succeeded in interesting manufacturers in France and Great Britain in the same work. At the Crocker-Wheeler works blind coil-winders are paid at piece rates and they are able to earn good wages without any contributions made to them on account of their infirmity.

CIVILIANS MUST "FIND THEMSELVES" WITH RELATION TO THE WAR

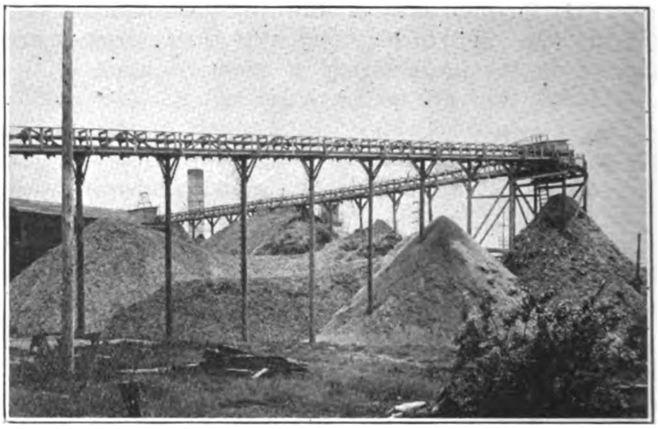
While on the subject of labor and the war it is not out of place to call attention to a paper by Arthur Wright, of London, England, also read at this meeting, on the subject of "War by Civilians." His contention was that it is not patriotic to wait until each citizen is forced into the occupation which will best enable him to contribute to the winning of the war, but he must take the initiative in the matter. The civilian should at once bring himself to believe that all that really matters at this time is the successful prosecution of the war.

While he did not make any specific suggestions as to what civilians in general could do, Mr. Wright called attention to the fact that in the allied countries there are many capable men and women who are devoting a great deal of time to rather insignificant work of a war nature, when with the necessary initiative they could be of vastly more use by using their special capabilities in some definitely efficient direction. He devoted his paper largely to controverting the following prevalent and pernicious fallacies: (1) The war cannot last much longer. (2) Business must be carried on as usual. (3) The war will necessarily ruin most businesses. (4) Civilians need do little on their own initiative, as the government will in due course call for all the help needed. (5) Owing to the terrible tragedies that are being daily enacted on the battle front, it is both unpatriotic and unfeeling to preach cheerfulness and optimism as to the future.

Progress in Electrical Machinery

Getting Greater Output from Existing Equipment Is the Task of Mechanical and Electrical Engineers Because They Cannot Get Much New Machinery

THE usual reports on power generation and distribution were not presented this year, but the committees brought out a number of valuable data. The committee on electrical apparatus showed that many companies have equipment with considerable overload capacity when compared to present-day ratings and temperatures. This could be more fully utilized. For instance, one plant had two water turbines which could develop 24,000 hp. each but the generators connected to them would not carry more than 10,000 kw. of load. By installing Sirroco fans on the rotors of the generators and inclosing the parts of the generators above the floor line, it was possible to supply cold air chilled by means of sprinkler heads so that 14,000 kw. could easily be carried. Later this was pushed up to 16,300 kw. with safety. Many companies also have increased line voltages to obtain greater line capacity by changing transformers from delta-delta to Y-delta connection.



EQUIPMENT FOR UTILIZING WOOD REFUSE FOR FUEL IN A HYDRAULIC PLANT STEAM AUXILIARY

The report of the committee on power generation was not available in finished form, as it usually is, but a statement was made that it will shortly be available through the technical press. The report took up such subjects as thawing frozen coal, storage of coal, methods to be used in handling coal, coal inspection, firebrick, boiler cleaning, etc. For the committee on underground distribution, E. B. Meyer, Newark, N. J., reported particularly regarding emergency cable practice. At the present time maximum use must be made of distribution equipment, and interruption of service to war industries must be avoided. It is especially important then to remember that the carrying capacity of cables is lower in summer and to increase the capacities of such cables particularly during hot, dry seasons. This can be done by the circulation of air through the cable ducts, circulation of water around the cable, hydration of the surrounding soil and moistening of cables and materials which conduct away the heat rapidly.

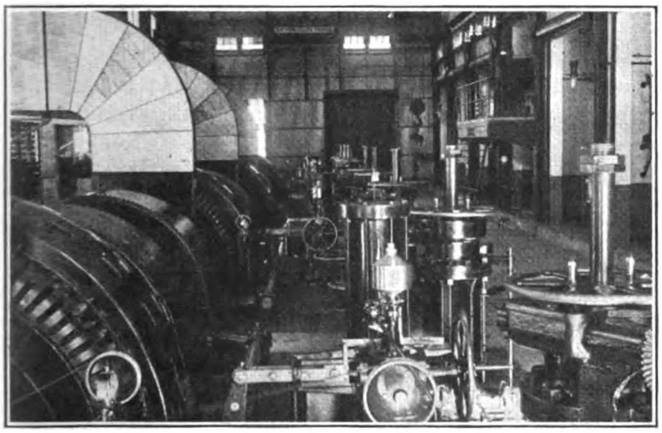
In special cases aerial cable has been used for operation at 13,200 volts. In one case the cable was insulated with paper on the individual conductors, with a paper jacket and a final covering of reinforced rubber over the whole. For mechanical protection a galvanized steel tape was wound over the cable. Such construction permits the use of ordinary pole lines for cable support. Two or more cables may be installed and changes or repairs made on the circuits without taking out of service any line, except the one on which the actual work is being done. The aerial cable construction is, of course, to be used only in special cases where it is desirable to cross underneath highway or railroad bridges and where open wires are undesirable or underground construction costs prohibitive.

War-time Problems in the Power Plant

Coal Shortage Overtops Everything Else in the Minds of Public Utility Operators at This Time—Quality as Well as Quantity Is a Factor in This Shortage

IN THE FIELD of power generation the discussion at Atlantic City naturally centered in fuel conservation. P. B. Noyes, director conservation division, United States Fuel Administration, analyzed the reasons for the fuel shortage and raised the question as to how we ought to meet the increased demand of 100,000,000 tons of coal for the coming year. This will mean an increase of more than 220,000,000 tons in excess of anything mined before the present war. To emphasize the magnitude of the coal movement in this country he said that the entire wheat crop of the country could be moved in twenty-six days, using the average number of cars employed throughout the year in the coal movement, and the cotton crop in one and one-third days.

Mr. Noyes believed that the fuel shortage will be more acute next winter than last and the problem is how to secure an equitable distribution of the coal that will be available. He said that the Fuel Administration wishes to make the utility business a 100-per cent war industry and then to assure it 100 per cent coal. In the conservation movement the ideal is to get consumers to realize that in saving coal they are keeping people at work and thus contributing to the winning of the war.



FORCED AIR CIRCULATION INCREASED THE CAPACITY OF THIS POWER PLANT

Following Mr. Noyes, Samuel Insull, president Commonwealth Edison Company, Chicago, Ill., among other things said that, while the orders, in general, issued by the Fuel Administration have had a tendency to reduce the load factor on power plants and hence the earning capacity of the business, he realized the importance of these orders. For example, while the first order as to electric signs affected the earning capacity of the Edison Company out of proportion to the saving obtained yet Mr. Insull would have issued the order himself had he been in Mr. Garfield's place. He attributed a part of the fuel shortage to the fact that, in Illinois at any rate, the miners are not working more than 60 per cent of the time, due to lack of open-top cars.

H. A. Wagner, president Consolidated Gas, Electric Light & Power Company, Baltimore, Md., urged the public utility companies to take a leading part in cutting down the use of open-top cars for non-essential purposes, bringing before public authorities and local fuel administrators the necessity for such action. Mr. Wagner also called attention to the poor quality of the coal now being furnished to utilities and suggested that if the quality were better fewer cars would be required to transport the coal. He thought that mines producing coal with high B.t.u. content should get more than their pro-rated supply of cars so that the greatest number of heat units possible might be available.

WATER POWER CAN SAVE SOME COAL

According to W. W. Nichols, Milwaukee, Wis., water power can be used greatly to reduce the coal consumption. Although 1917 was a year of light demand in water-power machinery, more than 1,000,000 hp. of this machinery was built and installed, representing a saving of 8,500,000 tons of coal besides a further saving in production, labor and transportation. Ten per cent of the estimated coal shortage of this year, therefore, would be met if the industry could do as well in installing water-power machinery.

Without building new plants development can be brought about by increasing the capacity of plants already built, and replacing machinery installed prior to 1911. By this means 6,000,000 tons of coal could be saved in the twelve months.

Referring to the possible effect of the development of water power on coal conservation, Philip Torchio, New York Edison Company, pointed out that at best the use of water power could only delay the exhaustion of our coal supply. The available water power in the Eastern States represents only about 8 per cent of all the power demand in that section, or 5 per cent of the estimate of Mr. Noyes for next year's demand. Mr. Torchio said that the average efficiency in generating energy from coal is 5¾ per cent, whereas now steam power can be produced at 19-per cent efficiency. The theoretical saving in coal by using the most economical means of generation would, therefore, be about two-thirds of the quantity now used.

Following Mr. Torchio, George A. Orrok, New York City, considered the possibilities of utilizing the culm which has accumulated around the anthracite mines. His data seemed to show that the amount of culm which is available for use is less than has been estimated by many. Of the 108,000,000 tons which have been dumped into culm banks in the last 130 years, one-quarter has probably gone back into the mines to prevent the falling in of the roofs or is otherwise unavailable; washeries have been in operation and have recovered a great deal of good coal also. Mr. Orrok also spoke of conveying coal by means of water. With water of one-half the volume of the coal, and with a 14-in. pipe and a velocity of 5 ft. per second nearly 4,000,000 tons of coal per year could be transported.

Electric Railways Are Serving the Nation

New Orleans Company Saves More Than 8000 Tons of Coal Annually Through Rerouting and Near-Side Stops—Shipyard Workers Operate Staten Island Cars—Service for Aviators and Shipbuilders at Dallas, Mobile and Beaumont

EVERY day electric railways are endeavoring to utilize their limited resources, as far as possible, to co-operate with government authorities in the prosecution of the war. The service performed varies, but a general idea of what is going on can be gained from sketches of the activities in different localities.

The ELECTRIC RAILWAY JOURNAL of June 1 contained a description of war work under way in certain Atlantic Coast cities. To this there are now added below several articles dealing mostly with Southern cities.

Sixty-five Seats per Passenger!

War Brings Rerouting in New Orleans—Curtailment of Waste Mileage Is Saving 5000 Tons of Coal and 138,335 Car-Hours a Year

FOR many, many years the New Orleans Railway & Light Company, New Orleans, La., has been suffering from a most wasteful multiplication of service under the franchise requirements of the underlying companies. It had become almost a sacred tradition to route practically all the lines along Canal Street, although crews and passengers had become tolerably familiar with the attractions of that famous thoroughfare. The cars were not content to go through only the busy section, but they wandered idly to a point (called Liberty Place) near the river.

Traffic checks showed that outside of five blocks in the center of the district so few riders were left that on the average each one had the privilege of using any of the sixty-five seats. This sounds fantastic, but it is true. All this waste was distressing—to the public, in causing unnecessary congestion, and to the railway, in causing unnecessary expense.

REROUTING TO AVOID WASTE MILEAGE

Finally, as a war measure to save coal, the company through Nelson H. Brown, manager of the railway department, put a thorough rerouting plan into effect on Dec. 23, 1917. The loop on Canal Street was shortened by landing passengers from lines terminating at Canal Street within a radius of five city blocks. Those desiring to continue to the river may do so by transferring to any of the six heavy trunk lines which use Canal Street between Rampart and Liberty Place. The lines have double-truck cars and short headways.

By the rerouting and changes on Canal Street, congestion was eliminated, speed was increased and headways were shortened. The following table shows the number of cars moved in each direction through Canal Street during the peak, before and after the change:

	To the River Before	To the River After	Decrease
Track 1.....	111	80	31
Track 2.....	119	65	54

	From the River Before	From the River After	Decrease
Track 1.....	111	80	31
Track 2.....	119	77	42

Another study carried out at the same time reduced the excessive off-peak service and increased the peak service as follows:

	A.M. Peak	Noon	P.M. Peak
Cars before the change....................	392	306	441
Cars after the change.....................	413	281	459

Through the more effective use of car-hours, eighty platform men were saved. No man lost his job, however, as applications were not accepted while the rerouting was under way. In addition, the normal ratio of resignation left practically no surplus. As a matter of fact, the draft may soon make a shortage.

The coal saving from the rerouting is at the rate of 5000 tons a year. Expressed in car-hours, the saving is equivalent to 138,335 car-hours a year. At 92.14 cents per car-hour for the operating accounts alone, the economy is a very welcome one—all the more so since it has been obtained by enriching the service instead of pauperizing it.

It should be added that before these changes became effective, the public received ample notice through car posters and comprehensive newspaper articles. In order still further to avoid annoyance and confusion, supervisors (inspectors) were located at the prominent street corners to direct people who were unfamiliar with the change.

Few requests for alterations in the rerouting plan have been made. On the whole, it appears to be as satisfactory to the public as it is to the railway.

Beginning on May 20, the company introduced a further improvement in service by abolishing the double stop (far-side and near-side) formerly in vogue at every rail intersection, whether steam or electric. The percentage of use of both stops at a crossing had been found to range from 25 to 60 per cent according to the time of day. By making stops on the near side only, the company saves 35,189 stops daily. At ½ lb. of coal per stop, this means 9 tons a day or 3285 tons a year—a tidy addition to the tonnage saved by the rerouting. Moreover, through the saving of ten seconds per stop, the running time is being reduced to the extent of from two to six minutes per trip. This saving is to the advantage of the public.

4000-FT. EXTENSION IS BEING BUILT

New Orleans has had no great enlargement because of war activities. The chief thing in that line is the shipbuilding plant which the Foundation Company is building on the Industrial Canal between the Mississippi River and Lake Ponchartrain. The canal itself will not be ready for eighteen months.

To serve the shipyard and other business that may develop, the New Orleans Railway & Light Company has begun a 4000-ft. extension of its Claiborne line with material from a postponed double-tracking of South

Claiborne. This track is laid directly on the neutral ground or park strip of France Street to Galvez Street. Eventually it will be extended still farther toward the lake.

The canal will also cause the Dauphin Street line to be shifted three blocks farther from the river to St. Claude Street, which will have one of the three bridges to cross the canal.

More Than 3500 Shipbuilders at Beaumont

BEAUMONT, Tex., is now busy with the building of wooden ships, and the community has hopes for steel and concrete ones, too. Toward the end of May about twenty-two ships were on the ways, and four had already been launched.

Of the five plants at Beaumont those of McBride & Law, with 450 employees, and J. N. McCammon, with 400 men, are within two blocks of the main street. The Tarver Shipbuilding Company, with 200 men, is within eight blocks of the Beaumont Traction Company's lines. The other two, the Lone Star Shipbuilding Company, employing 1300 men, and the Beaumont Shipbuilding & Dry Dock Company, employing 1500 men, are located across the river, but within half a mile of the company's lines. These two yards expect to employ approximately 500 additional men each within the next sixty days to equip the wooden boats that are being built in this section for the government. There will be fifty-two wooden vessels equipped for sea by these two companies.

The only changes in electric railway service thus far required have been increases at peaks and the earlier starting of interurban cars. Such cars now leave Port Arthur at 5.45 a.m. instead of 6 a.m., in order to accommodate about seventy-five shipyard and refinery workers who live there because of lack of housing facilities in Beaumont. Building in Beaumont, however, is now being actively carried on to avoid this. The Beaumont Chamber of Commerce figures that 10,000 people have been added to the population of 36,000 of a year ago.

Handling Aviators at Dallas

IN OR NEAR Dallas are two centers of the aviation forces—Love Field, the headquarters of a flying squadron; and Camp Dick, a ground school. Love Field is 4½ miles from the center of Dallas. It has from 1000 to 2000 occupants. Transportation is *via* jitney, as there is no electric railway service direct to the field.

Camp Dick is located on the Dallas Fair Grounds and has a population of about 3400. Electric railway service is furnished by the south belt line of the Dallas Railway, partly with regular cars run on an eight-minute headway off-peak and a four-minute headway for peak service. Chartered cars are also used for the twenty-minute run between the camp and either the steam or interurban terminal in Dallas, at a charge of $4 one way or $7.50 round trip. These chartered cars are likely to average 100 occupants. They are run chiefly for special occasions like train connections. Since the beginning of this service the car-hours of this line have been increased from about 255 to 276 a day and the earnings about $100 a day.

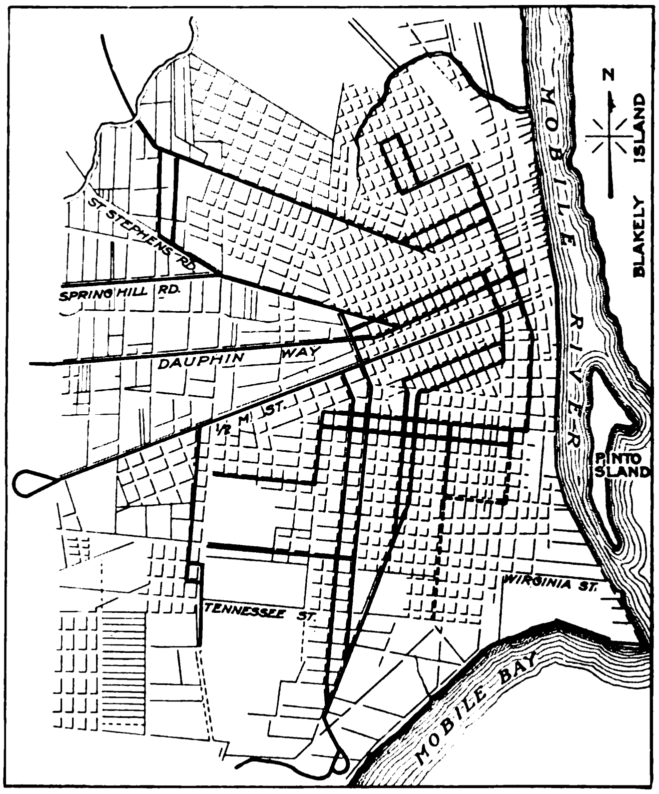
Mobile's Piers in the Bridge to France

Much Shipbuilding Within Mobile—Outside, at Chickasaw, Is a 13,500-Acre Yard and Town Development of Steel Interests—New Railway Facilities Required

THE splendid location of Mobile as a shipbuilding center has not been overlooked by the Emergency Fleet Corporation, the United States Steel Corporation and other big interests. Hence not only is the waterfront in Mobile itself covered with ships on the ways, but preparations are also going on outside for the making of fabricated steel ships, at one of the most elaborate housing developments in the country.

BIG ACTIVITIES AT CHICKASAW

To take this last-named work first, the salient facts about it are these. In 1917 the United States Steel Corporation, through its subsidiary the Tennessee Coal & Iron Company, bought a wooded tract of nearly 21 square miles (13,500 acres), bigger than Mobile itself, at Chickasabogue (Chickasaw Creek) 5 miles up the Mobile River. Although clearing did not begin until November, 1917, a recent visit to the property disclosed the fact that scores of buildings for the workers had already been completed. The housing development alone calls for two self-contained towns, 1000 dwellings for negroes and 600 for whites. At this plant the Chickasaw Shipbuilding Company, the subsidiary shipping company formed, will build 9600-ton steel ships for the export business of the United States Steel Corporation. Thus this development is not primarily for the present war alone. About 6000 men will be employed here soon, and eventually 20,000.



NEW SHIPYARD LINE PLANNED FOR MOBILE
Solid lines, existing railway; dash lines, proposed extension

To give electric railway service in this district the

Chickasaw Shipbuilding Company has built a 2-mile line on its own property to connect with the Prichard-Magazine-Whistler suburban line of the Mobile Light & Railroad Company. This suburban line is a single-track route up to Prichard, the end of the 5-cent zone. There the line bifurcates, one branch going to Whistler and the other to Magazine Point, the rate on each branch being 10 cents. The shipyard connection is beyond Prichard, making a third fork.

Until recently the private 2-mile line was incomplete, no copper having arrived. In the meantime the shipping company was giving a temporary service with two open trailers, leased from the Mobile Light & Railroad Company, and hauled by a steam locomotive. It is expected that on June 24 the line will be operated by the Mobile Light & Railroad Company. This will permit the through routing of cars and make it unnecessary for the shipbuilders to maintain a railway organization.

As before stated, shipbuilding developments are also being carried on within Mobile, where there are five companies building ships, employing about 3500 men.

Public Utility Representatives Confer With Fuel Administration Regarding Coal Conservation

A CONFERENCE was held at Philadelphia, Pa., on June 12, between representatives of the United States Fuel Administration and the public utilities of the State for the purpose of furthering measures instituted to conserve fuel.

The discussion was concerned primarily with the skip-stop system of electric railway operation, and it developed that it would be necessary for the Pennsylvania Fuel Administrator to initiate the discussion of the skip-stop plan through the county representatives. It is understood that these will be instructed to get in touch with municipalities and companies operating in their local districts, while the State Administrator will get in touch with the Public Service Commission.

Bulletin No. 1957 of the United States Fuel Administration was made the basis of further discussion on the general subject of coal conservation in the boiler room, regardless of the skip-stop system. The bulletin mentioned contains a questionnaire, from which a number of questions are reproduced below, as they suggest possible lines of fuel saving. The first section of the bulletin contains forms for recording local power plant data, concluding with a query as to the changes which are in progress which are expected to reduce fuel consumption and when these will be in effect.

The second section of the bulletin contains these and other operating questions:

Fuel—What provision is made for weighing fuel used each shift or day? What records are made of fuel used each shift or day? What grate surface is in use each shift, exclusive of banked fires? How much coal is used each shift, exclusive of banked fires?

Air Supply—Are means provided for measuring the draft over the fire? Are means provided for determining the excess air by flue-gas analysis? Are dampers provided for equalizing the draft in the furnaces? Is there a convenient means for regulating the draft by main or up-take dampers? Is there an automatic damper regulator in working order?

Boiler and Furnace Settings—Are the grates warped, broken or otherwise defective? Where have air leaks been observed?

Shipbuilders Running Cars

Former Employees of Staten Island Railway, Partly Paid by Shipping Authorities, Operate Cars To and From Work

OWING to the shortage of labor on Staten Island, N. Y., the operation of electric railway cars to the local shipyards is being cared for by shipyard workers with previous railway experience. These shipyard men run the cars out of the carhouse of the Richmond Light & Railroad Company in the morning, take loads of shipbuilders to work and then go to work themselves in the yards. The cars stand on sidings during the day. After finishing their day's work, the shipyard car operators bring the other shipbuilding employees home. The cars are then stored at night as usual.

The cars are in operation from two to two and one-half hours daily, and during this limited time they are handled as in normal or regular runs. The working conditions of the men differ in no respect from those for regular operation. From seventy-five to 100 passengers are carried on a car in each direction. Twelve cars are now in use, but the number will be increased to twenty.

At present there are twenty-four former conductors and motormen of the Richmond Light & Railroad Company operating the cars. These men form part of the 125 to 150 employees of the company who left for shipyard work when this was begun on Staten Island. The pay of the car operators is shared between the shipyards and the railway. The regular shipyard pay is 50 cents an hour, with time and a half for overtime. The regular pay of the railway is 30 cents an hour. Under the arrangement with the United States Shipping Board, the railway pays the car crews 30 cents and the shipyard authorities 45 cents an hour, making a total of 75 cents an hour at the overtime rate.

The general results of the use of shipyard conductors are a source of satisfaction to the company. The fare returns are commensurate with those secured in regular service. It would be difficult for conductors to tamper with the fare collection, however, for the passengers seem to appreciate the service and watch the conductors. Only two attempts to "knock down" fares have been observed and these were reported by the passengers.

The use of former employees on the shipyard runs, however, has not relieved the general labor situation confronting the railway. On the contrary, this is more acute than formerly, owing to the general labor stringency. The company now needs 100 men to make up its usual total. It has advertised in daily, weekly, Sunday and trade papers in seven states where there are organized industrial centers, but the responses thus far have been few and the results meager. No effort has been made to secure women conductors because of the use of open cars with running boards.

When the United States Shipping Board first made the proposition to the company to furnish transportation for the shipyard workers, the railway stated that it could not handle the work without assistance. It was then arranged that sidings should be built in the yards, with the board standing part of the expense. The cooperation in this respect and with regard to the assumption of part of the wage payment to the car operators has enabled the company to take care of the shipyard traffic.

Handling an Extra Hundred Thousand at Norfolk

For Government Work Company Builds a Million Dollar 66-Mile Transmission Line and Changes 20 Miles of Track to Broad Gage

IN JULY, 1917, business at Norfolk was below normal; by April, 1918, the population had increased from 100,000 to 200,000, exclusive of the large floating population of soldiers and sailors. This, in a sentence, is the result of war activities at Norfolk.

In all probability, the increase in population at this port equals that at Baltimore, Washington and Philadelphia, but the problem is immeasurably more acute in both the housing and transportation aspects because Norfolk could not possibly absorb all the newcomers, or a large proportion of them, by the device of turning residences into rooming houses.

As for railway service, the same degree of difficulty obtains. Norfolk with its narrow streets is simply an overgrown village, and its administration has retained the village viewpoint. This is clear from the fact that Granby Street, the main thoroughfare, is so narrow that vehicles cannot be run between the rails and the curb. Yet the municipality has not yet considered the logical remedy of routing a number of the downtown streets for one-way car and vehicular traffic. As usual, the selfish interests of land owners and business men in the congested section are allowed to hamper the general welfare of the city.

Thoroughly satisfactory street railway service was impossible even before the present boom conditions began. It may therefore be imagined what obstacles the Virginia Railway & Power Company must encounter now, not only in serving the usual city routes but also in meeting the imperative needs of the new governmental depots.

PRINCIPAL DEVELOPMENTS IN NORFOLK DISTRICT

The principal developments which have created such an extraordinary demand for more facilities in the Norfolk district may be summarized as follows:

Naval Base 9 miles from Norfolk on the site of the 1907 Jamestown Exposition, near Sewell's Point, involving a development of $30,000,000 to $50,000,000 on 400 acres of existing ground and another 400 acres of fill. Many of the State buildings of exposition days, which had been converted to residences, are now being used for officers' quarters, in addition to the hotel. Hundreds of new buildings for storage, training and other purposes have already been put up and more are coming.

Norfolk Quartermaster's Terminal, U. S. A., at Bush Bluff 6 miles from Norfolk on the way to the Naval Base. Here about 6000 men are employed in making piling and erecting eight storage warehouses of concrete, brick and tile, each 160 ft. wide by 1680 ft. long. About 13 miles of track are used here temporarily by the contractors. Housing is being provided for about 4500 of the men, but this does not prevent practically all of them from going to Norfolk when they have the money. It is hoped to complete construction work here before cold weather sets in, thus calling only for the use of existing open cars as hereinafter noted.

Tripling in size of the Portsmouth Navy Yard, involving an addition of 35,000 to 40,000 men to the population of Portsmouth.

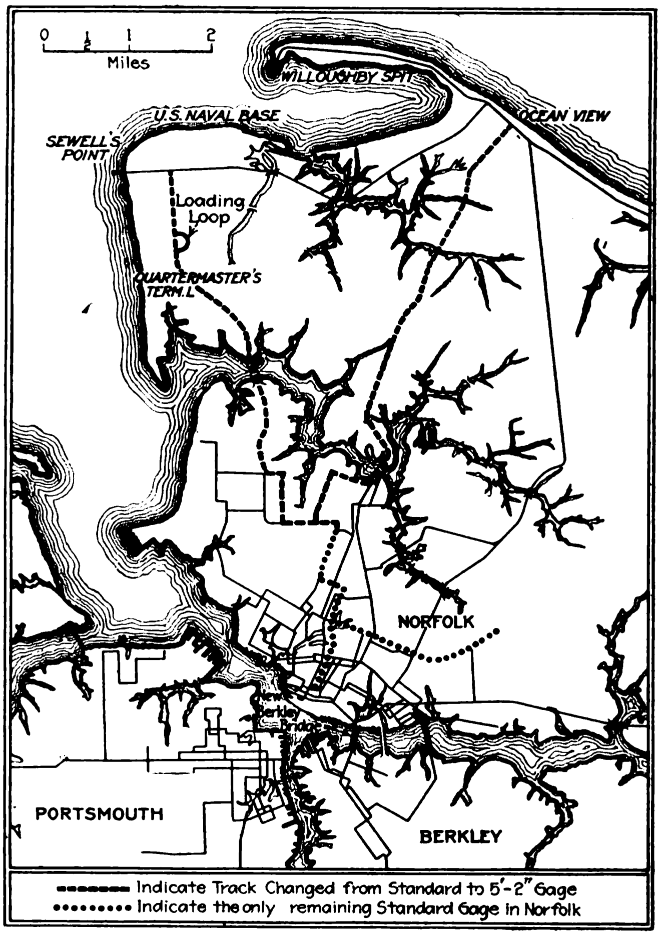
Construction of U. S. Engineers' Depot in Norfolk, at which about 1500 stevedores are employed.

Deepening of harbor to increase the width of the 40-ft. channel from 400 ft. to 800 ft.

Amusement travel of soldiers and sailors from Newport News.

CHANGING 20 MILES OF TRACK TO WIDE GAGE

One of the greatest difficulties which faced the Virginia Railway & Power Company in giving service to the outlying developments was the fact that the lines to the Jamestown Exposition (Naval Base) grounds and to Ocean View, 14 miles from Norfolk, which afforded a second route thereto, were 4-ft. 8½-in. gage whereas the Norfolk city lines were largely 5 ft. 2 in. To have attempted to change everything to standard gage would have involved at least three times the expense and far more time than to change these lines to broad gage, inasmuch as most of the special work was of the latter gage. Moreover, most of the standard gage track was open construction. This made it possible to change the gage of 12 miles of track—Norfolk to the Naval Base—in two days. Another 8 miles will be changed over soon to care for the Bay Shore line to Ocean View, making a total of 20 miles changed over. This leaves only 2½ miles standard-gage track owned by the Virginia Railway & Power Company in Norfolk



CHANGING THE TRACK GAGE IN NORFOLK FOR WAR PURPOSES plus 0.8 mile of track owned by the Norfolk Southern Railroad. This standard-gage track is shown on the accompanying map in the form of a badly-bent "T," the east-west leg of which is owned by the Norfolk-Southern while the portion south of the junction is operated in common by the two companies. At the Naval Base also, about 1 mile of track remaining within the grounds has been left at 4 ft. 8½ in. and leased to the government.

It may be added that the lines in Portsmouth and Berkley remain standard gage, except for the new Berkley Bridge and approach.

Through the expedient of changing the Jamestown Boulevard line to broad gage there were made immediately available forty open cars used for pleasure travel on the broad-gage line which serves Ocean View. In addition twelve closed motor cars were borrowed from the Norfolk city lines, and another forty-eight are to come. The latter loan will include twenty-four open trailers from Richmond. Out of 100 cars for the Naval Base and Quartermaster's Terminal service, nevertheless, fifty cars must be fitted for change in gage.

Aside from these changes, the company is using at Norfolk sixteen new vestibuled motor cars which arrived from the St. Louis Car Company last December in fulfillment of an order placed long before the various developments just described were expected.

ABSENCE OF STAGGERED HOUR BLOCKS THOROUGHLY SATISFACTORY SERVICE

Except for the fact that the men at the Quartermaster's Terminal are released half an hour earlier than those at the Naval Base, almost all the workmen must be handled simultaneously. There is not enough difference in time to use cars more than once. Since this service also overlaps the peaks in Norfolk itself, it is evident that the transport problem is most difficult. When the closing hour is sounded at the Naval Base, thousands upon thousands of laborers, hundreds of mule teams and motor trucks and scores of automobiles make one mad scramble to get out of the stockade as if they were trying to escape from imminent death. Despite the fact that scores of cars are standing in line only the first suitable one will do. Men will be seen hanging to fenders even when there is plenty of standing room inside, their obvious purpose being to escape the payment of fare. A prepayment area outside the Naval Base does not appear practicable to the company because of topographical conditions and the use of a 5 and 10-cent fare.

Partial relief, so far as preventing the clogging of the line is concerned, will be afforded here and at Sewell's Point by the construction of a third track for the storage of twenty-five to thirty cars.

The service from the Naval Base, as at other points, is handled in trains of two or three cars. To move two trailers at good speed is not difficult because of the entire absence of grades. Through runs are made wherever practicable.

If the company had any assurance of the permanence of this business, it would order multiple-unit equipment and operate five-car trains or more, but obviously it must meet the present conditions as best it can with existing equipment. The ideal arrangement for handling the twice-a-day traffic to and from the Naval Base would be to borrow an old steam locomotive and use it to haul a train of coaches. The Virginian Railway could have done this by running a spur, but it did not care to disturb its freight business. However, the electric railway is now negotiating for steam equipment which may be used if proper arrangement for payment of fare can be made with the government.

In explanation of the foregoing, it should be stated that Naval Base employees are granted a railway fare allowance of 20 cents per diem whether they live in 5-cent or 10-cent zones. Because of the undisciplined way in which they board the cars, however, so many fares are missed that the service is unprofitable. If the 20 cents per diem per man was paid directly to the railway, the men could ride on badges good on the specials. This would simplify the work of the trainmen enormously and also segregate this travel from other services. However, the simplest, cheapest solution would be to stagger the working hours of the men at the Naval Base at least, since they constitute the bulk of the travel.

Beside the service given by the railway, there are a number of automobiles and privateering motor trucks. The automobiles charge 25 cents for the trip. The motor trucks are not supposed to be used for this service, but many drivers are careful to hang about the Naval Base, after delivering their employer's supplies, for the personal profit of carrying a load to town at 10 cents per rider. Only a nominal license fee is charged for auto vehicles by Norfolk anyway.

The laborers at the Quartermaster's Terminal are not only smaller in number but also far more orderly. At this location, the company has built a loop where sufficient cars are stored to give prompt service.

Aside from the twice-a-day peak service required at these military bases, provision must be made for the riding of men on leave. This kind of traffic is extremely erratic. Regular days of leave may be suddenly canceled, an unusual number of men may receive a day off, or the expected travel will not materialize because pay day is too far away. No matter how spasmodic this travel is, and despite no notification of plans, the railway is always expected to be on the job.

A $1,000,000 TRANSPORTATION LINE BUILT TO USE POWER GENERATED AT RICHMOND

The acuteness of the railway situation is paralleled only by the demand for more power. The Naval Base alone is already taking 3000 kw. and 1500 kw. will be needed at the Quartermaster's Terminal. These demands are of course exclusive of the general increase in power requirements made on the company.

As the 12,000-kw. turbine at Norfolk was already up to capacity and no additional turbine capacity could be secured before 1920, the company has had to go to the extraordinary expedient of building a 66-mile, 110,000-volt transmission line from Richmond to Suffolk in order to transmit 15,000 kw. from its 20,000-kw. turbine at Richmond. This line will be constructed with Archbold-Brady A-frame and anchorage towers now under fabrication. Increased railway and power equipment totaling 15,000 kw. has also been ordered for the substations at Lambert's Point, Sewell's Point, Naval Base and Ocean View. A portable substation has also been in use on the Jamestown line for several years.

Automobiles, Inexperienced Labor and Other Accident Topics Discussed

Pacific Claim Agents' Association Takes Up Topics of Vital Current Interest at Its Portland Meeting—List of the New Officers Elected for the Ensuing Year

THE ninth annual convention of the Pacific Claim Agents' Association was held at the Portland Hotel, Portland, Ore., on May 1, 2 and 3. President H. K. Relf, Spokane, Portland & Seattle Railway, called the meeting to order on May 1 and in his annual address explained that the meeting last year had been postponed because the country had just entered the war, but the consensus of opinion this year was favorable to the holding of a meeting. He also said that the Director General of Railroads had approved until further notice the retention of membership in the association by claim agents of steam railroads. At the close of the meeting the following were elected officers for the ensuing year:

President, H. G. Winsor, superintendent of investigation and adjustments, Tacoma Railway & Power Company.

First vice-president, W. H. Moore, claim agent San Diego Electric Railway.

Second vice-president, J. S. Mills, claim agent Oakland Traction Company.

Third vice-president, C. A. Blackburn, claim agent Butte Electric Railway.

Secretary-treasurer, B. F. Boynton, claim agent Portland Railway, Light & Power Company.

Executive Committee: J. H. Handlon, San Francisco; A. M. Lee, Seattle; Thomas G. Aston, Spokane; J. T. Rupli, Seattle; F. J. Lonergan, Portland.

The next convention will be held at Oakland, Cal., at a date not yet set. The papers by Mr. Lee and Mr. Handlon were read by title only because neither of them was in attendance at the meeting. Abstracts of the papers which were presented are given on this and the following pages.

Accident Prevention Work

Due to the Prevailing Shortage of Competent Help Safety Work Is Lagging, Although the Need for It Is Greater Now than Ever Before

BY B. F. BOYNTON

Claim Agent Portland Railway, Light & Power Company, Portland, Ore.

THE accomplishment of much along accident prevention is very important just at the present time because so many of our old and tried men are leaving us to join the ranks and in the new material we are working with we have very young men and men along in years, and while I am satisfied they are doing the best they can, the results we obtained are not satisfactory.

In correspondence I have had with various companies, North, South, East and West, I find that the conditions are alike everywhere. Some of the big properties have discontinued most of their safety work and others have stopped it entirely. This I feel, is a great mistake as with the increasing number of automobiles and the inefficiency of the type of men we are having to handle our cars, we are really facing the most serious problem that has come to the claim agent in many years. On our own property we are still working along safety lines as best we can by lecturing our men before they are put to work, and also having frequent talks with them at the various carhouses, and we are posting safety bulletins which we receive from the National Safety Council. I think these bulletins are a great help. I feel we should continue to do the best we can and get the real old-timers who are too old to go to the front to continue to hammer away, and that we should continually place before the men anything we feel would be something that would set them thinking along safety lines, but I can find no organization either East or West that is putting forth any new ideas relative to safety protection.

I intended including in this paper what was being done in caring for street traffic along safety lines, but as Mr. Coffin, of our Public Safety Commission, has been kind enough to write a paper relative to the commission and its government of traffic on the streets, I have eliminated that part of it from my paper.

Old and New Employees

How to Obtain Co-operation from Both Under Present Conditions—Serious Increase in Accidents as a Result of Constantly Changing Personnel

BY H. G. WINSOR

Superintendent of Investigation and Adjustments, Tacoma Railway & Power Company, Tacoma, Wash.

THIS country has at present approximately 30 per cent of its man power actively engaged in work demanded by the government in connection with the war, and it is estimated that if the war continues another year, more than half of the man power of the United States will be employed in this manner. This abnormal condition affects our companies unfavorably in two ways: disorganization caused by enlistments and conscription and the advantages in seeking other employment where wages are much higher. We are eager to provide our share of men for the army, but not so willing to see our best men, many of whom have been in our service many years, leave their positions because they find it is difficult to pay living expenses on the most liberal wage that our properties can offer from the revenue secured on a 5-cent fare basis.

Owing to the demands of the war on the man power of the country, the personnel of all business institutions has changed or must soon do so. We can no longer depend on the young men as a potential factor in civilian endeavor and must turn to the man of middle age for the foundation of our organizations. This condition is at once a help and a hindrance in our reorganization work, a help because many of our most reliable employees are men who have been long in our service and make a splendid nucleus on which to build; a hindrance because men of this age who have been accustomed to other kinds of work do not as a rule like either the working conditions or the discipline to which they are subject while employed by a transportation company.

If the subject of this paper can be answered it means the successful operation of our companies, but if an answer cannot be given, it indicates a very serious condition. I will consider the last phase of the subject first and will consider men employed continuously for a period of two years as old employees.

THE OLD MEN IN SERVICE

A fair understanding of the responsibility which both employee and employer should assume in bringing about co-operative efficiency in our organization is important and generally understood by the older employees. Their knowledge and experience is a value to the companies which should receive just compensation. Their being in the minority should not deprive them of their rights to preference earned by faithful service. Their counsel and advice should be frankly sought in solving the unusual problems which now have to be solved. The importance of this cannot be too strongly emphasized.

Accident Prevention Is a Patriotic Duty

Our officials have endeavored to impress upon the minds of all of our employees the fact that accident prevention is a real patriotic duty, that the conservation of men is one of the fundamental principles which must apply in winning the war, and that the closest co-operation between all departments and individuals in the service is imperative in bringing about satisfactory results. And finally we apply a kindly word of admonition instead of a sharp rebuke to those who appear to be slackers in safety work, only applying disciplinary measures when this method fails. We believe good results are being obtained and that perseverance will in a measure bring satisfactory results. H. G. WINSOR.

Unjust criticism and ill-advised censure must be studiously avoided, and the company official should bear in mind the fact that the operation of a transportation company under present conditions brings just as many unusual difficulties to the employee as to the employer. We should not expect our older employees to act any differently as regards changed conditions than we do ourselves. How many of us are there who, under the strain of increased requirements of services to be given in many ways, coupled with steadily increasing demands for compensation, do not at times lose our poise? One of the dangers which should be avoided is to think only of our own troubles.

In my opinion a very large per cent of the old employees can be depended upon to maintain a co-operative spirit in their work even under conditions which reduce to a minimum the opportunity. While many of our old and reliable employees are leaving the service the cause is in most cases a desire to increase the income to meet the higher costs of living and not because of dissatisfaction with operating conditions.

THE NEW EMPLOYEE

In discussing this subject it will be necessary briefly to review the changed conditions brought about by our entry into the war, so far as it affects the personnel of our men. The demand for labor has increased many fold, and with the demand came a natural increase in the value of labor as well as its product. In every line of industry except public utilities these increased values were compensated for by increased prices of products or service, and while, in many instances, wages of men employed by public utilities have been materially increased, the increase has not kept pace with other industries because of our inability to secure increased revenue. In consequence, the type of men applying for work has been more and more unsatisfactory, and many companies have found it impossible to operate cars that were needed because of an insufficient number of competent platform men. This causes criticism by the public, which while demanding more efficient service strongly opposes any increase in fares.

Under such conditions the efforts made to secure co-operation in accident prevention must be planned on the basis of an entirely new condition of operation. Together with the changes brought about by war conditions many of our employees are now organized as labor unions, a majority of the members being new employees who do not appreciate the importance of accident prevention or the close co-operation which should always be maintained between the operating and claim departments. They can see no particular benefit in the smoker or other forms of "get-together meetings" which have been productive of so much good, and their general attitude in a majority of cases is opposed to the spirit of co-operative effort. To overcome this condition both the claim department and operating officials are placed in a position which calls for much thought and diplomatic administration.

As an example of present-day conditions the following may be of interest: During the first three months of this year, the number leaving and entering the service of our company at Tacoma was 42 per cent of the total number employed. During the same period, as compared to the first three months of 1917, car collisions increased 154 per cent, car and vehicle collisions 95 per cent and collisions with pedestrians 142 per cent. A careful investigation of the cause of this increase reveals the fact that inexperience and misunderstanding contributed in a large measure.

Shall we assume that conditions are such that we are powerless to correct the fault? Shall we plead that war conditions are wholly responsible? Not if we expect to maintain good standing in our profession. We must find a solution, and the suggestions which I am about to make are only intended to point to a remedy which is not difficult of application and which if persistently applied should bring about an improvement. This remedy is education.

We can hardly expect a man who has never had experience in operating a street car to understand all of the many details in connection with his work, nor can we reasonably expect that any ordinary man can absorb all of the instruction which he receives at once. Our organization has increased its force of instructors and has applied more comprehensive methods in following up the work done by new men. Our officials have endeavored to impress upon the minds of all of our employees the fact that accident prevention is a real patriotic duty, that the conservation of men is one of the fundamental principles which must apply in winning the war, and that the closest co-operation between all departments and individuals in the service is imperative in bringing about satisfactory results. And finally we apply a kindly word of admonition instead of a sharp rebuke to those who appear to be slackers in safety work, only applying disciplinary measures when this method fails.

We believe good results are being obtained and that perseverance will in a measure bring satisfactory results.

All employees should be encouraged to consult company officials regarding their troubles. They should also be made to feel that any suggestions offered for the good of the service will receive proper consideration and that the company appreciates the interest shown.

The principles involved are as old as time and there is nothing new in application except this—the demands of the times make it imperative that every patriotic citizen do his utmost to conserve this nation's resources.

The Value of Courtesy

The Claim Department Is in a Position Particularly to See Its Importance—In the Event of an Accident Courtesy Has Financial Value

BY F. M. HAMILTON

Superintendent Department of Accident Investigation, Puget Sound Traction, Light & Power Company

MUCH has been said and written concerning courtesy, but it remained for a committee appointed by President Williams of the B. R. T. to place an actual cash value upon this polite and agreeable virtue, for in the report of this committee covering ways and means to offset the rapidly increasing cost of operation they place at the very beginning of the transportation department this item, "Greater Courtesy by Train Employees."

I have no doubt but that every member here present could suggest many ways in which the constant application of this principle would result in great saving of time, which—in the transportation business—is always the equivalent of money.

Courtesy has a maximum value in the transportation business because it is the lubricant which makes it possible to rub elbows with our fellow men without friction, and since the platform men and particularly the conductors of urban and interurban trains are constantly in contact with the public, it is of the utmost importance that these employees in particular be taught to be courteous to the passengers in their charge under any and all circumstances. And although I am not prepared to recommend the general adoption of a cut and dried courtesy code, such as is now in effect on some lines, I do believe that no opportunity should be missed to bring this important matter to the attention of trainmen in every way possible, by bulletins, by daily reminders, by official talks, etc. However, unless the employees are made to realize that courtesy is a big item in that often not clearly definable thing known as "company policy," they are not likely to give it the important place in their daily work which it deserves.

Courtesy in its application to a public utility has a distinct value to the trainman, the company and the public: To the trainman, because it gives him the respect and co-operation of his passengers, and it is a well-known fact that a good-natured crowd can be handled quicker and safer than an ill-humored one; to the company, because it is weighed in the balance of public opinion, which in most cases is formed from a personal appraisal of its servants—the approval or disapproval of the treatment rendered by employees. The courteous man benefits those he comes in contact with by the sheer force of example, and the Bible statement that a "soft answer turneth away wrath" is literally true, and in no company section can this be better illustrated and proved than in the claim department. Let us always bear in mind that courtesy after all is but the exemplification of the Golden Rule.

Courtesy Must be Shown

Everyone having to do with the investigation of claims should be doubly courteous, for often we have to make up for the failure of some other employees to be courteous in the first instance. Always we must remember that the good-will of the public is of vital importance to our companies, and since we are ever ready to settle promptly every meritorious claim we should be able to reject the ones for which we are not liable without offense, even though we cause disappointment. Some people seem to be of the opinion that courtesy is not consistent with firmness, but they are badly mistaken, for only with courtesy is firmness to be distinguished from stubbornness. F. M. HAMILTON.

I daresay that the experience of every one of you has been identical with mine, and that in taking up with claimants or their friends the matter of adjustment, the fact that they have received kind and courteous treatment by the motorman and conductor materially aids in effecting an amicable and satisfactory settlement, while discourtesy and neglect are remembered long after the pain and injury arising from the accident are forgotten. And I know of several instances where claimants have rushed to attorneys for practically no other reason than resentfulness of treatment accorded by crews. If we are right, we can afford to be courteous; if we are wrong, we cannot afford not to be.

We all know and we are ready to grant that the platform man has much to contend with and that he daily and hourly faces a multitude of people with a multitude of trying dispositions. But that is an integral part of his day's work, and he must accept it along with early and late hours, eating his lunch on the run, etc., and it should be thoroughly impressed upon him from the time he first meets the employing official that he must be courteous under any and all circumstances. Now, I am not overlooking the matter of individual temperament or disposition, and the fact that some people are smiling and courteous by nature; that some are polite only when the mood is upon them; and that some belong to the "human crab" type; but these personal attributes should be apparent to the superintendent of employment, and the last class should never be even considered for service requiring close personal contact with the public.

So far I have only dealt with our subject in a general way—or in its direct application to employees coming in close contact with the public. But what about us of the claim department, whose special business it is to investigate accidents and occurrences out of which claims for injury and damage have been presented, or may arise? Are we ourselves alive to the importance of courtesy, and do we apply it to every detail of our business, or are we courteous only in the handling of claims wherein settlement has been determined upon, and neglect being as careful and courteous in explaining our reasons for declining. Everyone having to do with the investigation of claims should be doubly courteous, for often you have to make up for the failure of some other employees to be courteous in the first instance. Always we must remember that the good-will of the public is of vital importance to our companies, and since we are ever ready to promptly settle every meritorious claim we should be able to reject the ones for which we are not liable without offense, even though we cause disappointment. Some people seem to be of the opinion that courtesy is not consistent with firmness, but they are badly mistaken for only with courtesy is firmness to be distinguished from stubbornness.

How a Municipality Teaches Safety

The Work of the Portland Public Safety Commission Is Described—Through Its Efforts Accidents Were Reduced by Half

By H. P. Coffin

Executive Secretary and Manager of the Commission

A PUBLIC SAFETY COMMISSION properly organized is an assurance policy in the hands of a law-abiding communty against traffic violations, excessive speeding and accidents. It differs diametrically from an insurance policy in that it treats with present existing conditions and not the promises to pay of the unfortunate future. It represents primarily an effort to achieve uniformity of action in the field of public safety through the power of a wider public opinion awakened through education, corrective measures and a realization of what constitutes true conservation.

About three years ago this city had an epidemic of autophobia, which had a tendency to terminate in violato-paresis. Finally the Mayor called together a number of influential citizens to study the situation and make recommendations to reduce the hazard. Out of this sprang into existence the Public Safety Commission of Portland which has in this brief period established a national reputation in the results which it has accomplished.

In three years the number of motor vehicles have increased in this State from 23,581 to 50,800. Last year through the work of the commission the accidents were cut in half. Twenty-eight citizens were killed and 846 injured, a large percentage of these injuries slight. In comparison with other cities of this size and taking into consideration our short blocks and narrow thoroughfares, this is much below the average.

During the period of the commission's existence it has standardized the traffic regulations, established uniform signs and signals, perfected the fire drill in the public schools, materially assisted in reducing the fire hazard, introduced into the ordinance the near-side stop of the street car, and the regulation of the jitney. It has secured the centralization of authority over traffic by a designated captain who gives his entire time under normal conditions to this work, initiated a survey of traffic conditions and submitted an elaborate report to the Council with recommendations for the betterment of traffic. Thirty thousand school children have listened to the story of "safety first," with the surprising result that for three months following this campaign not one child of school age was injured in an auto or street car accident.

The commission has also partially fitted out and encouraged the police through uniformed officers to carry on this work through the medium of screen pictures, talks and concrete examples of carelessness which have been shown to you.

19,000 Complaints in Three Years

In the three years that the commission has been active, more than 19,000 complaints have been received and registered covering every kind of traffic violation and accident. This record is maintained in our office at police headquarters for the convenience of the police bureau and the judge of the municipal court.

The good accomplished by the commission has at last been recognized by the city through an ordinance introduced in the Council by the Mayor giving the commission added authority and power which will undoubtedly enlarge its usefulness to the community.

Now that we have a centralized bureau for the handling of traffic, it is our duty to co-operate with the captain in charge by making from time to time surveys and inspections, followed by a vigorous safety campaign among drivers and pedestrians, a full investigation of accidents as a preventive measure, a prosecution of chronic and flagrant offenders and finally, but not the least, the establishment of a bureau for the examination and licensing of auto drivers and their registration at police headquarters for the recording of violations and accidents. Thus keeping in close touch with the traffic, the commission is in position to make unbiased and practical suggestions for the benefit of the whole community and lends encouragement to the police in law enforcement. We have been encouraged by citizens advising us of their experiences in other cities with traffic conditions, complimenting us by a favorable comparison.

We have very little opposition in our work. It's only the malicious and ignorant that respond with "Bunk" when safety first is preached. Our people now realize its importance and appreciate the lack of co-ordination in the past.

Employment of Women in Railway Work

How It Will Affect the Claim Department—Experience in New York, Brooklyn and St. Louis Indicates They Are Well Qualified for Railway Work

BY THOMAS G. ASTON
Claim Agent, The Washington Water Power Company, Spokane, Wash.

RAILROADS, both electric and steam, have employed women in some branches, and the number of branches in which they are employed is gradually increasing. The question for us to consider is what effect this employment of women in electric railway work will have on the work of the claim department. There is little precedent on the subject which can be used as a guide.

It is always to the advantage of the claim department to have all persons engaged in railroad service absolutely loyal and undivided in their support of the company for which they are working, and one of the first questions that arise is whether men and women will work in harmony in this class of work. Where there is the union and the union rules will not recognize women, opposition by the men on this ground will have to be met. Where the open shop rule prevails, undoubtedly the union men on the railroad will be slow to aid the incoming woman. Then, there is the general antagonism on the part of many men against the introduction of women in any line of life or work that heretofore has been peculiarly the field of man. It is like the opposition of man to woman suffrage and to the work of clerks, stenographers and bookkeepers now commonly done by women with no thought of the propriety or impropriety or anything except of the physical and mental fitness for the job.

Women Operators Will Succeed

It is my opinion that because of the simplicity of operation of electric street cars in the United States, women can be as successful as drivers and conductors as men. It is a well-known fact that women become expert chauffeurs and show quickness of thought and excellent judgment in emergencies in the operation of automobiles. It certainly would not be any harder for a woman to drive a street car than it is to drive a large high-power automobile. Experience shows that women drivers of automobiles do not have as many accidents in proportion to the number of drivers as do men. The experience is the same in connection with the operation of elevators. It can be admitted that women are of a more nervous temperament than men, but it is also admitted that women are more cautious and are less reckless than men. It is the general opinion that they may become excitable and lose control of the machine when contending with congested traffic conditions. The correctness of this view is challenged. They are not so likely to take a chance, and the taking of chances is accountable for a great many accidents.

—THOMAS G. ASTON.

In Brooklyn and New York, the Central Labor Union protested to the Public Service Commission against the employment of women on electric railways, but the commission responded that it had no power to exclude any applicant from employment by reason of sex.

Information has been received that in one city where women conductors have been employed, there was a disposition on the part of the men to start the cars without signal from the women conductors and it is the belief of the employer that this was done deliberately. Whether or not unionism had anything to do with this, the information does not state. There do not seem to be any reported cases showing opposition to employment of women other than that furthered by unions as reported herein. In Italy, France and Great Britain, women have been very generally employed in this work and the general public not only in the United States but also in Europe received the introduction of women in this work with much favor.

To learn the experience of people in the United States, a circular letter, containing the following questions, was sent to ten companies operating street cars:

1. What has been your experience in regard to the reduction or increase of accidents since you began to employ women?
2. What effect has it had upon the public—are they antagonistic or favorable toward employing women?
3. Have you found that disorderly passengers have taken advantage of the fact that women instead of men are operating your cars?
4. How do they conduct themselves at the scene of an accident?
5. How do they respond to an emergency?
6. What success do they have in getting information and securing witnesses at the scene of an accident?
7. Have you or have you not found them sympathetic with the injured party to the extent of admitting liability?

The responses brought the information that New York, Brooklyn and St. Louis are the only places where women are employed in this work. From New York and Brooklyn we are told that accidents have not increased, that the public seems favorable toward women conductors, that disorderly passengers have taken no advantage of the fact that women were used instead of men, that women conduct themselves very well at the scene of an accident, that they respond fairly well to an emergency, that their reports of accidents and the securing of witnesses seem as adequate as those of the men, that they have not been found sympathetic to the extent of admitting liability. From St. Louis, Mo., we learn that the general public was favorable toward employing women, but the Central Trades & Labor Council and its members were against it, that disorderly passengers have not taken advantage of the fact that women were operating the cars, and that they conduct themselves in an agreeable manner at the scene of an accident.

WOMEN WELL FITTED FOR THE WORK

The rapid growth of commercialism in this country has given to women positions which were formerly occupied by men. The hesitation and timidity that formerly possessed women when seeking employment away from the home is passing away. Men and women commingle and work together in many branches of industry. In all work, not requiring physical strength, they become as efficient as men. It is the opinion of the writer of this article, that because of the simplicity of operation of electric street cars in the United States, women can be as successful as drivers and conductors as men. It is a well-known fact that women become expert chauffeurs and show quickness of thought and excellent judgment in emergencies in the operation of automobiles. It certainly would not be any harder for a woman to drive a street car than it is to drive a large high-power automobile. Experience shows that women drivers of automobiles do not have as many accidents in proportion to the number of drivers as do men. The experience is the same in connection with the operation of elevators. It can be admitted that women are of a more nervous temperament than men, but it is also admitted that women are more cautious and are less reckless than men. It is the general opinion that they may become excitable and lose control of the machine when contending with congested traffic conditions. The correctness of this view is challenged. They are not so apt to take a chance, and the taking of chances is accountable for a great many accidents.

It may be that the time will come in this country when we will need to employ women in the mechanical departments of steam and electric lines. A long war may force this necessity upon us. If that time does come, there seems to be no good reason why women cannot fill the positions except where great physical strength is required. In view of the various mechanical devices for lifting heavy articles which are used in all well-equipped shops, it would seem to be an unusual circumstance that would require more strength than women possess.

Venturing an opinion on this subject, I would say that women can successfully perform not only the duties of motormen and conductors but also most of the work in the mechanical department now done by men.

Prevention of Automobile Accidents

Driver Usually Is to Blame but He Should Be Taught to Exercise Greater Care—Safety First Efforts of Motormen Effects 33⅓ Per Cent Reduction in Accidents

BY W. H. MOORE
Claim Agent, San Diego (Cal.) Electric Railway

CAUSES given for automobile accidents embrace almost every excuse that can be in any way connected with an automobile or street car, but the underlying cause of most accidents is carelessness on part of the driver of the automobile. In fact, the records show that he is responsible for 90 per cent of them.

In justice to him we must remember that the number of automobiles in use greatly exceeds the number of street cars. We must also consider that the driver of an automobile holds a decided advantage in the way of prevention, on account of being able to change his course at any time and because he is reminded of the presence of street cars by tracks upon which they run. The difference in favor of the motorman is largely due to the systematic training which he has received in being taught the necessity of attending strictly to his duties so that no careless act of his may cause an accident. By its system of training, accidents of all kinds on the San Diego Electric Railway for 1917 were reduced 33⅓ per cent below those of the preceding year, with the same number of cars operated, while the number of automobiles greatly increased.

If auto drivers knew something of the distance required to bring a heavy street car to a stop under various conditions it would go a long way toward discouraging the practice of autoists stopping upon car tracks in advance of approaching cars with a feeling of security that the street car must stop for them. The average automobile driver may have a thorough knowledge of his car but knows little or nothing of the control of a street car or railway train. No doubt, the majority if not all members of the Pacific Claim Agents' Association drive automobiles, but it is safe to say that none of you take any chances by driving upon car tracks in advance of cars approaching at high speed, because the danger to you is apparent on account of your knowledge of the control of the street car, while perhaps the thought has never occurred to your brother autoists.

Safety first should also be taught in the public schools as a permanent branch of the common school education. The lessons could be worked out in a practical manner and entered in the text-books graduated to suit the different grades of the schools. The object in attending school is to acquire knowledge and store it away for future use, and it is just as essential to the future welfare of a child that he be trained in the art of protecting life and limb as to be able to name the wild animals that inhabit a foreign country. The safety-first training now carried on in the public schools has no doubt accomplished a great deal of good, but the plan just described would be more thorough as well as productive of more lasting results.

As a farther prevention of automobile accidents there should be a uniform set of simple traffic rules in all Pacific Coast States, and, one of the most important clauses in such a law should be to make it a misdemeanor for a person carelessly to cause a hazard of accident. Such a clause would be warranted because a person who carelessly causes a hazard is equally guilty with the person who has caused an accident, because if an accident was averted it was not due to any care of good judgment on part of the party causing the hazard, but owing to circumstances or the presence of mind and quick action on the part of some other person. Such a law would also discourage the beginner from driving into the congested district of the city before he became proficient in the operation of his car. If the motorman of a street car knowingly indulges in carelessness to the extent of jeopardizing the safety of others, he is quickly deprived of his right to operate a car, and there is no reason why the heedless automobile driver should not suffer the same fate.

We have traffic laws, but to enforce them seems a difficult problem. One plan would be to have a certain number of the police in each city assigned exclusively to safety duty. This would give such officers ample opportunity for the enforcement of traffic rules and at the same time they would be unable to wink at violations of the law under the pretext of attending to other duties. If they did so their neglect would become so apparent that they would soon be called to account. There should also be a traffic ordinance in every city, giving the street car the right of way at street intersections. Such a law is warranted for the safety and convenience of the public, if for no other reason. As a farther prevention of automobile accidents every motor propelled vehicle should be compelled to carry a sign inside the dash in a conspicuous place containing at least a dozen of the most important rules for the prevention of accidents. As a sample of such rules "Look both ways for approaching cars before driving upon car tracks," could be used. These words would soon become so firmly impressed upon the minds of the drivers that when a driver approached a railway track the subconscious thought would assert itself and prompt him to look before driving across.

Written Discussion on Mr. Moore's Paper

By J. S. Mills

Claim Agent, San Francisco-Oakland Terminal Railways

IT IS NOT my understanding that the object of this discussion is to find out what to do for ourselves so much as to find out how to obtain co-operation from automobile owners and drivers. Personally, I am very skeptical of any method which depends upon persuasion for its effectiveness. Education by way of illustrated pamphlets and newspapers is helpful to thoughtful people, but they give the least trouble. It is the thoughtless and reckless drivers whom we want to reach and no amount of literature seems to have the least effect upon them. To them, the much abused slogan "Safety First" is merely a catch phrase. It has no meaning.

The increasing number of automobile accidents clearly indicates the necessity for action along more effective lines than have been proposed by Mr. Moore.

Necessity always provides a remedy, and no great reform was ever brought about until the people were made to see the necessity for it, after which laws were promptly made to meet the demand. For example, the need for safety appliances in shops and factories and better railroad equipment was recognized and a considerable agitation of the subject was necessary to arouse the people, but the ever-increasing number of workmen minus fingers, arms and legs finally resulted in the passage of laws which enforced their installation. It was the same when the care of injured workmen was recognized as an unjust burden on charitable institutions and some form of insurance was demanded that commissions were appointed to investigate and their reports resulted in the adoption of workmen's compensation and insurance laws.

At the present time great numbers of people are being killed and injured by automobiles whose owners have no property other than the machine, and oftentimes only a small interest in that. In consequence, the dependents of the killed have no recourse at law, the injured must pay their own bills, and if unable to do so become burdens on the communities in which they live. In this situation the only remedy would seem to be the addition of a clause to existing state motor vehicle laws, making insurance against personal injuries compulsory. We are not entirely without experience in the workings of such laws, for when the "jitney disease" was at its height, city ordinances provided that a certain amount of insurance must be carried fully to protect passengers in the event of injury.

I am thoroughly convinced that if automobilists were compelled to carry insurance covering personal injuries, nearly all the reforms desired would soon be accomplished, among them the much desired examination and training of operators in the same manner as is now practiced by street car companies in the selection and training of motormen.

Moving Drafted Men Via Electric

Government Accepts Electric Railway War Board's Offer of Facilities—Work Will Be Nation-Wide

HENCEFORTH, as rapidly as the plan can be extended over the country, the transportation of drafted men for the United States Army will be carried on by electric railways. This is the result of a tender of such facilities by the War Board for the relief of the congestion on steam railroads.

After negotiations with government officials, it has been arranged that all drafted men will move by electric lines from the territories served by them direct to the different camps. If no through electric routes are available, the electric lines will be used to convenient junction points with steam railroads, provided the facilities of the electric lines are adequate to afford the services required for the entire movements and provided the steam trains later used do not originate at the same points as the electric trains.

The War Board has been requested by the official in charge of draftees to give information pertaining to the ability of electric lines to handle movements, prior to the issuance of government orders. Consequently the board is urging companies to furnish the data needed, such as schedules, maps and other traffic information for the preparation of itineraries if these are called for.

The compilation of such information is already under way for three states, Ohio, Michigan and Indiana. C. J. Laney, W. S. Rodgers and F. D. Norveil, representing the electric lines in these states, have been in Washington, and their surveys of the possible use of the electric lines are as follows:

A check of the drafted men to move on June 24-29 from Ohio county seats to Camp Sherman at Chillicothe shows that out of 800 men the interurbans can handle at least 50 per cent. The electric lines can move men from fifty-five counties out of a total of eighty-eight. The general movement will be as far as Columbus, since the interurban line from Columbus to Chillicothe is third-rail and cannot interchange cars with the other lines entering Columbus.

In Michigan out of a total of 7000 draftees to be moved at the end of June the electric lines can handle 4795 men in a period of five days.

From Indiana 1000 drafted men must be moved on June 24-26 to Camp Sherman. A large number can be handled to great advantage by the electric lines, and these will agree to carry from 45 to 50 per cent of the men over a five-day period. Delivery will be made to steam railroad connections.

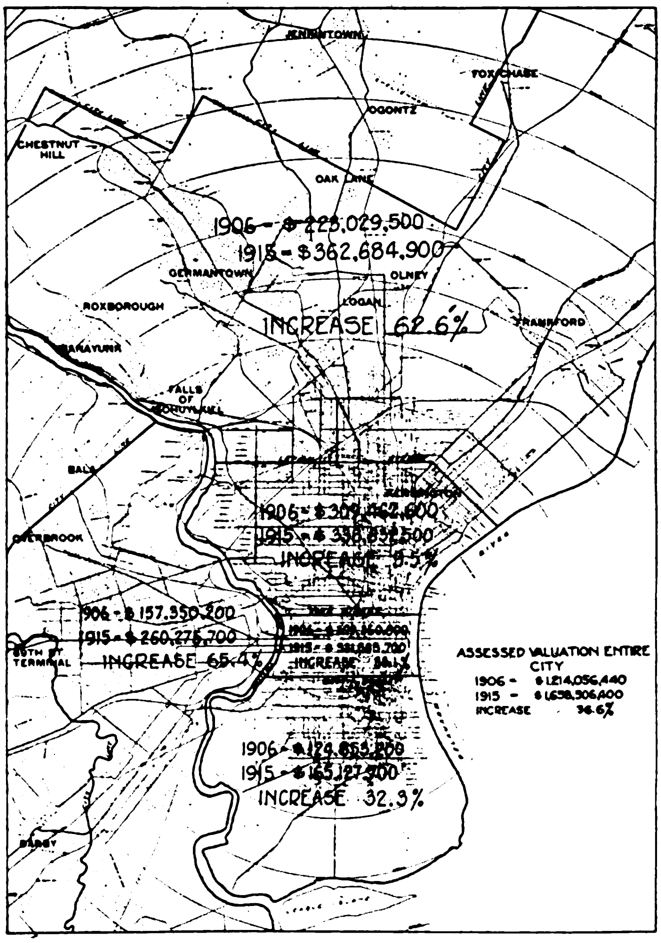
The shipbuilders of the Bay Cities, California, had a riveting contest as a feature of their picnic at Idora Park, Sunday, June 19. Through the courtesy of the San Francisco-Oakland Terminal Railways, the pneumatic transfer compressed air battery of six 11-ft. compressors was loaned to furnish the driving power.

No Abnormal Tax Increase from Rapid Transit

Shifting of Population and Values in Other Sections Neutralizes Increase in Assessed Valuations in Districts Immediately Served

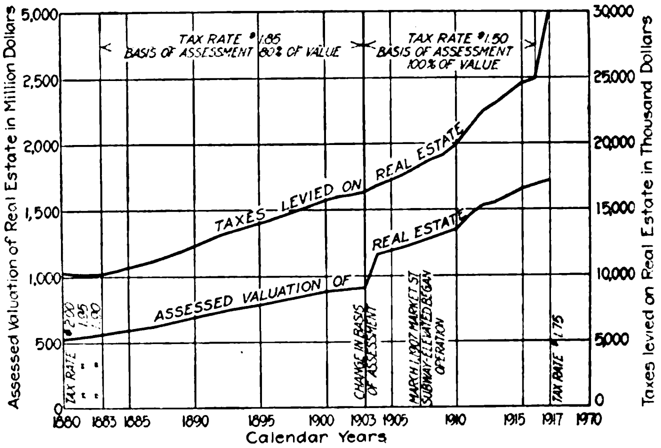
THE report of the Department of City Transit, Philadelphia, Pa., for the calendar year 1916 contains as one of its parts a noteworthy discussion of the effect of rapid transit construction upon real estate values and taxation. The report in general is a detailed statement of the negotiations and the engineering work for city-built rapid transit lines in Philadelphia from the time William S. Twining assumed the directorship of the department in February, 1916, up to the end of that year.

The report explains that prior to that time no final contracts had been drawn. The Department of City Transit had leaned toward a uniform 5-cent fare, with any city deficits to be borne by the general tax revenues. With Mr. Twining's advent recommendations were made in regard to changes in the construction schedule the unification of the city's and the company's systems, and a flexible fare meeting the cost of service. The report describes in detail how a substantial foundation was laid during 1916 for the building of an acceptable contract for the operation of the new lines by the Philadelphia Rapid Transit Company—a development which has now reached its final stage.



COMPARISON OF INCREASES IN ASSESSED VALUATIONS BY SECTIONS IN PHILADELPHIA

In the course of his report Mr. Twining mentions how he took exception to the premises formerly held by the municipality—namely, that the expansion of a city, due to rapid transit lines, will increase abnormally the total assessed value of the city's real estate; that its tax revenues will thus be abnormally increased, and that this abnormal increase should be available for meeting city deficits arising from the building and the operation of the rapid transit lines. In Mr. Twining's opinion, rapid transit lines are unquestionably an indispensable factor in developing suburban real estate, but it has never been proved that such development produces an abnormal increase in the total assessed valuation of a city. It undoubtedly produces a large increase in the districts immediately served by the rapid transit lines, but the shifting of population and values in other parts of the city which results from the building of these lines, largely neutralizes this increase. As a result, no abnormal increase can be detected in the assessed valuation of the property in the city when awarded as a whole.



ASSESSED VALUATION AND TAXES ON REAL ESTATE IN PHILADELPHIA

As tending to confirm this statement, Mr. Twining introduces in his report the accompanying diagram and map showing the assessed valuation in Philadelphia over a period of years. It will be noted, he says, that there is no abnormal increase to be detected due to the opening of the Market Street subway and elevated, which occurred in 1907. The assessed valuations of the city's real estate show a fairly uniform increase year by year. Some sections of the city show large increases and some are stationary or show a decrease. Mr. Twining does not dispute that a large increase in the assessed value of real estate in West Philadelphia took place following the building of the Market Street line. In considering the tax revenues of the city as a whole, however, he can detect no abnormal increase attributable to rapid transit.

In short, Mr. Twining thinks it a false assumption that an abnormal increase in tax revenue will be created as a result of building and operating rapid transit lines, and that without an increase of tax rates there will be a surplus of tax revenue available for meeting deficits. This assumes that there is a profit to a city resulting from its current taxes, whereas it is usually described as operating at cost, hence without profit.

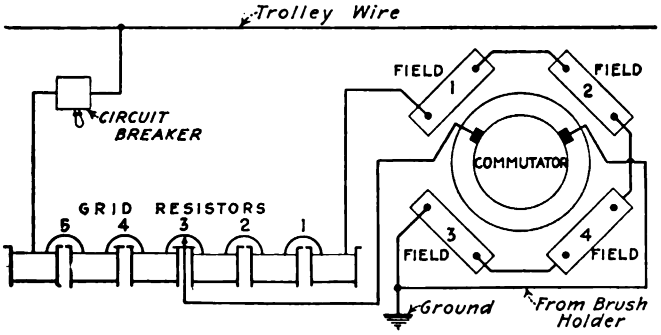
Using a Series Motor for Emergency Constant-Speed Work

Description of the Methods by Which the Fields Are Connected in Series With Resistance As a Shunt Across the Armature

By F. J. Foote
Master Mechanic Ohio Electric Railway Company, Columbus, Ohio

IT IS FREQUENTLY very convenient to use a railway motor that is built for series operation for driving a machine or line shaft in a railway shop. In these cases it is nearly always desirable to operate the machine at as nearly constant speed as possible. It is well known that a series-wound motor will speed up when the load is light and slow down when the load increases, thus giving very unsatisfactory operation for many uses. It is, of course, possible to rewind the field coils so that the motor may be used as a shunt motor, and where it is to be used for an extended time this should be done for economic reasons.

However, for work that is more or less temporary the following arrangement has been found by the writer to give very satisfactory results, as the maximum of speed adjustment and the minimum of power consumption is secured thereby. The method consists in placing sufficient resistance in series with the fields to hold the current down to a safe value when connected directly across the line, and then connecting the armature across from the point on the resistance that gives the desired speed to ground.



SERIES MOTOR ARRANGED FOR CONSTANT-SPEED OPERATION

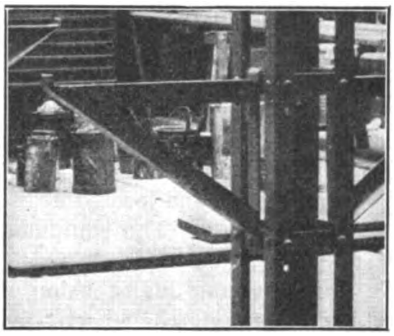
An accompanying diagram shows the connections for a railway motor used recently for temporarily driving the stokers on a battery of boilers, while the stoker engines were being repaired. The sketch shows the fields and armature of a four-pole motor. The grid resistors used consisted of some sections from a car. Enough of these grid sections were used to reduce the current to something less than full load for the motor. The fourth field was connected to ground, the first field to the resistance, and the resistance was connected through a circuit breaker to the trolley wire. This made the field circuit complete.

To furnish the voltage for the armature the cables from the brush-holders were connected, one to ground, the other to some point along the resistance, such as 3. If this gave speed too low, the connection was changed to 4 or 5; and on the other hand, if the speed was too high, the connection was changed to 2 or 1, as needed.

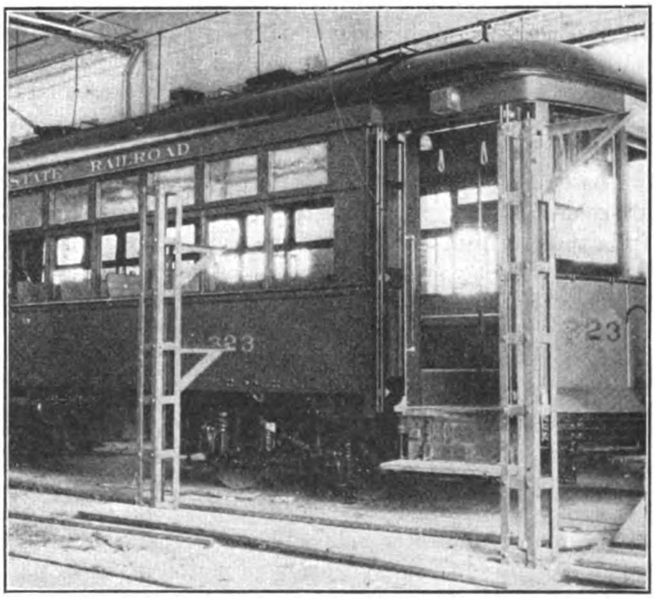
Of course, there was a waste of energy in this arrangement, but being only temporary, it was decided that this would be less expensive than to rewind the fields for shunt operation. The writer has tried various plans for using series motors for constant speed work, but the one just described is the most convenient and flexible, and has proved to be the most satisfactory of any of them.

Angle-Iron Posts for Car Painter's Platform

IN THE paint shop of the Empire State Railroad, at Lake Junction, near Syracuse, N. Y., rows of posts like those shown in the illustrations are installed between tracks for the purpose of supporting planks from which the painters work. These posts are set a couple of feet in the concrete floor and extend about 7½ ft. above the floor. The posts are made of 2-in. x 2-in. x $\frac{3}{16}$-in. angles connected by 2-in. x ¼-in. flat steel pieces. These are riveted to the angles and are spaced on 15-in. centers from the bottom to the top of the posts. The brackets for the planks are also made up of angle iron of the same size as that used in the posts, the upper part of the bracket being 20 in. long. The back of the bracket is formed of a piece of flat steel, 2 in. wide, with the top bent over to form a hook. At the outer end the upper side of the horizontal angle is turned up to form a toe to prevent the planks from slipping off. The bracket is held in place by its own weight and is very easily moved. A typical steel city car from the Oswego division can be seen in the background in the lower picture.



CLOSE-UP VIEW OF BRACKET



ANGLE IRON POSTS IN LAKELAND PAINT SHOP, EMPIRE STATE RAILROAD

Substation Equipment for St. Paul's New Electrification

The Spokane River Hydraulic System Supplies Power to This Substation at 102,000 Volts, Using Three-Phase Alternating Current

THE substation equipment for the Columbia River division of the Chicago, Milwaukee & St. Paul Railway, now being electrified, will be similar to that used on the original Montana electrification of this railway. The modifications which will be made have been shown by experience to be desirable or necessitated by the difference in operating conditions.

Power for this division will be supplied in the form of three-phase, 60-cycle, 102,000-volt alternating current from the Spokane River hydroelectric system of the Washington Water Power Company. The high-tension line will parallel the railroad and, looping into the substations, will form the high-tension bus for each station. In the stations the current will be stepped down to 2300 volts and then transformed by motor-generator sets into 3000-volt direct current for train operation. There are to be three substations altogether, spaced approximately 30 miles apart and located at Taunton, Doris and Kittitas respectively. The equipment in each will be practically the same.

The incoming high-tension line will enter the substation through condenser-type bushings and will be controlled by a 3-pole Westinghouse type GA oil circuit breaker, arranged for remote mechanical operation and providing automatic protection against overloads and reverse power.

The transforming equipment is designed on the unit basis; that is, there will be a transformer for each motor-generator set, and no low-tension buses will be provided. The Taunton station will have two such units, to be immediately installed, giving it a capacity of 4000 kw., and the other two stations will each ultimately have three units, providing a capacity of 6000 kw. each.

The transformers will be of the oil-insulated, tubular, air-cooled, shell type, connected star-delta, with several full-capacity high-tension taps to provide the necessary flexibility. The normal capacity of each transformer will be 2500 kva., but they are especially arranged to carry the high overloads encountered in railway service. The ventilating ducts and the coils are vertical, so that the oil in absorbing heat from the coils flows upward in the natural direction, thus preventing the formation of hot spots under short-time heavy peak loads. Each transformer bank will have a type GA circuit breaker which provides overload protection.

The motor-generator sets will each consist of a 2800 hp., 2300-volt, 14-pole synchronous motor of 514 r.p.m., coupled to two 1000-kw., 1500-volt direct-current generators connected in series. Both the motor and the generators will be separately excited by means of direct-connected exciters.

The normal rating of the sets will be 2000 kw., but they are designed to carry 3000 kw. for two hours and 6000 kw. for five minutes. These very severe overload conditions make good commutation an absolute essential for satisfactory operation. As a 6-pole generator possesses inherently the best commutating characteristics and will handle excessive currents without flashing, this type was adopted for these sets. It is recognized, however, that a short-circuit on the direct-current line at or near the substation will result in currents that would ordinarily cause flashing, but special arrangements have been made that will suppress flashing even under these extreme circumstances. The method employed was fully described in the ELECTRIC RAILWAY JOURNAL of May 4, page 858.

Because of the use of regenerative braking by the locomotives, the generators will at times operate as motors. For this reason they will be shunt wound so as to avoid the difficulty of operating differentially-wound motors in parallel, and to obtain satisfactory division of a heavy regenerating load without careful attention on the part of the operators.

The load factor on these substations will be comparatively low, so that it is desirable to eliminate as many continuous losses as possible. An interesting means for accomplishing this result is the use of separate motor-driven blowers which are automatically started when the temperature of the motor-generator sets reaches a predetermined degree. During periods of light loads or short-time peaks, the motor-generators will operate well within safe temperature limits without forced ventilation, but when the loads are heavy the necessary ventilation will be provided. In this way the expense of operating the ventilating sets during light-load periods is avoided.

In order to provide maximum protection to the operators, the control of the 3000-volt direct current has been designed in accordance with high-tension alternating-current practice. The circuits will be completely separated; all breakers and switches will be controlled from a gallery above the operating board; and it will be possible to isolate the station from the railroad operating system by means of remote controlled switches in the feeder circuits which can be opened under load. The normal control of the outgoing feeders will, however, be by type GA circuit breakers with overload and reverse power protection. Electrolytic lightning arresters will be mounted on the roof of each of the substation buildings.

All the equipment for these stations is being supplied by the Westinghouse Electric & Manufacturing Company.

Convict Labor Rebuilds Power Plant

The United Gas & Electric Engineering Corporation has recently completed the rebuilding of a plant in Leavenworth, Kan. This work was carried on under difficult conditions as regards labor. The construction dragged very slowly until the Leavenworth company succeeded in obtaining permission from the Governor of Kansas to use labor from the State penitentiary at Lansing. The convicts were very glad to get a chance at work of this kind affording much more freedom and enjoyment than the humdrum prison life and it made the early completion of the work possible. In rebuilding the plant new equipment was installed consisting of stokers, boilers, a 1500-kw. turbine, a new concrete stack and a new condensing equipment consisting of a pumping pit in the river connected to the plant by 1500-ft. pipe lines.

AMERICAN ASSOCIATION NEWS

Jitneys Waste Man-Power

Letter from W. V. Hill of the War Board to General Crowder Says They Are Non-Essential

ON MAY 31, W. V. Hill, of the American Electric Railway War Board, wrote to Maj.-Gen. E. H. Crowder, Provost Marshal General of the Army at Washington, as follows:

> Referring to your announcement with respect to amending the selective service regulations dealing with habitual idlers and men engaged in non-useful pursuits: In this connection I desire to call to your attention a class of men who are engaged in the so-called jitney-bus business. There are thousands of them most of whom are within the draft age operating these vehicles throughout the country in competition with electric railways, thus performing a duplicate and unnecessary service to the public. This service can and should be performed by the electric railways.
>
> For illustration, take the situation in San Francisco, Cal.: There are approximately 500 jitneys operating on Market Street competing with the electric railway service for a distance of 3 or 4 miles, for they will not compete on long hauls. The car service is ample to handle all of the traffic, but as a result of the jitney competition the cars are obliged to operate with very light loads during most of the hours of the day.
>
> It is therefore evident that the jitney is a non-essential, consuming large quantities of gasoline, rubber, steel, etc., as well as wasting man-power, for it will take the services of twelve men operating jitneys to perform the service of transporting the number of passengers occupying the seats of one street car which requires two men to operate.
>
> On the other hand, some of the electric railways of the country have furnished as high as 40 per cent of their trainmen to the government under the selective draft act. The result is, they are confronted with a very serious problem of furnshing ample transportation facilities to shipyards, plants and industries engaged in manufacturing war materials—all of which are very essential to the proper conduct of the war.
>
> The electric railways, unlike many other industries, have derived very little benefit by reason of the war, for the increased cost of operations, both in labor and materials, have placed these properties in serious financial condition, and state and municipal authorities have been slow to respond to their appeal for increased fares. This in brief is our situation.
>
> We therefore trust you will give careful consideration to the foregoing, as it is an important factor to our government, depending upon us to keep open the arteries of transportation as indicated above.

Bulletin on Housing Law

THE American Electric Railway War Board has issued Bulletin No. 25 giving the text of the federal housing act, approved on May 16, under which the President is authorized to purchase, acquire by lease, construct, requisition or condemn electric railways if needed to provide housing for war workers.

Support for the War Board

A REFERENCE was made last week to a circular letter on the work being carried on by the War Board in Washington sent by the American Electric Railway Association to those companies which have not yet contributed to its support. The explanation is made in this letter that it has been the policy of the board since its inception to represent all of the electric railways individually and collectively and not simply the members of the association, so that it is being sent to all companies. The members of the board serve without compensation, but certain expenses are inevitable, such as office rent, collection of data, etc. Each road is being asked to contribute in proportion to its gross income. So far 126 roads in the United States have contributed $23,275, but the time has come when additional revenues are needed.

Pamphlet on Freight Haulage

THE American Electric Railway Association has had reprinted in pamphlet form the article by A. B. Cole on freight haulage on electric railways, published in the issue of this paper for May 11, and is sending copies to members of the Chamber of Commerce of the United States and other commercial organizations as well as to a number of manufacturers. Additional copies can be secured from the association office at a price of 10 cents each.

Toledo Section Elects Officers

A MEETING of members of the joint section of the Toledo Railways & Light Company and associates at which officers for the coming year were elected was held on the evening of May 24. Interest in the election was very keen, the candidates for office having held a meeting on May 7 with the nominating committee to decide the manner in which the election should be conducted. After considerable discussion, it was decided that all those running for office should be provided with electioneering cards similar to those used by candidates for city offices, etc. In this way all prospective office holders were able to present their own reasons as to why they felt they were best qualified to fill the office for which they were running. As a consequence, it was no uncommon thing during the campaign to hear two rival candidates expounding their individual merits before different members of the joint section.

As a result of the interest felt in the election 250 members were present, and as the results were bulletined much good-natured bantering was evident. The officers elected were as follows:

Chairman, G. E. Snider, engineering department; vice-chairman, J. J. Duggan, Acme Power Company; financial secretary, J. L. Wright, electric meter department; treasurer, M. K. Thomen, engineering department; secretary, G. E. Lafferty, general office; members of executive committee, T. J. Nolan, H. Friede, and William Long.

To indicate the interest in the Toledo Section, it is worthy of mention that on May 24, 1917, the beginning of the first joint section year, there were 335 members. On Jan. 1, 1918, there were 292 members, and on May 24, 374 members. From May 24, 1917, to May 24, 1918, 159 members were dropped from the rolls due to the draft, enlistments, and other reasons, but during the same period 194 employees applied for membership, so that had the war conditions not come the section would probably now have 500 members. Eighty new members were admitted since the meeting of May 7.

Prior to the final result of the balloting a musical program, in charge of L. D. Scouten and F. M. Sommerville, was rendered by the boys from the Starr Avenue carhouse. At the conclusion of the meeting a buffet lunch was served.

LETTERS TO THE EDITORS

Are Reconstructed Safety Cars Worth While?

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION

DALLAS, TEX., May 30, 1918.

To the Editors:

Several of our members are interested in the subject of changing ordinary single-truck, double motor two-men cars with hand brake equipment into front entrance one-man cars, and I would like to have some data showing whether such cars could be reconstructed into one-man safety cars with efficient results. There are many types of old cars whose design lends itself to such reconstruction, so far as the mere mechanical conditions are concerned, while there are other types with which such reconstruction is out of the question.

A recent survey of this matter throughout the Southwest has led me to the conclusion that it will eventually pay almost any street railway a better return to use the complete one-man safety car rather than the reconstructed car. Recent observation and information have pretty well demonstrated that the average old type, single-truck car weighs too much per passenger for economical rapid acceleration and retardation and that a 30-in. wheel necessitates not only higher steps, which tend to delay loading and unloading and to increase step accidents, but the additional height of the car from the track seems to add greatly to the "jerk" made during rapid acceleration and braking. So far as the safety devices for the doors, the "dead-man's handle" and the fare receiving and recording devices are concerned, these can be placed on any car and will probably be as efficient on one type as another.

The main factors in favor of the safety one-man car specially built for the purpose are its smaller weight per passenger capacity and the lessened distance of the car floor from the rail. The front entrance is, of course, a necessity both from the point of fare-taking and recording and also from the fact that the passengers entering and leaving are less liable to be injured by extremely rapid acceleration and retardation, the tendency of such being to aid in "welcoming the coming and speeding the parting passenger" and doing so in such a manner that he is not thrown backward in either case.

I have been enabled in two cases to watch the parallel operation on the same lines of a car specially built for this purpose and reconstructed cars, the safety one-man cars being used on regular schedule and the reconstructed cars as fillers-in during rush hours. A very close record shows that the passengers prefer the first type and that there is with this type a distinct difference in the time of acceleration and braking at each stop. Meters on all of these cars show a distinct and quite large saving of current used in favor of the car built specially for the purpose. The "reconstructed" cars in both these cases have really had nothing added to them except certain of the safety devices—not including the dead-man's handle. They were equipped with 30-in. wheels, one step to the platform and motors of ample capacity for their previous two-men operation, and they were of comparatively light weight for their passenger capacity

In these two cases the difference of economy of operation and satisfactory service to the public were so marked that it would seem to be unwise to reconstruct cars fully for safety one-man operation as under no conditions of traffic would they approach the "100 per cent service," which is possible with a car built specially for the purpose.

As this is an important matter with many of our members at the present moment, I would be very glad to have, from any of your readers who have tried reconstructing cars for this purpose, the operating and financial results obtained from a reconstructed car, as well as opinions as to the desirability of so doing.

H. S. COOPER, Secretary.

Use Auto Trucks With Flanged and Rubber Tires

CLEVELAND, OHIO, JUNE 7, 1918.

To the Editors:

The insufficiency of steam road terminals and the lack of equipment of electric interurbans brought into use last winter the auto truck for both short-haul and long-distance freight transportation. That the need of this departure was great and the service helpful, goes without saying. The cost, however, was terrific—first, in the economic waste of the small unit, second, in the destruction of miles of improved highways, and, third, in the millions that now must be spent in the repairs yet to be made.

It is no stretch of the imagination to say that for every dollar earned, $10 was either wasted or destroyed. Economic laws will eliminate the waste, but it is only improved service both in cost and time that will save the roads which otherwise must be destroyed in a short time.

As I see it, this can be brought about by the interurbans, and, at the same time, give to these struggling roads an increase of revenue which most of them so sorely need. How? By the interurbans entering the field not only as transporters of freight over the rail, but as deliverers of the same freight by auto truck when the end of the rail route is reached. To accomplish this all that needs to be done by the interurbans is to purchase auto trucks and equip these trucks with flanged wheels and couplers. When single trucks are to be used, couple them on to "locals;" when many are to be run, move them in trains. When the end of the rail route is reached, place on the wheels demountable rims with truck tires. The truck then will be ready for house to house delivery. By route-sorting the goods at the point of origination instead of at the destination, the labor necessary in loading and unloading will be saved. The cheapness of electrical rail movement is so great over that of a gasoline-propelled car operating on brick pavements that competition will be entirely out of the question.

The thought herein expressed came to me as I was driving over a new pavement completely destroyed last winter. I am submitting it to the operators of interurban properties for what it is worth.

PETER WITT.

News of the Electric Railways

TRAFFIC AND TRANSPORTATION
FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Labor Hearing June 24

General Labor Principles Will Be Discussed Before Messrs. Taft and Walsh at Washington Session

A question of great importance to electric railways is to be argued in Washington on June 24 before Messrs. Taft and Walsh, joint chairmen of the Federal War Labor Board. This is on the point as to whether the lack of financial ability is to be considered a bar against the payment of higher wages to dissatisfied employees. In recent years several arbitration boards have held that employees are entitled to a proper standard of wages even though the employer may be able to show that financial disaster may result from taking on the additional burden. This is of particular interest to public utilities which are in the dilemma of not being able to raise the price of their product to meet the extra charges. In this connection, the board also has been asked to point a way out of the difficulty by suggesting measures of relief in the event that higher wage scales are established for any of the parties to the proceedings.

CASES MULTIPLIED RAPIDLY

These developments are the result of controversies over wages for employees of the Detroit and Cleveland companies, and more recently for those working in Chicago, East St. Louis, Scranton, Newark, N. J., and Portland, Ore.

The Chicago hearing took place on June 12, after appeals to the board by employees of the Chicago Surface Lines, the Chicago Elevated Railways, the Chicago & West Towns and the Evanston (Ill.) Railway companies. The case of the Surface Lines was peculiar in that the company had not submitted to the jurisdiction of the board while the employees and the city, as partner in the net receipts, had done so. Attorney W. W. Gurley for the company referred to the fact that the present contract does not expire for two years and said that while the men might be entitled to more pay the financial condition of the company would not warrant such expenditure. He said that until the board could point a way out of the difficulty the Surface Lines would not agree to a joint submission.

A new point was presented by Attorney F. H. McCulloch for the Evanston Railway, who said there are no war industries in that city, and he did not see where the War Labor Board could assume jurisdiction. This company has usually followed the Surface Lines in fixing a wage scale, but the lawyer said if there is to be any submission he would insist on a separate hearing. Attorney Willard McEwen for the West Towns company did not make the same claim as to war industries, but he insisted on a separate hearing. The men are not seeking a change in working conditions in any of these cases, but they insist that even though the existing agreement has not expired the wage schedule does not meet present cost of living and there will not be enough trainmen to operate the cars unless a change is made.

Chairman Walsh announced that all the disputed points would be considered by the special section composed of Mr. Taft and himself. He invited the lawyers to join in the Washington hearing where the financial situation will be argued. It was said at the office of the American Electric Railway Association that Past-President Thomas N. McCarter would represent that body at the hearing.

Schenectady Strike Settled

Men Agree to Temporary Advance—City Will Waive Its Franchise Fare Rights

The strike of the employees of the Schenectady (N. Y.) Railway has been settled. It was declared off on June 12 after the men had been out twelve days. They agreed to accept an increase of 6½ cents an hour, and after a four-hour caucus of the Council the Aldermen agreed to waive franchise rights to a 5-cent fare under certain conditions.

SETTLEMENT BASED ON LETTER TO MAYOR

The basis of the settlement was a letter addressed by the Council to James R. Buchanan, federal commissioner of conciliation. This provided that the request of the company to the Council for permission to have the Public Service Commission pass upon its application for increased fares without regard to franchise limitations would be taken up immediately upon the report of the examiners to be employed by and to report to the Council as to the necessity of increased revenue for the company. In conclusion the letter said that if the report showed that the company needed more revenue by increased fares the Council would then grant the railway permission to apply to the Public Service Commission for relief without insisting upon the city's present 5-cent fare rights under the existing franchise.

The men demanded a 9-cent-an-hour increase. They have been getting a maximum of 31½ cents an hour. Final settlement of the wage rate will be determined by the Federal War Labor Board.

Progress on Chicago Drafts

Agreement Reached on Several Additional Points in Proposed New Chicago Ordinance

Representation for the city and the employees on the board of directors of the surface and elevated lines may be made a part of the ordinance for the unification of the lines and the construction of a subway system. This proposition was put up to the companies by a sub-committee of the City Council on June 15. While Mr. Busby said he had no objection to offer, he would refer the matter to the board of directors.

CHANGES IN FINANCIAL PLAN

Views of security holders on the proposed ordinance were made known to members of the committee by Mr. Busby. His statement applied only to the surface lines, but it is understood that similar contentions will be raised on behalf of the owners of the elevated properties.

The modifications suggested by Mr. Busby applied only to the financial plan, and it is understood that all parties are practically agreed on the other provisions of the ordinance. In brief, Mr. Busby suggested that the interest rate start with 6.35 instead of 6.22 per cent, and that an additional rate of 1¼ per cent be allowed on "new money." Provisions for refunding of existing securities were also discussed, and Mr. Busby contended that there should be proper protection for the money which will go into new construction, as these extensions would have no operating value if anything should happen to the rest of the property.

The sub-committee favored Mr. Busby's suggestion to the extent of removing the 5 per cent limit on cost of refunding. The members also allowed an interest rate of 6.35 on original capital only. At the same meeting Walter Fisher, special counsel, gave an opinion to the effect that the traction fund could not be used by the city for general corporate purposes and also that the city had no authority to invest part of this fund in Liberty Bonds.

ORDINANCE IN MAIN ACCEPTABLE

An adjournment was taken to allow the companies time to give a final answer on provisions of the ordinance as already outlined.

At a meeting of the committee on June 19 Mr. Busby, speaking for all the Chicago companies, stated that the ordinance as previously outlined, accounts of which have appeared in the ELECTRIC RAILWAY JOURNAL, was acceptable.

Massachusetts Wage Award

Increase in Wages Awarded to Trainmen and Other Employees in Worcester, Springfield and Other Cities

One of the largest electric railway wage increases ever awarded in New England was announced on June 15 by Henry B. Endicott, executive manager of the Massachusetts committee on public safety, as arbitrator between the Amalgamated Association and the Springfield Street Railway, Worcester Consolidated Street Railway, Interstate Consolidated Street Railway, Attleboro Branch Railroad and the Milford, Attleboro & Woonsocket Street Railway. Mr. Endicott's award follows extended negotiations and conferences between the parties, and extends various agreements for one year from June 1, 1918, besides fixing the rate of pay and other matters bearing upon working conditions. It is estimated that the award will cost the Springfield company alone $400,000 a year in extra operating expenses. Further fare increases appear likely.

On the Springfield system, the daily wage arrangement is continued and the award and previous rates are as follows:

	New Rates	Old Rates
First half year, rate per day..	$3.33	$2.555
Second half year, rate per day.	3.48	2.705
Second-year men, rate per day.	3.60	2.855
Third-year men, rate per day.	3.69	2.955
Fourth-year men and thereafter, per day............	3.87	3.105

The employees of the Worcester company demanded that their wage scale be fixed for conductors, messengers and motormen at the rate of 45 cents an hour for the fourth and subsequent years of employment instead of at the previous rate of 34.5 cents. In the conferences the company agreed that the maximum rate should be not less than 40 cents an hour. Mr. Endicott found that, taking into consideration the constant increase in the cost of living and the pay of men now in similar industries in Massachusetts, 43 cents an hour was a fair rate, and so decreed. The new schedule for Worcester, which is also made to apply to the other companies except Springfield, is: Fourth year and thereafter, 43 cents; third year, 41 cents; second year, 40 cents; second six months, 38.5 cents; first six months, 37 cents per hour.

Mr. Endicott was asked to decide whether all employees other than messengers, conductors and motormen should receive an increase of 35 per cent in their wages. It appeared from the evidence that the wages of the miscellaneous employees had been based upon no uniform system. Wages of one class of employees in Springfield differed from the wages of the same class in Worcester. Inter-departmental wages also differed in the same city. Several classes of employees received substantial increases in pay since May 1 and others were working for the same scale which had been in effect for some time. The award states:

"If miscellaneous employees were to receive a uniform raise in wages, equal to that received by the blue-uniformed men they would be entitled to an addition of 24.5 per cent over their present rate. I appreciate that uniformity of wages both within each company and throughout all the companies as a group would be advisable if the companies were now just starting in business. I am inclined to believe, however, that apparent inequalities are often due to local conditions, or were originally caused by varying conditions of employment. An attempt to systematize them by an examination of the wage sheet alone without an accompanying intimate knowledge of the histories of the companies would probably lead to injustice. I therefore decide all employees whose wages * * * have not been increased since April 30, 1918, shall receive an advance in pay to the amount of 24.5 per cent of the previous wage, and I leave the minor wage inequalities for gradual adjustment by the men and the companies."

The union urged an eight-hour day instead of a nine-hour day for shop and other employees. It was Mr. Endicott's opinion that a change from a nine-hour day to an eight-hour day at this time was inadvisable. He decided that the working hours should continue as they were prior to June 1, 1918.

The union raised the question whether, if a shorter work day was granted to men in any department such shorter work day should apply to all men doing the same kind of work in such department. It was contended that the hours in some departments were not uniform. In his finding Mr. Endicott refused to order uniformity in hours as requested, and stated that while uniformity was desirable and to be encouraged when practicable, this was not the moment to attempt a readjustment of working hours. The men urged that Sunday and holiday runs be arranged so that eight hours should be the maximum for a day's work, performed within ten consecutive hours, and that cars operating between midnight and 6 a. m. be paid for at the rate of a full day's pay. The arbitrator found it unwise at the present time to make such readjustments of service.

San Francisco Loop Improved

With the completion of four tracks for the full length of Market Street in San Francisco, and the inauguration of through service on municipal cars from Twin Peaks Tunnel to the ferry, total traffic around the ferry loops has been increased about thirty-two cars per hour during the rush period. During the heaviest traffic in the exposition year 275 cars an hour passed around the loop by both systems. Experience since the completion of the improvements recently made indicate that the capacity of the loops will now be more than 300 cars an hour. Under the existing agreement as to routing of cars on inner and outer loops, however, the maximum loop capacity practicable is about 295 cars an hour.

About forty municipal cars have been added to the regular schedule in order to supply the new service on the outer Market Street tracks. A factor that has always prevented any great improvement in running time at the loops has been the heavy vehicular traffic constantly crossing the loop entrance and exit. Grade separation to eliminate this trouble has been frequently suggested, but funds for such changes are not now available. As the present need for increased capacity was brought about by the additional number of municipal cars to use the loop, the reconstruction costs have been borne exclusively by the Municipal Railway system.

Shipping Board Acts Promptly

The United States Shipping Board Emergency Fleet Corporation, A. Merritt Taylor, director of passenger transportation and housing, finding it impracticable to secure from the Telford Road Company and from certain of the boroughs between Darby and Chester, Pa., such franchises for the Southern Pennsylvania Traction Company as that company would be justified in accepting, it proceeded to lay a second track for the account of the government, the same to be operated in conjunction with the company's existing single track, thus making a double-track railway.

In requisitioning so much of the roadbed of the Chester & Darby Telford Company as it required for right-of-way, the Fleet Corporation posted requisition notices along the turnpike.

Ninety thousand workers are engaged in the shipyards and munition plants in the district southwest of Philadelphia, including Chester. Many thousands must be added in the near future in order that the plants may be operated at full capacity and in certain instances materially enlarged.

The double-tracking of the railway on the Chester & Darby Telford road, which is known as the Chester Pike, will give track capacity for the conveyance of 19,000 passengers an hour in one direction. The capacity of the single track which has been in use is limited by a minimum headway or schedule time of fifteen minutes between cars. With two-track operation it will be possible to operate cars on a forty-second headway in each direction.

Provision has also been made by the Emergency Fleet Corporation for enlarging the power supply of the Southern Pennsylvania Traction Company. In addition arrangements have been made for the purchase of twenty-two additional cars. The contract for the construction of the new line has been awarded to McArthur Brothers, New York, who expect to complete the work in about two months.

News Notes

Air Brake Man Honored.—The degree of Doctor of Engineering has just been conferred upon Walter V. Turner, manager of engineering for the Westinghouse Air Brake Company, by the University of Pittsburgh, in recognition of his valuable services to the engineering profession and to humanity.

Wage Increase on Suburban Line.—The Philadelphia Railways, operating 13 miles of line between Philadelphia and Chester, has increased the wages of conductors and motormen, from 30 cents an hour to 35 cents for first-year men, 36 cents for second-year men and 37 cents an hour for third-year men.

Strike on Zanesville City Line.—Because the company offered them an advance of 3 cents an hour, when they had demanded from 5 cents to 7 cents, the motormen and conductors on the city line of the Ohio Electric Railway at Zanesville walked out and completely tied up the service on June 4. The interurban lines were not affected.

Rapid Transit Work Resumed.—Nearly 6000 of the men engaged as laborers on subway and rapid transit construction work in New York returned to work early in the week commencing June 17 under an agreement reached between the Board of Estimate, the Public Service Comission, and contractors and the labor unions, whereby the men are to be paid the increased wage demanded.

Would Arbitrate the Woman Question.—The Toronto (Ont.) Railway is said to have expressed its willingness to refer the question of the employment of women as conductors to a conciliation board. This plan is said to meet with the approval of the men, who at a meeting on May 11 adopted a resolution opposing the use of women at this time. The opposition of the men was referred to in the issue of the ELECTRIC RAILWAY JOURNAL of May 8, page 983.

Trustees to Act On Wage Increase.—M. C. Brush, president of the Boston (Mass.) Elevated Railway, on June 14 sent a letter to the executive board of the union of the employees of the company informing that organization that he will take no action on their request for an increase in wages as it is a matter for the consideration of the new board of trustees. These will be appointed by the Governor and will take charge of the road about July 1.

Wage Demands in Vancouver.—The British Columbia Electric Railway, Vancouver, B. C., already confronted with a demand for increased wages from the conductors and motormen representing an additional expenditure of $520,000, has recently had presented to it a proposed agreement from the electrical workers in the company's employ, which, if granted, will mean another additional expenditure of $120,000. The proposed agreement is a very extensive one, and is designed to establish a flat rate of $6 a day for skilled men.

Pennsylvania Commission's Docket Crowded.—The calendar of the Public Service Commission of Pennsylvania for the week ended June 15 contained a long list of minor cases, including a score or more jitney complaints from western counties and small contract matters between public utilities. The commission will not take any vacation, although the members individually and at different times will be absent for a few weeks from their duties. At Wilkes-Barre on June 13 the commission planned to hear the city of Wilkes-Barre and nine surrounding boroughs present their claims that the rates of the Wilkes-Barre Railway are unreasonable. Inadequate service is charged by the opponents of the increase.

Dayton Men Demand an Increase of Wages.—Although the managers of the electric railways at Dayton, Ohio, expressed their willingness to submit to the National War Labor Board demands made by their employees the men early in the week commencing June 17, assumed a threatening attitude and insisted that the companies grant their request in full. This includes an increase from a minimum of 28 cents and a maximum of 45 cents an hour to a minimum of 45 cents and a maximum of 50 cents an hour. On June 19 the employees of the Peoples' Railway, the City Railway and the Dayton Street Railway went on strike. The companies have asked the City Commission to take over roads and operate them.

Buffalo Rounding Up the Crooks.—Three conductors employed by the International Railway, Buffalo, N. Y., have been convicted of stealing fares recently and the case of another conductor now under arrest is still pending. One of the trio was fined $100; a second was fined $50 and a third was fined $25. It is charged that the men collected the fares from passengers without allowing the passengers to deposit the fares in the fare box. The case of a fourth conductor is being investigated by company officials co-operating with the police. He is charged with making and selling a device which could be inserted in the fare box in such a manner that the coins would not register.

Wage Advance in Davenport.—The Tri-City Railway, Davenport, Iowa, has voluntarily increased the wages of its employees for the fourth time within the past year. Under the 1917-1918 contract, which was effective until June 1, 1918, the wage scale for trainmen varied from 27 cents to 32 cents an hour. On Nov. 1 an increase of 1 cent an hour was voluntarily granted, and on Dec. 1 a 7 per cent war bonus was added to this. On May 1 last the 7 per cent war bonus was increased to a 10 per cent, and on June 6 the war bonuses were discontinued effective June 1 and a straight 4 cents an hour increase was granted, making the present wage scale from 32 cents to 37 cents an hour. Shop men will also receive an increase in wages at this time.

Policy With Regard to Returning Employees.—The management of the Honolulu Rapid Transit & Land Company, Honolulu, T. H., has notified the employees of the company to the effect that "employees entering the federal military service, who shall thereupon notify the company in writing of their intention of returning to their present employment, will be considered as on extended leave; and will be entitled to their seniority upon reporting for duty with an honorable discharge within sixty days from the date of said discharge or termination of federal service, if in a satisfactory physical condition. The retention in service of new employees and their respective rights of seniority and the rights of seniority of present employees, will be subject to the foregoing regulation."

Classification of Military Engineers Suggested.—The fact that many engineers are in the National and the enlisted army at a time when the national organizations are constantly receiving requests for engineers, chemists and other technical men has impelled the Engineering Council, representing the national engineering societies, to address the secretaries of war and navy on the subject. The council urges that "technically trained men of all ages should be enrolled and conserved for technical duties, and special efforts should be made immediately by the War and Navy Departments to find and record such men among drafted and enlisted forces and to assign them to places in which their special qualifications are needed." The Engineering Council offers to assist in locating and classifying such men, if its assistance is desired.

Advance for Interurban Men.—Platform men employed by the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., have been granted a wage increase. For the first six months of service, the men will receive 30 cents an hour; second six months, 32 cents an hour; after the first year, 37 cents an hour in passenger service and 41½ cents an hour in express service. The train crews of the Buffalo, Lockport & Rochester have severed their affiliation with the Order of Railway Trainmen, associated with the Brotherhood of Locomotive Engineers, and have joined the Amalgamated Association of Street & Electric Railway Employees. The Buffalo, Lockport & Rochester men are now allowed to operate their cars between the terminals in Rochester and Lockport. Heretofore the cars were taken at the Rochester city lines by local crews and in Lockport they were taken at the city line by crews of the International Railway, Buffalo, N. Y.

Financial and Corporate

$17,320,000 Advance to B. R. T.

W. F. C. Will Grant Loan if Note Holders Will Exchange 70 Per Cent of Maturing Fives for New Sevens

The War Finance Corporation on June 19 came to the aid of the Brooklyn (N. Y.) Rapid Transit Company with an announcement that it would make a direct loan of not more than $17,320,000 to the company for refinancing purposes. This advance is based upon a proviso requiring holders of the company's maturing notes to consent to exchange not less than 70 per cent of the face value of their holdings for new three-year 7 per cent secured notes. The notes to be retired consist of an issue of $57,735,000 of 5 per cent notes which will come due on July 1.

As collateral for the direct loan the War Finance Corporation will take new three-year notes at par. These will be secured by $57,735,000 of first mortgage 5 per cent bonds of the New York Municipal Railway Corporation, now deposited as security for the present notes, and by $39,000,000 of ten-year 6 per cent bonds of the Brooklyn Rapid Transit Company to be issued under a consolidated and refunding mortgage recently approved by the stockholders. The directors of the War Finance Corporation have decided that the Brooklyn Rapid Transit Company application comes within the scope of the "exceptional cases" clause contained in Section 9 of the act.

The War Finance Corporation received letters from the Comptroller of the City of New York and from the Public Service Commission of the First District of New York expressing a desire that the application of the company be granted in the interest of the city.

B.R.T. EXPLAINS PLAN

After the announcement by the War Finance Corporation, the railway issued a statement in part as follows:

"A circular will be sent to noteholders during the next few days inviting them to deposit their notes with the Central Union Trust Company of New York under an extension plan under which noteholders will have the privilege of accepting for each $1,000 note either (a) $300 in cash and $700 face value of the new three-year 7 per cent secured notes, or (b) $1,000 face value of the new three-year 7 per cent secured notes.

"The indenture will provide that the company will cause to be pledged thereunder any additional consolidated and refunding mortgage bonds to an amount equal at face value to expenditures made out of the current surplus earnings of the company for capital purposes and for which the company may be or become entitled to draw bonds from the trustee, as well as any first mortgage 5 per cent sinking-fund gold bonds acquired by the company with such current surplus earnings.

"In order to conserve cash and to that extent to avoid the sale of additional securities pending the life of the new notes, the indenture will further provide that while the notes are outstanding the company will pay no dividends upon its capital stock in cash or in any securities or script unless such security or script shall by its terms rank subsequent to the rights of the holders of the notes as against any of the assets of the company.

"The plan has been approved by Kuhn, Loeb & Company, the Central Union Trust Company of New York and Kidder, Peabody & Company, the bankers who placed the maturing issue of notes and who represent a large amount thereof."

$100,000,000 UTILITY POOL PROPOSED

James N. Wallace, president Central Union Trust Company; Thomas W. Lamont, of J. P. Morgan & Company; Charles H. Sabin, president Guaranty Trust Company, and Frederick W. Strauss, of J. & W. Seligman & Company, all of New York, have been appointed as a committee by W. P. G. Harding, managing director of the War Finance Corporation, to consider the question of giving aid to public utility companies. The appointment of the committee is the result of a recent conference in New York between directors of the War Finance Corporation and representative bankers, as noted in the ELECTRIC RAILWAY JOURNAL of June 15.

One matter which this committee is said to have under consideration is the organization of a $100,000,000 corporation, the function of which would be to purchase the securities of public utilities and in turn discount its paper with the War Finance Corporation. Bankers throughout the country would be asked to subscribe to the capital stock of the company in proportion to their ability to do so, thus spreading any risk which might be involved and at the same time insuring the active co-operation of leading financial interests in all sections toward securing better treatment for public service properties.

It is reported that conferences in the matter have been held, but that no definite decisions as to the formation of such a corporation have been reached.

The Chicago Clearing House has named E. D. Hulbert, of the Merchants Loan & Trust Company; George M. Reynolds, of the Continental & Commercial National Bank, and F. O. Wetmore, of the First National Bank, as a committee to consider the need of public utility relief from the various financial burdens of the present.

POWER NEEDS RECOGNIZED

The War Industries Board has sent to Congress the draft of a proposed bill to appropriate $200,000,000 to increase the power supply in overloaded industrial centers of the East. Cities along the Atlantic seaboard in which munitions and materials for war are being manufactured would be the especial beneficiaries under the measure, which has been committed to the care for the present of Representative Kitchin, chairman of the House ways and means committee, and of Senator Martin of Virginia, chairman of the appropriations committee. The measure is said to have the backing of President Wilson.

It is felt in Washington that much more than $200,000,000 will be needed, inasmuch as in the Pittsburgh district alone, which supplies power for a radius of 100 miles, $40,000,000 or $50,000,000 for additional plant facilities might be needed. The War Industries Board is now making a census of the various power needs of the different localities engaged upon war work.

The proposed measure is emergency legislation. It is expected by the Washington correspondent of this paper, however, that it will be difficult to pass in Congress, although all government interests engaged in obtaining war material admit that such legislation is needed at once.

Lima Tramway Earnings Gain

The report of the Lima (Peru) Light, Power & Tramway Company for the year ended Dec. 31, 1917, shows a gross revenue of $2,142,480, an increase of $156,120 over 1916. The operating expenses amounted to $1,436,295, an increase of $76,740. In commenting on these results the directors refer to the increased tramway traffic, increased employment of electric power and the high premium on Peruvian currency as factors contributing to the improvement in revenues. On the other hand, the increased cost of raw materials and the growing difficulty of securing materials at any price from the United States are factors reflected in the increased expenses.

The gross revenue from the tramways in 1917 amounted to $1,085,890, expenses to $694,995 and net profits to $390,895. The gross revenue increased by $84,130, expenses by $61,520 and net profits by $22,610.

Four quarterly dividends were declared during 1917, amounting to a total of 5 per cent for the year. The net profits were distributed as follows: $374,720 for amortization and depreciation; dividends distributed, $328,460; carried forward to profit and loss, $3,010. The balance of the profit and loss account on Dec. 31, 1916, was $456,195.

Standard G. & E. Gains

Reports for Railway Subsidiaries Show Revenues Nearly Back at the 1913 Mark

The gross earnings of the subsidiaries of the Standard Gas & Electric Company, Chicago, Ill., for 1917 showed an increase of 12.92 per cent over the previous year. These gross earnings, aggregating $19,341,487, were derived from seven different classes of utilities, 4.18 per cent coming from electric railway operation. The accompanying statement gives a summary income report for the utilities giving railway service. The total railway receipts in 1917 were $808,625 as compared to $753,725 in 1916. The receipts almost reached the 1913 mark of $828,168.

The Arkansas Valley Railway, Light & Power Company exceeded expectations for 1917. The year was one of exceptional prosperity for the territory served. The gross earnings increased 13.3 per cent, with an increase of 14.2 per cent in net. In 1916 these increases were 7.6 per cent and 11.7 per cent respectively.

The Ottumwa Railway & Light Company during the year added a considerable amount of new lighting and power business. The Fort Smith Light & Traction Company is retaining its former standing among the subsidiaries. During January and February, 1918, this company earned materially in excess of its proportionate interest charges, and for the twelve months ended Feb. 28, 1918, it showed a surplus. The improvement is due primarily to the establishment of a number of new industries, whose location was partly influenced by the discovery of new gas fields in the vicinity.

The report states that the placing of securities of the respective companies in the communities served has proved to be even more successful in 1917 than was anticipated from the excellent results obtained in 1916. Customer ownership is appealing to the public in an increasing degree. From Jan. 1, 1917, to March 23, 1918, inclusive, local sales numbered 5240, aggregating $4,008,350 par value of securities.

On Dec. 31, 1917, the total depreciation reserves of the subsidiary companies amounted to $3,273,658. The surplus balance of these companies totaled $1,505,125, making an aggregate amount of $4,778,783. This has been invested in extensions and enlargements of the properties.

The total taxes of the subsidiaries during 1917 were $1,436,414, equal to 7.42 per cent of the aggregate gross earnings and 16.85 per cent of the aggregate net earnings. The increase in taxes in 1917 was $273,602, and the increase in six years has been $826,666.

1917 INCOME STATEMENT OF RAILWAY SUBSIDIARIES OF STANDARD GAS & ELECTRIC COMPANY

Company	Gross Earnings	Net Earnings	Interest Charges (Net)	Amortization of Debt Discount and Expense	Dividends Charged to 1917 Income Preferred	Dividends Charged to 1917 Income Common	Earnings Retained in Surplus or Depreciation Reserve	Deficit after Interest Charges
Arkansas Valley Railway, Light & Power Company...........	$1,428,467.23	$645,222.05	$370,532.75	$2,500.00	$66,578.35	$135,000.00	$70,610.95	....
Fort Smith Light & Traction Company......................	508,669.52	154,266.14	181,912.33	....	....	....	....	$27'646.19
Northern States Power Company...........................	7,154,508.89	3,389,780.50	1,709,837.74	140,000.00	916,011.05	188,931.71	435,000.00	....
Ottumwa Railway & Light Company.........................	365,406.66	142,989.07	67,982.03	250.00	32,382.00	24,375.00	18,000.04	....

Financial News Notes

Small Bond Issue Authorized.—The Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., has been authorized by the Indiana Public Service Commission to issue $28,000 of bonds to reimburse the treasury for sums expended for extensions and betterments.

Northern Ohio Proposes New Security Issues.—Application has been filed with the Ohio Public Utilities Commission by the Northern Ohio Traction & Light Company, Akron, for permission to issue $600,000 of first mortgage 5 per cent bonds and $160,000 par value of preferred stock.

Abandonment in Tennessee.—The Holston Valley Railway, operated by the Bristol (Tenn.) Traction Company, between Bristol and Big Creek Park, Tenn., a distance of 10 miles, will discontinue operation. Orders have also been issued by J. A. Caldwell, receiver for the Bristol Traction Company, for the removal of the former company's tracks on several of the streets in Bristol.

Pittsburgh Argument on July 1.—The United States District Court for the Western District of Pennsylvania has fixed July 1 for hearing arguments on the questions at law raised in answer to the bill brought by the protective committee of bondholders of the Pittsburgh Railways and subsidiaries against the Philadelphia Company, Pittsburgh Railways and the United Traction Company, Pittsburgh.

$1,000,000 Mortgage Authorized.—The stockholders of the Syracuse & Suburban Railroad, Syracuse, N. Y., have authorized a mortgage of $1,000,000 to secure an issue of bonds for that amount. Of the money raised through this issue, $550,000 will be used to pay outstanding bonds. Part of the remainder will be used to reimburse the company for capital expenditures and the rest will be held in the treasury.

Authorized to Fund $182,500 of Notes.—Springfield (Ill.) Consolidated Railway, controlled by the Springfield Railway & Light Company, has been authorized by the Illinois Public Utilities Commission to issue two lots of 5 per cent gold bonds, one for $75,500 and the other for $107,000. The total amount of $182,500 is needed to pay notes issued by the company since Dec. 31, 1913, representing improvements of a permanent nature.

Lethbridge Deficit $28,800.—The Lethbridge (Alta.) Municipal Railway in 1917 did slightly better than was anticipated. The deficit for the year amounted to $28,878, whereas the result had been estimated at $30,178. The cost of operation was kept as low as possible, according to the report of the local commissioner, and the improved patronage increased the earnings. The earnings figures for the last calendar year follow: Earnings $52,203; operating expenses, $43,821; fixed charges, $37,260; deficit $28,878.

$350,000 of Arkansas Valley Notes Offered.—H. M. Byllesby & Company, Inc., Chicago, Ill., and Bonbright & Company, Inc., New York, N. Y., are offering for subscription at 97¾ and accrued interest $350,000 of bond secured 7 per cent gold notes of the Arkansas Valley Railway, Light & Power Company dated June 1, 1918, and due Dec. 1, 1920. The total authorized issue is $1,500,000. The proceeds of the sale of the notes will reimburse the company for expenditures incurred for additions and improvements to the property.

$1,581,000 of West End Refunding Bonds—The West End Street Railway, Boston, Mass., has requested the authorization by the Public Service Commission of an issue of $1,581,000 of its bonds to refund an equal amount of bonds due on Aug. 1, 1918. In case the proceeds of the sale of the bonds are more than sufficient for that purpose the West End company will pay to the Boston Elevated Railway such excess to be invested in permanent additions, alterations and improvements upon the property of the West End in accordance with the terms of the lease.

Short Iowa Road Abandoned.—Electric railway communication between Sioux City, Iowa, and Dakota City, Neb., has been severed by the Sioux City, Crystal Lake & Homer Electric Railway and will not be resumed. The line between Sioux City and Dakota City was built about twelve years ago, but has never been a paying proposition. The property was recently ordered to be junked. Already a portion of track in Dakota City has been torn up and the rails between Crystal Lake and Dakota City have been sold. Cars will be run during the summer season between South Sioux City and Crystal Lake.

Purposes of New Puget Sound Issue.—The issue of $12,250,000 of 7 per cent three-year mortgage gold notes of the Puget Sound Traction, Light & Power Company, Seattle, Wash., referred to in the ELECTRIC RAILWAY JOURNAL of June 15, will be used to refund $10,057,000 of 6 per cent mortgage bonds of the company maturing on Feb. 1, 1919, and to enable the company to take care of construction work now under way, including the White River development of 20,000 hp., the 10,000-kw. steam unit at Georgetown, and the steam plant on Western Avenue. These projects will cost in the neighborhood of $1,250,000.

Crosstown Road to Be Sold Under Foreclosure.—The property and franchises of the Central Crosstown Railroad are to be sold at auction by Referee Lyttleton Fox, and the New York Railways Company, which is now operating the road, will be the purchaser if the Public Service Commission clothes it with the necessary authority. Foreclosure proceedings against the Central Crosstown Railroad were instituted because of a default of principal and interest under the company's first consolidated mortgage. A public hearing on the application of the New York Railways for permission to make the purchase was set by the Public Service Commission for June 20.

$2,151,000 of Refunding Bonds Authorized.—The Public Service Commission for the Second District of New York has authorized the Albany (N. Y.) Southern Railroad to issue $2,151,000 of first refunding mortgage thirty-year 6 per cent bonds. Of this amount $1,451,000 is to be used by the company in exchange for a like amount of first mortgage thirty-year 5 per cent bonds now outstanding. The company is also authorized to pledge $700,000 in 6 per cent bonds as security for its three-year notes amounting to $550,000, to be sold at not less than 96, and the proceeds are to be used to reimburse the treasury, to discharge floating liabilities outstanding on June 30, 1917, and to pay for proposed new construction amounting to $190,683.

P. R. T. Wants War Taxes Shifted.—E. A. Ballard, counsel Philadelphia (Pa.) Rapid Transit Company, recently asked the ways and means committee of the House of Representatives to draft the new war-revenue bill so that the underlying companies must pay the war taxes themselves. The leases under which the Philadelphia Rapid Transit Company now operated requires this corporation to pay all taxes on the earnings of the underlying companies, but Mr. Ballard desires the law to state specifically that the contracts apply only to ordinary taxes and not to special war taxes. The leased companies are planning to oppose this change, on the ground of the inviolability of the contract.

Drawing New Plan to Care for Interest Payments.—T. Porter, secretary of the committee of bondholders of the Barcelona Traction, Light & Power Company, Ltd., Barcelona, Spain, on June 18 addressed a statement to the holders of the bonds of the company to the effect that owing to the delay and complications resulting from the continuance of the European war, it will be impossible for the company to resume full payment in cash of the interest on its bonds on Dec. 1, 1918, as was contemplated when the bondholders met in June, 1915. He says the committee, in consultation with the directors, are formulating a plan, the basis of which will be the payment in cash of a portion of the interest commencing with the coupon due on Dec. 1, 1918, with compensating arrangements for deferring payment of the full interest. In due course the plan will be submitted to the bondholders for their approval. In the meantime the committee requests holders of the interim scrip issued during the last three years in satisfaction of the interest coupons, to defer lodging the same for exchange into definitive notes.

Indianapolis Security Holders Organize.—J. F. Wild, president of the J. F. Wild State Bank, Indianapolis, Ind., has been elected as the chairman of a committee of fifteen security holders of the Indianapolis Street Railway to represent the newly-organized Association of Indiana Holders of Indianapolis Street Railway Securities. The committee is composed of the following: H. H. Hornbrook, Indianapolis; W. T. Durbin, Anderson; E. L. Mckee, Indianapolis; Walter J. Ball, Lafayette; R. K. Willmann, Hartford City; John W. Smith, Muncie; Frank Donnar, Greencastle; Henry C. Bennett, Robert Elliott, George C. Hitt, Otto N. Frenzel, Samuel Reid, J. F. Wild and Michael Ready, Indianapolis, and W. L. Hough, Greenfield. J. M. Pearson, of J. F. Wild & Company, has been appointed to act as secretary of the organization. The plan to organize was referred to in the issue of June 8.

New Orleans Refunding Plan Arranged.—The New Orleans Railway & Light Company has authorized an issue of $4,000,000 of one-year 7 per cent notes, dated June 1, 1918, due June 1, 1919, and callable at 100 and interest on thirty days' notice, for the purpose of refunding its two-year notes of an equal amount which matured on June 1, 1918. The company requests that all holders of the matured two-year notes deposit same for exchange for the new notes dollar for dollar. Details of the extension, as well as copies of the correspondence between the Mayor of New Orleans and the company, in response to the latter's request for increased rates, have been mailed to all noteholders of record. The company was unable to meet the notes at maturity on account of the refusal of the War Finance Corporation to advance the necessary funds. The letter of President D. D. Curran of the company on this phase of the matter was published in part in the issue for June 8.

Electric Railway Monthly Earnings

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$74,840	*$44,032	$30,808	$19,557	$11,251
1m., Apr., '17	70,632	*41,137	29,495	18,841	10,654
12m., Apr., '18	897,032	*530,058	366,974	232,075	134,899
12m., Apr., '17	860,144	*486,017	374,127	219,215	154,912

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Apr., '18	$145,620	*$107,066	$38,554	$30,996	$7,558
1m., Apr., '17	111,840	*77,929	33,911	29,649	4,262
12m., Apr., '18	1,503,319	*1,279,649	223,670	364,362	†140,692
12m., Apr., '17	1,260,774	*875,961	384,813	358,215	26,598

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO

1m., Apr., '18	$346,988	*$242,089	$104,899	$56,644	$48,255
1m., Apr., '17	304,819	*222,485	82,334	44,938	37,396
12m., Apr., '18	4,157,639	*3,088,042	1,069,597	598,598	470,999
12m., Apr., '17	3,677,280	*2,339,418	1,337,862	522,904	814,958

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

1m., Apr., '18	$1,721,352	*$1,122,208	$599,144	$494,273	$104,871
1m., Apr., '17	1,502,961	*895,423	607,538	430,014	177,524
12m., Apr., '18	20,311,495	*13,326,305	6,985,190	5,504,730	1,480,460
12m., Apr., '17	17,735,092	*10,142,214	7,592,878	5,087,199	2,505,679

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, ME.

Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$246,126	*$169,013	$77,113	$71,158	$5,955
1m., Apr., '17	233,439	*158,628	74,811	66,499	8,312
12m., Apr., '18	3,090,145	*2,150,267	939,878	841,377	98,501
12m., Apr., '17	2,959,916	*1,893,698	1,066,218	810,671	255,547

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., Apr., '18	$321,032	*$245,482	$75,550	$67,686	$7,864
1m., Apr., '17	298,279	*185,584	112,695	64,945	47,750
12m., Apr., '18	3,806,380	*2,728,789	1,077,086	795,086	282,505
12m., Apr., '17	3,247,423	*1,999,445	1,247,978	962,727	485,251

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, ME.

1m., Apr., '18	$73,081	*$57,264	$15,817	$19,412	†$3,595
1m., Apr., '17	68,053	*50,275	17,778	15,702	2,076
12m., Apr., '18	873,818	*728,709	145,109	194,767	†49,658
12m., Apr., '17	836,375	*596,756	239,619	185,585	54,034

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., Apr., '18	$616,280	*††$366,427	$249,853	$178,385	$71,468
1m., Apr., '17	473,358	*260,594	212,764	183,824	28,940
12m., Apr., '18	6,530,330	*††3,961,029	2,569,301	2,134,071	435,230
12m., Apr., '17	5,617,994	*3,048,517	2,569,477	2,182,930	386,547

* Includes taxes. † Deficit. †† For the month $18,518, and for twelve months $252,848 included for depreciation.

Traffic and Transportation

Trenton Fare Case Continued

Final Hearing in Appeal for Six-Cent Fare Expected to Be Held on June 25

The hearing on the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., for a straight 6-cent fare was continued before the Board of Public Utility Commissioners on June 13 and will probably be completed on June 25. An appraisal of the company's property was presented as made by the J. G. White Engineering Company. John W. Burke, of the White Company, occupied the stand the greater part of the day. He placed the value of the physical property at $4,875,614. George L. Record, representing the city of Trenton, objected to the acceptance by the utility board of this valuation, stating that a previous one had been made in 1915.

VALUATION FIGURES ADMITTED

The company maintained that the utility board had ruled that an appraisal of property would be required in connection with any application for increased rates, and that previous valuations were only general approximations. Chairman Slocum, of the utility board, permitted the appraisal to be admitted as evidence. The valuation did not include any allowance for intangibles. In the Passaic Gas case, it was stated, the utility board allowed 30 per cent for intangible items, and if a similar allowance was made in the present case the total valuation of the Trenton system would amount to more than $8,300,000.

Mr. Burke said he based his valuation on what he termed "normal fair prices." He said the valuation at prevailing war prices would be $6,148,700, which is about $1,250,000 more than his estimate of the fair value of the physical property. Mr. Burke estimated the annual depreciation fund for renewals, replacements and reserves at from $150,000 to $175,000.

FARES ELSEWHERE NO CRITERION

President Rankin Johnson, recalled to the stand, gave figures he was asked to furnish at the last hearing as to cost of materials and equipment during the years 1914, 1915, 1916 and 1917. Counselor Edmund M. Hunt endeavored to have the witness testify as to a comparison of fares in Trenton and in other cities of the country, but President Slocum ruled that it was immaterial in this case what the fares were in other cities. Mr. Johnson read correspondence between the company and the trolleymen's union in which an increase to 40 cents an hour flat rate was demanded and in which the company offered a graduated scale reaching a 40-cent rate after five years of service. Mr. Johnson testified that the company had figured, when it made its application for an increased fare, on spending $20,000 a year for increased pay for its employees. The men's demands would entail an added expenditure of from $60,000 to $80,000. Mr. Record asked that this testimony be ruled out as the pay increase was as yet not an accomplished fact, but President Slocum ruled that it should remain in the record.

The hearing was adjourned until June 25.

Columbus Fare Hearing Begun

At a meeting of the Columbus City Council on June 7 Samuel G. McMeen, president, and Harold W. Clapp, general superintendent of the Columbus Railway, Power & Light Company, Columbus, Ohio, presented arguments for the increase of the rate of fare from eight tickets for a quarter to 5 cents straight, with universal transfers. Six business men joined in the plea.

President McMeen declared that the company wanted to pay its employees more money for their work, but could not do so at the present rate of fare. In connection with this, though he did not mention it, there are rumors that the men are organizing for the purpose of demanding an increase in their wages. Mr. McMeen further stated that if a temporary bridge is erected across the Scioto River at Broad Street the company will lay tracks, so that cars may be operated on the West Broad Street line across it.

J. Clare Miller, director of the Columbus Chamber of Commerce, declared that efficient service was needed in order to carry out the work at the plants which are making war materials. In view of the increased cost of all labor and materials, he favored an increase in the rate of fare, so the company will be able to furnish such a service.

George M. Schwartz, president of the Manufacturers' and Jobbers' Association, reported that at a recent meeting of that organization, most of the members spoke in favor of granting an increase in the fare. Several others spoke along the same line and one or two stated that some extensions must be built in order to keep pace with the increase in population and the growth of the town.

Councilman Alcot declared he would oppose any increase in the rate of fare because of the following clause which he said appears in the franchise:

"The municipality shall not, during the terms of such grant or renewal, release the grantee from any obligation or liability imposed by the terms of such grant or renewal of a grant."

All Baltimore Skip Stops

This Method of Operation Applied to Entire Maryland City in About a Month

The staggered skip-stop method of car operation has been applied to all the lines of the United Railways & Electric Company, Baltimore, Md.

The process of application was a gradual one, beginning on April 7 with two lines. In quick succession the method was adopted on other lines so that in about a month the entire system was being operated under this plan.

The adoption of the staggered skip stop on the lines in Baltimore was accompanied with extensive publicity to inform the patrons of the method of operation; its purpose and advantages, and the points of each individual line which would be affected. This publicity included the use of advertising space in the newspapers, car window posters, large car cards, the company's publication for its patrons, *Trolley News*, and other agencies.

The company presented in a special edition of *Trolley News* a letter from P. B. Noyes, director of conservation of the United States Fuel Administration, to F. A. Meyer, fuel administrator of Maryland, urging the adoption of the staggered stop in Baltimore as the means of coal conservation. A letter from Mr. Meyer transmitting Mr. Noyes' letter to the Maryland Public Service Commission was also presented to the public. While the United Railways had for some time been considering the staggered skip stop and had actually tried the skip-stop method of operation on a few lines last year, the application of the staggered stop at this time was due particularly to the urgent recommendation of the government.

TERRITORY SURVEYED CAREFULLY

Extreme care was exercised in surveying every one of the lines of the United Railways for the purpose of fixing the stops in each direction on all of these, and these surveys were checked and rechecked by experts who personally went over the ground in order to see that the stops should be absolutely fair and equitable to the public. That this detail work was very thoroughly done is testified to by the fact that there have been comparatively few complaints.

As the staggered skip stop was put into operation on each line the stopping places were clearly indicated by signs on the poles nearest the stopping points which designated these points. These signs were labelled "North Stop," "South Stop," "East Stop," or "West Stop." The lettering was black on a white background.

A special edition of *Trolley News* was issued for each line as the staggered skip stop was applied to it, and these special editions were placed in the racks of the cars of the line affected. They described the method of operation and gave a list of the stopping places of the cars in both directions.

Rate Limit Removed in Jersey

Highest Court Supports State Regulation of Franchise Rates—Public Service Fare Case Is Now Closed

The last legal barrier to the determination of fair rates in New Jersey has been removed by a ruling of the court of final jurisdiction that franchise rates are alterable. This decision is of far-reaching importance in connection with pending applications for higher fares, including that of the Public Service Railway, which operates through most of the State. The hearings in this particular case have been completed, and it is expected that a decision will soon be announced by the Board of Public Utility Commissioners.

STATE RATE-MAKING IS SUPREME

The ruling in regard to the paramountcy of the State rate-making power was handed down on June 17 by a seven-to-two vote of the New Jersey Court of Errors and Appeals. The case was that of the Atlantic Coast Electric Railway vs. Board of Public Utility Commissioners. The decision affirms the opinion of the Supreme court of the State as expressed in the recent Collingswood Sewerage Company and Northampton, Easton & Washington Traction Company cases, noted in the ELECTRIC RAILWAY JOURNAL of March 30, page 623.

The syllabus of the decision now rendered by the Court of Errors and Appeals makes the following statements:

"The Senate and General Assembly, in whom by our Constitution the legislative power is vested, must necessarily, as the representative of all the people of the State, be held to retain all the sovereign powers, except as far as they have by unmistakable language intrusted them to others. The traction acts of 1893 and 1896 did not expressly authorize municipalities to contract with street railway companies. The power is implied from the power to grant or refuse consent to a location of tracks, and to impose lawful restrictions; the implication of power ought not to be extended beyond the necessities of the case.

"Full effect can be given to the language of the traction acts of 1893 and 1896 by holding that the force and effect of a contract under Section 32 of the act of 1893 is the force and effect of a contract by which the municipality and the railway company, the only parties thereto, are bound, but that no restriction is thereby implied on the sovereign powers of the State to fix such just and reasonable rates as subsequent conditions may make desirable.

"The power of a municipality to impose lawful restrictions upon granting consent to the location of tracks of a street railway is subject to the condition that they be reasonable. The lawful restrictions that may be imposed upon granting consent to the location of tracks of a street railway must be lawful not only at the time, but from time to time, that is, at all times."

CONSTITUTIONAL QUESTION NOT INVOLVED

In its opinion the court says:

"Our Constitution does not, like the Constitutions of some other states, confer upon municipalities the right to grant street franchises. We have been careful to keep the sovereignty of the State unimpaired and have not parcelled out the sovereign powers among minor political subdivisions.

"Municipalities with us act solely by virtue of legislative authority and as legislative agents. The Legislature may intrust to municipal corporations certain powers and may even authorize them to make irrepealable contracts, but the courts ought to be, as they have been, astute to see that such powers are not unnecessarily extended by implication."

Upon the legal reasons above expressed, the Court of Errors and Appeals has now reversed the Supreme Court decision which held that because Bradley Beach had a contract with the Atlantic Coast Electric Railway for a straight 5-cent fare, without a transfer within Bradley Beach, the commission was without power to grant a transfer and thereby bring about a change in the rate.

FINAL ARGUMENTS IN PUBLIC SERVICE CASE

The Board of Public Utility Commissioners on June 12 heard the final arguments on the application of the Public Service Railway for permission to raise its fare from 5 cents to 7 cents and also charge 2 cents for transfers, with an additional cent for a transfer upon a transfer. Notes on the testimony presented in this case since April have been published from time to time in the ELECTRIC RAILWAY JOURNAL.

The counsel for the municipalities, in closing, argued that it would be preposterous for the commission to set aside the 5-cent fare clauses in franchises and at the same time permit the franchises otherwise to stay in force. The municipalities, it was asserted, should have the right to dictate entirely new franchises. The city counsel, however, opposed the whole idea of altering the existing franchises, on the ground that restrictive fare clauses should not even be set aside as a war measure.

Thomas N. McCarter, president, made the final arguments for the railway. In his view, the fundamental question in New Jersey as in all parts of the country is whether or not the electric railway industry can continue to perform its functions, so important for war purposes. Judging by what has developed since the proceeding was started before the commission and what is going on in the steam railroad field, he felt that the relief to be granted ought to be greater than that asked for in the petition. There ought to be 7-cent fare with a suspension of the right to transfer. With the danger of increased wages coming from an order of the War Labor Board, with the danger of increased taxes and with the certainty of higher coal and other costs, he did not believe that any less increase would give the desired relief.

Trans-Bay Fares Increased

Key Route Permitted by California Commission to Equalize or Balance Rate Situation

The Railroad Commission of California has granted the application of the San Francisco-Oakland Terminal Railways for an increase of its commutation and suburban rates to conform with rates carried in the tariffs filed with the commission on June 5 by the Southern Pacific Company covering trans-bay service. Nothing in the order is to be construed as authorizing an increase in fares on the traction division of the San Francisco-Oakland Terminal Railways.

The Railroad Commission has, on the other hand, dismissed the application of the Southern Pacific Company for an increase of trans-bay and suburban rates. The company asked for this action, or an indefinite continuation of its application.

The San Francisco-Oakland Terminal Railways, the Key Route company, asked the commission for authority to increase its passenger fares between San Francisco and points reached by its lines in Alameda and Contra Costa Counties. Shortly after the case came before the commission, the Southern Pacific Company also asked the commission for authority to increase its trans-bay passenger fares with the exception of the creek route, and later included this. Still later the Key Route applied for a readjustment of its street car fares in Alameda and Contra Costa Counties. All these proceedings were consolidated and hearings held. It was at this time that the railroads were taken over by the government under Director General McAdoo, and the trans-bay suburban service of the Southern Pacific came under federal control.

Director General McAdoo initiated new passenger and freight rates on all federally controlled railroads, the passenger rates effective on June 10. This new rate increased commutation fares 10 per cent on the Southern Pacific lines.

The Railroad Commission, considering this action of the federal authorities, that trans-bay rates have been on a parity continuously since the inauguration of the service of the two systems, and that the entire suburban transportation structure rests on this basis, decided that this parity should be continued pending a complete study of the situation. The commission has before it all of the data necessary for definite conclusions, but it has not yet been possible to come to a final decision. It states its belief that a 10 per cent raise is entirely warranted.

The rate increases (commutation and one-way fares) for trans-bay service are to apply only while the San Francisco-Oakland Terminal Railway's rate application (No. 2985) is under consideration by the Railroad Commission and until the effective date of the final decision as to the proper rates to be granted upon such application. The trans-bay rates now are: Monthly trans-bay commutation rates, $3.30; increased from $3. One-way trans-bay rates, 11 cents; increased from 10 cents.

Poughkeepsie Fare Increase Allowed

The Public Service Commission for the Second District of New York has granted the petition of the Poughkeepsie City & Wappingers Falls Electric Railway for a 6-cent fare upon the understanding that no dividends are to be paid upon the capital stock until the railroad and equipment of the company are brought to a state of efficiency. Chairman Hill's memorandum specifically details improvements which should be made by the company.

The commission held that the company was not giving proper service and that this fact would warrant it in denying an increased fare on the principle that service should precede payment and unless the increased revenues will be used to better the service, the commission says it would be extremely reluctant to grant an increase.

There were no municipal fare restrictions in franchises given the company. An abutting property owner, in a statutory written consent, required a 5-cent fare limit between Vassar College and the New York Central Railroad station and this limitation was invoked at the hearing. The commission holds that fares cannot be fixed by private contract as regulation of rates is a governmental function.

No questions were raised on the trial as to the accuracy of the company's proof of its financial condition and the commission says there seems to be no escape from the conclusion that the company has made its case for an increase of rates.

The extent to which so-called intangible assets of a public service corporation, as a component part of the capitalization upon which a return should be computed, is another matter that is discussed.

Company Upheld in Forfeiture Case

Judge Chatfield in the United States District Court for the Eastern District has granted a permanent injunction restraining the city of New York from forfeiting the contract of the Manhattan & Queens Traction Corporation for failing to complete the extension from South Jamaica to the city line.

Six-Cent Fare for Buffalo

City Council Votes to Recommend This Fare to Public Service Commission as War Measure

Recognizing the necessity for allowing the International Railway, Buffalo, N. Y., to charge a higher rate of fare than 5 cents so as to prevent a walkout of the company's employees, who demanded a substantial wage increase, and also to keep the company from threatened receivership, the City Council on June 14 voted to recommend to the Public Service Commission that the railway be allowed to charge a 6-cent fare within the city of Buffalo.

Company Will Appeal to Commission

An immediate application will be made by the company to the commission for permission to charge a 6-cent fare in the city of Buffalo. As the result of the action taken by the City Council, there will be no objection on the part of the municipal authorities. It is expected that the 6-cent charge will be approved by the commission so it can be put into effect by July 15.

The approval by the City Council of the company's application for a 6-cent fare prevented a strike of the company's motormen and conductors called for June 15. As soon as the Council agreed to recommend the increased fare to the commission, officers of the company conferred with representatives of the platform men. As a result a new wage scale was agreed upon to become effective as soon as the 6-cent fare is approved by the commission. The new scale follows: First-year men, 35 cents an hour, an increase of 8 cents an hour over the old scale; second-year men, 37 cents an hour, an increase of 9 cents; third-year men, 39 cents, an increase of 10 cents; fourth-year men, 41 cents, an increase of 10 cents, and fifth-year men, 41 cents, an increase of 7 cents.

Financial Retrenchment to Follow

Under the provisions of the agreement between the City Council and the International Railway the company agrees to suspend all dividends other than those necessary to provide funds to pay the interest on the bonds of the International Traction Company. This means that dividends will continue to be paid on common stock of the International Railway, but that no dividends will be paid on the common stock of the International Traction Company.

Petitions are being circulated in the city for a referendum vote on the action taken by the City Council. The Corporation Counsel of the city says that a referendum can properly be held, but Henry W. Killeen, of counsel for the railway, says that a referendum is illegal because the action of the City Council does not give the company a higher fare, but merely recommends that the Public Service Commission give the company permission to charge a higher rate of fare. This procedure is necessary because of the company's franchise, known as the Milburn agreement, which fixes 5 cents as a maximum fare which can be charged within the city limits.

The extra money collected by the company by reason of the 6-cent fare must be placed in a separate fund which shall be devoted exclusively to the payment of the increased wages of the company's employees; to provide additional maintenance and renewals requested or directed by the Public Service Commission, and to provide other betterment of service which may be required by the City Council.

Each month the company is to make a written report to the Council of its receipts and disbursements in the city for the calendar month in form as may be required by the Council. All the books, accounts, reports, agreements and documents of the company are to be open and accessible to the Council at all times. All contracts, franchises and grants made by the city since 1890 are to remain in force notwithstanding this agreement.

Company Held by $300,000 Bond

The agreement will continue for the duration of the war and for six months thereafter. The company has agreed to give the city permission at that time to take steps in an action which may, if successful, abrogate the company's 999-year franchise. The company will give a bond for $300,000.

The action of the City Council followed an investigation into the company's financial condition. The inquiry covered a period of almost six weeks. The report of the investigators showed that the company was in a very poor financial condition and was unable to pay its employees a higher wage without an increase in the rate of fare.

Advance Asked in Class Rates

Petitions are being filed by the interurban railways of Indiana with the Public Service Commission, asking for an increase of 25 per cent on all class and commodity rates. The petitions of the Public Utilities Company, Evansville; Marion & Bluffton Traction Company, the Evansville Railway and the Ohio Electric Railway were filed on June 17, and the petitions of the other interurban railways of the State were to be filed by June 19.

In nearly all of the petitions for an increase in freight rates it is shown that the electric railways are practically doing an express business at steam road rates, and unless they receive the same rate of increase that was granted to the steam road carriers, which will be effective on June 25, the electric railways will be swamped with freight business which they would not have the facilities to handle. A decision is asked by June 25.

Compromise Fare Increase Approved

Massachusetts Commission Signifies Its Willingness to Approve Modified Fare System, with Reduced Rates at Off-Peak Hours

In a forty-eight page finding dated June 11 the Public Service Commission of Massachusetts announced its willingness to approve a compromise fare increase schedule on the Bay State Street Railway, following extended hearings during which representatives of the company and the principal municipalities served agreed upon many of the rates under consideration and, as modified in conference. A new schedule will be filed by the company embodying the various changes.

The unit of cash fare is at present 6 cents. In general, the city districts have an inner zone in which free transfers are given and an outer zone in which the unit fare carries only to and from the city center or intermediate points, without transfer privileges. The maximum haul per single fare varies considerably. The interurban lines are divided into zones of varying lengths which frequently overlap to avoid charging a double fare for short local rides. North of Boston the longest zone on such lines is 7.93 miles and the shortest, 1.37 miles, the corresponding maximum and minimum south of Boston being 7.02 miles and 1.37 miles. Many reduced-rate tickets are sold, mainly to accommodate regular travel of comparatively large volume.

The schedules considered apply somewhat different treatment to the urban and suburban lines, as distinguished from the interurban. In nearly all of the cities a new inner zone of greatly restricted area is created, the radius being between 1.5 and 2 miles. Outside, but usually within the free transfer territory a second zone averaging about 1 mile in width is created. Under the schedule (No. 77) as filed, the fare within the inner area is 6 cents, with free transfer privileges at the center, no reduced rate tickets being sold. The cash fare between any point in the outer zone and any point in the inner zone is 8 cents, but six tickets are sold for 45 cents.

The compromise schedule restores the 5-cent rate, by the use of tickets, for rides within the inner area which do not extend beyond the center, and the 7.5-cent ticket to and from points in the outer zone, with transfer privileges, is superseded by a 7 1/7-cent ticket without transfer privileges. The agreement between the company and the communities, which was outlined previously in the ELECTRIC RAILWAY JOURNAL, also describes the practice, new to Massachusetts, of charging less than the regular rate in the off-peak hours, when traffic is slack. These are:

Six tickets for 25 cents, good only on local rides to and from the center of the first zone, without transfers or through rides.

Four tickets for 25 cents, good in the same manner to the center of the first zone from the second zone.

In general, these off-peak tickets will be good from 9 a.m. to 4.30 p.m. (to 6.30 p.m. Saturdays), but not good at other times or on Sundays and holidays.

The Chelsea zone has been elongated to reach to Scollay Square terminus in Boston, and on the line between Boston and Lynn, through Chelsea, the schedule (No. 77) provides for tickets sold at the rate of eight for $1, where the cash fare would otherwise be 18 cents, in order to meet steam railroad competition.

Another schedule before the commission, No. 75, covers the interurban lines outside the city zones and in general follows the "copper zone" plan with rates varying according to traffic density. Out of 403 miles of main track outside the outer city zone, the rate is 2 cents on 249 miles, 2.5 cents on 37 miles and 3 cents on 117 miles.

The third schedule before the board, No. 62, eliminates all reduced-rate tickets which the company deems unnecessary and attempts to place the remainder on a uniform basis. Forty-nine such tickets out of seventy-three are retained, their use being confined to the rush hours and the rate is made 70 per cent of the regular cash fare.

The company estimated that the three schedules would add $2,021,000 annually to its revenue, an increase of 19.8 per cent upon the 1917 gross income within Massachusetts; and that the compromise plan will reduce this increase to $1,671,000.

THREE INCREASES SINCE 1916

Since September, 1916, the company has been permitted to raise its fares in Massachusetts on three occasions, the average increase in rate being about 20 per cent. While provision was made in the city districts for the sale of twenty tickets for $1, in practice less than 30 per cent of the riders in these districts used these tickets. The total gain expected from the three increases was about $1,120,000. The gain in 1917-1918 under the increased rates was at the rate of $863,359 for a year, which was hardly more than might have been expected from two years' increase in traffic without any change in fares. Traffic fell off last winter on most Massachusetts lines owing to severe weather and service reduction. The Bay State company estimates that about 34,000 men in its territory have gone into the army and that the loss in revenue resulting exceeds $300,000 a year. War activity has led to influx of population at certain points, and the company's final conclusion is that all three increases added about 8 per cent, or $792,000 a year, to the revenue.

Last May wages were increased $65,000 by 1916 agreement. Early this year the company agreed to pay its employees in addition a special war bonus of about $300,000 a year. Effective June 10, the men are to receive an additional $750,000 a year. Operating expenses have risen from 18.72 cents per car-mile in 1914 to 29 cents in 1918. The estimated total charges for 1918 are $12,710,255 and the estimated gross income, $10,507,488.

After discussing what the company has achieved in the way of operating economies and possible sources of increased revenue, the commission concludes that the main reliance must be placed upon an increase in passenger fares. The city lines were responsible for 15.74 per cent of the 1917 income deficiency and the country lines for 84.26 per cent. Under the compromise plan the city lines will produce 63.77 per cent of the desired increase and the country lines 36.23 per cent. Under Schedule 77 the commission is of the opinion that the fares fixed by the company are high in relation to the areas established in the inner zones. The minimum fare in the larger cities for a 3-mile ride from the center would be 7 1/7 cents in the rush hours and 6¼ cents in the off-peak hours, even under the compromise plan, and in some instances it would be 10 cents, where the limit of the outer zone is less than 3 miles from the center. The only advantages which the larger cities have over Woburn, Gloucester and the Hyde Park district of Boston lie in the 5-cent tickets in rush hours and the 4 1/6-cent tickets in off-peak hours, available for short-haul rides.

RELATION OF PUBLIC CONTROL ACT TO FARE SITUATION

Under the Bay State public control act, recently passed, the property (if the act is accepted by the company, as it probably will be) will be taken over by a new company capitalized on such a basis that the annual interest and dividend charges (computing common stock dividends at 6 per cent) will not exceed 6 per cent upon the amount found by the commission in 1916 to be the rate base, plus subsequent additions and improvements. New capital is to be furnished, partly by the security holders and partly through the issue of serial bonds in effect guaranteed by the State, any resulting burden being distributed proportionately upon the cities and towns served. To this extent the credit of the State will be placed behind the company.

The decision reviews other features of the Bay State act as previously published in the ELECTRIC RAILWAY JOURNAL, and points out that the legislation passed meets the requirements of the company to an extent probably not anticipated at the time of the hearings. It re-establishes the company's credit, relieves the company from burdens in relation to amortization charges, depreciation allowances, and contributions toward highway and bridge work, etc., so as to prevent fares from reaching an unduly high level during the period of the war. The trustees to be appointed by the Governor will have full control of rates, but as this control will probably not be assumed before autumn, the commission feels that the decision in the pending case could not be postponed with propriety.

With respect to the proposed rates on rural interurban lines covered by Schedule 75, little question can be raised. The decision holds that the copper zone system is logical in conception and deserves a fair trial. In deciding whether the rate on a particular line should be 2, 2.5 or 3 cents per mile, certain rather arbitrary distinctions have been made, but the higher rates have not been applied to lines where the traffic would justify a lower rate.

CITY ZONES COVER THICKLY-POPULATED DISTRICTS

Schedule 77, relating to the city districts, raises more difficult questions. If it were not for the increase of $750,000 a year in wages the commission would be disposed to require radical changes. Taking into consideration the financial benefits to be derived from the new legislation, the burden imposed upon the city districts under this schedule would, in the opinion of the commission, be unjust as the situation stood prior to the granting of the last wage bonus. This wage increase is nearly half the sum the company expects to derive from the new compromise schedule. The commission concludes that no change need be made at this time. The zone system of fares proposed within the city districts seems to be better adapted to the urban territory in which the company operates than to the similar territory served by certain other street railways. In the main, the cities are compact, the thickly-settled portion falling largely within the inner zone limits. There seems to be a general feeling that the preservation of a 5-cent rate for short-haul traffic within the central areas and the experimental introduction of a still lower rate during the off-peak hours compensate in substantial measure for the disadvantages of the zone plan, and will offer an opportunity to test the effect of low charges in inducing extra riding.

Regarded from this point of view, the new schedule is an attempt to confine the inner zone within which the minimum fare is charged to the limits of the thickly-settled portion of a city, rather than an attempt to reduce it to an arbitrary circular area with a radius of about 1.5 miles; and for this reason the precedent established is in the commission's opinion less undesirable and dangerous to the public interest. As the short-haul offsets the long-haul riding in city traffic, the central single-fare area may often, without detriment to earnings, be made larger than would appear possible.

In regard to Schedule 62, dealing with the so-called "workingmen's tickets," the chief question is whether these should be provided more generally. The commission does not feel called upon to suggest additional applications under present conditions in a sweeping manner, but reserves the right upon petition to take up particular cases, and its attitude is the same with regard to zone limits. The board feels that the new 7 1/7-cent tickets, taking the place of the 7½-cent tickets, should be used in connection with through rides to or from interurban territory beyond the outer zone. Otherwise through riders would have to pay the 8-cent cash rate and would thus be worse off under the compromise plan than under the original schedule. With minor modifications, the commission is prepared to approve a new schedule tentatively prepared as Bay State Tariff No. 78, combining and superseding those before the board, which are now canceled by the commission.

What Virginia Cases Portend

The favorable action by the Corporation Commission of Virginia in connection with the recent fare application of the Charlotteville & Albemarle Railway and the Lynchburg Traction & Light Company, both of which have been referred to recently in the ELECTRIC RAILWAY JOURNAL, is regarded to have been influenced by the conference which the committee representing the public utilities of Virginia held with the Corporation Commission the latter part of April. At the end of that hearing the chairman of the commission indicated that a statement would possibly be issued setting out in a general way the attitude of the commission, but up to June 6 this had not been done. The attitude of the commission, however, is apparently to consider the applications in the nature of a war emergency, for so far as the records are available they show that all of the grants of increases have been limited to Nov. 30, 1919.

Transportation News Notes

Illinois Road Would Raise Fares.—It has been announced that the Chicago & Joliet Electric Railway, Joliet, Ill., will petition the Public Service Commission of Illinois for an increase from 5 cents to 7 cents on all city lines and an increase of one-half cent a mile on the interurban lines.

A Two-Page Publicity Spread.—In connection with its application to the Illinois Public Utilities Commission for a 7-cent fare, as noted recently, the Alton, Granite & St. Louis Traction Company published in the Alton daily papers a two-page advertisement setting out in full why a higher fare is needed. This will be followed by smaller advertisements dealing with particular phases of the situation.

Electrics Seek Increase of Interstate Rates.—Increases in both passenger and freight rates to conform with the 25 per cent advance for roads under federal control was asked of the Interstate Commerce Commission on June 15 by the Ohio Electric Railway. The Terre Haute, Indianapolis & Eastern Traction Company has also filed an application for increase in fares between points on its line in Indiana and Illinois to the basis of 2½ cents per mile.

Folder on Fares and Service.—The New York (N. Y.) Railways has issued over the signature of T. P. Shonts, president, an eight-page folder 6 in. wide by 9 in. high entitled "Street Car Fares and Street Car Service." It contains a list of 6-cent fare cities, zone fare cities, cities in which fare appeals have been made and extracts from statements made about the public utilities by Comptroller of the Currency Williams, Secretary McAdoo and President Wilson.

Transportation of Soldiers a Question.—As a result of a campaign by the Hearst papers of Chicago, the City Council of that city has referred to the committee on local transportation the question of requesting the surface and elevated lines to carry men in the uniform of the United States Army, Navy and Marine corps without compensation. The railways have not as yet made any statement as to what action they will take if such a request is made. It is expected that the matter will come up for decision at an early date.

Skip Stops at El Paso.—The El Paso (Tex.) Electric Company announced that the skip stop would be introduced on June 5 on the Fort Bliss, Highland Park and Government Hill lines which have no direct jitney competition. The stops are located every other block, averaging six or seven to the mile. Stop signs are hung from the span wires. Announcement of the change was made in the newspapers. It was planned to allow one day's grace in accustoming riders to the change by advertising to them in the cars on June 5 substantially as follows: "We stopped to pick you up to-day, but hereafter the skip-stop rule will be rigidly enforced. Better take the right corner!"

Workingmen's Tickets to Go.—The International Railway, Buffalo, N. Y., has filed with the Public Service Commission for the Second District of New York, a new tariff schedule to go into effect on July 1. It is proposed to discontinue the sale of tickets in strips of ten for 25 cents, good for use between points within the city of Niagara Falls between the hours of 6 and 7 a.m. or between 6 and 7 p.m. The tickets will not be accepted for passage on and after July 1, but unused portions will be redeemed on a basis of 2½ cents per coupon. The proposed change effects an increase.

Five-Cent Fares the Rule.—E. I. Lewis, chairman of the Public Service Commission of Indiana, has announced the granting of a straight 5-cent fare to the Louisville & Southern Indiana Traction Company, which operates in New Albany and Jeffersonville. This practically completes the institution of straight 5-cent fares in the larger cities of the State by the commission as a war-time relief measure. In Indianapolis this relief could not be granted as the company did not surrender its franchise. The case of the railway there must be passed on by the Supreme Court before the commission can act.

Modification of Zone Charge—The Peekskill Lighting & Railroad Company, Peekskill, N. Y., according to a schedule filed with the Public Service Commission for the Second District, has reduced its fare from 7 to 5 cents between any two stops within zone 2, in line division, northeast of Locust Avenue to and including Lake Mohegan, and between any two points within zone 3, Verplanks division west of Montrose to and including Verplanks. Monthly commutation tickets good for fifty-four rides between Verplanks and the corner of the Albany Post Road and Welcher Avenue will be sold for $3.78. This is a new fare.

Fare Protest Served on Company.—The Public Service Commission for the Second District of New York has served upon the United Traction Company, Albany, the complaint of Mayor McIntyre of Rensselaer against the company's proposal to increase the Rensselaer-Albany fare to 6 cents with no transfer. It is expected the complaint will be heard upon the hearing of the suspended schedule of the company increasing interurban rates affecting Albany, Troy, Cohoes, Green Island and Waterford. The date has not been fixed. The complaint claims the rate of fare between Albany and Rensselaer is fixed at 5 cents by the laws of 1905.

Wants to Apply Steam Rates.—The Joplin & Pittsburg Railway, Pittsburg, Kan., which recently was authorized by the Public Service Commission of Kansas to charge 2 cents a mile in that State outside of towns, has now petitioned the commission for permission to charge 3 cents a mile. Besides asking an increase to 3 cents a mile for passenger fares, the company wants a flat raise of 25 per cent in freight rates to conform to the advances allowed the steam railroads. A hearing will be held before the commission during the week commencing July 2. The matter of fares over the line was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for May 11, page 935.

Portland Jitneys Prepare for Comeback.—It is expected that jitneys will be operating shortly in Portland, Ore., under the provisions of the new bonding act approved by the voters at the recent city election, noted in the ELECTRIC RAILWAY JOURNAL for June 1, page 1065. E. W. Rossman, president, secretary and treasurer of the Jitney Bus Union, states that sufficient numbers of men have been enrolled in the United Motor Bus Association to insure the operation of jitneys under a blanket bond of $10,000, and securities in the form of Liberty bonds will be deposited with the city treasurer in the near future. One hundred men will deposit $100 each to make up the necessary amount.

Violation of Traffic Orders Charged.—The Public Service Commission of Maryland has adopted a resolution directing its general counsel to commence an action against the United Railways & Electric Company, Baltimore, for the purpose of having alleged violations of the order of the commission dated Feb. 18, 1918, and other service orders covering overcrowding, etc., prevented by mandamus or injunction. About two years ago the commission adopted rules regarding the crowding of the cars. Since that time there have been many complaints alleging violations of the rules. Some months ago the company petitioned the commission to make modifications. The commission did so. It has since been charged that the company has not lived up to the letter of the modified orders.

Grand Jury Reports on Women Employees.—A special Grand Jury which for several weeks had been investigating complaints as to the conditions surrounding the employment of women as conductors and guards on the surface and subway lines of the Brooklyn (N. Y.) Rapid Transit Company on June 17 handed in a presentment to County Judge McDermott charging the company with "inexcusable neglect" in failing to cause a careful investigation to be made of the character of each woman applying for work. The conditions, the Grand Jury finds, are such as to make the conduct of a few reflect upon the many decent and self-respecting women employed by the company and should be remedied forthwith. The company regards the finding of the Grand Jury as "primarily a tribute to the high standing and character of the great majority of the patriotic and courageous women in our service."

Professor Richey on Rate Inquiry Board.—Prof. Albert S. Richey of Worcester Polytechnic Institute has been appointed a member of a special commission to decide whether the New Brunswick Power Company, St. John, is entitled to increase its railway fares and rates for electric light, power and gas. His colleague on the commission will be Le Guy W. Currier, Boston, Mass. A bill introduced in the New Brunswick Legislature to authorize the New Brunswick Power Company to advance its electric railway fares and its rates for gas and electric current was defeated owing to opposition by St. John citizens and newspapers, but a bill introduced at the city's instance was passed, providing for an investigation of all the company's property, franchise rates, etc., with the proviso that the commission to be appointed under it may grant temporary relief, if it is satisfied that the same is necessary.

Mr. Cobb Retorts—Numerous criticisms in the daily papers of the suggestion by John T. Cobb, the Boston banker, that the New York traction companies abandon night service to save expenses have led him to reply that his suggestion was made only because economies had to be effected and he thought that it would be less inconvenient to a smaller number of people for the companies to shut off night service than to curtail day service, but any more satisfactory plan would be welcomed by the managements and undoubtedly also by the Public Service Commission. The metropolitan press seems now to have a better understanding of the subject. The New York *Sun* in a recent editorial said: "Radical cutting down of the city's transportation lines is impossible, if we are to remain efficient. It cannot be done. If the transit companies absolutely need higher fares, we will pay them."

East St. Louis Company Would Increase Rates.—The East St. Louis (Ill.) Railway announced by advertisement in the daily newspaper on June 18 that it was filing with the Public Utilities Commission and the Interstate Commerce Commission tariffs for increased fare from 5 cents to five tickets for 30 cents (7 cent cash fare) on all East St. Louis city lines, and for increased fare from East St. Louis to St. Louis from 10 cents to five tickets for 55 cents (12 cents cash fare). The East St. Louis Railway owns and operates the cars which operate over the East St. Louis city tracks, but the East St. Louis & Suburban Railway and the Alton, Granite & St. Louis Traction Company also carry city pasengers on interurban cars. All three companies will be affected in so far as the rate of fare affects passengers whose destination is anywhere within the city limits, but the East St. Louis Railway is the company which will be principally affected by the increase. The company incorporated as part of its announcement the estimated results of the increase as affecting the East St. Louis Railway. It also presented data on the need of the increase.

Schenectady Fare Appeal.—Horace E. Andrews, president, and J. P. Barnes, general manager, representing the Schenectady (N. Y.) Railway conferred recently with the Public Service Commission for the Second District. They asked if the commission was willing to take up the Schenectady fare question and Chairman Hill informed them that the commission would take the same position it has taken on fare questions in Buffalo and White Plains, namely that unless jurisdiction is legally conferred upon the commission so that it could make a binding order, the commission cannot see its way to act. A move to secure the necessary action of the city has since been made in connection with the settlement of the strike referred to on page 1201 in this issue of the ELECTRIC RAILWAY JOURNAL. The hearing of the petition of the company for annulment of existing orders of the commission requiring the sale of round-trip tickets between Schenectady and Albany and Troy and also between Schenectady and Ballston Lake was adjourned by the commission on June 13. The railway is to file new tariffs at once covering proposed rate changes and then the commission will hear the evidence on the company's petitions to annul and also the necessity for rates under the new tariff.

Personal Mention

H. H. Lyons, superintendent of the Ordway division of the Arkansas Valley Railway, Light & Power Company, Pueblo, Cal., has enlisted in government service, and will take special training at Fort Collins.

Henry Hoffer has been appointed chief instructor of the Washington Railway & Electric Company, Washington, D. C. Mr. Hoffer succeeds E. C. Elliott, who becomes assistant superintendent of transportation of the company.

J. J. Stanley has been elected president of the Syracuse & Suburban Railroad, Syracuse, N. Y., succeeding W. J. Harvie, who remains as general manager and a member of the board. Mr. Stanley is president of the Cleveland (Ohio) Railway.

Arthur W. Warner, head of the real estate department of the Interborough Rapid Transit Company, New York, N. Y., has obtained an indefinite leave of absence and will enter the government service to assist in the buying, commandeering, and valuation of property for the army and navy.

E. C. Elliott, chief instructor of the Washington Railway & Electric Company, Washington, D. C., has been appointed assistant superintendent of transportation of the company. Mr. Elliott graduated from the platform of the old horse car and has been in the service twenty-five years. He passed through the stages of conductor, starter, clerk, inspector and instructor. In the latter capacity he succeeded W. F. Dement in charge of the company's school.

William F. Dement has been appointed superintendent of transportation of the Washington Railway & Electric Company, Washington, D. C., in which capacity he has been acting for some time. Mr. Dement began his railway career with the Columbia Railway in 1890, as a driver of a one-horse car and was advanced to clerk and then supervisor. In 1900, when the road became a part of the system of the Washington Railway & Electric Company, he was promoted to depot clerk and later to inspector. He organized and conducted the school for instruction of motormen and conductors.

F. H. Williams of the Manitoba *Free Press* has succeeded H. C. Howard as publicity agent for the Winnipeg Electric Railway, Mr. Howard having joined the business staff of the Vancouver *Sun*. Mr. Williams is well known in Western Canada, having been connected with the Winnepeg *Telegram*, the Edmonton *Capital* and the Edmonton *Bulletin* during the past six years. He has only recently returned from France where he served ten months in the trenches with the Forty-second Battalion of Montreal. Mr. Williams had his left leg shattered by an explosive bullet in the battle of Vimy Ridge, on April 9, 1917, and spent nine months in a hospital before being sent back to Canada.

LESLIE SUTHERLAND

Leslie Sutherland, vice-president and general manager of the Yonkers Railroad, has been elected second vice-president of the Third Avenue Railway, New York, N. Y., which controls the Yonkers Railroad. Mr. Sutherland began his railroad career in 1908, when he was appointed receiver of the Yonkers Railroad. After the receivership was lifted in 1912 Mr. Sutherland was elected vice-president and general manager of the company, which position he continues to hold in addition to his new office with the Third Avenue Railway. Despite the tightened conditions of the money market when Mr. Sutherland was made receiver of the Yonkers Railroad he succeeded in borrowing $600,000 on receiver's certificates, practically rebuilt the road, restored it to public prestige and doubled the receipts in four years. Mr. Sutherland has had a wonderful career of achievement. He left school when twelve years of age. He held several minor positions and then began the study of law. On account of ill health he was obliged to give up office work and became an apprentice bricklayer. While serving in this trade he entered Cooper Union, New York, taking the course in the school of science and art. It seems now rather singular that one of the buildings on which Mr. Sutherland worked as foreman of construction was the cable house of the Third Avenue Railway on the Bowery, of which property he now becomes vice-president. In addition to his business interests, Mr. Sutherland has been prominent in public life, being twice elected Alderman, serving twice as president of the Board of Aldermen and later as Mayor of Yonkers. He was twice elected county clerk of Westchester County. Mr. Sutherland has also represented the Republican party in ward, city, county, State and national conventions. Throughout all Yonkers and Westchester County Mr. Sutherland's name is a household word. He is Yonkers' favorite son.

K. B. Conger, assistant secretary and assistant treasurer and real estate manager of the Hudson & Manhattan Railroad, New York, N. Y., has been appointed by the Director General of Railways general manager of the company in charge of the operating affairs of the railway.

J. C. Moore has resigned as auditor of the Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., to accept a similar position with the Chicago, South Bend & Northern Indiana Railway, and the Southern Michigan Railway, South Bend, Ind. Previous to his position with the Chicago, North Shore & Milwaukee Railroad, Mr. Moore had been auditor of the Oklahoma Railway, Oklahoma City, Okla., and assistant auditor for the Union Traction Company of Indiana, Anderson, Ind.

C. A. Hall has been appointed manager of the electric light and power department of the Eastern Pennsylvania Railways, Pottsville, Pa. Mr. Hall was employed in 1904 by the Consolidated Light Company, Huntington, W. Va. In 1907 he went with the Ohio Valley Electric Railway, Huntington, W. Va. He became superintendent of the Canonsburg Electric Light, Heat & Power Company, Canonsburg, Pa., in 1909, and following the purchase of this utility in 1911 by the West Penn Power Company, Pittsburgh, Pa., he was appointed local manager of that corporation in charge of the Canonsburg territory. Under Mr. Hall's management this property was entirely rebuilt and many improvements made to the service.

W. B. Atwood, formerly general superintendent of the Wheeling (W. Va.) Traction Company, has become safety engineer with the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. The accident expenditure of the company at Youngstown is considered too high by the officers, and to Mr. Atwood will be intrusted the work of studying accident prevention on the property and then adopting such corrective measures as may suggest themselves to him as applicable. Before going to Wheeling in 1916, Mr. Atwood was vice-president and general manager of the Geneva, Seneca Falls & Auburn Railway, Seneca Falls, N. Y. He was graduated from Cornell University, and has had considerable steam railroad experience in addition to his electric railway work.

C. C. Coulthard has been appointed assistant superintendent of the lines of the Mahoning & Shenango Railway & Light Company in New Castle, Pa. Mr. Coulthard became connected with the New Castle Traction Company, the predecessor of the Mahoning & Shenango Railway & Light Company, on

May 3, 1900, but began his career in 1892 on an electric line which was operated by the Pennsylvania Railroad from Ellwood City to Ellwood Junction. He was a conductor for two years on this line. Later he went to the Shelby Tube Works. When Mr. Coulthard entered railway work in New Castle the company was under the general managership of Gaylord Thompson. He continued on through the administrations of A. A. Anderson, M. E. McCaskey, W. C. Smith and G. J. A. Paul and into the present management.

W. J. Grambs, formerly superintendent of light and power of the Puget Sound Traction, Light & Power Company, Seattle, Wash., has been appointed supervisor of the Sea Training Bureau of the United States Shipping Board for the Pacific Northwest. He will have charge of the receiving station in West Seattle and the training ships *Iroquois* and *Chippewa* recently taken over by the government. These duties will be performed in addition to his work as section chief of the recruiting service of the Shipping Board for Washington and Oregon noted some time ago. Mr. Grambs entered government service on Sept. 1, 1917, and has had charge of the navigation schools in Seattle, Tacoma, Portland and Bellingham and the marine engineering school at the University of Washington. John Harsberger holds the position formerly held by Mr. Grambs.

Obituary

S. M. James, assistant superintendent of transportation for the Kansas City (Mo.) Railways, died suddenly at his home on May 19. Mr. James had been with the company at Kansas City for the last eighteen years as a member of the transportation department.

Capt. Frank W. Hulett, engineering corps, American Expeditionary Force, was recently reported killed in action in France. Captain Hulett was thirty-five years of age. He was graduated from Yale University in 1908. He was in the service of the government for two years in the Philippines, and for five years was electrical engineer of the Lewiston, Augusta & Waterville Street Railway.

Charles F. Freeman, aged seventy-two years, organizer and former president of the Dallas (Tex.) Rapid Transit Company, which was later sold to Stone & Webster, died at his home in Dallas on May 31. Mr. Freeman as president and manager of the Rapid Transit Company, now known as the South Bend Line and consolidated with other companies under the Strickland-Hobson franchise, is said to have brought the first electric street car to Texas. Mr. Freeman continued as president of the Rapid Transit Company until 1902, when the property was sold to Stone & Webster.

Construction News

Construction News. Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

Franchises

Los Angeles, Cal.—The Board of Public Utilities of Los Angeles has approved the application of the Los Angeles Railway for a franchise over Country Club drive to the new high school. The company is prepared to extend the Eleventh Street line at once.

Hamden, Conn.—The Connecticut Company has received an extension of time on its franchise to construct a line in Hamden from the Dixwell Avenue terminus to Centerville, passing through Highwood and connecting with the Whitney Avenue line.

New York, N. Y.—The New York & North Shore Traction Company has asked the Board of Estimate for the right to abandon its franchise for the two lines extending from Flushing to Whitestone and Little Neck. A public hearing on the application was scheduled to be held in Flushing on June 21.

Philadelphia, Pa.—The finance committee of the City Councils of Philadelphia has refused to approve an ordinance providing for a new contract between the city and the Frankford, Tacony & Holmesburg Street Railway, relative to bearing the costs of keeping Frankford Avenue in repair. The city, however, will spend $60,000 for that purpose as an emergency war measure.

Seattle, Wash.—The application of the Puget Sound Traction, Light & Power Company for relief from its franchise obligations during the period of the war has been referred by the Mayor of Seattle to a committee of two Councilmen and Thomas F. Murphine, superintendent of utilities.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—An extension to Yucaipa will be built by the Pacific Electric Railway as soon as possible.

Chatham County Traction Company, Savannah, Ga.—The Railroad Commission of Georgia has granted the Chatham County Traction Company authority to issue $150,000 capital stock. The company is building a line from Savannah to Port Wentworth. (April 27, '18.)

United Railways & Electric Company, Baltimore, Md.—Several lines of the United Railways & Electric Company will be rerouted, necessitating the building of several short connections.

Detroit (Mich.) United Railway.—In conjunction with the new car line now under construction, connecting Ferndale and Dearborn Avenues, the Detroit United Railway will build an additional line to the northerly end of the Ford shipbuilding plant on the River Rouge, north of Fort Street. The new line, which will be double-tracked, will connect with the new Ferndale line at Dix Avenue and extend north 1 mile on the east side of the Pére Marquette Railroad. The company will spend approximately $500,000 in constructing these two new lines, and most of the track will be on private right-of-way.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Officials of the Trenton & Mercer County Traction Corporation and members of the Board of Public Utility Commissioners of New Jersey recently held a conference relative to the construction by the company of an extension to connect the West State Street and Trenton Junction lines and the Pennsylvania Railroad Company's tunnel and subway under the Delaware and Raritan canal near the State Hospital. Rankin Johnson, president, said his company was ready to proceed with the work of building the new road. The traction company will have to cut its tracks to permit the Pennsylvania Railroad to complete its tunnel and subway improvements. The tracks will have to be relaid at a new grade. The company has asked the commission for permission to remove the tracks from a private right-of-way on a portion of the Trenton Junction line. The tracks on the Trenton Junction line near the State Hospital woods were recently damaged by a washout.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District of New York has requested the Brooklyn Heights Railroad, a subsidiary of the Brooklyn Rapid Transit Company, to change its track layout in Long Island City so as to accommodate larger cars of the Graham Avenue line, which was recently extended over the Vernon Avenue bridge to Long Island City.

New York (N. Y.) Railways.—A public hearing will be held on July 14 in the Board of Estimate chamber on the matter of changing the tracks of the New York Railways on Central Park West from the east side to the center of the street.

Poughkeepsie City & Wappingers Falls Railway, Poughkeepsie, N. Y.—The memorandum of Commissioner Hill of the Public Service Commission for the Second District of New York in the decision permitting the Poughkeepsie City & Wappingers Falls Electric Railway to charge a 6-cent fare specifically details improvements which are to be made by the company. These include the replacement of 5384 ft. of single track in Main Street with double track, reconstructing 12,461 ft. of track on the South Side line, repairing track, securing two additional cars for the Wappingers Falls division, to repair and properly clean cars, replace wires and poles, install automatic block signals, reroute and make other improvements tending toward safety of operation, convenience of passengers and better service.

Chillicothe & Camp Sherman Electric Railway, Chillicothe, Ohio.—The Public Utilities Commission of Ohio has approved the steps which are looked to for securing of traction service from Chillicothe to Camp Sherman. The commission approved the joint application of the Chillicothe & Camp Sherman Electric Railway Company and the Chillicothe Electric Company for authority to transfer property to the new company, the Chillicothe & Camp Sherman Electric Railway Company. The price to be paid for the property transferred to the new company is $270,800, which is to be met by transfer of securities of the new company, $50,800 of common capital stock, $120,000 7 per cent preferred stock and $100,000 6 per cent mortgage bonds. (June 1, '18.)

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Operation has been begun by the Mahoning & Shenango Railway & Light Company on its 3-mile extension to East Hill and Buhl Park, Sharon.

London & Lake Erie Railway & Transportation Company, London, Ont.—An offer has been made by the London & Lake Erie Railway & Transportation Company whereby the city of St. Thomas may acquire the south end of the line running between St. Thomas and Port Stanley for approximately $150,000.

Toronto (Ont.) Suburban Railway.—This company will install a safety switch at the intersection of Lansdowne Avenue and Davenport Road.

Southern Pacific Company, Portland, Ore.—A plan has been formulated in Portland whereby special trains operated by the Southern Pacific Company, with transfer privileges to all city lines of the Portland Railway, Light & Power Company, may be operated for the benefit of shipyard workers in South Portland, and the plan will be submitted to the government and railroad officials. The plans were formulated by Edward M. Cousins, traffic expert, who says they have the approval of representatives of the Shipping Board, and the special committee of the City Council appointed by Mayor Baker to devise means for handling special problems pertaining to public utilities in Portland. A similar plan has been worked out for shipyard workers in the East Side, Peninsula District, St. Johns and Vancouver, providing for operation of trains by the Oregon-Washington Railroad & Navigation Company with transfer privileges to city lines. Three yards in that vicinity employ 7000 men, who are compelled at this time to walk eight blocks up a steep incline to reach street cars. A plan is also under way to place broad-gage street cars on the Southern Pacific electric lines, running near the three shipbuilding plants.

Seattle (Wash.) Municipal Railway.—A contract has been awarded to Geske & Company, Seattle, at $16,186 for furnishing labor, material, etc., for the elevated line along East Marginal Way and West Spokane Street. The committee appointed by the Board of Public Works, Seattle, has decided upon a 20-ft. vertical clearance, an 18-ft. horizontal span, 9 ft. from the center of the track to the elevated track supports, as the specifications for clearances for the railroad tracks under the city's elevated railway to the industrial district in the southern part of the city. The railroads have agreed to these specifications, and the Board of Public Works has adopted the committee's decision.

North Coast Power Company, Vancouver, Wash.—The Public Service Commission of Washington has instructed the North Coast Power Company to install an electric signal service on the line from the Cowlitz, Chehalis and Cascade office on Pacific avenue to Eleventh Street. One block will be placed at the office, another on John Street and the third at Eleventh Street.

Shops and Buildings

Lake Shore Electric Railway, Cleveland, Ohio.—Negotiations have been opened by the Lake Shore Electric Railway with the Sandusky Brick Company for the leasing of part of the old Goosman property on Wayne Street for a package station. It is understood that the company will use the north side of the building for the station. Loading platforms sufficiently long enough to handle several cars will be built and a spur run in from Wayne Street to enable the cars to reach the platform.

Ohio Electric Railway, Springfield, Ohio.—Plans have been prepared by the Ohio Electric Railway for the removal of its carhouse, repair shops and storage house from Columbus to Springfield. Ground has been purchased for the new building in West North Street. The contract for the construction of the storage house has been awarded to the Concrete Steel Construction Company. Contracts for other buildings have not been let.

Oregon Electric Railway, Portland, Ore.—A report from the Oregon Electric Railway states that it will purchase within the next few days one 13-in. brass finishing lathe, one ¾-in, plate binding roll, one double-end punch and shear and one 42-in. wheel lathe.

Power Houses and Substations

Alabama Power Company, Anniston, Ala.—The 90-mile transmission line of the Alabama Power Company from the power plant in Walker County to the government development work at Muscle shoals has been completed. The company is now building a 30,000-kw. extension to its Warrior reserve steam plants, which is to be completed by Oct. 1.

New Orleans Railway & Light Company, New Orleans, La.—The economizer and boiler in the central power plant of the New Orleans Railway & Light Company, at Market and South Peters Streets, recently exploded from unknown causes. It was estimated that the plant was damaged in excess of $50,000.

Union Street Railway, New Bedford, Mass.—Work on the new $1,000,000 power house of the Union Street Railway at the foot of Middle Street is progressing steadily, most of the steel framework being erected. It is expected that the concrete chimney, which will be 220 ft. high, will be completed within the next couple of weeks.

Albany (N. Y.) Southern Railway.—Of an issue of $2,151,000 of first refunding mortgage thirty-year 6 per cent bonds, recently authorized by the Public Service Commission for the Second District of New York, $190,683 will be used by the Albany Southern Railway for new construction. The new work proposed includes new crib work on the Albany-Greenbush bridge, additional transmission line, additional power facilities in Rensselaer and gas mains.

Pacific Power & Light Company, Astoria, Ore.—The construction of a new power transmission line has been completed by the Pacific Power & Light Company from its local system to a connection with the lines of the Northwestern Electric Company at its conduit plant on the White Salmon River, a distance of about 7½ miles. The line provides for an interchange of power between the Pacific Power & Light Company, the Northwestern Electric Company and the Portland Railway, Light & Power Company. The Pacific Power & Light Company has installed a new feeder panel for motor load control at its Toppenish substation.

Rutland Railway, Light & Power Company, Rutland, Vt.—New additions and extensions to its transmission system are being considered by the Rutland Railway, Light & Power Company to provide for increased capacity.

West Virginia Traction & Electric Company, Morgantown, W. Va.—Work has been begun by the West Virginia Traction & Electric Company on the erection of a new transmission system from Morgantown to Masontown to supply energy to the plant of the Elkins Coal & Coke Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS
FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Enormous Increase in Consumption of Wire

Railways Are Buying, But Official Requirements Dominate the Market—Rubber Supply Sharply Curtailed

Unless reports are misleading the demand for copper is growing steadily. The supply is variously stated as sufficient for all purposes and again a shortage is in sight. Perhaps these views are colored by the attitude of the people expressing them toward the market and also possibly by price considerations. At any rate wire and cable manufacturers, referring to their output of electric railway goods, state copper is difficult to obtain. Sellers are not numerous, and it appears as if the fixed governmental price is mentioned as too low. Consequently if an advance can be obtained a disposition to hold on to the metal with the hope of realizing a higher profit from commercial users, at least, is not surprising. Possibly this and other phases of the situation received consideration at a meeting of the producers with the sales managers of copper selling companies in New York on Tuesday. The distribution of supplies was discussed, but not a word on the price situation was disclosed.

Deliveries have also hampered the operations of the wire and cable plants. Even on government orders the delays occasioned by wrong routing and side-tracking of copper pressingly needed to fill orders has hindered the shipment of finished goods materially. Five cars of copper coming to a New York cable manufacturer from a near-by Southern point took more than five weeks to reach its destination. Of the great quantity of wire and cable used for power-house transmission and also for railway lines it is said the consumption has risen enormously since the first of the year, the majority of manufacturers reporting vastly increased sales.

The amount of wire goods sold during the last few weeks was about 75 per cent higher than in January. This ratio is being maintained. According to the statement of a large manufacturer the price of wire may not go up, but it certainly would not be lowered.

The consumption of rubber by rubber-covered, cable and weatherproof wire manufacturers has been curtailed by governmental restriction on its importation to about seven-tenths of what is usually called for. Furthermore, manufacturers' requirements and the use to which the material is to be put must be given in detail and every stage of the process and the ultimate destination and purpose of the finished article must be furnished. The prices fixed by the government, after placing rubber on the restricted import list which went into effect on May 1, as previously mentioned in the ELECTRIC RAILWAY WAY JOURNAL, are on the following scale: 62 cents a pound for standard smoke sheet; 63 cents a pound for standard quality first latex crepe; 68 cents a pound for fine Para, c.i.f. New York.

Producers of rubber-covered wire are displaying some concern over the future outlook for rubber. It is this condition that is beginning to have an effect on prices.

Largest Output of Bituminous Coal in History

Labor Shortage Is a Disturbing Factor and Is Seriously Restricting Production of Anthracite

Bituminous coal production during the week ending June 8 was the largest in history, according to the report of the United States Geological Survey. The soft coal produced (including lignite and that made into coke) is estimated at 12,465,000 net tons an increase over the week of June 1 of approximately 1,900,000 net tons or 17.8 per cent and the same increase over the week of June 8, 1917. The average daily production is estimated at 2,077,000 net tons, considerably in excess of the 1,791,000 net tons during the week preceding and 1,789,000 net tons during the same week of the preceding year.

With a depleted working force the anthracite industry is creating an output of 275,000 tons daily by intensive methods, but this cannot be maintained if further inroads are made in the ranks of the mine workers. Many collieries are now running with from 25 to 40 per cent short of a full force. The constant dwindling of the anthracite miners is now a serious question. It entails decreased production with probable cost increase to some consumers. The labor question seems to be the main disturbing factor to maximum hard coal production at the present time and it is one that should receive the immediate attention of interested officials. Before the war there were 177,000 mine workers in the anthracite industry. The number has been drawn down to about 145,000 now. With such reduced labor power, the existing output of coal is large. It is being accomplished with the aid of the much more highly developed mining facilities.

Trolley and Register Cords Again Advanced

Government Restricts the Importation of Asphalt—Prices to Go Higher—Raise on Cement

Several minor articles in general use by traction companies are either advancing in price or a shortage is impending. Trolley, bell or register cords, which were marked up during the spring, are reported as tightening in price. An advance of 9 cents a pound was made within a few weeks. Shortages of raw material have increased the cost of production of all cords, and there is little to indicate that they will be any cheaper for a long time to come.

The War Trade Board has placed asphalt upon the restricted imports list. Imports for 1918 will be limited to a total quantity of 30,000 tons from Venezuela and 32,000 from the Island of Trinidad. All outstanding licenses for the importation of asphalt are revoked as to shipments made after June 15, Allocation of the amounts permitted to be imported, regulation of the price and other details will be arranged after conference with the War Industries Board.

Asphalt importers, after this official announcement, said it would have no immediate effect on prices, but an advance should be looked for in a short time. It was bound to come as soon as the stocks on hand were depleted. An increase of 50 cents a ton was made last week. Asphalt filler is likely to go higher at the same time.

On June 25 cement will be advanced 8 cents a barrel at all points on carload lots. Contracts now being entered into are being executed on that basis.

Industrial Survey for War Work

Charles A. Otis, recently president of the Cleveland Chamber of Commerce, has been made chief of the new Resources and Conversion Section of the War Industries Board, and has suggested the Cleveland plan as a model for all of the other nineteen regions into which the country has been divided. Under this plan, the Cleveland district, which comprises fifty-four counties in northern Ohio and three in northwestern Pennsylvania, has been divided into eight sub-regions, each with a local war industry commission which reports to the district committee on the possibility of caring for government war orders.

Material for Cars Difficult to Obtain

Manufacturers Frankly Admit Their Anomalous Position—Prices and Promises in Same Class—Labor's Attitude

Priority certificates for the delivery of needed material for the manufacture of railway equipment, rolling stock and supplies are now the all-important consideration in the acceptance of orders. Unless long deliveries on rolling stock are acceptable it seems there is no other way to obtain cars, unless the equipment is directly or indirectly for government use or for the purpose of aiding in the prosecution of the war. A recent order for one-man cars was placed specifying August as the delivery date. The purchasing agent of the company thought he was particularly fortunate in securing the shipment so early. The remark was qualified by the statement that cars of this type are now almost carried in stock. That is to say, some of the builders have standardized the safety car and are therefore in a better position to construct and ship such orders at a definite time.

Another company in the market for a lot of closed double-truck cars, 50 ft. in length, finds that one car builder who was consulted stated his plant's capacity was taken up in the production of gun carriages and he would be unable to fill a rolling stock order under a year and a half. In other words, he would rather not take the order under the circumstances. Of course, other builders are in better shape, and it was ascertained that on this particular lot delivery could be made in October. A priority certificate would probably shorten the time—ninety days being about the period designated.

Snowplow requirements have been delayed this year later than usual; but a number of companies have finally placed orders. Deliveries are specified from September to December. Equipment of this kind is not carried in stock, consequently anticipation must be the rule if plows and sweepers are expected. The drawback is in obtaining material. Price is secondary in almost every instance. The selling agents of a concern in this line have recently been instructed by their factory not to book orders for any equipment unless the buyer is in a position to get priority on getting and delivering the raw material. This applies on everything.

With the government assuming the allocation of steel and iron products the situation is rendered still more uncertain and trying. An inquiry for a quotation on steel fenders a few days ago was met with the reply from the manufacturers that it was impossible to name a figure until the material could be located and delivery was assured. In other words, at present and probably for an indefinite period, shipment of completed orders is too hazy a proposition even to discuss. The curtailment in the supply of steel is rendering a change necessary in the construction of cars. Where steel parts have always been specified, wood is being substituted.

Skilled labor is becoming scarcer. Rather, it is shifting from one industry to another, as higher wages are offered. Possibly the government is planning to control the supply of labor and its distribution, as announced on June 13 by the Department of Labor, and thus may bring relief. Not a manufacturer of railway material or devices but has had his plant's efficiency and production more or less affected. As for wages demanded and paid it is almost beyond belief as compared with the prewar scale. It has also played no small part in the enhancement of prices and uncertain shipping promises. The plan will have its first practical test beginning July 15.

After that date all industries employing more than 100 workers will be compelled to obtain labor through the Federal Employment Service. This restriction will be eventually extended to cover skilled men. "Pirating labor" by bidding high prices for workmen, thus causing the shifting of numbers of skilled operations from one industry to another, sometimes crippling important war work, is also to be taken in hand.

The operation of traction roads has been greatly hampered by the lack of sufficient platform men. The car crews have been decimated by the glittering wage offers of shipyards and munition plants. In one instance from 125 to 150 motormen and conductors on one railway operating in shipyard territory abandoned their regular work for this employment. The road is still 100 men short of a full operating complement, and it is employing every man of age and upward fit to handle and control an electric car. One important line in the leading Eastern city running on an average of 1000 cars daily, now has only 600 in service, shortage of competent car crews causing the limitation in the service the company is able to render.

Rolling Stock

Gary (Ind.) Street Railway referred to in last week's ELECTRIC RAILWAY JOURNAL as having received six double-end center-entrance cars (two motors and four trailers), supplies the appended specifications:

Number of cars ordered	Six
Name of road	Gary Street Railway
Date order was placed	June 12, 1917
Date of delivery	March and April, 1918
Builder of car body	McGuire-Cummings Mfg. Co.
Type of car	Two motor and four trailer, double-end center-entrance
Seating capacity	56
Weight (total)	Motor, 43,000 lb.; trailer, 30,000 lb.
Length over bumpers	45 ft.
Length over vestibule	44 ft.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft.
Body	All steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Arched
Air brakes	Westinghouse Traction Brake Co.
Bumpers	Rico anti-climbers
Control, type	HLD
Couplers	Tomlinson No. 8
Curtain fixtures	Rex all-metal
Curtain material	Pantasote
Designation signs	Hunter illuminated
Door operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Fenders or wheelguards	H-B life guards
Gears and pinions	Westinghouse
Hand brakes	Double-acting
Heaters	Gold Car Heater Co., No. 405-E with thermostatic control
Headlights	Crouse-Hinds combination
Motors, type and number	4 WH-514-A
Registers	International
Sanders	O-B Pneumatic
Sash fixtures	Edwards No. 13-O. D-1
Seats, style	Hale & Kilburn
Seating material	Rattan
Step treads	Universal anti-slip
Trolley catchers or retrievers	Knutson
Trolley base	Union Standard No. 13-D
Trucks, type	Light weight with 6-ft. wheelbase
Ventilators	Railway Utility Co.
Wheels (type and size)	Griffin 26 in.

Tacoma (Wash.) Municipal Railway, through C. D. Atkins, commissioner of public works, has purchased ten passenger cars from the Minneapolis (Minn.) Street Railway at a cost of $60,000. They were recently received and put in service on the tideflats car line serving the shipyards and industrial districts. Previous mention of the transaction, then in contemplation, was made in the ELECTRIC RAILWAY JOURNAL of May 11.

Public Service Railway, Newark, N. J., which placed an order for thirty-three cars with the Cincinnati Car Company, as noted in the ELECTRIC RAILWAY JOURNAL of May 4, furnishes the following specifications:

Number of cars ordered	33
Name of road	Public Service Ry. Co.
Builder of car body	Cincinnati Car Co.
Type of car	Passenger—prepayment motor car
Seating capacity	46
Weight (total)	Approximately 42,500 lb.
Bolster centers, length	24 ft. 6 in.
Length over bumpers	48 ft. 4¼ in.
Length over vestibule	34 ft. 0¼ in.
Width over all	8 ft. 7 in.
Height, rail to trolley base	11 ft. 5⅜ in.
Body	Semi-steel
Interior trim	Cherry
Headlining	Agasote
Roof, arch or monitor	Combination
Air brakes	General Electric Co.
Bumpers	Channel iron
Car trimmings	Bronze
Conduits and junction boxes	Westinghouse
Control, type	WH-HL.
Couplers	Tomlinson
Curtain fixtures	National Lock Washer Co.
Curtain material	Double Pantasote
Designation signs	Hunter
Door operating mechanism	Public Service Ry. Co.
Fare boxes	Johnson
Fenders or wheelguards	H-B life guard
Hand brakes	Horne Mfg. Co.
Heaters	Gold Car Heating Co.
Headlights	Trolley Supply Co. No. 14
Journal boxes	Symington Torsion lid
Lightning arresters	Westinghouse-MR
Motors	2-WH. 307, C. V. 4. outside hung
Registers	Sterling No. 15
Sanders	Public Service Ry. Co.
Sash fixtures	O. M. Edwards Co.
Seats, style	Longitudinal—H. B. & W.
Seating material	Canvas lined rattan
Step treads	Lead—Public Service Ry. Co.
Trolley catchers	Ideal
Trolley base	U. S. No. 14
Trucks, type	Standard O-45
Ventilators	Garland
Wheels (type and size)	Drivers: 33 in., steel; Pony: 22 in., cast

Trade Notes

Goldschmidt & Forbes, Inc., New York, N. Y., have been appointed agents for New York and New Jersey for the Drew Electric & Manufacturing Company, Indianapolis, manufacturer of electric railway, light, power and gas materials.

Railway Improvement Company, New York, N. Y., has just shipped twenty-one Rico coasting recorders to the Australian General Electric Company for use on the lines of the Melbourne-Brunswick-Coburg Tramways Trust, Melbourne, Australia.

Princeton (Ind.) Utilities Company has been chartered by James C. Johnston, Samuel T. Heston, Jacob L. Knauss and Sampel L. May. The company is capitalized at $40,000 and proposes to supply light, heat and power in the city of Princeton and surrounding country.

American Chamber of Commerce, Paris, France, in its fortnightly information pamphlet, publishes a list of articles which are prohibited for exportation and re-exportation. Among other commodities is given that of compositions of products for electric insulation and tubes and pipes for boilers.

Jeffery-Dewitt Insulator Company, Huntington, W. Va., which has opened its new plant at Kenova, W. Va., will continue operation of the present factory at Detroit and enlarge it to meet the demands for manufacturing spark-plug porcelains and other porcelain material of that nature.

O. S. Lair, department manager for the Western Electric Company in various cities of the United States for the last seventeen years, and for the last four years manager of the Los Angeles (Cal.) office of the company, has resigned. Mr. Lair will become associated with the W. Ross Campbell Company, Los Angeles.

A. Huetter, for a number of years superintendent of the Boonton (N. J.) Rubber Manufacturing Company, is now vice-president and general manager of the Premier Rubber & Insulation Company of Dayton, Ohio. The new plant of the company, completed April 1 and in operation since May 1, is a one-story brick building, 68 ft. x 100 ft., with a separate power house of its own.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has purchased the property, business and good-will of the Krantz Manufacturing Company, Inc., of Brooklyn, N. Y., manufacturer of safety and semi-safety electrical and other devices, switchboards, floor boxes, bushings, etc. The supply department of the Westinghouse Company will act as exclusive sales agent of the products of the Krantz Manufacturing Company, whose business will be continued under its present name. H. C. Hoke of the Westinghouse company, will represent the supply department at the Krantz factory.

New Advertising Literature

General Electric Company, Schenectady, N. Y.: Bulletin 46,019A, describes the construction and specification of its portable instrument Type P-8.

Illinois Electric Porcelain Company, Macomb, Ill.: Catalog on electrical porcelain installations in which it features power insulators for distribution voltage.

Walter A. Zelnicker Supply Company, St. Louis: Bulletin No. 237, or that for May, 1918. It contains seventy-two pages descriptive of used and new material for sale by this concern.

Ohio Brass Company, Mansfield, Ohio: "Guarding the Grade Crossings" is the title of an illustrated catalog describing in detail, accompanied by statistics, the company's national trolley guard, with various illustrations shown in connection with prominent electric railways throughout the country.

Page Steel & Wire Company, New York, N. Y.: Illustrated booklet entitled "Aristos Copperweld Copper Clad Steel Wire." It contains notes on the manufacture of wire in general, on physical and electrical properties of composite (copperweld) wire, gives tests, specifications and suggestions for determining sizes of wire on high-tension and trolley lines, and contains information for calculating line drop, feeders and short transmission lines, sag and tension in spans.

NEW YORK METAL MARKET PRICES

	June 12	June 19
Copper, ingots, cents per lb	23½	23½
Copper wire base, cents per lb	26½	26¼
Lead, cents per lb	7¼	7.235
Nickel, cents per lb	40	40
Spelter, cents per lb	7.62	8
Tin, Chinese,* cents per lb	.92	90
Aluminum, 98 to 99 per cent., cents per lb	†33.00	†33.00

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* No Straits offering. † Government price in 50-ton lots or more, f.o.b. plant.

OLD METAL PRICES—NEW YORK

	June 12	June 19
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	19	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6¼	6¼
Zinc, cents per lb	5¼	5¼
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.00

ELECTRIC RAILWAY MATERIAL PRICES

	June 12	June 19
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 34
Weatherproof wire (100 lb. lots), cents per lb., New York	34¼ to 37.10	35 to 37.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.42 to 38.35	35.42 to 38.35
T-rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T-rails (A. S. C. E. standard), 100 to 500-ton lots, per gross ton	$67.50	$67.50
T-rails (A. S. C. E. Standard) 500-ton lots, per gross ton	$62.50	$62.50
T-rails, high (Shanghai), cents per lb	4¼	4¼
Rails, girder (grooved), cents per lb	4¼	4¼
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3¼	*3¼
Angle plates, cents per lb	*3¼	*3¼
Angle bars, cents per lb	*3¼	*3¼
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per' b	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	80%	80%
Car window glass (single strength, first three brackets, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.50	$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.50	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (truck lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.26
Cement (carload lots), Seattle, per bbl	$3.60	$3.60
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.59
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.58
White lead (100 lb. keg), New York, cents per lb	10¼	10
Turpentine (bbl. lots), New York, cents per gal	52½	42½

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* Government price. † These prices are f.o.b. works, with boxing charges extra.

Electric Railway Journal

Consolidation of STREET RAILWAY JOURNAL and ELECTRIC RAILWAY REVIEW

Volume 51 New York, Saturday, June 29, 1918 *Number* 26

The Debacle—or the Dawn

THE future of the electric railway industry may depend upon things which have been going on in Washington this week. The hearings of the War Labor Board, to which we refer on another page, are bringing to the front crucial problems upon which the very life of this industry hangs. Firstly, Messrs. Taft and Walsh have announced that the War Labor Board will take the position that a reasonable wage should be awarded to electric railway employees, regardless of the financial condition of the companies. Secondly, the President of the United States, in his letter addressed to presidents of the telegraph companies, has stated that the decisions and recommendations of the War Labor Board during the war should be followed. Thirdly, the board evidently recognizes that in making wage awards it must do all in its power to secure prompt compensatory fare increases so that its purpose of securing maximum railway efficiency will not be defeated by the ruination of the properties.

It is difficult to see how one can cavil at any of these general propositions. Labor must be paid a fair wage. That should be the fundamental policy of every industrial company. It is not only a matter of justice, but in times like these it is a matter of necessity. Such high wages are being paid in munition plants, steel works, shipyards and elsewhere, and such is the shortage of man power, due to depletion on account of the war draft, that companies which do not pay generous wages cannot compete in obtaining the labor they must have in order to operate. The problem, therefore, is very practical as well as ideal.

It is likewise important that the decisions of the War Labor Board should, as far as possible, be followed. This board was created on behalf of both employers and the working men; it is supposed to represent the most intelligent views of each side. It was created as a patriotic move to help win the war by assuring to both employers and employees that during the war labor matters would be considered in a broad and enlightened manner. The board is composed of five representatives of work-people, five of employers and two representing the public at large. It was stipulated that in all controversies the board should not be regarded as having made a decision unless its opinions were unanimous. Upon failure to reach such a decision, an umpire was to be appointed whose decision should be final. This procedure should be followed, especially in connection with decisions rendered on general questions of policy. We are glad to note that Mr. Taft and Mr. Walsh this week called in the full board to consider the question of recommending fare increases by the federal authorities, and we hope that the same plan will be followed in making all other broad decisions. Companies have the right to insist upon this, and then in turn the board will have the right to insist upon compliance with its decisions by both labor and capital.

RAILWAYS MUST NOT BE RUINED

Yet, to take up the remaining or third point, adherence to such decisions, in the absence of other compensating activities, may mean the wreckage of the electric railway industry. The war emergency, which has placed a great burden of high living costs on the workingman, justifying larger and more generous wages, has borne down equally hard upon the companies themselves; for second to the obligation to pay generous wages to labor is certainly the obligation to return a fair interest payment to those who have invested their money in providing this form of public service. A very large number of people are dependent for their livelihood upon the return from such investments. These very people also have to pay the high cost of living. Their rate of return cannot be increased, but it is certainly fair that it should be maintained.

There is another and even larger aspect of the matter, aside from the justice involved. Communities must have service. The life of the nation must go on. That life is made up of the activities of a great number of communities. The energies of these various communities go into producing those factors with which the war must be won. In some cases this is a direct and, in others, an indirect effort. Not all communities have munition plants and shipyards to and from which work-people must be carried on electric railways, but every community is concerned in the productive life of the nation, and upon that productive life being maintained at its highest pitch of efficiency depends our ability to win this war. Electric car service, therefore, is a vital necessity in helping to win the war. Such service must be given to the public in full measure and at all hazards.

Electric railway managers have of late been forced to an absolutely false position. They have been compelled to resist demands of labor, not because they did not oftentimes recognize the justice of those demands, but because they could not see where the demands could be met with due regard to their obligations to give public service and to meet their fixed charges. Such railroad managers have also been placed in a false position toward investors in their property, the investors having a right to expect that a fair return would continue to be paid upon their investment and that managers of properties would avoid, at all hazards, allowing their companies to go into receivership.

Appeals have been made to state legislatures, to municipalities, to commissions, to courts and to Washington, but all practically without avail. The rigidity of the fixed fare has been largely maintained, although there have been a few exceptions. Many of these exceptions, however, have been of such a character as practically to nullify the apparent generosity of communities. The way in which the hands of companies have been tied in places like Buffalo and New Orleans is absolutely unjustified from any statesmanlike point of view. Municipalities find electric railway companies completely at their mercy, and municipalities are acting, in many cases, in a spirit of the sheerest Bolshevikism.

It is undoubtedly true that many of the companies find themselves bound hand and foot with franchise restrictions which, if pushed to the limit, mean inevitable strangulation. Then come along courts like the Court of Appeals in New York State, saying that commissions with power from the state to decrease rates of all kinds, franchise or no franchise, cannot permit rates to be raised if the franchise stands in the way! There is thus put in the hands of petty politicians in municipalities throughout the United States a political weapon which many of them are not slow to use.

For example, Mayor Hylan in New York City is frankly in favor of municipal ownership and operation. He claims that the election in New York City last fall practically indorsed that policy. The New York Legislature refused to pass a bill making it possible to municipalize railroads in New York State. Mayor Hylan, however, sees in the distress of the New York electric railways an opportunity to force them into bankruptcy. These companies cannot get increased revenues without permission of the Board of Estimate, which is likely to follow the Mayor's initiative. Withholding justice will ultimately mean bankruptcy for all companies in New York City if present tendencies go on unchecked. It is conceivable that investors, seeing their properties deliberately wrecked by such tactics, might, as a last resort, actually invite municipalization, in order to save something rather than, for the sake of a principle, allow the last increment of their equities to be melted away. But what can be said of the morality and the honesty of such a policy on the part of a city official? And Mayor Hylan's case is not unique.

Contemporaneous with all this is the necessity many companies are under to undertake new financing, or, at any rate, to refund securities in this year. We understand that about $125,000,000 in electric railway securities must be refunded. The War Finance Corporation has taken the position that it cannot refund or finance corporations which are not thoroughly solvent and that, in any case, the financing should be done by banks and then perhaps rediscounted through the War Finance Corporation. Even in the case of the Brooklyn Rapid Transit Company, where the War Finance Corporation did come to the measurable relief of the company, the obligations imposed were such that the company had to stop all dividends. Thus the attitude of the government to-day is that, while the public is forcing the companies toward bankruptcy, the government and the public will not assist in financing a company which, even by reason of the emergency of the war, is or threatens to be bankrupt.

THIS IS WHAT CONFRONTS YOU

Briefly, then, the electric railway industry is faced with a demand expressed through a public agency, the War Labor Board, for increased wages for its men; it is faced with a demand from the public for the highest possible grade of service to help achieve the supreme public necessity, that is, to win the war; yet the public refuses to permit it to raise its charges so as to meet its increased obligations and, in the case of companies which must be refinanced, refuses to assist them in their difficulties.

It is no wonder that the country has seriously considered whether or not it would not be wise for the President to assume partial control of electric railways. This is frankly a counsel of despair. It is not necessary in order that the public may have the service or that duplication of effort may be avoided, as was necessary in the case of the steam railroads. The only possible necessity for the President taking over the electric railways of the United States would be because municipal and local authorities refused to allow companies to earn sufficient revenue to enable them to give adequate service, to pay adequate wages and to obtain necessary capital with which to continue their work.

WHY FEDERAL ACTION MUST COME AT ONCE

Is it not a tragedy, one of the supreme tragedies of this war, that this country should have had to face this question: "Must the President of the United States, as an act of statesmanship, be forced to grant federal relief simply because authorities in localities and municipalities prefer to play petty politics rather than frankly face the needs of the hour?" There was never a greater call to local authorities to manifest statesmanship in national and city affairs. It would be a great pity if the President had to exercise control over utility rates, for it would take away from municipalities that restraining influence which their authorities ought to be able to exert on the operations of their local utilities.

Nevertheless, the record of local authorities during the last few years is not such as to inspire any confidence that in general they will deal speedily with utility fare increases unless strongly pushed by the government. But there must be no dilatory action in handling this fare question; if wages are substantially increased, more revenues must simultaneously be secured or in all likelihood the whole industry will be thrown into a panic. The situation, therefore, demands federal action. A national agency, empowered to intervene in local situations in case the cities or commissions refused immediate relief, would give an opportunity for the exercise of local patriotism and at the same time insure the railways against disaster.

MEET THE SITUATION SQUARELY

Let the War Labor Board consider the electric railway labor problem from the point of view of what wages the men should receive. Obviously it cannot be considered on the basis merely of what the companies are able to pay. Let it rather be dealt with from the point of view of what the companies should be able to pay. Let the national authorities at the same time tell local regulatory bodies in specific terms what they should do, and provide an agency with mandatory powers to intervene in case the local authorities fail to do their duty in a spirit of statesmanship and generosity.

As to the exact manner in which the federal government might assume control of the fare situation, several practical ways could be devised whereby local conditions would be met. Clearly, it would be unwise to make any blanket increase of fares. Each community must be dealt with on its own merits. One practicable scheme might be for the President formally to take over the fixing of electric railway fares and then transfer his powers in that respect to the public service commissions in the various states. The commissions would then act not by virtue of their state powers but directly on behalf of the President in the exercise of his war powers, and there could be no such conflict as has recently arisen over the power of commissions as against municipal franchises. Another practicable plan would be the appointment of an electric railway administrator, whose duties would be to act on behalf of the President in seeing to it that the electric railways have sufficient funds to be able to maintain their service, pay adequate wages and attract new capital.

In either of the foregoing plans we should assume that the War Labor Board would fix the wages in accordance with local conditions or would supply local agencies to fix these on its behalf. Indeed, the War Labor Board might transfer its functions. as far as electric railway wages are concerned, to local representatives of the electric railway administrator or to the local public service commission. There is every reason why the functions of establishing wages and of fixing fares necessary to earn those wages should be concentrated in one head, just as has been the case in the steam railroad industry, where the whole matter is in the hands of Mr. McAdoo. There is one cautional signal, however, which should be displayed at once lest later it become a danger signal and even a catastrophe result. Additional revenue must be obtained, but there is a good deal of difference between raising the basic fare and obtaining sufficient revenue to achieve the purpose in mind. It has already been the experience of a number of companies that the percentage of increased revenue after the fare was raised was not so great as the percentage increase in the fare itself. In other words, the increased fare has tended somewhat to reduce business. The situation must be regarded, therefore, from the point of view of revenue exclusively.

The die is not yet cast. The War Labor Board has not yet announced its formal decision regarding a recommendation to Congress or the President for fare aid to electric railways. The moment is critical, and we earnestly hope that this board and other government powers will meet the issue with vision. Let their act be the Dawn of a new day—not the beginning of the Debacle.

Insurance Against Obsolesence Is a Prime Necessity

AT THE MOMENT there is a great deal of "marking time" in the matter of putting rolling stock, power equipment and the like into an up-to-date condition. It should always be in this condition to enable the railways to give first-class service, which after all is simply effective and courteous operation of equipment.

When one inquires as to what is new on almost any electric railway property to-day he is met with the reply: "Oh, we are just trying to keep things moving, that's all." Really, that's about all that can be done under present conditions of high prices, scarce labor and limited resources, but a great deal more ought to be done even in war time. It can be done only by removing the limitations upon resources.

The indications are that the war will be a long one, but even if it should end this year a long period of high prices is still ahead. In the meantime track is running down, obsolete motors are "eating their heads off" in expensive maintenance and energy consumption, and power plants are operating with antique engines and boiler equipment and without essential labor-saving devices, etc.

There is no standing still in the electric railway business any more than in another, and if we are not going forward we are of necessity retrograding. Railway managers understand this condition all too well, but the facts are not fully appreciated by the public. One would think that people would realize that necessarily neglected track joints and special work, for example, produce discomfort in riding and reduced schedule speed, while at the same time they react unfavorably upon the equipment, the power plant and the track itself. What is true with regard to repairs is just as true in the matter of replacements and betterments. If a machine or a device of any kind is uneconomical it should be replaced, provision having been made for such a contingency in advance.

In their balmier days the electric railways were prompt to avail themselves of the advances in the design of all kinds of equipment and they deserve recognition and reward for this in the form of liberality in fare adjustments, taxes and general obligations. That most of them cannot do so at present is due to lack of understanding of the circumstances rather than penuriousness on the part of the public. But whatever has or has not been done in the past, something must be done now and done right speedily.

New Partnership Features Contained in Tentative Chicago Consolidating Ordinance

ANOTHER long-pending controversy appears to have been carried a considerable way toward a businesslike settlement by the action of a sub-committee of the Chicago City Council recently. The ordinance for consolidation of the elevated and surface lines of that city was approved by the sub-committee and accepted by the utility representatives on June 19. It now needs favorable action by the stockholders, as well as in the main committee and in the Council itself, after which the measure will be submitted to popular referendum. If again indorsed there, the final steps must be taken in the State Legislature. While these necessary steps will defer final outcome for some six months, the attitude of the local newspapers and of the thinking people of the community lead to the hope that improved service is to be made possible in Chicago and that the city is to have effective power of control over local transportation.

As usual, the tentative ordinance is the result of a compromise in which neither party gets all that it was seeking. The people, however, in the event that the measure becomes law, are assured the benefit of traction consolidation and betterments which can be produced by the expenditure of some $300,000,000 during the thirty-year life of the franchise. The elevated lines with proposed subway connections are to serve their real intended purpose of rapid transit, taking more and more of the long-haul traffic from the surface routes. The latter, already covering about 500 miles of streets, are to be developed to a greater extent and serve as feeders. People who have been paying 10 cents when using the surface and elevated lines jointly are to get such service for 7 cents, and there is to be no curtailment of the present generous transfer privileges on either system.

The men who framed the ordinance were also guided by experience with a fixed fare and have wisely provided for raising or lowering the rates as costs demand. Thus they have assured protection also to the investor who is to have a guaranteed return on capital. Chicago was the first city to adopt the partnership principle in a contract ordinance. During the past eleven years the surface lines system has been brought up to a standard of maintenance which is perhaps not excelled by any other property in the country. The city meanwhile has been getting its 55 per cent of the profits, and has accumulated a fund amounting to some $24,000,000. The mistake of not putting this money to some effective use has, however, been appreciated for some years past, and the new arrangement will provide for the more modern practice of amortization. Thus, the people in years to come may have the choice of taking over the lines without the use of funds other than the surplus earnings of the property.

The proposed franchise is an improvement upon the Kansas City ordinance which had the handicap of a fixed fare, and also upon the Cleveland measure which had a limit to its flexible fare. It is more like these enactments in having a guaranteed rate of return. It differs from the Dallas ordinance which has also a limit to its sliding scale of fares. It has features more like those of Philadelphia and Boston in this respect. It is novel in providing that labor as well as the municipality should have a vote on the board of directors.

Representatives of the city and the companies are to be congratulated in taking these steps to bring order out of chaos. Time appears to be an important element in bringing the matter to a conclusion, and those who have the interest of the traveling public at heart should not place any further obstacles in the way.

The Right Man Can Be Found Within the Organization

PUBLIC management of the Boston Elevated Railway will be of interest to the entire electric railway industry on account of the unusual opportunity to observe the working out of a bona-fide service-at-cost plan. We say bona-fide because the Boston arrangement is unique in its enlistment of the public credit to guarantee a stated return upon the investment in case the rates charged prove insufficient. This provision is a remarkable tribute to the integrity of the management over a long period of years, and it means that honest capitalization is to be fairly rewarded even though a draft upon the tax levy may be required. The significance of this provision to the industry is fundamental.

Active management of the railway will soon be in the hands of the board of public trustees just appointed by Governor McCall, and from them the public will expect much. In the interest of all concerned it is now most important to avoid administrative experiments, because public convenience and necessity demand maximum efficiency. Waste of money through incompetent, inexperienced or dilettante conduct of affairs would be intolerable, for to-day every dollar in public service work should yield one hundred cents worth of results.

The Boston Elevated Railway should be directly managed, under the supervision of the public trustees, by an executive knowing the property from A to Z. It has been hoped in Boston that President Brush could be persuaded to remain at the head of the company under the new regime, and a resolution to that effect was recently passed by the City Council and addressed to the incoming trustees, a most unusual compliment in itself. It seems likely, however, that Mr. Brush will find it difficult, if not impossible, to decline all the tempting and pressing calls to enter other lines of work. In such case the public trustees will do well to look for his successor among the several high-grade and efficient executives who have been associated with Mr. Brush, for the success of the property under State control will depend quite as much upon the skill with which its chief executive deals with its complicated operating problems as it will upon the soundness of the general policies laid down by the trustees themselves.

Raise Rates to Permit Higher Wages

Living Wage Must Be Paid, But War Labor Board Should Not Disregard Financial Condition of Properties—Federal Aid Is Needed to Secure Compensating Revenue Increases, and President Has Power in War Emergency to Raise Rates—Further Assumption of Control Is Neither Necessary Nor Desirable

WHAT EFFECT, if any, should the financial condition of electric railways have upon the determination of reasonable living wages by the War Labor Board? To this fundamental question, more important than any other today confronting the industry, representative operators have been devoting their attention this week at hearings before the board in Washington. The consensus of opinion seems to be that the War Labor Board should make what in its opinion are proper wage awards but that, in so doing, it should also use every means in its power to secure for the railways corresponding increases in revenues. Increased wages without higher rates would mean the ruination of the properties, in view of the present abnormally high operating ratio and the preponderately large part played by wages in operating expenses.

What the Electric Railway War Board Finds

1. Congress has the power, in times of war and national emergency, to regulate electric railway fares.

2. Under existing legislation, the power has been conferred upon the President to regulate such rates.

3. An emergency exists—brought about by the extraordinary war increase in costs of labor and materials—which calls for the immediate exercise of this power by the President.

4. If prompt relief is granted by way of an increase in fares, it will not be necessary for the President to exercise the further power of taking over the possession and operation of these properties.

As to how the War Labor Board should help to secure adequate rates, it is the opinion of railway men that this board should seek to secure direct federal aid through the President or Congress. During the week the sentiment has been developing that the electric railway situation calls for prompt and radical action at the hands of the national government. This feeling finally, at the request of the War Labor Board, gave rise to the submission of a finding, approved by both railway and union representatives, that not only Congress but also the President has power to increase electric railway fares.

Direct aid by the federal authorities, it is felt, would by no means require government operation, for the primary purpose would be not to create unity of operation, as in the case of the steam railroads, but rather to secure justice for individual utility owners and maximum utility efficiency for the nation. These results could be obtained by continued private operation, with government supervision of rate-making for the purpose of securing general and expeditious relief.

This Is of Vital Concern to Every Company

Lest electric railway operators should think that the discussion of such points is purely academic, it would be well to add that the War Labor Board, according to an official announcement, intends to adopt a definite policy on the question of the financial ability of the carriers to pay higher wages. Furthermore, the board is seeking enlightenment in regard to the living wage, as a preliminary move to the establishment of a minimum wage rate commensurate with the increase in the cost of living necessities. The policies formulated by the board in these matters will be of great importance not only to companies in Chicago, Ill., Newark, N. J., Detroit, Mich., Cleveland, Ohio, Schenectady, N. Y., East St. Louis, Ill., Portland, Ore., Pittsburg, Kan., and Joplin, Mo., which are directly concerned because of pending wage negotiations before the board, but also to the electric railway industry as a whole.

What constitutes a living wage was barely discussed at the first sessions. It was evident, however, that the employees will try to show what should be a minimum wage, when the increased cost of food and other necessities is considered, and then what constitutes a reasonable wage on electric railways, when wages in other industries in the same localities are taken into account. For instance, as this paper was about to go to press, the men were introducing as relevant evidence the fact that most of the building trades in Chicago were receiving 70 cents an hour in 1917 and 80 cents an hour in 1918. These later sessions, however, will be covered in detail in next week's issue.

What the Board Wanted to Know

The hearings before the War Labor Board began on June 24 before the joint chairmen, William H. Taft and Frank P. Walsh, to whom have been assigned the pending electric railway wage cases. Mr. Taft, in opening, stated that the board wished to hear argument upon two points: (1) What recognition should the board, in making wage awards, give to the financial status of the companies? (2) What is a living wage? He said that a number of specific questions had been submitted to the board as arbitrators in various cases, that general questions had also been presented and that some cases had not yet been assigned for arbitration. Before any of the points in question were settled, however, Mr. Walsh and he thought it best to take up the two above-mentioned issues, in which all are interested.

The first speaker for the companies was Thomas N. McCarter, chairman of the Electric Railway War Board and president Public Service Corporation of New Jersey, Newark, N. J. Mr. McCarter's remarks are abstracted on pages 1227 and 1228. In response to a query from Mr. Taft, he said that commissions are slowly responding to the appeals of the companies where they have the power to act, but that it is more difficult to deal with municipalities. If the War Labor Board should see fit to make recommendations in regard to fare increases, he felt that it would be very helpful to have this done with the approval of President Wilson expressed most explicitly.

NET INCOME OF RAILWAYS IS VANISHING

The declining earning power of electric railways was ably described by P. H. Gadsden, resident Washington member of the Electric Railway War Board and president Charleston Consolidated Railway & Lighting Company, Charleston, S. C. In his opinion, utilities today have three great problems. First—and fundamental—they need substantially increased revenues to meet the extraordinary increases in all operating costs. Second, they must refund $225,000,000 of securities (more than one-half is for electric railways) during this year in a time of a practical governmental monopoly of the money market. By July 1 $100,000,000 of securities will have matured without being refunded or otherwise provided for. Third, the utilities are confronted with extraordinary demands for increased facilities to help carry out the war program. From $100,000,000 to $200,000,000 of new capital must be found in 1918 for additional facilities.

In the face of these problems the utilities are doomed to destruction unless relief is afforded. The electric railways are in the worst condition. During the first three months of 1918, as compared to 1917, the gross operating revenues of 108 leading companies gained $1,500,000 or 2.4 per cent, but the operating expenses increased $4,978,000 or 11.7 per cent and the net income fell off $4,045,000 or 76.5 per cent. These figures were obtained from companies having 40 miles of track or more. The smaller railways have probably suffered worse.

The operating ratio of the 108 companies for the last few years were as follows: 1913, 60.78 per cent; 1914, 61.85 per cent; 1915, 62.81 per cent; 1916, 62.84; 1917, 66.37 per cent; 1918 (first three months), 70.5 per cent. This record, Mr. Gadsden averred, shows that the income of the companies is being progressively eaten up by the rising expenses of operation. By this time next year, at the present rate of decline, the net income will have reached the vanishing point.

Mr. Gadsden said that electric railways must have more revenues but that the ordinary methods of securing relief are too slow. Direct federal action is needed, and this is possible because when an industry becomes of national importance in war time Congress can assume regulation thereover. Hence, Mr. Gadsden stated, if reasonable consideration on the part of the War Labor Board shows wage increases to be justifiable, the board should recommend to the President that proper steps be taken through a federal agency to increase rates. In Mr. Gadsden's opinion, federal aid for utilities during the war period would not be ill received by commissions and cities.

In closing he suggested that arbitrations by the War Labor Board would be more effective if the board could get the commissions and municipalities to agree in advance to support the awards. This might be done in many cases but not all.

GOVERNMENT OPERATION IS NOT NECESSARY

J. S. Clark, of E. W. Clark & Company, Philadelphia, Pa., said that the railways have no quarrel with the men as to the necessity for a living wage, but should the War Labor Board, by deciding upon wage awards, expedite the destruction of the utilities? The answer to the question lies in higher rates, which experience shows mean higher revenues.

Mr. Clark believed that Congress has power to provide an appropriate remedy to meet the national need for going utilities. The act providing for the taking over of the steam railroads authorized the assumption of control over any transportation system used in direct war work or for any other purposes connected with the present emergency. Furthermore, although nothing in the order of the government was to be constructed as affecting electric railways, it was stated that by a subsequent order, if and when it should be found necessary or desirable, possession, control or operation of such carriers might be taken.

In the case of the steam lines, Mr. Clark pointed out, the operation had to be for government account, since only by this method, under a suitable agreement for compensation to the carriers, could the readjustment of facilities for the best transportation of troops, other passengers and freight be accomplished without injustice to individual lines. In other words, the purpose of taking over the steam railroads could only be served by unified operation on government account.

The utilities, however, are entirely different, for they serve separate communities and do not need to be operated together to secure war efficiency. It would be sufficient for government purposes merely to have the rates increased. Even if the government should take over the operation of the utilities, however, it would be necessary to do so only in a supervisory way. Each individual utility could be operated under national control for the account of its owners, not the government, and the operating personnel could remain unchanged.

COMPANIES CONCEDE JUSTICE OF FAIR WAGE INCREASES

Andrew Squire, counsel for the Cleveland (Ohio) Railway, covered both questions raised by Mr. Taft, but his remarks regarding a living wage will be noted later. On the subject of the general justice of higher wages, the brief filed by Mr. Squire said: "The company concedes that the men are entitled to an increase in the wage scale because of the sudden and unexpected increase in the cost of living brought about by conditions beyond the control of either party."

In amplifying this statement, however, Mr. Squire emphasized the point that the financial condition of the company should not be disregarded. When the War Labor Board decides what will be a reasonable wage increase, the public must pay the bill. Mr. Squire agreed with the general proposition that fair wage awards should not be restricted by the present inability of companies to meet wage increases, but that, on the other hand, the War Labor Board should tell the public that it must grant a sufficient fare to enable the companies to pay such wages.

W. W. Gurley, general counsel Chicago (Ill.) Surface Lines, was of the opinion that the employees are entitled to fair wages, and presumably the War Labor Board will act along remedial lines if the proof shows that wages should be increased. Any award, however, will simply raise the practical question of payment, and a substantial increase will lead necessarily to the financial disaster of the Chicago surface railways.

Mr. Gurley suggested that the War Labor Board should make a strong recommendation to commissions and municipalities in regard to their patriotic duty in permitting adequate fares. He felt that the city authorities in Chicago would be influenced by such a declaration from the national board and would look upon a fare increase as a war necessity. He said that he had made no examination as to the power of the President to grant direct federal relief.

GETTING TOGETHER FOR FEDERAL RELIEF

The continued hearings on June 25 resulted in a more detailed discussion of the part the War Labor Board should play in securing higher fares. The subject was brought up in the opening argument for the union leaders, when Jacob C. Le Bosky, Chicago, Ill., stated that the companies must pay reasonable wages in spite of their financial condition, and that the obtaining of rates is a problem for them to solve. This same idea, it may be noted, was expressed in a brief filed by the Cleveland and Detroit locals of the Amalgamated Association of Street and Electric Railway Employees of America, in which the following statement was made:

"The financial condition of the companies has nothing to do with the issue which the War Labor Board is called upon to decide. After fixing a living wage for the employees, which is the sole arbitral issue, the function of the board upon this matter has been properly performed. If the companies cannot pay sufficient wages 'to insure the subsistence of the worker and his family in health and reasonable comfort,' they can get relief through the proper channels. The public will have to pay more for transportation if necessary. As Oscar S. Straus has said, 'rates should be subordinate to wages and not wages, as now, subordinate to rates.'

"If a company is not paying any dividends, if it is unable to pay its bond interest and in consequence is thrown into the hands of a receiver, even then that company ought to pay a living wage to every one of its employees. This is the accepted policy everywhere. It underlies all statutes relating to mechanics' liens, and the somewhat kindred statutes whereby labor is made a preferred creditor in cases of bankruptcy."

While the men at first thus considered the condition of companies an irrelevant matter in wage determinations, Mr. Le Bosky went on to say that happily the railways have avenues of relief open and that the employees will do nothing to oppose the granting of proper aid. In his opinion the national government has ample power, whether now expressed in legislation or not, to take the utilities under its protection.

This statement led Mr. Walsh to suggest that the War Labor Board would be materially aided if the representatives of the companies and of the unions would get together and ascertain what power of this sort the national government really has under existing legislation. Mr. Walsh said that the prime necessity is for utilities to have men for operation, and these should not be asked to make sacrifices below reasonable wages. In view of the apparently serious financial condition of the railways, however, perhaps the time has come to declare a general truce on controversial points between cities and railways and let the President increase fares at once in order to keep electric railway employees in their essential employment and insure maximum utility efficiency.

After some discussion as to what was the real understanding between all parties as to the relevancy of the financial condition of the railways, Mr. Taft summed up the situation, without an expression of dissent, as follows: The War Labor Board, which is empowered to act only in arbitrating wage disputes voluntarily submitted to it, is impressed with the arguments concerning the awkward position of utilities. The main purpose of the board is to keep war industries in operation, and if by wage awards the cessation of operation should be caused, the purpose would be defeated, however just the awards might be as abstract propositions. Hence, although it is the duty of the board to fix reasonable wages, despite the poor financial condition of utilities, any awards made should be accompanied by a recommendation for fare action by the proper authorities to prevent the awards from being nullified and maximum production from being injured.

Mr. Walsh believed that legal authority might be found for federal control of utility rates, in principle at least, and he stated that if the lawyers of both parties would look into this point the board might be in a position to recommend Presidential action or immediate legislation. Accordingly the session was adjourned so that during the afternoon and evening the union and railway representatives, as they said they were willing to do, might work up the most direct plan for having the national government meet the present utility emergency by increasing fares. Possibly, the chairmen suggested, a federal committee, agent or rate administrator might be authorized by the President or Congress to investigate individual cases and grant the relief needed.

PRESIDENT WILSON CAN RAISE RATES

As the result of this joint conference the War Board of the American Electric Railway Association on June 26 presented to the War Labor Board a brief covering three propositions, as follows:

1. Congress has the power, in times of war and national emergency, to regulate the rates of fare to be charged by electric railways.
2. Under existing legislation, the power has been conferred upon the President to regulate such rates of fare.
3. An emergency exists which calls for the immediate exercise of this power on the part of the President.

The brief was signed in concurrence by James H. Vahey, counsel Amalgamated Association. In fact, all the conferees were in favor of the conclusions reached except Fielder Sanders, street railway commissioner of Cleveland, who said that the director of law of that city wished to present argument later in regard to the local situation. City Counsel of Detroit, however, stated that his position was in accord with that of the conference, for the cars must be kept running. Some constructive action must be taken, and if a federal rate increase is the only solution it must be adopted.

The facts and citations of law set forth in the brief are shown in the following abstract:

1. The fact that the operations of any industry under the exigences of war have become necessary and essential to the nation's welfare immediately impresses upon that industry a national character and justifies the federal government in exercising the federal power to regulate and control. The power of the federal government over an industry in time of war rests not upon the fact that such industry may or may not be engaged in interstate commerce, but upon the more comprehensive bases that such industry, under the demands of war, has become necessary to the nation's welfare. When such a situation has been created, the power of the federal government, certainly during the period of the war and for a reasonable time thereafter, is paramount to that of the state.

In pursuance of these principles, we have seen the government progressively fix the prices of wheat, milk, sugar, etc., through the Food Administration; of anthracite and bituminous coal, and of coke, through the Fuel Administration; of pig iron, aluminum, steel, cement, lumber, hides and leather, and a large number of other basis articles, through the price-fixing committee of the War Industries Board. Within the last few weeks a Textile Administrator has been appointed, with large powers over the entire textile industry of the country. Prior to the war the federal government did not possess the power to regulate the prices of these articles. How has it been derived? From the increasing necessities of the situation. As each article in turn becomes more and more necessary to the nation's welfare, and more and more intimately connected with the prosecution of the war and the needs of the war program, it comes within the sphere of federal control.

The power exists in Congress to fix rates of electric railways. We have seen this power exercised in recent months in the case of the steam railroads. A large increase in rates has recently been ordered, applicable to both interstate and intrastate rates. This power in Congress to fix intrastate rates did not spring from the fact that the government took possession of the railroads, but existed because of the paramount power and duty to carry on the war. Rate-making was in that case, as it is in this, a necessary war measure, and the power thus to fix rates exists independent of any other power to take over or operate such properties.

Within the last four months, the fact that public utilities are directly contributory to the conduct of the war and are essential to the nation's welfare, has been recognized officially by practically every department of the government, executive and legislative. Moreover the Act of Congress, entitled "An act to punish the wilful injury or destruction of war material, or of war premises or utilities used in connection with war material and for other purposes," commonly known as "the sabotage act," approved April 20, 1918, expressly includes electric railways. War utilities are defined in that act as follows:

> The words shall include all railroads, railways, electric lines, roads of whatever description, railroad and railway fixtures, * * * or any other means of transportation whatsoever, whereon or whereby such war materials or any troops of the United States, or of any associated nation, are being or may be transported either within the limits of the United States or upon the high seas.

The power of Congress to regulate electric railway rates in times of war and national necessity was recognized and exercised during the Civil War in an "act to provide internal revenue to support the government, to pay interest on the public debt, and for other purposes," approved June 30, 1864, (Thirteenth U. S. Statutes at Large, page 223), as follows:

> And be it further enacted, that every person, firm, company, or corporation owning or possessing or having the care of management of, any railroad, canal, steamboat, * * * or other vessel, or any stage-coach or other vehicle engaged or employed in the business of transportating passengers or property for hire, or in transporting the mails of the United States, or any canal, the water of which is used for mining purposes, shall be subject to and pay a duty of 2½ per cent upon the gross receipts * * * provided, that all such persons, companies, and corporations, shall have the right to add the duty or tax imposed hereby to their rates of fare whenever their liability thereto may commence, any limitations which may exist by law or by agreement to the contrary nothwithstanding.

2. If the President be advised that Congress has not as yet passed the necessary legislation and conferred upon him authority to regulate the rates of fare of electric railways, we respectfully urge the War Labor Board to request the President to seek from Congress such additional legislation as to give him the power referred to.

3. But we contend that Congress already has conferred upon the President the power to regulate the rates of electric railways by:

(a) An act making appropriations for the support of the army for the year ended June 30, 1917, and for other purposes, approved Aug. 29, 1916 (Compiled Statutes, page 3778), in part as follows:

> The President, in time of war, is empowered, through the Secretary of War, to take possession and assume control of any system or systems of transportation, or any part thereof, and to utilize the same, to the exclusion as far as may be necessary of all other traffic thereon, for the transfer or transportation of troops, war material and equipment, or for such other purposes connected with the emergency as may be needful or desirable.

(b) The proclamation of the President taking over the steam railroads, dated Dec. 26, 1917, provides:

> Nothing herein shall be construed as now affecting the possession, operation and control of street electric passenger railways, including railways commonly called interurbans, whether such railways be or be not owned or controlled by such railroad companies or systems. By subsequent order and proclamation, if and when it shall be found necessary or desirable, possession, control or operation may be taken of all or any part of such street railway systems, including subways and tunnels.

(c) An act to provide for the operation of transportation systems under federal control, with just compensation to the owners, etc., approved March 21, 1917.

(d) Army appropriation act, approved Aug. 24, 1917, creating the Council of National Defense.

(e) Proclamation of the President establishing the War Industries Board, dated May 29, 1918.

(f) An act to authorize the President to provide housing for war needs, approved May 16, 1918:

> The President, for the purposes of providing housing, local transportation and other general community utilities for such industrial workers are as engaged in arsenals and navy yards of the United States and in industries connected with and essential to the national defense, and their families, * * * is hereby authorized and empowered, within the limits of the amounts herein authorized:
>
> To purchase, acquire by lease, construct, requisition, or acquire by condemnation or by gift such houses, buildings, furnishings, improvements, local transportation and other general community utilities and parts thereof as he may determine to be necessary for the proper conduct of the existing war.
>
> To aid in providing, equipping, managing, and maintaining houses, buildings, improvements, local transportation and other general community utilities by loan or otherwise to such person or persons and upon such terms and conditions as he may determine; provided, that no loan shall be made at less rate of interest than 5 per cent per annum, and such loan shall be properly secured by lien, mortgage, or otherwise.

(g) An act making appropriations to supply urgent deficiences in appropriations for the military and naval establishments on account of war expenses for the fiscal year ended June 30, 1917, and for other purposes, approved June 15, 1917, empowers the President:

> To requisition and take over for use or operation by the United States any plant, or any part thereof without taking possession of the entire plant, whether the United States has or has not any contract or agreement with the owner or occupier of such plant.
>
> The word "plant" shall include any factory, workshop, warehouse, engine works; buildings used for manufacture, assembling, construction, or any process; any shipyard or dockyard and discharging terminal or other facilities connected therewith.

(h) This act was subsequently amended to give the President specific power to take over electric railways, as follows:

> To take possession of, lease or assume control of any street railroad, interurban railroad, or part thereof, wherever operated, and all cars, appurtenances and franchises, or parts thereof, commonly used in connection with the operation thereof, necessary for the transfer and transportation of employees of shipyards or plants engaged or that may hereafter be engaged in the construction of ships or equipment therefor for the United States.
>
> The President may exercise the power and authority hereby granted through such departments of the government and through such agency or agencies as he shall determine from time to time.

(i) The act commonly known as the "Overman Act" confers power upon the President to make such re-distribution of functions among executive agencies as he may deem necessary whenever any functions, duties and powers hitherto by law conferred upon any executive department, bureau, agency, officer or agencies in his judgment shall seem best fitted to carry out the purposes of this act.

4. Thus Congress has conferred upon the President full and complete power and authority to assume control of the electric railways of this country. The greater power includes the less. The power to assume control may be entire control or a limited control, and if for the purpose of

(Continued on page 1243)

Increased Revenue to Offset Higher Wages

Power of the Federal Government to Raise Rates Considered —Other Action Possible

BY THOMAS N. MCCARTER
Chairman American Electric Railway War Board

I ADDRESS this board not in behalf of any particular electric railway company nor in reference to any case pending before the board. I speak as chairman of the War Board of the American Electric Railway Association, representing the entire industry. The purpose of the War Labor Board, as is evidenced by its name and by the proclamation of the President of the United States creating it, is to devise for the period of the war a method of labor adjustment. It is created to fulfill a war function. A very considerable number of cases affecting the wage scale of important electric railway systems throughout the country are already listed for determination before the board, and more will follow. In approaching the consideration of the problems involved, it is of the utmost consequence that the board should be fully cognizant of existing conditions affecting the electric railway industry, as follows:

1. The electric railways of the country are an indisputable and essential part of the nation's war machine. Their ability, generally speaking, not only to continue effective operation but to meet the increased demands put upon them by the location and development of war industries, is a war essential and has been clearly recognized as such by the administration, as appears from a citation from the last report of the Comptroller of the Currency and the correspondence between the Secretary of the Treasury and the President of the United States relating to the matter. The citation from the report of the Comptroller of the Currency is as follows:

> National and state banks, and many thousands of small and large investors, have suffered seriously from the decline of the earning capacity of public utility corporations and the consequent shrinkage in the value of their securities, representing investments of many hundred millions of dollars. These losses naturally diminish the power and disposition of the public to respond to the calls of the government for money for war. This danger should arouse, I venture to suggest, the anxiety and stimulate the efforts of the Congress and of every patriotic citizen. A more urgent and pressing peril is forced upon our attention by the obvious fact that we are dependent so largely on the efficiency and strength of these corporations and on our railroads for speed and success in preparing for and prosecuting the war.
>
> The corporations referred to supply light, heat, power and electric railway transportation for passengers and freight. They touch intimately the daily life of the people. In normal times they have been favorite targets for sneers and savage criticisms from large parts of the public and the press. In some instances, doubtless, they have deserved and invited hostility. In others, the attacks upon them probably have been unjust and unreasonable. Frequently they have been the victims of beneficiaries of local politics, suffering injury in the end in either case. Yet, generally, they were able to serve the needs of their communities with reasonable efficiency, and to earn fair returns on the money invested in them. Now they are threatened with ruin. If they are allowed to sink into inefficiency, much of the most important war work of the government will be crippled or paralyzed.
>
> The work of the war has thrown upon many of these corporations strains which they are unable to endure without prompt help. The costs of their labor and of all material for operation, betterment and upkeep have increased heavily and suddenly. They are required to increase radically and quickly their service and facilities. Industries manufacturing war munitions and materials demand of the public utility corporations constantly greater supplies of power and light. At the industrial centers, car lines are being rushed and overburdened by new armies of workers. The gas companies are called upon for gas for cooking and heating in quantities beyond all normal calculations, and far beyond their present capacity. They are urged continually to furnish more coke and coal by-products, toluol, and other elements absolutely essential in modern warfare. Where cantonments have been established the demands on the resources of water, lighting, and transportation companies are especially severe; ability to comply with such demands is necessary for the safety and comfort of the fighting men in training.
>
> The continued and increasing efficiency of these corporations is important for the successful conduct of the war. This efficiency is not possible with present conditions. Corporations proved by their own figures to be approaching bankruptcy cannot obtain money for improvements or maintenance. On the other hand, banks and citizens suffering severe losses from investments, in the securities of these entirely legitimate and once promising enterprises, will be discouraged from lending money to the government or deprived of the means to lend.
>
> The first and most important relief to the public utilities corporations can be given by the state public utilities commissions and municipal and local authorities with the broad-minded co-operation of the people generally, understanding the necessities of war and realizing that the more promptly its burdens are accepted, the sooner they will be lifted. It is essential that forbearance and consideration be exercised by State commissions and municipal authorities, and that the corporations also be permitted to make such additions to their charges for service as will keep in them the breath of solvency, protect their owners against unjust loss, and give them a basis of credit on which they may obtain the funds with which to meet the strains put on them by the government's needs. The breaking down of these corporations would be a national calamity.
>
> Because of the gravity of the situation in this regard, I am moved to ask for it the careful attention of the Congress and the public.

The Federal Reserve Board and the board of directors of the War Finance Corporation have each taken a similar position. The underlying thought is that the pre-war financial status quo of these companies must be preserved intact during the period of the war, in order that they may efficiently meet the burdens cast upon them by the war.

INCREASED RATES NECESSARY

2. It is a matter of common knowledge that the electric railways of the country, none too prosperous before the war, have been placed in a condition of dire necessity by the increased costs of operation arising out of the war and already existing. This condition of affairs and the resultant necessity for increased revenues to these companies was clearly recognized in the administration documents above referred to. These companies are at the present time very generally making strenuous efforts to secure increased rates with which to meet existing conditions.

HIGHER WAGES CAN BE PAID ONLY FROM LARGER REVENUES

3. Recognizing the higher costs of living, most of the companies of the country have already put into effect one or more wage raises to their trainmen. In my judgment, many of the companies have already fully met the just demands of the times, and they have all gone the limit based on their present revenues. Dissatisfaction, however, among the trainmen seems to be quite widespread, strikes have been threatened,, and many appeals have been made to this board. In order to preserve their efficiency as war factors, the companies are readily submitting themselves to the jurisdiction of this board. The total labor costs of the electric railways of the country approximate 60 per cent of all their operating expenses, as shown by the census of 1912. Under circumstances that I have shown to exist in this industry, I do not

assume that this board contemplates any ruthless increase in wages, especially in cases where the companies have already made raises commensurate with the increased costs of living. To the extent, however, that the burdens of these companies are increased by the decision of this board, the pre-war financial status and the efficiency of these companies as war factors are correspondingly impaired, unless such results are simultaneously accompanied by a compensating increase in revenue to the companies affected. In other words, where increased wage scales are ordered by this board the very results sought to be avoided by the President, the Secretary of the Treasury, the Comptroller of the Currency, and the government boards above referred to, will be brought about, unless compensatory increases are allowed.

Federal Control Over Rates

4. How can these increases be assured? It may very well be that in war-time, under the Constitution and existing legislation, there is lodged in the President, acting through appropriate channels, power to raise rates in an amount equal to wage increases imposed by this board, or, if such power does not exist under present legislation, that it is within the power of Congress to enact it. If so, it should be done. Nor does it follow that it would be necessary for the government, in exercising this power, further to burden itself by taking over the operation and management of these properties, as it was compelled to do in the case of the steam roads. But, if the exercise of such power by the government is not legal or practicable, it is certain that this board should not make any substantial award of increased wages tending to bring about the result that I have indicated, without doing all that it can do to secure for the company affected a corresponding increase in revenue. The least that it can do, in my judgment, is to certify to the State Commission or local authority having rate-regulatory power over the particular company whose wage scale is affected by the order of the board, the exact amount of money involved in the increase of wages ordered, with a statement that the same has been ordered by the board as an element of war efficiency, accompanied by a recommendation on the part of the board that the regulating body forthwith secure to the company affected, in such manner as it thinks proper, a compensating increase in revenue. Such a recommendation would be quite in keeping with the spirit of that clause of President Wilson's letter to the Secretary of the Treasury in which he says:

> I shall be glad to have you communicate with the local authorities whenever the information in your possession suggests that such a course is desirable and in the national interests.

Such a recommendation, it is believed, would be fully respected by the various regulating bodies and carried into effect. It will only be by the adoption of one or the other of the methods above outlined that the pre-war financial status and war-time operating efficiency of the electric railways of the country can be preserved, as the government has undertaken to preserve the status of the steam railroads by following large increases in wages with an enormous increase in rates.

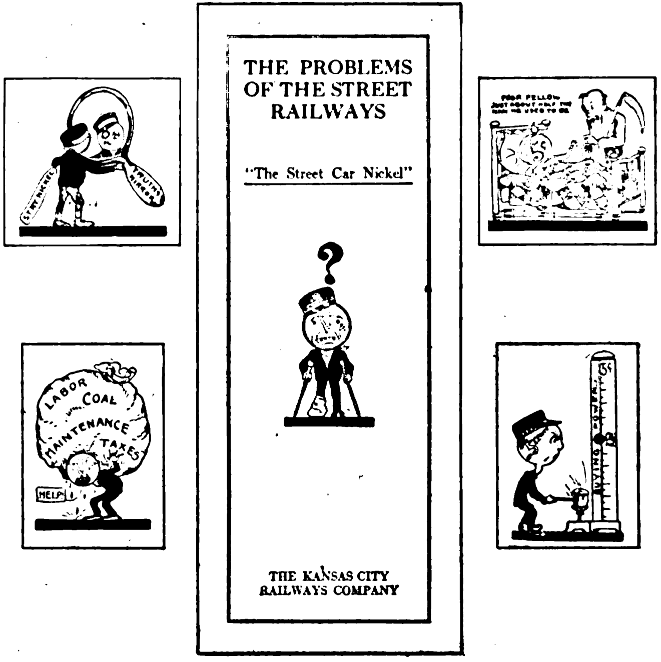
The Street Car Nickel

To Some People It May Look Big for a Ride, But to Railways It Looks Small for Coal, Labor and Other Necessities

TWENTY nickels may still be required to make $1, but there is a great difference between a nickel and the "street car nickel." Such is the lesson brought home to the public by the clever sixteen-page pamphlet being distributed by Kansas City (Mo.) Railways.

The booklet explains how the public now enjoys better cars, faster trips, smoother track, universal transfers, longer rides, more efficient service, heated cars and more lines. The company, however, has to meet constantly increasing expenses with the nickel now worth 2½ cents. The public does not appreciate what it gets for a nickel, or what the company has to do with a nickel.

It is pointed out that the problem is everybody's, and its solution is vital to every citizen of the community.


THE PROBLEMS OF THE STREET RAILWAYS
"The Street Car Nickel"
?
THE KANSAS CITY RAILWAYS COMPANY
STREET NICKEL
TRUTH'S MIRROR
LABOR
COAL
MAINTENANCE
TAXES
HELP
POOR FELLOW JUST ABOUT HALF THE MAN HE USED TO BE
5¢

FRONT COVER OF PAMPHLET ISSUED BY KANSAS CITY RAILWAYS, ALSO CARTOONS USED TO ILLUSTRATE ITS PAGES

Moreover, the point is emphasized that the situation is the result of conditions, not management. The government recognizes the disastrous effects of attempting to furnish service at less than cost, and it has urged that state and local bodies give immediate relief to utilities.

The extended work which the company has done in connection with its present fare case is well shown in a thirty-two-page booklet containing facsimile reproductions of newspaper advertisements issued since the early part of March. The advertisements emphasize the point that "the price of service must meet its cost."

The company has also published in pamphlet form editorial comments from local newspapers concerning the proposed revenue increase. All recognize the fundamental principle that the price of service must meet its cost. The pamphlet also contains extracts of decisions by commissions in other states and the text of the utility-relief resolution recently adopted by the National Chamber of Commerce.

Power Generation and Transmission Progress

American Institute of Electrical Engineers Held Its Annual Convention at Atlantic City This Week With a Program of Valuable Papers on Lightning Protection, Power Production and Distribution, and Related Subjects

As THIS issue of the ELECTRIC RAILWAY JOURNAL goes to press the American Institute of Electrical Engineers is in session in its annual convention at Atlantic City. The headquarters of the meeting were at the Marlborough-Blenheim Hotel and the meeting covered the period from June 26 to June 28, inclusive.

At Wednesday's sessions the retiring president, E. W. Rice, Jr., president of the General Electric Company, delivered his presidential address, and the president-elect, Prof. C. A. Adams of Harvard University, was introduced. Reports of technical committees were received and a conference of Institute officers and delegates of sections and branches was held. Technical papers were delivered at the Wednesday afternoon and Thursday morning sessions, and others were scheduled for Friday morning and afternoon. During the convention there were conferences of various kinds and a simple entertainment program was provided.

Following are abstracts of some of the Wednesday and Thursday papers. Others of interest to electric railway men, together with an epitome of the discussion, will be given in a later issue.

Split-Conductor and Aerial Cable in Power Distribution

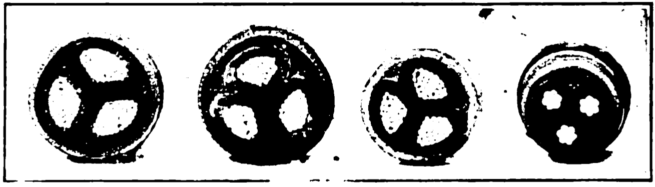
Papers by W. H. Cole and E. B. Meyer Bring Out Some of the Characteristics of the Newer Designs in High-Voltage Cables

ONE of the newer developments in underground power distribution, covered in a paper by W. H. Cole of the Edison Electric Illuminating Company, Boston, Mass., is the use of the split-conductor cable for the purpose of insuring continuity of service. In connection with this Mr. Cole discussed various methods and protective schemes in use for disconnecting faulty lines.

The Edison Company has in use a total of about 142 miles of this cable, the earliest installation having been about five years ago. The preferred form of cable is the so-called "concentric twin" type, in which one conductor forms a core surrounded by a thin layer of insulation on which the second conductor is laid. A three-phase cable consists of three such split conductors, each surrounded by a heavier layer of insulation, with the whole incased in the usual over-all layer of insulating material and sheathed in lead.

Another paper in the field of cable practice was one by E. B. Meyer, Public Service Electric Company, Newark, N. J. Mr. Meyer's topic was the use of aerial cable in power transmission and the paper was along the same lines as the report of the committee on underground distribution presented by Mr. Meyer before the N. E. L. A. last week and abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for June 22, page 1182. On account of war conditions the Public Service Electric Company has considered it desirable to use aerial cables, which have been found able to withstand the heat of the summer sun without deterioration. The company uses paper-insulated cable with reinforced rubber jackets. Cross-sections of such cable are found in an accompanying illustration.

The cable is supported from a stranded steel messenger wire by means of metal rings, the messenger being clamped to the poles by means of a special braced suspension clamp.



CROSS-SECTIONS OF REINFORCED RUBBER MULTI-CONDUCTOR CABLE, WITH AND WITHOUT LEAD SHEATHING

The company has in service about 12 miles of cable operating at 13,200 volts and about 3 miles in operation or under construction for 26,400-volt service.

Doctor Steinmetz on "America's Power Supply"

Electrical Collection of Power and Distribution and Use of Induction Generator as Auxiliary to Synchronous Generator Advocated to Reduce Waste

ESPECIALLY appropriate at this time of fuel shortage was a paper by Dr. Charles P. Steinmetz on the subject of power resources in this country. He took up in particular the possibility of utilizing small water powers and of producing electrical power as a by-product in heating plants. In discussing the energy resources of the United States, Dr. Steinmetz endeavored to answer the questions which arose in his mind and which would naturally arise in the mind of any engineer or manager who is looking at the matter of power production in a large way. These questions relate to the possible sources of power supply, the means to be utilized in developing these more fully and the possibility of eliminating a part of the present energy waste. He considered as the sources of energy the coal reserve (including oil and gas), the water power, and that portion of the sun's heat which reaches the earth's surface.

1,000,000,000 TONS OF COAL IN 1920

Taking up first the coal production of the country and its equivalent in electrical power, Dr. Steinmetz quoted data to show that since 1870 the coal production has increased annually on an average 6½ per cent, which would bring the total for 1920 to 1,000,000,000 tons. Estimating the chemical energy of a ton of coal to be equivalent to approximately one kw.-year (continuous or twenty-four hour service) the present annual consumption of coal represents in energy about 867,000,000 kw.-years. At a conversion efficiency of 10 per cent this would mean a continuous production of about 87,000,000 kilowatts.

One possible source of coal saving would be in utilizing in the form of electrical energy a part of the output of boilers used for heating purposes. By passing the steam from these boilers through steam turbines, for example, it would be possible to extract a certain amount of "high-grade" energy from the steam, and it would be necessary only to generate an additional amount of steam proportional to the efficiency of the turbine. For example, assume that 200,000,000 tons of coal is burned for heating purposes and that the steam which it produces is passed through turbine generators with an efficiency of 10 per cent. Then it would be necessary only to burn 20,000,000 tons more in order to produce 20,000,000 kw. continuously.

Even if the total efficiency of conversion from chemical energy to electric power were only 3 per cent it would be possible for a ton of coal to produce 250 kw.-hr. as a by-product in this way and, at a bulk value of ½ cent per kilowatt-hour, this would represent a power recovery value of $1.25 per ton of coal.

OUR POTENTIAL WATER POWER IS NOT LIMITLESS

Taking up the possible energy supply from water power, Dr. Steinmetz estimated that a continuous production of 230,000,000 kw. is the maximum possible hydroelectric power which could be produced in this country if every river, stream, brook or little creek throughout its entire length, during all seasons and including all water of the freshets, were used and could be used. Obviously we could never hope to develop more than a part of this power. It is startling to note, however, that this power production is only a little more than the total now produced from coal and is about equal to the present total energy consumption of the country. Thus while hydraulic energy may and should supplement that of coal, it can never entirely replace coal as a source of energy. This is probably the strongest argument for efforts to increase the efficiency of our methods of using coal.

13,000,000,000 KW. FROM THE SUN

The third possible available source of energy discussed by Dr. Steinmetz, very briefly, was solar radiation.

The solar radiation at the earth's surface is estimated at 1.4 calories per square centimeter per minute. Assuming 50 per cent of cloudiness there would be delivered on the surface in North America, between 30 and 50 deg. of latitude, a total of 800,000,000,000 kw. This is 1000 times as much as the total chemical energy of coal consumption, and 800 times as much as the potential energy of the total rainfall.

If only one-tenth of the solar radiation could be realized it would produce 13,000,000,000 kw. continuously on that portion of the earth's surface unsuited for agriculture. Here then would be the great source of energy for the future.

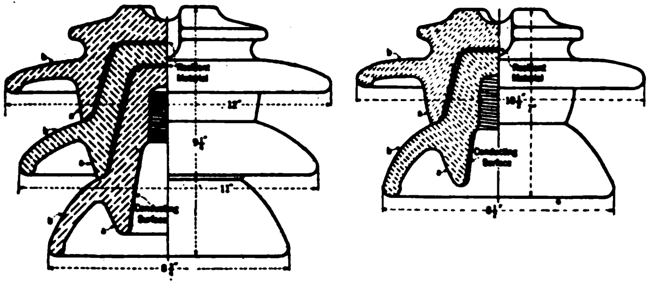
It would obviously be impossible to collect electrical power from small sources by means of the usual type of power plant. For collecting purposes Dr. Steinmetz suggests the use of induction generators driven by water or steam turbines. These machines would be operated without governors and with a minimum of auxiliary apparatus. The governing would be done from central synchronous plants. Automatic control could be used in order to insure perfect functioning of the small plants with the general system.

The induction generator, which is simply the induction motor driven above synchronous speed, is well suited to the above purpose in that its exciting current is drawn from the synchronous plant and its control is extremely simple.

Applying Theory and Practice to the Design of Transmission Line Insulators

A New Design is Proposed Which, in the Opinion of the Designer, Eliminates Some of the Faults of Earlier Designs

IN A rather elaborate paper on the subject of line insulators, G. I. Gilchrest, Westinghouse Electric & Manufacturing Company, listed some of the defects of existing insulators and proposed a new type as depicted in the drawings below. His paper contained results of numerous tests set forth in tabular and graphical form, and his main line of thought was as follows:



THREE-PIECE AND TWO-PIECE PIN-TYPE INSULATORS OF THE DESIGN PROPOSED BY MR. GILCHREST

Owing to the rapid progress of transmission engineering the older designs of insulators are not altogether satisfactory. Some of the main causes of pin-type insulator failures have been: Improper distribution of dielectric field; improper distribution of surface leakage; porosity; mechanical breakage (from handling, mischievous shooting and stone throwing; insufficient strength of the supports, and brittle material); lightning; birds and animals short-circuiting lines; unequal expansion of metal, cement and porcelain; internal stresses in material, and defective batches.

The proposed designs embody these features (see figures): Surfaces *a* conform to the flow lines of the electrostatic field; surfaces *b* of the rain sheds conform to the equipotential surfaces; lines of mechanical stress are parallel to the electrostatic flow lines; the leakage resistance per shell is about uniform, being increased gradually from the head to the center shell; there is approximately uniform capacity per shell.

In designing these insulators the purpose has been to insure that the shortest air path under electrostatic stress shall be at least long enough to prevent overstressing of the air at any point. Further, the surface resistance of the proposed design is gradually increased from the top to the center shells, the increase being considered as an advantage since the center shell will usually become dirtiest. With regard to porosity, the thicker portions of the porcelain in the cemented area should minimize the number of the pieces that will give trouble later in service. Mechanically the proposed design should be substantial due to the increase of thickness of the rain sheds and the addition of a drip edge.

Among other advantages of the proposed design is the low impulse ratio, *i.e.*, the ratio of the impulse break-down voltage to the continuously applied breakdown voltage. Again, the body of the porcelain bounded by the flow lines *a* should have an impulse ratio close to unity. A very high impulse voltage might puncture the rain sheds, leaving this body of the unit intact.

Mechanically the introduction of a resilient material between tops of shells should eliminate the tendency of certain older designs to split off. Greater radii of curvature at the tops of insulator shells and a cement section sloped from the axis should tend to eliminate the trouble from any difference of coefficient of expansion of the porcelain and the cement. Furthermore, internal stresses set up in the insulator parts during manufacture should be very much decreased by the elimination of small radii in corners and sudden changes of cross-section of the material.

War Board Activities Discussed at Illinois Meeting

Work Has Included Consideration of War Finance Act, Rates, Wages, Fuel Conservation and Handling of Troops—Election of Officers

THE Illinois Electric Railway Association held its annual meeting on June 20. Members and delegates met at the Missouri Athletic Association, St. Louis, Mo., at 8.30 a.m. and enjoyed an excellent breakfast arranged for by D. E. Parsons, general manager East St. Louis & Suburban Railway. Following the breakfast and still under the direction of Mr. Parsons the members of the party boarded a special car on the East St. Louis & Suburban Railway and were carried across into Illinois to the St. Claire Country Club, where the meeting came to order at 11.30 a.m. with J. P. Blackhall, chairman of the executive committee of the association, presiding.

Following the regular business of the association—rollcall, reading of the minutes and reports of committees—the meeting was addressed by Britton I. Budd, president of the Chicago Elevated Railways and member of the American Electric Railway War Board. Mr. Budd spoke at length of the War Board, outlining the necessity that had arisen for this branch of the American Electric Railway Association and explaining how it had been organized. The first step taken by the board was in connection with the war finance act to enable the electric railways to obtain sufficient relief to guarantee necessary operation. The War Finance Corporation, as noted in the ELECTRIC RAILWAY JOURNAL for June 8, has since made the statement that the scope of its work did not include the making of direct loans to the electric railways, but that these must be obtained through the banks. Recent meetings with the corporation have been held by the War Board with the result that it may be necessary to amend the war finance act to cover such loans, for, as Mr. Budd says, "It is absolutely necessary for some arrangement to be made whereby electric railways can obtain direct assistance."

In the matter of rates the War Board has conferred with the railroad administration on the subject of passenger rates. With the Fuel Administration it has also made a study of the skip stop with the result that this service is being put into effect all over the country as a measure for the conservation of fuel. The board is in close touch with the new War Labor Board which has been established, and is consulted with regard to any question concerning the electric railways which comes before the government. In fact, the board enjoys the absolute confidence of all branches and departments of the federal government. Mr. Budd also described the purposes of the meetings of the War Labor Board on June 24, at which it would be represented by its chairman, Mr. McCarter.

An item of importance to the interurban roads, said Mr. Budd, is the fact that the railroad administration has decided to route all drafted men over the electric roads wherever possible. All roads have been requested to make up schedules and file them with the administration, and they will be notified of troop movements as on the steam roads. The same holds true with the land movement of naval men. The agitation of the Hearst newspapers of Chicago for free transportation of men in uniform is not practical, and contradictory to state and federal legislation. The executive committee was requested to appoint someone to take charge of placing the various schedules in the hands of Provost Marshal General Crowder.

Mr. Budd said: "The position of the electric railways and their ability to serve has been greatly improved, and they occupy to-day a more important place than ever before. The work of the American Electric Railway Association and its War Board is vital to the industry at this time of so many momentous questions. The association and the board should have the hearty support of every railway company."

OFFICERS ELECTED

The new officers elected for the ensuing year are: President, D. E. Parsons, general manager East St. Louis & Suburban Railway; vice-president, F. J. Baker, president Bloomington, Pontiac & Joliet Railway; secretary-treasurer, W. C. Sparks, general manager Rockford and Interurban Railway; executive committee—C. F. Handshy, assistant general manager Illinois Traction System, chairman; H. E. Chubbuck, vice-president executive Illinois Traction System; Britton I. Budd, president Chicago Elevated Railways; E. C. Faber, general manager Aurora, Elgin & Chicago Railroad; F. E. Fisher, general superintendent Chicago, Ottawa & Peoria Railway; E. M. Walker, general manager Terre Haute Traction & Light Company.

Following a short address by the president-elect, in which he outlined the importance of the work before the association for the coming year, a luncheon was served at 2.30 o'clock and the facilities of the club were thrown open to the members of the association. The afternoon was spent on the golf links by the majority of the members.

Bluff Point Meeting Well Attended

The Economic Situation Was Considered in Several Papers and Reviewed by Speakers in the Discussion—Publicity as a Solution Recommended by Ivy L. Lee and B. A. Hegeman, Jr.—Association Pledges Its Support to the Government

IN VIEW of the financial condition and outlook of the electric railway industry, the New York Electric Railway Association at its thirty-sixth annual meeting, held at Bluff Point on June 22, dispensed with technical papers and discussed instead the financial needs of the properties and the proper methods of securing relief. The tenor of the whole discussion was that the companies should take up with courage, frankness and faith the momentous work of educating the public in regard to the need of higher revenues to provide adequate wages to employees and adequate service to the public—all to the end that the carriers might be enabled fully to perform their essential services in this hour of national need.

Telegram Sent by the New York State Association to President Wilson

Bluff Point, N. Y., June 22, 1918.

To the President of the United States,
Washington, D. C.

The New York Electric Railway Association in convention here, keenly realizes that good electric railway service is essential to the war program of the national government.

By resolution, we pledge to you and to the government our best endeavor to maintain these utilities at the highest degree of efficiency.

Our combined mental, physical and electrical strength is enlisted in the Government's service.

New York Electric Railway Association,
H. B. WEATHERWAX, *President.*

REMARKS BY PRESIDENT FISK

The meeting, which was attended by about 125 delegates, was presided over by the president, Wilbur C. Fisk, president Hudson & Manhattan Railroad. In his opening speech President Fisk related how the meeting last year had been held in a brief and formal manner on account of the declaration of war and how during the year the work of most of the committees had of necessity been practically suspended. The year, however, had been very eventful for the railways, and the executive committee had decided that it was essential to meet and discuss the situation. President Fisk said that one question was of fundamental importance—the need of income sufficiently great not to hamper the companies in their efforts to co-operate with the government. Progress toward securing more nearly adequate revenues has been made but the work which has been accomplished is only the beginning of what must be done.

William F. Stanton, secretary-treasurer of the association, reported that the work of the special committee of ten appointed to consider ways and means of securing additional revenues had been untiring, and that a great deal had also been accomplished by the committees representing the association in connection with the pending revision of accounting classifications by the Public Service Commission for the Second District.

Mr. Stanton reported the addition of four new members of the association, the membership now including thirty-four active, eighty-seven allied and eight associate members. The secretary reported that the association now included all of the larger electric railway companies in the State and that the membership committee hoped eventually to bring all the remaining companies into the association.

The cash balance on hand on July 1, 1917, together with receipts during the year, totaled $9,855.72, with disbursements of $3,243.39, leaving a balance of $6,612.33, of which $3,000 was invested in Liberty Bonds.

LOCAL ASPECTS OF FARE SITUATION

The only formal address of the meeting, presented by Thomas Conway, Jr., professor of finance, University of Pennsylvania, was a comprehensive review of the movement for higher fares in the State of New York. This address is published in abstract on another page. Following this the subject was held open for discussion, and the first two speakers described the local aspects of the fare situation in Rochester and other northern cities and in New York City.

J. F. Hamilton, vice-president New York State Railways, Rochester, N. Y., said that after the famous Rochester decision of the Court of Appeals, holding that the commission now has not the power to alter franchise rates, the company applied for relief to the municipal authorities in Utica, Syracuse and Rochester. After conferences an agreement was reached in Utica and Syracuse whereby the cities were to engage accountants to go over the company's books and make a report to the Public Service Commission, and the resulting recommendations then made by the commission would be accepted by the cities. It happens that there are no franchise fare restrictions in Syracuse. Some exist in the case of Utica, but this municipality has passed an ordinance waiving the restrictions during the period of the war.

The situation was more difficult in Rochester, Mr. Hamilton explained, inasmuch as the authorities there had been fighting a rate increase through the courts.

An understanding has been reached, however, in accordance with which the city will employ accountants to report to the law committee of the Common Council. The company has been assured by the municipal administration that this body will then render fair and just treatment. Mr. Hamilton added, however, that owing to a recent wage increase the position of the company will not be much improved by the grant of a 6-cent fare, as compared to the improvement if the higher fare had been granted, earlier, for now most of the fare gain will be absorbed by the wage increase.

F. T. Wood, assistant to vice-president and general manager New York Railways, described in the main the hearty and straight-forward co-operation displayed by his company's employees in the movement for higher fares. It will be recalled that two years ago the employees formed a local organization called the Brotherhood of New York Railways' Employees. The company has been absolutely frank with this organization; it has opened up the financial books and has shown the employees that its earning power is so low as now to approach very close to the danger line. The men realize that the company is doing all that it can for them and on their own initiative they have offered to help as much as possible.

A committee from the brotherhood of its own volition called upon city officials and explained the company's need for increased revenues. In line with a policy of complete publicity, they then published the substance of the conference in the employees' magazine. They also produced, for distribution on the cars, a circular calling the public's attention to the opportunities of more remunerative employment in other fields, to the need of efficient utility operation and to the impossibility of the company's paying living wages and remaining solvent without a fare increase. Furthermore, the men explained that unless a fare increase is granted they will have to seek employment elsewhere when their individual contracts expire at the end of the summer. Many passengers wrote on the circulars distributed a personal indorsement of the men's position and returned them to the conductors.

The viewpoint of the manufacturers on the subject of the need of higher fares was then presented by B. A. Hegeman, Jr., in a paper of which an abstract appears in another column.

THE PUBLIC MUST BE TRUSTED

Called upon to express the opinion of the publicity man, Ivy L. Lee stated that things are now in the air the outcome of which cannot be guessed a week ahead, but that utilities must have faith in the ultimate fairness of the public. In general he believed that it is absolutely necessary to get down to fundamentals—to reconsider all attitudes toward labor, commissions and the public.

For instance, now is a time when labor should be taken completely into the confidence of the railways. The companies should join with labor before the public, for they are in no position to resist the demands of employees for a living wage. A frank statement to the public that the labor charge constitutes the first lien on the utility revenues would gain the confidence of the community more readily than any other means.

As for co-operation with the commissions, the companies should seek to remove the present defects in the regulatory system in New York State. The companies must secure for the commissions complete power and then have confidence that this power will be exercised only in a helpful manner.

In a time such as at present, Mr. Lee averred, only one attitude will appeal to the public, and this is that the real and sole aim of electric railways is to help in all possible ways to win the war. Consequently the companies must co-operate with the public in giving essential war service. This involves the placing of confidence in the fairness of the public. Without this there is little hope. Every utility must proceed upon the theory that the public, when once placed in possession of the facts, will be not only fair but even generous.

Mr. Lee said that he had been impressed with the lack of imagination and courage displayed by the steam railroad executives in dealing with the public. Time and time again, if these officials had gone before the public with the whole story, they would have received support. In the case of the eight-hour law, meaning a wage increase to only 25 per cent of their employees, the companies might well have said to the public that the other 75 per cent were not included in the plan proposed, that this large body of employees should also be relieved and that the compensation paid to the companies should be adjusted simultaneously. With such a program of justice thoroughly and frankly explained, the public would have acted fairly.

The only reason, Mr. Lee stated, why Director-General McAdoo has succeeded in establishing such extraordinary increases in wages and rates for the steam lines is because the public believes in the government. The main work now for electric railway operators is to lay their case before the public with such courage, frankness and palpable sincerity that the public will have the same faith in them as in public officials.

The only way to get permanently out of the slough of despond, Mr. Lee concluded, is to make the public see that the companies desire to co-operate with the men through the payment of living wages, with the public through the maintenance of proper service and with the nation through giving all possible aid in the prosecution of the war.

President Fisk stated that he agreed with Mr. Lee and that the sentiments expressed formed his exact platform. From the applause he judged that the same thing could be said of the association.

FARE QUESTION SHOULD BE SCIENTIFICALLY STUDIED

Joseph K. Choate, vice-president J. G. White Management Corporation, concluded the discussion of the financial situation. He said that what it had been possible to do during the last year had been accomplished through the backing of the association, and that the work of the committee of ten had been spread over the whole United States. Indeed, about 20 per cent of the money subscribed had been spent in furnishing information to the industry outside of New York State.

The committee is to meet soon to carry on its activities, and it will devote much attention to publicity work. Moreover, in Mr. Choate's opinion, a scientific study should now be undertaken in regard to electric railway rates. The companies failed to provide for such an investigation once before, but they misunderstood the situation.

Now, said Mr. Choate, the peculiar condition existing is this: Expenses are so rapidly rising that a 6-cent fare is almost certain to prove inadequate in furnishing the revenues needed. A 10-cent fare may be necessary, but will this encourage highway-building and a wider use of jitneys and automobiles? In other words, is there a fare point beyond which the electric railway industry cannot afford to go? In Mr. Choate's opinion, funds should be raised for a thorough investigation of the rate question. It is necessary work, and the time is opportune.

The nominating committee then reported the following names for the ensuing year: President, H. B. Weatherwax, vice-president United Traction Company, Albany; first vice-president, E. A. Maher, Jr., vice-president and general manager Third Avenue Railway, New York; second vice-president, T. C. Cherry, vice-president Rochester & Syracuse Railroad, Inc., Rochester; secretary-treasurer, William F. Stanton, assistant to president New York State Railways (Rochester Lines). The nominees for the new executive committee were the following: W. O. Wood, president and general manager New York and Queens County Railway, Long Island City; J. E. Hewes, vice-president and general manager Albany Southern Railroad, Albany, and W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company. The nominees were all unanimously elected. Mr. Weatherwax was then escorted to the chair, and after remarks, which are published elsewhere, he declared the meeting adjourned.

BANQUET ADDRESSES EMPHASIZE PATRIOTIC AIMS

President Fisk presided at the banquet in the evening, and before introducing the speakers presented the resolutions prepared by the committee appointed for that service, with Charles C. Castle as chairman, at the morning session. The first resolution pledged the members of the association to maintain their utilities in as efficient a condition as possible and placed their strength at the services of the government. This resolution was embodied in a telegram sent by President-elect Weatherwax to President Wilson and is reproduced at the beginning of this article. The second resolution was in memory of Captain Bullock, formerly of the Brooklyn Rapid Transit Company and always an active member of the association, who recently met his death at the front in France. This resolution, which was adopted by a rising vote, follows:

> Whereas, This association has learned with deepest sorrow and regret of the death, in the service of his country, of Captain Harry A. Bullock, Secretary of the New York Municipal Railway Corporation, and
>
> Whereas, Captain Bullock was known to us as a railway man of ability, initiative and intelligence, and as a citizen, whose patriotism was well reflected in his instant response to the call of the Nation in its hour of need, be it
>
> Resolved, that the New York Electric Railway Association assembled in annual convention hereby expresses its appreciation of the services rendered to the industry by Captain Bullock and of that devotion to duty which caused him to lay down his life in the Nation's cause and that it expresses by this resolution its heartfelt sorrow at his untimely end, and be it further
>
> Resolved, that the secretary be instructed to spread this resolution on the minutes of this meeting and forward a copy thereof to Captain Bullock's family.

The two speakers of the evening were Hon. William H. Edwards, collector of internal revenue of New York, and Ivy L. Lee. Mr. Edwards, who was a famous football player at Princeton during his college days, laid emphasis on the necessity for team work in this country among all classes to win the war. He quoted the recent letters of President Wilson and other prominent officials in Washington on the importance of trolley service to the national efficiency, and urged more intensive work on the part of all in the United States to support our men at the front and defeat the enemy.

Mr. Lee prefaced his remarks with the statement that he was pleased to hear the resolutions presented in regard to Captain Bullock because they had been reporters together on the New York Times sixteen years ago. He paid a high tribute to the character and attainments of the former Brooklyn official. He then gave a very interesting account of conditions at the front in Belgium, France and Italy where he had recently been in the interests of the Red Cross. During this trip he had found hard at work at a hospital close to the battle line Dr. J. J. Moorehead, formerly chief surgeon Interborough Rapid Transit Company, but now enlisted as a war surgeon. Mr. Lee then described the work of the Red Cross among the refuges from the territories overrun by the enemy and the stimulating effect of its ministrations upon the populations and military forces of our allies.

Higher Fares Essential

The One-Fourth of Our National Wealth Subject to Regulation Is Suffering and Needs Relief

By H. B. Weatherwax
Vice-President United Traction Company, Albany, N. Y.

According to the census, the total wealth in the United States in 1912 was $188,000,000,000. This may be divided into that part subject to regulation and that not subject to regulation. The first part aggregates $26,000,000,000, of which $5,000,000,000 represents the electric railways, the balance being the investment in steam railroads, telegraphs, telephones, Pullman and private cars, shipping and canals, water works, privately owned, and light and power plants privately owned. The wealth not subject to regulation in the census classification amounts to $162,000,000,000 and represents real estate, personal effects, manufacturing plants and their products, mining plants and their products, live stock, etc. This accumulation of $188,000,000,000 represents the savings of the entire 400 years of settlement in this country.

There is no official statement of the annual income, but estimates have been made by several authorities. From them it may be inferred that the total value of the national product and of all productive service in 1912 was in excess of $35,000,000,000. It is startling to reflect that the accumulations of four centuries are no more than the income of five years of our present time, and reflection gives ample warning of the dangers inherent in income and inheritance taxes that strike directly to the productive capital fund.

Roughly the investment of potential capital (or wealth productively employed) divides into three principal groups, namely, (a) agricultural production, (b) manufacturing and mining, and (c) steam and electric railways, light, power and gas companies, etc., regulated by an ever increasing mass of legislation, federal and state. At a time when capital invested in groups (a) and (b) is profitable to an unusual and amazing degree, capital invested in group (c) is embarrassed and so generally threatened with destruction as to show this condition is not the accident of corporate management, character of the service or geographical location. We must look for an explanation to the difference in circumstances, to the regulation of statute and commissions. For more than a generation these public utilities have been the subject of public attack and have been on the defensive. It is the legislature and the commissions upon whom the responsibility seems to rest and to whom we must look for a speedy solution of our problems unless we are to be involved in disaster.

The electric railways have been in private hands, except in a very few cases, since their construction began about thirty years ago. At this moment the physical condition of these properties is better than at any time in their history and there is no occasion for anxiety regarding their equipment or ways and structures for many months. The matter for anxiety and anxiety of the gravest character is the supply of labor, the freedom of management, the maintenance of working capital and the integrity of credit.

One of the companies which I represent has increased the wages of its platform men 95 per cent in eighteen years, 70 per cent in ten years and twenty-five per cent in the last six months, other employees having been increased in proportion. The cost of materials and supplies has increased even more rapidly. During the same period the price of what we have to sell has remained stationary or reduced by regulatory bodies. At the present time the investor in electric railway securities is confronted with a picture of the National government fixing the price of coke at an advance of 216 per cent; of wheat at an advance of 156 per cent; bituminous coal at an advance of 115 per cent; of pig iron at an advance of 105 per cent; of freight rates of the railroad, through the Interstate Commerce Commission, under private ownership, covering nearly a period of thirty years' operation at an advance of 4 per cent, and under Federal control for a six months' period of advancing rates about 45 per cent. No wonder he hesitates or declines absolutely to invest in our business.

THE SITUATION IN NEW YORK STATE PARTICULARLY URGENT

The courts in this State, as you know, have decided that the Public Service Commission has no jurisdiction to increase the rate of fare fixed by contract between the municipalities and the carriers. This should not be so and this association must make strenuous efforts to have the legislature at the coming session remedy by the proper legislation this very perplexing situation. During the last few days of the legislative session a bill known as the "Pratt bill" was introduced which was thought would remedy the situation, but it was defeated. An effort should be made at the next session to have a similar bill passed. The only other remedy for increasing fares where franchise limitations obtain is to get the City Council to permit the increase. Something along this line has been accomplished, but usually it is for the period of the War only, and when the War ends utter confusion will result unless some legislation is obtained that will remedy the situation for all time.

The Status of the Higher Fare

A Review of the Movement to Secure Higher Electric Fares in the State of New York.

BY THOMAS CONWAY, JR., PH.D.
Professor of Finance, University of Pennsylvania

IT IS NOW fifteen months since the members of the New York Electric Railway Association took limited action to secure a living rate of fare, thereby inaugurating a great movement which has swept over the entire country and has won the endorsement of the President of the United States, the Secretary of the Treasury, the Comptroller of the Currency. and practically all of the Public Service Commissions. To Joseph K. Choate, chairman of your committee on ways and means to obtain additional revenue, falls the honor of being the first man in the public utility field to foresee the situation in which the utilities now find themselves, and to propose remedial measures. Early in January, 1917, Mr. Choate, wrote to Lucius S. Storrs, then president of the American Electric Railway Association, calling attention to the serious tendencies which were manifesting themselves with respect to the operations of electric railways, and suggesting that steps be taken by the national organization to secure relief. Owing to a combination of circumstances, it was impossible to secure definite action along the lines of Mr. Choate's proposal at the mid-winter meeting of the Association, held in February, 1917. The situation daily grew worse, and in April, 1917, Mr. Choate suggested to James P. Barnes, then president of your organization, that this association should take definite steps to secure financial relief through higher fares. This was, I believe, the inception of the movement with which everyone in the industry is now familiar.

It has been my privilege to be closely associated with a number of rate cases in other jurisdictions. I know it to be a fact that the testimony produced by your "committee of ten" concerning the financial condition of electric railways, the increased cost of operation, the cessation of new construction, and the need for relief, has been introduced into evidence before numerous other commissions and is to-day the most complete and authoritative statement in existence of the problem of the electric railways. The advice of the members of your committee of ten, and particularly of its distinguished chairman, has been sought by electric railways throughout the entire country.

In this state, as you know, thirty-six companies made application to the two public service commissions for permission to raise rates. During the late summer and fall of 1917, cases were pushed to trial as rapidly as possible, consistent with the other work of the commissions. All told, twelve decisions have been rendered. In every instance where the facts have been adjudicated the Public Service Commission has formally found that the companies were entitled to additional revenues.

The electric railways of this state have presented their cases frankly and fully. They have asked only for the opportunity to earn a fair return upon the fair value of their property and they have not proved the fair value of their property. They have not asked for dividends on overcapitalization, but have fully met the standards which are set up in the public service commissions law and the decisions of the courts of this state. So far as the equities are concerned, they have clearly established their right to larger revenues.

While the companies have won every case upon the facts, they have not been so fortunate with reference to the law. Late in 1917, the city of Rochester made application for a writ of prohibition against the Public Service Commission to restrain that body from considering upon its merits the application of the New York State Railways Company for permission to increase its rate of fare in the city of Rochester to 6 cents. The Appellate Division denied the application, whereupon an appeal was taken to the Court of Appeals, which, on April 5, 1918, held that the Public Service Commission was without jurisdiction to raise street railway fares above the figure named in the franchise, and issued a writ of prohibition restraining the commission from hearing the application of the company. I have talked to a number of lawyers of long experience and high standing and have yet to find one who fully understands the lengthy opinion of the Court of Appeals and can tell exactly where the court stands. With all respect to the court, this opinion is one of the finest examples of judicial camouflage which can be found in the law books. Of one thing alone are we certain. As the public service law now stands, the commission is without power to advance rates beyond the amount specified in the franchise. No one can be certain, from reading the opinion, whether an amendment to the law would give the commission this power or whether there is some insuperable barrier which makes it impossible for the legislature to confer this power upon the commission. The companies must, therefore, wait for the legislature to convene again and at that time endeavor to secure an amendment to the public service law, giving to the commission power to raise rates when it finds, after considering all of the facts, that the companies are entitled to a higher rate of fare. When and if this law is passed, there will inevitably follow a judicial test as to its constitutionality, and then the Court of Appeals will presumably rule as to whether the legislature can delegate to the commission the power to grant relief to the utilities. At best, almost two years must elapse before the legal question will be definitely settled.

> **I am certain that, while much remains to be done and a difficult task is still ahead, we have passed through the worst of our struggle for justice. * * * We have awakened the public conscience. We have started a movement for a living rate of fare which has spread all over the country. We have broken the tradition in that a nickel and a carfare are synonymous, and these achievements are the controlling factors in the situation and will eventually bring success. The task of the moment is the work of public education. It has been our task from the first day of our campaign for higher fares. DR. THOMAS CONWAY, JR.**

Immediately following the decision of the Court of Appeals, the several companies which had petitioned for increases in fares requested the municipalities which they served to amend their franchises by striking out the stipulation of a maximum fare of 5 cents, conferring upon the Public Service Commission the right to fix, from time to time, just and reasonable rates of fare. Up to the present time, I believe, action has been secured from nine municipalities.

WHAT HAS BEEN DONE IN DIFFERENT CITIES

Six-cent fares are already in effect in the villages of Waverly and Ossining, where the award of the Public Service Commission was overthrown by the Rochester decision and where the local authorities have waived their rights to a 5-cent fare under the franchises of the local companies. A 6-cent fare is in effect in the city of White Plains, to be continued until the first of August, in the expectation that the Public Service Commission for the Second District will, in the meantime, fix a fare sufficiently high to permit the rendering of proper service. This is the result of an agreement with the Common Council. The city of Syracuse has withdrawn its opposition to a 6-cent fare and has consented to abide by the decision of the Public Service Commission as to its necessity. There were no franchise restrictions in Syracuse.

The city of Kingston has amended the franchise of the Kingston Consolidated Railroad, so as to remove the restrictions as to the rate of fare, which is to be left to the decision of the Public Service Commission.

The cities of Utica, Troy, Watervliet and the villages of Green Island, Tarrytown, Scarsdale and Harrison have, by proper action of the local authorities, agreed to leave to the Public Service Commission the question as to whether a 6-cent fare shall be collected. An examination of the books of the New York State Railways, operating in the city of Rochester, is being made by accountants representing the city and the company, with the understanding that if the finances of the company show the necessity, a 6-cent fare shall be permitted to be collected.

In the city of Buffalo, accountants appointed by the Common Council are examining the books of the company for the purpose of determining whether the collection of a 6-cent fare is necessary.

The Public Service Commission for the Second District has, in the case of the Ogdensburgh Street Railway (whose franchises contain no restrictions as to rate of fare), permitted the collection of a 7-cent fare, and that rate is now in effect.

The Public Service Commission has also granted a 6 cent fare to the Poughkeepsie City & Wappinger Falls Railway.

I understand that the matter of amending the franchises is under consideration in a number of other cities. The progress of securing amendments to franchises, conferring upon the commission the right to fix just and reasonable rates is very encouraging, and there is good reason to hope and expect that other cities in the state will confer upon the Public Service Commission similar authority.

It is unfortunately true, however, that in a few cases the appeals of the railway companies have not been received in the broad-minded fashion in which they should have been considered. When the companies have gone to some of the municipalities armed with facts and figures to show their dire necessities and have asked to have their franchises amended so that the Public Service Commission might fix just and reasonable rates, and when these companies have pointed out that the failure to make these modifications in franchises would lead to receiverships, the municipal officials have said in substance: "Well, what of it? We don't care whether you go into a receivership or not. As a matter of fact, we would like to have you go into a receivership. You fellows have been robbing us for years, and now, when the wheel has turned, we shall have our innings. We will give you no relief, and we hope that you get so poor that you will be forced into bankruptcy." Where this position is not a cheap Bolshevik play to the galleries, it is the result of a complete misunderstanding of the facts. There are doubtless honest and well meaning municipal officials who share the rather widespread belief that the street railway business has been tremendously profitable. The average man, riding upon a trolley car, sees perhaps fifty people, all of whom have paid a nickel or more, and figures out that most of the money goes to the stockholders. He has no comprehension whatever of the cost of operating a road. The idea that street railways have been tremendously profitable has been fostered in the public mind by the lurid stories appearing in muck-raking magazines concerning high finance operations in one or two cities through the multiplication of capitalization in mergers and consolidations. The street railway, therefore, to a considerable group of people, symbolizes a financial engine of extortion through which the public is robbed. The difficulty is that these people are mentally living in a past generation. Their ideas are thirty or forty years old. They fail to distinguish between a few financial buccaneers who, years ago, exploited a few properties, making money out of selling securities rather than operating the railway, and the great mass of electric railways. These people totally misunderstand the position which your companies have taken and which electric railways the country over are taking in asking for higher rates. They forget, or never heard, that all you are asking for is a fair return upon the fair value of your property.

> **What will the cities gain by strangling their public utilities? Of what advantage is it to them to make capital reluctant to enter an industry outrageously mistreated, leading to higher rates of interest and a consequent increase in the cost of service? All of these questions lie at the very heart of the present situation. It is the duty of every electric railway man to see that each is fully and frankly discussed in the public press and wherever it is possible to direct public attention to them. In this way, and in this way alone, in my opinion, can a permanent solution of present difficulties be achieved.**
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> DR. THOMAS CONWAY, JR.

It seems to me, beyond question, that favorable action by those municipalities which have amended their franchises has been secured because of two reasons—in the first place, the educational work which your committee of ten and the individual companies have done to acquaint the people of New York State with the condition of the electric railways as a whole and the several companies individually. In the second place, I am certain that the fair-minded portion of the public has been impressed with the justice of the railways' claims by the decisions of the Public Service Commission, holding that the companies were entitled to higher fares, rendered prior to the pronouncement of the Court of Appeals.

Even where some doubt exists in the minds of municipal officials or the public, it seems to me that the fairness of the companies' contention that no injustice can be done to the people in any city by passing the franchise amendment requested is self-evident to all. The amendment does not, *ipso facto*, authorize the company to charge higher fares. It merely permits the Public Service Commission, after a full inquiry, to fix a just and reasonable rate, that is to say, one which is high enough to yield what the courts of the state and of the United States have held to be a fair return upon the investment and not so high as to constitute an unjust burden upon the public. When the franchise amendment is secured, the companies must then prove to the commission that they are entitled to a higher fare, showing the value of their property and all of the facts concerning their operations—especially what they have earned and what it has cost them to render the transportation service.

It is to the lasting discredit of a few municipalities that they have either ignored the request of their local street railways for an amendment to the franchise or have allowed months to elapse without taking action upon such requests where the facts could not be a matter of dispute because they had already been determined by the commission. A typical case is found in the failure on the part of the city of New York to render justice to the New York & North Shore Traction Company. This company has been subject to the jurisdiction of the New York Public Service Commission, First District, throughout its existence. This commission granted to the company certificates of public convenience and necessity; the line was built under the general supervision of the commission, which carefully checked and audited the cost of construction and fixed the capitalization of the company. Its operation, since construction was finished; has been under the continuous supervision and scrutiny of the commission. Surely, we have there no possibility of a dispute as to the facts.

In its recent decision, upon the application of the company for permission to institute 7-cent fares, the commission had formally found that the company has never earned a fair return upon the value of its property; that the return in the fiscal year ended June 30, 1917, equaled 2.44 per cent upon the cost of the enterprise, as originally approved by the commission; that, because of insufficient earnings, over 35.82 per cent of the original investment has been lost, due to insufficient maintenance and consequent accrued depreciation, and that even the fare of 7 cents, which the company desired, was in no way sufficient to yield a fair return. The commission, however, held that it did not have the legal right to authorize the increase in rates, but recommended to the city of New York that the franchise of the company be amended by striking out several absurd provisions with reference to the amortization of the original cost of the property (doubtless written into the franchise by a former chief of the bureau of franchises of the commission) and that the provision concerning a 5 cent maximum fare be stricken out, the right to fix rates of fare being conferred upon the commission. This decision was rendered on January 7, 1918. Has the city of New York recognized its clear duty and granted to this ill-starred enterprise the relief which is indisputably necessary? We all know nothing has been done.

The explanation for the failure to render justice to those companies about which there was no possibility of doubt concerning the equity of their claim for higher fares is twofold. In the first place, municipal officials, as a rule, have political aspirations. They desire to succeed themselves in their present posts or aspire to more lucrative offices. Some of them, lacking courage and foresight, feel that to increase rates will be unpopular, and will therefore cost them votes. Whatever may be their private opinions, these chicken-hearted officials feel that the utility has no right to ask them to impair their political prospects in order that justice may be done. These officials, moreover, feel that the street railway will struggle through somehow. Stockholders may have to go without dividends; maintenance may be neglected; no new cars may be purchased; bankruptcy may even occur. No matter what happens can be turned to their advantage. If service deteriorates, they can gain popularity by appearing to champion the rights of the people through vigorously protesting against the inadequacy of the service. If additional facilities are not provided, they can seek refuge through vilification of the corporation or blame the condition upon the war. If the corporation is forced into bankruptcy, they can prate of overcapitalization, and dilate upon the alleged advantages to the people and to the municipality of a receivership and a reorganization. Anything that happens, they figure, adds to their political capital.

The second reason for the unwillingness of a certain group of public officials to act promptly and courageously in doing justice to the electric railways is the desire of some of them to hasten the day of municipal ownership of such utilities. Without going into the motives which inspire these officials to champion municipal ownership, the fact remains that many of them see, in the present crisis, an opportunity to hasten the accomplishment of this end. The failure to give deserved relief to the street railway companies will doubtless bring the owners of these properties to the point where they will be the chief advocates of municipal ownership. Thus, the municipal ownership advocate argues, the best way to accomplish his purpose is to refrain from giving relief to the street railways.

STEAM RAILROAD PARALLEL CITED

A parallel for the position in which the electric railways find themselves is found in the recent experience of our steam railroads. Some years ago, when operating costs began to rise, the railroads applied to the Interstate Commerce Commission for relief through higher fares. Their necessities were fully and exhaustively presented. Various organizations of shippers, actuated by the selfish desire to pay as little as possible for carrying freight, opposed the petitions for higher rates. The representatives of one or two state commissions joined in the movement. Instead of the matter being decided calmly and judicially upon its merits, it became a national political issue. The members of the Interstate Commerce Commission failed in their duty. Again and again relief was either denied or given only in small measure. The consequences of this short-sighted action are now plainly evident. Unable to make a favorable financial showing, the railroads could not procure additional capital. New construction practically ceased. Additional rolling stock could only be secured by a few roads, and then only in insufficient quantities. The business of the country was expanding at a tremendous pace, while our transportation system was stationary. And then war suddenly came to us. Unable to handle normal business, our transportation system, which had been allowed to atrophy, completely broke down. National disaster stared us in the face, and the only recourse was for the Government to take over the roads, to guarantee a reasonable return to investors, and to provide the capital necessary to make up the short-sighted mistakes in the past.

What has occurred since we entered the war? The Interstate Commerce Commission, last spring, granted a 15 per cent increase in freight rates and numerous advances in passenger fares. Now that the needs of the railroads are judged upon a business basis, the Director General of Railroads has put into effect a further increase of 25 per cent in the freight rates and of from 10 to 33 per cent in passenger rates. We have heard little recently from the self-appointed champions of the people who formerly filled the newspapers with specious combinations of figures designed to show that the railroads needed no additional revenues.

It requires no prophet to say to you that officials of a few municipalities are riding for the same fall as did the Interstate Commerce Commission. He who is blind today to the needs of the utilities is directly opposing the efforts of the nation to win the war. I wish it were possible definitely to fasten upon every municipal official who refuses to grant relief to an electric railway the stigma that he is hindering the Government in its gigantic task. From this conclusion there can be no escape. The welfare of the utilities is a matter of great public consequence. The higher officials of our government, including the Comptroller of the Currency, the Secretary of the Treasury and the President himself, have spoken plainly and unequivocally. By doing so, they have greatly simplified the problem of securing relief for the public utilities.

THE DUTY AHEAD

In spite of the discouraging decision of the Court of Appeals and the uncertainties as to the ability of the Legislature of New York to confer upon the commission the power to advance rates, I feel optimistic concerning the outlook. I am certain that, while much remains to be done and a difficult task is still ahead, we have passed through the worst of our struggle for justice. The example of the municipalities which have conferred upon the commission power to fix just and reasonable rates increases the likelihood that the other municipalities will be equally fair and just. We have awakened the public conscience. We have started a movement for a living rate of fare which has spread all over the country. We have broken the tradition that a nickel and a carfare

are synonymous, and these achievements are the controlling factors in the situation and will eventually bring success. The task of the moment is the work of public education. It has been our task from the first day of our campaign for higher fares. In spite of the discouraging experience which has befallen some of us, I think we are all still confident of the fair-mindedness of the American public, once it is made to see its duty. If we do not have this confidence, it must inevitably follow that we despair of this great experiment in democracy which we are now trying to extend by force over a larger portion of the earth.

It is a difficult task to capture and hold public attention in these days filled with tremendous events, but the very difficulty of this task should stir us to greater efforts and more effective work. While endeavoring to secure modifications of franchises, I believe this association should, at the same time, continue its campaign of education designed to create public sentiment in favor of a legislative amendment to the Public Service Law, giving to the duly constituted, properly equipped administrative body, especially created by the state for the regulation and control of public utilities, the power of fixing just and reasonable rates, irrespective of agreements as regards rates entered into years ago under totally different circumstances and conditions between the early pioneers in the electric railway field and the municipalities. If the charges of the utilities can be reduced by the commissions, why should they not be increased, after the facts have been determined? What is more absurd than to give to the commission the right to regulate standards of service and, at the same time, deprive them of the ability to give to the railway an earning power sufficient to furnish the service which the commission has ordered?

CRISIS OF SITUATION APPROACHING

What will the cities gain by strangling their public utilities? Of what advantage is it to them to make capital reluctant to enter an industry outrageously mistreated, leading to higher rates of interest and a consequent increase in the cost of service? All of these questions lie at the very heart of the present situation. It is the duty of every electric railway man to see that each is fully and frankly discussed in the public press and wherever it is possible to direct public attention to them. In this way, and in this way alone, in my opinion, can a permanent solution of the present difficulties be achieved. With tremendous increases in the cost of operation occurring almost hourly; with wages mounting to heights far beyond the financial ability of the utilities to reach and with operating problems more difficult than have ever been faced in the past, the situation is indeed discouraging, but let every man who must face these tasks comfort himself and rekindle his hope by remembering that, if I may borrow the phrase, we are approaching the very "peak and crisis" of the situation, and that if we can succeed in lodging the power to establish just and reasonable rates with the commission, we will have established the electric railway industry upon a sound financial basis; we will have made it a business into which not only capital but brains will continue to embark, and in which men will feel amply repaid for spending their lives in endeavoring, to the best of their abilities, to serve the public.

More Publicity Needed

Railways Should Explain Their Problems to the Public—Manufacturers Are Ready to Help in Any Way

BY B. A. HEGEMAN, JR.
President National Railway Appliance Company, New York

PUBLIC UTILITIES are the only industry that is required by law to sell its wares at a "before the war" price, notwithstanding the admitted fact that they are struggling valiently to keep their heads above water under this ruinous condition, but with the extraordinary cost of material and labor, they will surely "go under" unless some relief in the nature of increased revenue through fare increases is not forthcoming in the immediate future. You will no doubt ask—have we not done everything possible, with everybody possible, and in every way possible, to lay our troubles before those interested? In the main, you have, but there is still more that you can do and that in one word, is *advertising*. I am, and have always been, a great believer in advertising and if you will look at the wonderful results that have been achieved within the last year by following out the idea of an intensive advertising campaign, I think you will agree with me.

LIBERTY BONDS SOLD BY ADVERTISING

Since the United States entered the war a little more than a year ago, about $10,000,000,000 has been placed at the disposal of the government. How? By advertising. There have been three Liberty loans, and now we are getting ready for the fourth. On the occasion of the first loan, our country asked for $2,000,000,000 and it received $3,035,226,850. The number of subscribers to that loan totaled more than 4,000,000 people. On the occasion of the second loan, $3,000,000,000 was asked for and $4,617,532,000 was received. The number of people subscribing to this loan totaled 9,500,000. When the third Liberty loan came around, $3,000,000,000 was again asked for and $4,170,019,650 was received from 17,000,000 subscribers. In each case the government got more than $1,000,000,000 in excess of what it asked for. How? By advertising. Look at the last Red Cross drive: A hundred million was asked for and $160,000,000 was received. How? By advertising. Look at all the other various relief associations, the Y. M. C. A., the Knights of Columbus, the Salvation Army and a host of others which made drives, all, without exception, receiving considerably more than they asked for originally to carry through their projects. And how? Again I say, by advertising.

The American public does not object to paying if properly approached, for the people know what they want, want what they want and get what they want and they don't care, in a good many cases, how much they pay for it, but they do object to paying when the idea is tucked away back in their heads that the other fellow is getting the big end of the deal. The 5-cent piece for a car ride is almost as sacred to them as the American flag. To a good many of them it is more familiar. Unfortunately, their whole knowledge of the subject, as Dr. Conway so forcibly points out, has been along lines not conducive to a healthy state of mind. They have been led to believe that the railway business was tremendously profitable, and until comparatively recent times no one has attempted to change this opinion.

Why is this so? The average man hasn't been educated up to the facts. His ideas on the actual cost of railway operation are very hazy. Then there are the yellow sheets that pass for newspapers, with their stories of high finance, graft and other toothsome morsels that comprise the only means of education about the railways that ever reaches that man. Is it any wonder that the average man thinks that an unjust burden is being put upon him when he is asked to pay an extra cent for a car ride and that it is up to him to fight, in his own small way, all he knows how to avoid paying the extra cent. If the people who are dependent upon the electric railways for their transportation facilities, only knew just how much the thousand and one things entering into the construction, maintenance and operation of a railroad had advanced in cost during the past three or four years, they would be forced to realize that increased revenue must be provided or that they would be compelled to walk where they now comfortably ride. This information can be effectively brought to the attention of the public by a display in your cars of posters giving in the form of the deadly parallel the data referred to, the truth of which could not be denied.

I am told that in many cases where recently the railways have received the right to charge a 6-cent fare, the labor union has immediately demanded an increased wage. This fact the public should also know. Keep them posted and thereby command their support.

What have the railways done to correct these conditions? How many have conducted active and constant publicity campaigns? Comparatively few. There has been a spurt here and there, but it soon died out and things are as they used to be before.

You have a commodity to sell which is absolutely essential, but because it is absolutely essential is no reason why it should not be advertised. It is because it is needed every day in the year that it should be advertised every day in the year. Full and frank publicity between the railroad manager and his public are two things to be very much desired.

How to Reach the Public

This question of railway advertising is still in its infancy. The technical journals have done their share in a small way and the financial papers of standing have also done theirs, but the technical papers and magazines and the financial journals do not reach the majority of the public, and as a result comparatively few of the people whom you are trying to reach know the actual conditions as they exist to-day. Therefore, it is up to you to educate them. And how are you going to do that? Again, I answer, by advertising. Advertise to-day; advertise to-morrow; advertise every week in the month and every month in the year. Lay your troubles honestly before your customers and show them how they ultimately will suffer unless they help.

Besides posters and advertising in newspapers and magazines, get your publicity man to write little stories of human interest along railroad lines for the newspapers and magazines. Publish a company magazine and tell your troubles to your employees and their families. Get up an attractive folder, distribute it to your passengers, place copies in hotel racks, in the schools, clubs, etc. See that the conventions that come to your city receive a supply. Tell your story all the time.

I often wonder if it ever occurs to any of us that thousands of the public are dependent on the prosperity of our public utilities for their material existence, either as stockholders in these companies, employees of the railways themselves or employees in the varied lines of business catering to the needs of these railway companies. Is it not reasonable to suppose that if the facts of the case were frankly stated to this portion of the public they might arrange the vote so as to inject a certain amount of rigidity into the wobbling spines of some of our public servants? I have always felt that a counter-attack might produce some good results. Quiet submissions don't get us very far removed from a receivership, and when that comes, who is blamed? Why not at least try and inform the stockholders. Let them know that they are partners in the business and must do their part? We manufacturers will tell our associates that it is up to them to help if three meals a day are to be expected. Am I wrong in feeling that much might be acccomplished if something along these lines were tried?

Ways in Which Manufacturers Can Help

I was asked to discuss Dr. Conway's paper from the manufacturers' standpoint, and while I have said a good deal that apparently has no relation to my subject, whatever makes for better conditions on the railroads, makes for the manufacturers' prosperity. We are truly interdependent. From the manufacturers' viewpoint the present situation is extremely serious. With conditions as they are, with little new equipment coming through, with repairs cut down to actual necessities, the manufacturer, so far as the electric railways are concerned, is doing little compared to three years ago and the situation is not looking very rosy for the future.

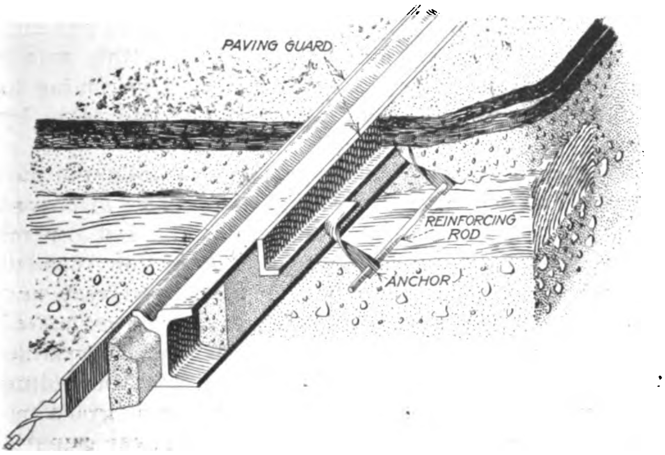
When I mentioned frankness between the railroad people and their public, I said nothing about the railroad managers in their dealings with the manufacturers, as I wanted to speak to you about that later on. This is a question of vital importance, especially in these trying times when billions are being discussed with the same calmness that we used to discuss hundreds and thousands. I am firmly of the opinion that the day is now here when this question of frankness between the railroad man and the manufacturer is a matter of fact, rather than fancy. Gentlemen, your problems are our problems. Why can't we get together and help each other? Much has been said in the past at meetings and conventions regarding this very subject, but too little has been actually done. We want to help you in your troubles but have not been accorded the opportunity. The fact remains, we are standing ready, are with you in spirit, awaiting a call to do something that will benefit you, and in benefiting you we ourselves will be benfited.

The Eastern lines of the Pennsylvania Railroad on June 5, 1918, had 7227 women in this employ. This is an increase of 1545 over the number on May 27. During the same ten days the number of male employees decreased by 900. The average labor turnover on the Pennsylvania lines, East, exclusive of the general office force, is at the rate of 100 per cent annually.

Preventing Disintegration of Paving Along the Rail Head

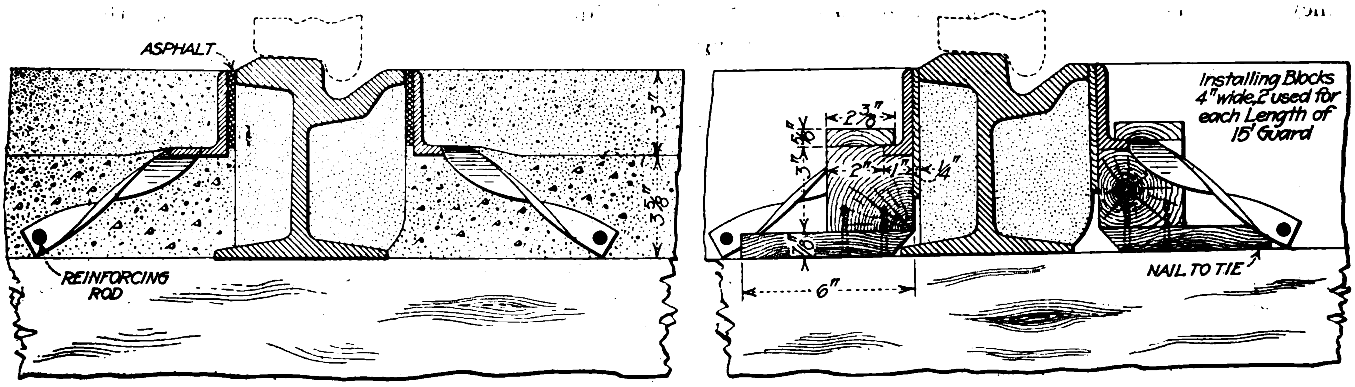
Newly Invented Angle-Iron Paving Edge Permits Motion of Rail Without Causing Damage to Paving

THE maintenance of paving along the rail head is a serious element in the operating cost of the way department on any electric railway property having track in paved streets. Vertical play of the rails together with the "punishment" which the paving gets from heavy wagons and motor trucks combine to break away the paving where it comes in contact with the rail heads.



PROSPECTIVE VIEW OF PAVING GUARDS, WITH ANCHORS AND REINFORCING RODS

For the purposes of securing the ties, rails and fillers in a semi-rigid construction, free to vibrate without detriment to the adjoining paving, the International Steel Tie Company, Cleveland, Ohio, has placed on the market a line of guards, of angle iron, provided with substantial anchors. These are securely locked into the concrete paving foundation by means of twisted strips and anchor rods. The accompanying drawings clearly show the details of construction. The guard, of course, permits the use of any suitable foundation under the ties, such as broken stone, soil, etc.

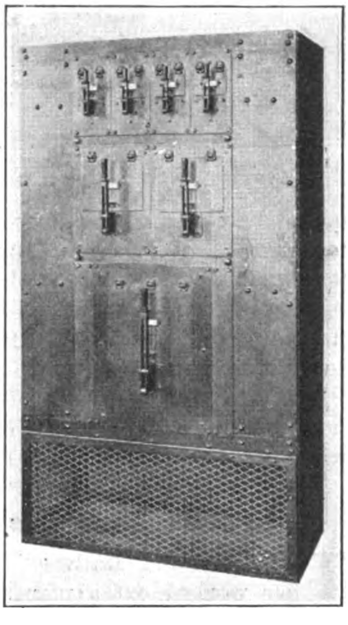

ASPHALT
3"
3⅝"
REINFORCING ROD
Installing Blocks 4" wide, 2 used for each Length of 15' Guard
2⅜"
5/16"
3"
2"
1"
¼"
7/8"
6"
NAIL TO TIE

CROSS SECTION 7-IN. GROOVED RAIL WITH 3-IN. PAVING GUARDS, AND OF SAME RAIL WITH GUARD IN PROCESS OF INSTALLATION

The same plan is applicable to the edging of a permanent roadway, such as brick or asphalt on concrete foundation, preventing disintegration where this roadway joins the unpaved portion of the highway. A modification of the plan also permits the formation of a steel protected flangeway alongside of T-rails. In many cases the use of this scheme would undoubtedly overcome municipal objection to the use of T-rail in city streets.

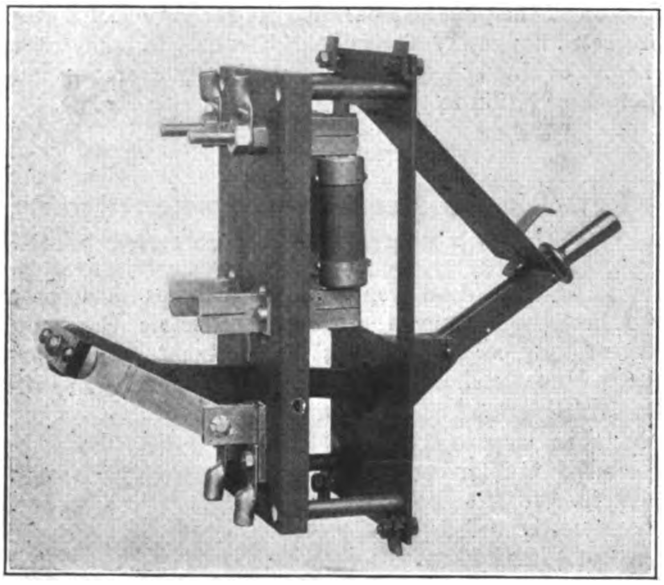
Low-Tension Dead-Front Switch Panel Provides Safety for Operators

A LINE of dead-front panel switches has been brought out by the General Electric Company, Schenectady, as a safety-first development. These are for use as distributing panels and for generators and feeder panels of power plants or shops and are somewhat similar in construction to the safety-first switchboard described in the ELECTRIC RAILWAY JOURNAL of Dec. 16, 1916, page 1260. The switches have a current rating range of from 60 to 600 amp.



FRONT OF A SAFETY-FIRST SWITCH PANEL

A switch unit consist of a standard knife switch with fuse clip parts mounted on a slate base and supported by iron ducts at the back of a sheet-steel panel. The operating handle is so arranged that it is in a vertical position when the switch is "on" and inclined at an angle of 60 deg. with the panel when the switch is in the "off" position. The operating link passes through both the steel panel and the slate base and transmits the motion from the handle to a lever attached to the cross-bar of the switch. The steel panel of the switch unit is provided with a sheet-steel door which is hinged at the top, allowing it to open upward as far as the stop on the operating handle behind which it is mounted. This door gives access to the fuses from the front of the panel but cannot be opened while the switch is "on," and when this door is open the switch



SAFETY SWITCH AND OPERATING MECHANISM

cannot be closed. This provides for the inspection and replacement of fuses and protects the operator from coming in contact with the live current-carrying parts, as the fuses are on the load side of the switch and the fuse clips must be dead before the fuse compartment door can be opened.

The panel frame is built of riveted angle iron and the current-carrying parts back of the panel are inclosed in expanded metal.

Spot-Welding for Brake Hangers

THE Portland Railway, Light & Power Company has worked out a plan for decreasing the cost of maintaining the half-ball brake hangers used on Brill-22 special trucks. Thus it has not only been possible to reduce the cost, but the uncertainties of delayed deliveries and the necessity for foreseeing requirements in placing advance orders have been eliminated.

When the trucks come in for the regular inspection after running 80,000 miles, a limit gage is applied to the brake hangers to determine whether their wear warrants replacement. Formerly worn hangers were scrapped, but now they are saved and sorted according to the extent of wear. In the case of a worn ball, a steel sleeve is spot-welded on, and in worn sockets, malleable-iron bushings are put in and spot-welded around the rim, thus bringing the hangers back to standard gage and providing uniform wearing surface.

The cost of repairing the brake hangers in this way has been less than the price of new hangers at the factory and it is believed that the repaired hangers give even longer wear than the new equipment. The repair costs, approximately, are 13 cents each for the steel sleeves or bushing, about 5 cents for boring or turning, and 5 cents each for spot-welding.

By adopting as standard several gage sizes for the ball and socket joint, it has been possible to extend the repair over several stages of wear. For example, the worn brake hangers are sorted according to extent of wear and repaired accordingly, to fit gage standards of 1¾ in., 2 in., 2¼ in. or 3-in. sizes.

The plan has been evolved by F. P. Maize, master mechanic for the company.

A Safety Siding That Saved Nine Lives

ON THE Lake Burien line of the Seattle Municipal Railway there is a 4.5 per cent grade just above a curve where the line passes around the brow of a hill. The curve has a radius of 180 ft. and a central angle of 55 deg., so that a runaway coming down the hill would probably leave the track on this curve. In fact, a truck which escaped from a work crew did run away down this grade and plunged over the bank at the curve.

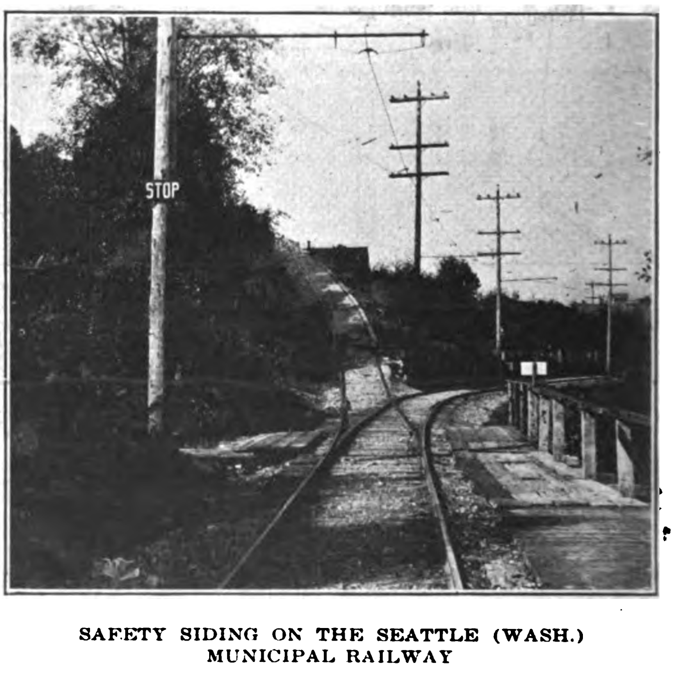
To provide a safeguard at this point, a safety siding was constructed just above the curve, consisting of a 120-ft. length of track running up hill on a 15 per cent grade. The switch from the main line to this safety siding is always left open, necessitating cars coming to a full stop and the throwing of the switch lever by hand.

Not long after this safety siding was built, the motorman of a car containing eight passengers disobeyed a stop order at the top of the grade and lost control of the car when the trolley whipped off as they rounded the curve. The car continued on down the grade and by the time it reached the safety siding is estimated to have reached a speed of at least 60 m.p.h. Striking the switch, the car was safely shunted onto the siding and ran up the entire 120 ft. of 15 per cent grade before the momentum was overcome and the car came to a stop.

The only injuries were those sustained by the conductor when he leaped from the car soon after control was lost. The passengers all crouched on the floor of the car and as it did not tip over even when reaching the end of the siding, neither they nor the motorman were injured in any way.

Since this accident the rails on the upper part of the safety siding have been replaced by a coarse gravel trough with guard rails to prevent the trucks from leaving the graveled roadbed.

The safety siding was designed and built under the direction of the Department of Public Utilities of the City of Seattle.



SAFETY SIDING ON THE SEATTLE (WASH.) MUNICIPAL RAILWAY

Increase Rates to Permit Higher Wages

(Concluded from page 1226)

the war the only control that is necessary, as we contend, is to bring about increased revenue through an increased rate of fare, there is ample authority for the President to exercise control over electric railways to the extent only of regulating their rates of fare.

The purpose of all the above-mentioned legislation was to confer upon the President the authority to do whatever was necessary in the national defense as far as the transportation facilities of the country were concerned. If this purpose can be carried into effect by a control limited to the fixing of rates of fare, he undoubtedly under such legislation has such power. This is all that is necessary to meet the present emergency and put electric railways in condition to discharge efficiently their duties so essential to the nation's welfare at this time. The power may be exercised through such instrumentality as the President may designate.

ARGUMENT IMPRESSES LABOR BOARD SECTION

That the presiding members of the War Labor Board were impressed by the arguments in the brief was indicated by the immediate responses. Mr. Taft said: "This matter probably ought to come before the whole board, which meets tomorrow. On this brief, which is very complete, the points are established not only that Congress has the power, with respect to which we had a little doubt, but that under the language of these statutes the President has the power. Therefore, after a hearing of the case, should we regard it as necessary to invite the attention of the President to the necessity of raising rates in respect to electric railways, we would not hesitate to recommend it. That, of course, would involve the appointment of some kind of rate tribunal or agency to take up each case on its merits. This board would not attempt to recommend what the rates should be, or what in any particular case should be done."

Mr. Walsh said: "We are not asking for control except to get the additional revenues for increased cost of labor and materials. My suggestion would be that the President appoint an administrator—I believe in centralizing these powers in war times—to have jurisdiction over all transportation utilities of the country, to get the staff of experts necessary to find out the necessities of the situation and to keep his hand on this subject during the war."

At this point Mr. McCarter emphasized the fact that unless rates are raised in compensation for higher wages, the electric railway industry will be ruined. The employees should be treated fairly, of course, but if a very substantial increase is granted and the railways secure as aid only the good offices of the War Labor Board in urging fare increases, a serious panic will occur in the industry and the country at large. In other words, any delay in securing the fare relief will mean wide-spread disaster.

ARGUMENT REPEATED BEFORE WHOLE BOARD

On June 27 Director of Law Fitzgerald of Cleveland stated that he did not dissent from the proposition that either Congress or the President has power to relieve the electric railways in the present emergency, but that he questioned the present advisability of federal action. He admitted that the present maximum fare under the Tayler franchise in Cleveland is not enough to give the stipulated 6 per cent return to the stockholders, and that before the city and the company could settle the matter of a new fare scale a public referendum requiring from forty to sixty days might be required. He thought that if delay ensued and the interests of the nation became jeopardized, it would then be time to erercise the extraordinary power of intervention by the federal government.

Mr. Taft stated that the War Labor Board does not intend to recommend any particular form of action by the national government, but one would suppose that each fare case will have to stand on its own feet and the question of intervention in any particular city will be presented to the agency appointed. His questioning of Mr. Fitzgerald seemed to indicate a belief that if a federal agency were empowered to enter a local situation and grant appropriate relief for the duration of the war in case the city authorities refused to act promptly, this would not be inequitable.

William D. Mahon, president Amalgamated Association, then said that the men are not asking for any change in hours of labor for a day's work; they will continue to labor ten hours, even eleven, twelve or thirteen hours, in view of the present emergency, even while other industries are securing an eight-hour day. The men, however, must have a living wage, and they will leave for other industries if they do not receive it speedily. If this situation is not squarely met, the efficiency of the companies will be destroyed. As for Cleveland, the men there will not wait during the delay of a referendum or any such thing, and the union will not let one city hold up a national settlement. In short, he concluded, there must be no delay in meeting the wage situation. Mr. Squire also emphasized the need of prompt action in Cleveland and his lack of confidence that the city will grant speedy relief.

In view of the fundamental importance of the question of federal aid, Mr. Taft asked that the argument of the railways, which as before stated was concurred in by the union representatives, be repeated before the whole board, for he desired any recommendation made by Mr. Walsh and himself to meet with the approval of the board. Consequently the argument was repeated by Mr. Gadsden and Mr. McCarter in the presence of the two chairmen and eight out of the ten representatives of employers and labor. Decision in the matter was then reserved, and the hearings were ordered to be continued on June 28 for the further consideration of the living-wage question. It is expected that decisions on this question will be handed down within the next month.

71 PER CENT WAGE INCREASE IN CLEVELAND TOO MUCH

The first evidence presented by the railways on the subject of a living wage was given by Mr. Squire, who said that the Cleveland Railway can find no excuse for the men demanding an advance to 60 cents an hour or an increase of 71 per cent at this time. In the last eight years the company has made five advances in wages by agreement with its men, and the wages in the last year were 40 per cent more than in 1910. Mr. Squire pointed out that motormen and conductors are not skilled employees, and the work is not difficult.

The wages in Cleveland from May 1, 1917, to May 1, 1918, were 32 cents an hour for the first year of service and 35 cents an hour thereafter, the average being sub-

WHAT AN INCREASE IN WAGES MEANS IN CLEVELAND

Increase in Cents per Hour	Total Average in Cents per Hour	Increase in Wages	Increase in Cents per Car-Mile	Total in Cents per Car-Mile
1	35	$77,000	0.2139	7.4888
2	36	154,000	0.4277	7.7026
3	37	231,000	0.6416	7.9165
4	38	308,000	0.8555	8.1304
5	39	385,000	1.0694	8.3443
6	40	462,000	1.2833	8.5582
7	41	539,000	1.4972	8.7721
8	42	616,000	1.7111	8.9860
9	43	693,000	1.9250	9.1999
10	44	770,000	2.1388	9.4137
11	45	847,000	2.3527	9.6276
12	46	924,000	2.5666	9.8415
13	47	1,001,000	2.7805	10.0554
14	48	1,078,000	2.9944	10.2693
15	49	1,155,000	3.2083	10.4832
16	50	1,232,000	3.4251	10.7000
17	51	1,309,000	3.6389	10.9138
18	52	1,386,000	3.8528	11.1277
19	53	1,463,000	4.0667	11.3416
20	54	1,540,000	4.2806	11.5555
21	55	1,617,000	4.4945	11.7694
22	56	1,694,000	4.7084	11.9833
23	57	1,771,000	4.9223	12.1972
24	58	1,848,000	5.1362	12.4111
25	69	1,925,000	5.3501	12.6250
26	60	2,002,000	5.5639	12.8388

stantially 34 cents an hour. The average amount per car mile was 7.2749 cents, the total wages for the year being $2,620,484. The effect of a wage increase at various rates is shown by the accompanying table, which was included in the company's brief. The present operating-expense allowance is 16 cents per car mile, of which more than 45 per cent goes to conductors and motormen. Wages at 60 cents an hour would take 80 per cent of the operating-expense allowance.

RAILWAY MEN PRESENT

The electric railway men present in Washington during the hearings—most of them having gone there to handle pending wage cases before the board—included the following:

Henry G. Bradlee, Boston; James P. Barnes, Schenectady; F. W. Brooks, Detroit; H. C. Clark, New York; Joseph S. Clark and C. M. Clark, Philadelphia.

A. L. Drum, Philadelphia; H. C. Donecker, Newark, N. J.; Edwin C. Faber, Washington; H. B. Flowers, Baltimore; P. H. Gadsden, Washington; W. W. Gurley, and A. L. Gardner, Chicago.

J. F. Hamilton, Rochester; Horace Lowry, Minneapolis; Thomas N. McCarter, Newark, N. J.; J. J. Stanley, Andrew Squire and H. J. Crawford, Cleveland; W. H. Sawyer, Columbus, Ohio.

C. L. S. Tingley, Philadelphia; Edmund W. Wakelee, Newark, N. J.; H. B. Weatherwax, Albany; Bernard F. Weadock, Detroit; F. H. McCulloch, Evanston, Ill.

M. C. B. and A. R. M. M. Associations Hold Special Meeting at Chicago

THE usual conventions of the Master Car Builders' and Master Mechanics' Associations were omitted this year but in their place was a joint meeting of representative members. This was held at Chicago on June 19 and 20. Its purpose was to accept reports of committees and transact necessary business. The attendance, including representatives of both associations, was about ninety. A large number of reports were presented in printed form and provision was made in the program for essential discussion.

The secretary's reports contained the following data regarding the associations. The M. C. B. Association now comprises 446 active members, 593 representative members, 14 associate members and 19 life members, a total of 1072. The A. R. M. M. Association membership in the several classes is: Active, 902; representative, 98; associate, 17; honorary, 45; total, 1062.

Wm. Schlafge resigned the presidency of the Master Mechanics' Association, and F. H. Clark, general superintendent of motive power B. & O. Railroad, was elected to the office. Changes were also made in the vice-presidencies of this association and one vice-presidential change was made in the Master Car Builders' Association.

AMERICAN ASSOCIATION NEWS

C. M. Mock Explains Consolidation Plan at Chicago

AT THE meeting of the Chicago Elevated Railroads company section held on May 21 C. M. Mock, chief engineer, read a comprehensive paper covering the tentative plans for the consolidation of the surface and elevated roads in Chicago. The remainder of the meeting was given over to patriotic matters, including a talk about the navy by Ensign E. W. Roemer and a report on the several Liberty Loans by N. W. V. Griffin.

Section No. 1 Stirred by Patriotic Addresses

THE evening of May 16 was "Patriotic Night" to the employees of the Milwaukee Electric Railway & Light Company. There was patriotic music followed by the entry of the color guard with the employees about to enter military service. Lieut. J. A. Crozier of the British-Canadian Recruiting Mission, and Dr. C. H. Beale, a local orator of note, were the principal speakers, their themes having to do with the war. Appropriate "movies" and songs rounded out the program.

"Human Frailty" Discussed at Manila

AT THE MEETING of joint company section No. 5 held at Manila on May 7, 1918, L. C. Bewsey, day carhouse foreman, department of shops and carhouses, Manila Electric Railroad & Light Corporation, read a paper on "The Human Element as Applied to Electric Railways." The paper stirred up quite a little discussion, a number of the speakers taking issue with Mr. Bewsey, considering him too severe on his fellow men. However, the general impression was that the paper was well worth while. The burden of the argument was that a great deal of the difficulty of operating an electric railway satisfactorily is due not so much to faults in equipment as to faults in the personality of the workers.

The speaker said that "we can be classed as dishonest if we are inefficient, or fail to give the public all of the comforts, convenience and courtesy to which it is entitled. In the operation of the electric railway we hear much said of mechanical and electrical failures, but seldom of man failures. For example, when a car is pulled into a carhouse with a broken trolley pole the failure is classed as mechanical; yet the pole would not have been broken if some man had not failed to make a perfect pole, or to install it properly, or to give it thorough inspection and care, or to operate his car carefully around a curve or under special overhead work, or to turn the pole when the car was backing up, or to keep the trolley wire in repair."

News of the Electric Railways

TRAFFIC AND TRANSPORTATION

FINANCIAL AND CORPORATE • PERSONAL MENTION • CONSTRUCTION NEWS

Pittsburgh's New Revenue

Receivers Indicate Increase in Receipts Under New Fare Will Go Back into the Property.

A statement has been issued of the receivers outlining the channels into which the Pittsburgh (Pa.) Railways intends to divert the new revenues under the increased fares put into effect on June 20 as noted briefly on page 1254 in this issue of the ELECTRIC RAILWAY JOURNAL. This statement follows in part:

EXTRA WAGES $1,700,000

"Whatever the increased receipts may be, every cent will be consumed in paying increased wages and increased costs of material essential to the operation of the cars and to the maintenance of roadbed and rolling stock in the best possible condition. Increased wages alone will consume $1,700,000 of the expected additional revenue.

"It is the aim and intention of the receivers to keep the street railway property in good operating condition. Track and roadbed will be placed in the best possible condition as far as the revenue will allow and every available car will be prepared to meet unusual winter difficulties.

"The electric equipment of the cars was badly damaged last winter by continued storms and much trouble was due to inability to secure repair parts promptly, although ample provision in the way of reserve equipment had been made for a normal winter. Our superintendent of equipment has arranged to prevent all trouble that may possibly be foreseen and has perfected plans to reduce the possibility of large amounts of moisture and snow entering the motor casing, a prime source of trouble last winter. So far the reserve stocks of field coils have been increased from 102 to 766 and of armatures from 89 to more than 200, and it is expected that during the summer these reserve stocks will be largely augmented, with the result that it will be possible to make winter repairs more quickly than ever before. As an addition and unusual precaution all coils are being doubly impregnated with insulating compound to enable them better to withstand exceptional snows and thaws.

SHOPS FULLY MANNED

"At present all departments of the shops are fully manned and they are capable of carrying out the policy of placing the equipment in the best possible condition, although no assurance against a labor shortage later on is given by the war situation. Fifteen cars for interurban service and fifty double-truck steel trail cars for city service are being added to the equipment this year in addition to the number operated during 1917.

"The receivers intend to bring the roadbed to the highest possible standard.

"One of the contributing causes to unsatisfactory service last fall and winter was the dissatisfaction among some of the trainmen, who refused to work trippers and trailers and to perform their duties satisfactorily until a wage advance was given them prior to the termination of their agreement. Since the appointment of the receivers an additional advance in wages has been made, and disputes as to working conditions have been eliminated. Increased wages in the shops and substations has resulted in improved efficiency in these departments.

"Orders of the fuel administration to enforce the adoption of the skip-stop plan on practically all of our lines will result in an improvement of the service."

Additional Facts About East St. Louis Wages

On June 1 the E. W. Clark & Company Management Corporation properties in East St. Louis, known as the East St. Louis & Suburban Railway, East St. Louis Railway and Alton, Granite & St. Louis Traction Company, voluntarily increased wages 2 cents an hour, making 33 cents for city men and 35 cents for interurban men, although the companies had a contract with the motormen and conductors which did not expire until May 1, 1919.

The men seemed to be dissatisfied with this increase and the company frankly stated that it was willing to have it considered that the men had struck and the matter left to the National War Labor Board for conciliation or arbitration.

The men met on the morning of June 4 and decided to strike. The strike lasted about twelve hours, the men returning to work after signing an agreement to leave the matter for conciliation or arbitration by the National War Labor Board.

As the matter now stands, the National War Labor Board will notify the parties interested when and where arbitration or conciliation will be considered. It was presumed that the arbitration would start some time after the joint meeting on June 24 in Washington of the National War Labor Board and representatives and employees of electric railways.

This matter was referred to very briefly in the ELECTRIC RAILWAY JOURNAL for June 15, page 1159.

Service-at-Cost Grant

Ordinance Introduced Into Council of Columbus Fashioned After the Tayler Grant in Cleveland

Councilman Lamneck introduced in the City Council of Columbus, Ohio, on June 17 an ordinance, based upon the terms of the Tayler franchise at Cleveland, which if adopted will take the place of the present grant to the Columbus Railway, Power & Light Company. It provides for a sliding scale of fares subject to adjustment; appointment of a railway commissioner to supervise operation; control of service and fare regulation by Council, and proper extensions and improvements to be designated by the city.

The initial fare would be 3 cents with 1 cent for transfer, but the fare scale would range from 2 cents with 1 cent for transfer to 4 cents or seven tickets for a quarter with 1 cent for transfer. The barometer would consist of an interest fund to start with $500,000. If it should increase to $700,000, the fare would fall automatically to the next rate, but if the fund should be reduced to $300,000, then the fare would be increased.

A board of arbitration would be provided to settle disputes about fares, operation, wages and other questions on which an agreement could not be reached.

The present draft also provides for an increase in the wages of motormen and conductors and other employees, with the provision that the maximum shall be 40 cents an hour. It would guarantee stockholders 6 per cent on their investment as ascertained by an appraisal of the property. The city would have a right to purchase the property on six months' notice at an appraised value plus 10 per cent.

The whole Council on June 21 voted down a motion to consider the Lamneck ordinance, which would have given the company a grant something like the one in force at Cleveland. It was placed on the table where it will remain unless some of the members change their votes.

A resolution was adopted providing for the appraisal of the company's property by the Public Utilities Commission.

A city charter provision requires that the Council must declare its intention to change any franchise before the change is actually made, but City Attorney Scarlett gave an opinion to the affect that this intention can be declared just before the vote on the passage of such an ordinance is taken. One member gave this as his reason for opposing the Lamneck ordinance.

Community Plan Likely

Appeal for Relief by New Orleans Railway & Light Company Results in Counter Proposal from City

The Commission Council of New Orleans, La., has refused the request of the New Orleans Railway & Light Company for an investigation of the merits of the plea of the company for increased revenues based upon the unusual advance in operating costs incident to the present abnormal conditions, but has made overtures to the company for a community of interest operating plan. In consequence, the company feels that it must seek to meet terms proposed by the city or accept the likelihood of the appointment of receivers. D. D. Curran, president of the company, has admitted this. In doing so he has pointed out publicly the general effect of each course.

CO-OPERATION ESSENTIAL

Under these circumstances it is the opinion of the board of directors that the interests of the community and of the company will be best served by the acceptance of co-operation of the city and of the co-ordinate management proposed, with certain detailed understandings as to method and procedure. In consequence a letter has been sent to the Mayor by Mr. Curran, stating the company's attitude on some of the points under discussion. This statement follows in part:

"1. As to the city's representation on the board of directors of the company, there can be and is no objection on our part. In fact, we shall go further and arrange for one or more of such officials to become members of the executive committee of our company which more intimately directs its affairs.

"2. There is no objection on our part to your honor designating a manager to be elected by the board of directors and to act subject to it.

"3. Our books, records and properties are open to such examination and investigation as you may require to enable you fully to safeguard the public interests.

"4. The company's outstanding obligations and liabilities (other than capital stock) will on July 1, 1918, be almost $43,000,000. While this figure disregards the $30,000,000 stockholders' interest, which, as to the preferred stock, represents actual cash investment at par and, as to the common stock, represents substantial values and rights received and now enjoyed by the company, we are nevertheless willing to accept the former figure as the basis of return pending the valuation to be immediately made of the properties of the company.

OPTION TO CITY ACCEPTABLE

"5. While times are abnormal and interest rates have risen, the company is nevertheless willing to accept the rates of return suggested in your communication of June 4.

"6. The condition for an option to the city of New Orleans to acquire the properties of this company is assented to.

"7. No provision is made in said communication for future improvements, betterments and extensions which will become necessary with the growth and development of this city. These, we assume, will be taken care of by mutual understanding and arrangement.

"8. Said communication proposes no immediate method of proceedure for the ascertainment of the value of our properties. In view of the constantly reiterated charges of over-capitalization, such value should be arrived at with the least possible delay."

The Commission Council has adopted a resolution authorizing the Mayor to take whatever steps may be necessary to consummate and carry out the plan proposed by him and accepted by the company as to principle but not in detail.

PRESIDENT CURRAN TO BONDHOLDERS

Reference to these negotiations is contained in the letter of Mr. Curran to the noteholders in regard to the company's inability to meet interest due on June 1. Mr. Curran said:

"As we have already advised you, the inability of the company to pay its two-year debentures at maturity on June 1 was due to unprecedented financial conditions caused by the war. The company appealed to the War Finance Corporation for relief, which was not granted, as the corporation decided it did not have the necessary jurisdiction.

"The company then made immediate appeal to the city of New Orleans for an advance in rates to cover increased operating costs, and as a result of these negotiations the city of New Orleans has entered into an agreement with this company whereby the Mayor, the Commissioner of Public Utilities and the Commissioner of Public Property have become members of the board of directors to insure complete and helpful co-operation in future between the city and the company both as to rates and labor problems. Through this co-operation all of the company obligations will be materially improved and strengthened."

Mayor Behrman and Commissioners Lafaye and Glenny have been elected to the board of the company in accordance with the agreement entered into between the company and the city.

Winnipeg Tied Up Three Days

Electric railway transportation in the city of Winnipeg, Man., was tied up for three days during the week of May 18 owing to 1000 employees of the Winnipeg Electric Railway striking in sympathy with civic employees who went out to enforce demands for a raise. The strike involved 15,000 workers in over a dozen unions. It was the most disastrous in the history of the city. From the time that the first civic employees walked out until a settlement was effected was over a month.

The railway men walked out on the morning of May 22 and a settlement was reached at noon on May 25. The basis of the agreement finally reached between the company and the men was that all matters affecting increase in wages should be arbitrated, with a strike as the last resort.

The Winnipeg Electric Railway suffered severely in loss of revenue. May 24, Victoria Day, came on Friday and preparations on a large scale had been made for entertaining the public at the various parks. Up until noon of the holiday hopes were held out that an agreement would be reached that day and crews were at the various carhouses waiting to take their cars out. The walkout was very regrettable owing to the fact that only last winter a new schedule had been drawn up for the railway men providing for increases in all branches. The best of relations now exist between the company and its employees.

Wage Disputes Before War Board

The strike of trainmen of the electric railways at Dayton, Ohio, which began on June 17, was brought to an end on June 24 through the efforts of Governor James M. Cox. All disputed points will be referred to the War Labor Board for settlement. The men demanded increases in wages and recognition of their union. All the local Dayton lines were affected by the strike.

New York Men Appeal to Public

The Brotherhood of New York (N. Y.) Railways Company Employees has addressed the public as follows:

"Due to the increasing high cost of living the employees of the New York Railways have demanded an increase in their wages, sufficient to enable them to support their families. The financial condition of the company is such that the officers of the company are unable to meet this demand unless they are permitted to charge a 6-cent fare on their cars.

"The Board of Estimate and Apportionment and the Public Service Commission have the power to grant this concession for the period of the war.

"It is to the benefit of the city that the men shall patriotically continue to operate the cars, in order that the public may enjoy an uninterrupted service, and because of this attitude the public should be willing to see that the men get fair wages.

"Unless the employees receive better wages, they will consider themselves free to seek more remunerative employment elsewhere, this will practically mean a shutdown on the street car lines, and the public will be deprived of a necessary means of transportation."

Another Step in Chicago

New Agreement for Operation of Surface and Elevated Line Put Before Bankers

Henry A. Blair, chairman of the Chicago (Ill.) Railways, will outline to the banking interests the features of the traction settlement ordinance agreed upon by the railroads and the Council committee.

There are three banking groups interested. Their individual interest has been to date Harris, Forbes & Company for the Chicago Railways, J. P. Morgan & Company for the Chicago City Railway and the National City Bank for the Chicago Elevated Railways.

The ordinance provides that the companies shall receive as their remuneration 6 per cent guaranteed on their investment now rated at $220,000,000, and 0.35 of 1 per cent additional if earned and accumulative if unearned in any one year. The present 45 and 55 per cent division of net earnings between the companies and the city will be discontinued and the city will receive all that is left after the 6.35 per cent on invested capital. There remains to be worked out the division of the 6.35 per cent among the three companies, but the matter has progressed so far now that an understanding is regarded as a certainty.

Boston Trustees Named

The trustees who are to manage the property of the Boston (Mass) Elevated Railway under the plan to turn the system over to the Commonwealth, noted previously at length in the ELECTRIC RAILWAY JOURNAL, were named by Gov. McCall and confirmed by the Council on June 26, as follows:

Louis A. Frothingham, North Easton.
Galen L. Stone, Brookline.
William M. Butler, Boston.
John F. Stevens, Boston.
Stanley R. Miller, Winchester.

Wages Increased in Spokane

A voluntary increase in the wages of trainmen, effective from June 14, has been announced, by the Washington Water Power Company and the Spokane Traction Company. The increase is approximately 2 cents an hour.

Under the new schedule the operators of one-man cars for the Washington Water Power Company will receive a straight wage increase of 2 cents an hour. The advance affects 85 per cent of the employees of the company. An increase of 2 cents an hour is granted employees on the two-men cars for the first six months period with an average increase of 1 cent an hour for the various classes after that length of time.

A similar announcement was made for the Spokane Traction Company. The scale for that company is as follows:

Two-men cars: first six months, 33 cents; second six months, 33 cents; second year, 34 cents; third and fourth years, 36 cents; fifth year, 37 cents; after five years, 39 cents. One-man cars: first six months, 37 cents; second six months, 38 cents; second year, 39 cents; third and fourth years, 41 cents; fifth year, 42 cents; after five years, 44 cents. Time and a half will be allowed for all overtime.

Massachusetts Commission Reduced

Governor McCall named Chairman Frederick J. Macleod and Commissioners Joseph B. Eastman and Everett E. Stone as members of the newly reorganized Massachusetts Public Service Commission on June 21. Commissioners John F. Meany and Charles A. Russell are retired from the board by the recent legislative act reducing its personnel from five to three. Chairman Macleod is designated for a three-year term, Mr. Eastman for two years and Mr. Stone for one year. The first two named are lawyers and the third an engineer by profession. By the terms of recent legislation the supervision of the Boston Elevated Railway and the Bay State Street Railway will pass to boards of trustees to be appointed by the Governor, but the commission will exercise broad powers of regulation over other electric railways in the State, whether these elect to operate under the general service-at-cost or under the present broad regulative authority of the Public Service Board.

News Notes

New Falls Line Opened.—The International Railway, Buffalo, N. Y., has opened its new Falls line. The plans for the road were described at length some time ago in the ELECTRIC RAILWAY JOURNAL.

Maine Road Increases Wages.—Wage increases were made on June 4 in all departments of the Rockland, Thomaston & Camden Street Railway, Rockland Me. The maximum pay in passenger service was set at $3 and in freight and mail service at $3.10.

Interurban Men Want Increase.—The trainmen in the employ of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., have demanded an increase of 15 cents an hour. Their present contract continues two years more.

Wage Increase in Little Rock.—The Little Rock Railway & Electric Company, Little Rock, Ark., has entered into an agreement with its trainmen for two years dating from June 1 for an increase in the wage scale from 29 cents to 35 cents. The scale has been from 20 cents to 25 cents.

Wages Increase in Asheville.—Announcement has been made by the Asheville Power & Light Company, Asheville, N. C., that the wages of its conductors and motormen have been advanced over the scale established two years ago. The increase will total about $23,000 a year.

Strike Averted.—The threatened strike of trainmen of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., has been averted. Company officials have announced a wage increase varying from 5 cents to 8 cents an hour according to length of service. The men have accepted the increase.

Employees Receive Increase and Fares Go Up.—The City Council of Alliance (Ohio), is said to have agreed to an increase in the rate of fare from 5 cents to 6 cents and as a consequence the Stark Electric Railway has announced an advance of from 7 to 12 cents an hour in the wages of motormen and conductors on both the city and interurban lines.

Shipping Board Has Powers of Expropriation.—On June 18 President Wilson issued an executive order delegating to the United States Shipping Board, Emergency Fleet Corporation, the power granted him under the act of April 22, 1918, to take over transportation systems for the transportation of shipyard and plant employees and for other purposes.

Cleveland Railway Issues a White Book.—The Cleveland (Ohio) Railway has reprinted under date of June 10 in pamphlet form the communications to the City Council in regard to its franchise, wages, street railway fares, etc. The booklet contains twenty-four pages. It should prove of much interest to electric railways in general, but particularly to companies that operate under service-at-cost grants.

Electric Railway Accountants Wanted.—The United States Civil Service Commission announces a competitive examination for examiners of accounts for the Interstate Commerce Commission. There are two grades, one paying from $2,200 to $3,000 a year, the other from $1,800 to $2,100 a year. Some accountants are wanted with electric railway experience and others with steam railroad and other experience. Applicants must not have reached their forty-eighth birthday.

Railway Men in W. S. S. Drive.—Roy Crandall, publicity agent for the International Railway, Buffalo, N. Y.; Elmer M. Hill, Buffalo editorial representative of the ELECTRIC RAILWAY JOURNAL, and W. J. Whiteside, traffic agent for the International Railway, have been appointed members of the publicity committee of the War Savings Stamps campaign committee in western New York. The International Railway has agreed to co-operate in the campaign by placing posters in all its cars.

Wage Increase in Montreal.—The employees of the Montreal (Que.) Tramway have been granted an increase in wages retroactive to June 1, increasing the schedule by about 20 per cent. Conductors and motormen will now receive for the first and second years 31 cents instead of 25 cents an hour, for the third and fourth years 33 cents instead of 26 cents, for the fifth year 35 cents instead of 26 cents and after the fifth year 37 cents as compared with 29 cents heretofore.

Damage from Elevated Construction Denied.—The United States Supreme Court on June 3 sustained the Federal Court in denying damages to Chicago property adjacent to the elevated railroads of the city. The decree of the lower court holding that there was no damage for the reason that property was benefited through concentration of travel from the elevated lines was upheld. The decision affects twenty suits which remain out of 100 cases instituted after the construction of the Chicago elevated loop by the Union Elevated Railroad.

Clearing House Established for Engineers.—Placement of engineers as civilians in any and all government departments as well as in private positions will be the function of the newly-established service clearing house in Chicago of the U. S. Employment Service of the Department of Labor. For some time a division of education has been operating. Last week a division of engineering was initiated with the appointment of A. H. Krom as director, reporting to Dr. P. L. Prentis, district superintendent. Offices have been taken at 29 South La Salle Street, Chicago.

Decides Against Toledo "News-Bee."—The Supreme Court of the United States handed down a decision on June 10 dismissing the writ of error asked by the Toledo Newspaper Company and N. B. Cochran in the contempt case against them in the United States Circuit Court of Appeals for the Sixth Circuit. The case arose during the 3-cent fare controversy in Toledo during 1914. The newspaper attacked the railway and the federal judge who granted an injunction requested by the railway concerning the enforcement of the 3-cent fare ordinance. The Supreme Court upheld the penalty imposed by the federal judge.

W. S. S. Advertised in New York Cars.—Through the courtesy of Theodore P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y., the company donated to the War Savings Committee for the week of June 21-28 the windows in all subway cars to be used in advertising the intensive war savings drive. The cards bore an extract from the President's message, appealing to every man, woman and child in the United States to become a pledged saver and investor in government securities. Similar cards were placed in all elevated cars, and in all surface cars controlled by the Interborough Company.

Trenton Wages Adjusted.—The wage differences between the Trenton & Mercer County Traction Corporation, Trenton, N. J., and its motormen and conductors have been settled by the company making an offer of 38 cents an hour flat rate to the men. The men voted on June 20 to accept the new offer, after they had insisted upon walking out if their demands for 40 cents an hour were refused. The company recently granted an increase to 35 cents an hour for all platform men and announced that it would pay 37½ cents an hour after July 1. The new rate will go into effect on the latter day. The agreement which had been in force called for 29 cents an hour.

Wants Trenton Indictments Sustained.—Prosecutor A. Dayton Oliphant of Trenton, N. J., on June 22 appealed to the New Jersey Court of Errors and Appeals in litigation to have the Supreme Court overruled in quashing the indictments against the directors of the Trenton & Mercer County Traction Corporation. Argument is to be set down for the November term of court. The Mercer County Grand Jury held the directors responsible for maintaining a nuisance. The case was carried to the Supreme Court. That body ruled that the allegations made did not constitute a crime. Argument will be directed by the prosecutor to prove this decision incorrect.

Government Aids Company.—An order granted in the Supreme Court at Buffalo, N. Y., allows George Bullock, receiver for the Buffalo & Lake Erie Traction Company, to enter into an agreement with the United States Navy Department by which the Navy will finance various extensions and improvements to the company's property for the purpose of advancing war work at Erie, Pa. The court order specifically permits the receiver to lease to the Navy Department twelve motor cars and ten trailers. The Navy, it is reported, is considering the construction of additional trackage in the city of Erie and is planning to reconstruct some old lines so as provide additional transportation facilities for war workers at Erie.

Engineering Council Seeks Committee Helpers.—The Engineering Council is asking for volunteer help among the members of the different engineering societies. The work of the council is conducted largely through committees, many of whom often need special information in some community or state, help in compiling information already accumulated or scouting for men fitted for some particular service. Hence it urges engineers who can help to write to Secretary A. D. Flinn, 29 West Thirty-ninth Street, New York, registering their names and addresses and stating in a general way the extent or nature of service each is willing to render. Here is an opportunity for some of the younger members of the profession to take a hand in society activities, but the request is not limited to men of few years.

Trenton Suburban Men Present Demands.—The employees of the New Jersey & Pennsylvania Traction Corporation, Trenton, N. J., have asked for an increase in pay from 31 cents to 40 cents an hour. The present scale calls for 29 cents an hour, but the company recently granted an increase of 2 cents an hour. The working agreement between the company and men does not expire until 1919. The men and the corporation have forwarded a joint appeal to the War Labor Board at Washington for assistance in settling the wage dispute. On June 22 the men rejected the wage offer of 35 cents an hour, insisting upon original demands of 40 cents flat. The agreement between the men and corporation calls for 29 cents an hour. The company recently granted a raise of 2 cents.

Increase in Wages by New York State Railways.—James F. Hamilton, vice-president and general manager of the New York State Railways, has announced that the company has granted an increase of 2½ cents an hour in pay to its employees in Utica, Syracuse, Rochester and on other lines owned by the company. The announcement followed a conference attended by officers of the Amalgamated Association representing employees of the company at which the union men demanded the increase. They urged in support of their claim that the proposed increase would make the wages of New York State Railway employees equal to those recently granted after a strike to employees of the Schenectady (N. Y.) Railway, United Traction Company and Hudson Valley Railway, Albany, N. Y. Mr. Hamilton has also announced that the company has agreed to submit the question of further increases, should it arise, to the National War Labor Board.

Break in Tama Dam Floods Power Plant.—On June 6 high water caused the breaking of a dam at Tama, Iowa, and the flooding of the Coralville generating plant of the Tri-City Railway & Light Company. The water filled the 14-ft. basement and rose 3 ft. above the operating floor, 3 ft. beyond the highest stage recorded previously. Practically no damage was done to the plant, but 400 tons of coal were washed away and the grounds around the plant were washed out in some places to a depth of 8 ft. Pumps were installed as quickly as possible and there was only a few hours' interruption to service, as a temporary connection was made with the University plant and later a connection with the transmission line of the Iowa Railway & Light Company. On June 12 the water had receded only about 4 ft., but it was believed that the damage would not be serious and that the plant would be in operation again in a few days.

Program of Meeting

Central Electric Meeting Postponed

The summer meeting of the Central Electric Railway Association to be held at The Breakers, Cedar Point, Ohio, has been postponed until July 17 and 18. The meeting was originally set to be held on July 10 and 11.

Financial and Corporate

Electric Railway Statistics

Returns for March, 1918, and for the Quarter Show Mounting Expenses and Stationary Earnings

A comparison of electric railway statistics for the quarter, January-March, 1918, with figures for the corresponding months of 1917, made by the information bureau of the American Electric Railway Association indicates almost no increase in revenue and a considerable increase in operating expenses, with a consequent falling off in net earnings and operating income. All parts of the country are affected, with the Eastern district showing the largest deficit. A similar comparison for the quarter January-March, 1917 and 1916, was far more favorable.

Data for the three months ended March 31, 1918, representing 7517 miles of line of companies scattered throughout the country, figured on the per mile of line basis, indicate an increase in operating revenues of only 2.54 per cent, while operating expenses increased 11.17 per cent and net earnings decreased 13.97 per cent. Data representing approximately 75 per cent of the above mileage indicate an increase in the amount of taxes paid of 4.80 per cent and a decrease in operating income of 22.10 per cent.

The returns from the city and interurban electric railway companies, as shown in detail in the appended tables, have been classified according to the following geographical grouping: Eastern District—East of the Mississippi River and north of the Ohio River. Southern District—South of the Ohio River and east of the Mississippi River. Western District—West of the Mississippi River.

Of the three groups on the accompanying table the Eastern makes the worst showing and the Southern the best, though as has been pointed out all groups show a decrease in net earnings and operating income.

Data for the Eastern district representing 4885 miles of line, indicated an increase in operating revenues of 1.91 per cent in operating expenses of 12.79 per cent and a decrease in net earnings of 19.61 per cent. Returns representing approximately 70 per cent of the above mileage indicate an increase in the amount of taxes paid of 4.13 per cent and a decrease in operating income of 32.98 per cent. Returns for the Southern and Western groups make a slightly better showing.

The operating ratio for the country

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS FOR QUARTER, JANUARY-MARCH, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, January-March, 1918	Per Mile of Line			Amount, January-March, 1918	Per Mile of Line			Amount, January-March, 1918	Per Mile of Line			Amount, January-March 1918	Per Mile of Line		
		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917
Operating revenues	$43,098,471	$5,733	$5,591	2.54	$25,788,498	$5,279	$5,180	1.91	$3,758,158	$4,380	$4,194	4.43	$13,551,815	$7,639	$7,360	3.79
Operating expenses	30,683,134	4,082	3,672	11.17	18,956,634	3,881	3,441	12.79	2,281,276	2,659	2,417	10.01	9,445,224	5,324	4,882	9.06
Net earnings	12,415,337	1,651	1,919	†13.97	6,831,864	1,398	1,739	†19.61	1,476,882	1,721	1,777	†3.15	4,106,591	2,315	2,478	†6.58
Operating ratio, per cent	1918, 71.20; 1917, 65,68				1918, 73.52; 1917, 66,43				1918, 60.71; 1917, 57.63				1918, 69.69; 1917, 66.33			
Av. No. miles represented	1918, 7,517; 1917, 7,416				1918, 4,885; 1917, 4,852				1918, 858; 1917, 803				1918, 1,774; 1917, 1,761			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$30,600,704	$5,589	$5,497	1.67	$16,317,929	$4,669	$4,623	1.00	$1,876,394	$4,964	$4,696	5.71	$12,406,381	$7,739	$7,588	1.99
Operating expenses	22,564,518	4,121	3,742	10.13	12,727,619	3,642	3,265	11.55	1,121,556	2,967	2,589	14.60	8,715,343	5,437	5,053	7.60
Net earnings	8,036,186	1,468	1,755	†16.35	3,590,310	1,027	1,358	†24.37	754,838	1,997	2,107	†5.22	3,691,038	2,302	2,535	†9.19
Taxes	2,151,945	393	375	4.80	1,147,269	328	315	4.13	158,105	418	400	4.50	846,571	528	500	5.60
Operating income	5,884,241	1,075	1,380	†22.10	2,443,041	699	1,043	†32.98	596,733	1,579	1,707	†7.52	2,844,467	1,774	2,035	†12.83
Operating ratio, per cent	1918, 73.73; 1917, 68.07				1918, 78.00; 1917, 70.63				1918, 59.77; 1917, 55.13				1918, 70.25; 1917, 66,59			
Av. No. miles represented	1918, 5,475; 1917, 5,425				1918, 3,495; 1917, 3,463				1918, 377; 1917, 372				1918, 1,603; 1917, 1,590			

† Decrease.

COMPARISON OF REVENUES AND EXPENSES OF ELECTRIC RAILWAYS MARCH, 1918 AND 1917

Account	United States				Eastern District				Southern District				Western District			
	Amount, March, 1918	Per Mile of Line			Amount, March, 1918	Per Mile of Line			Amount, March, 1918	Per Mile of Line			Amount, March, 1918	Per Mile of Line		
		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917		1918	1917	% Increase Over 1917
Operating revenues	$15,555,228	$2,062	$1,948	5.85	$9,271,497	$1,898	$1,800	5.44	$1,392,242	$1,623	$1,468	10.56	$4,891,489	$2,721	$2,563	6.16
Operating expenses	10,542,304	1,398	1,264	10.60	6,437,747	1,318	1,180	11.69	810,160	944	822	14.84	3,294,397	1,832	1,690	8.40
Net earnings	5,012,924	664	684	†2.92	2,833,750	580	620	†6.45	582,082	679	646	5.11	1,597,092	889	873	1.83
Operating ratio, per cent	1918, 67.80; 1917, 64.89				1918, 69.44; 1917, 65.56				1918, 58.16; 1917, 55,99				1918, 67.33; 1917, 65.94			
Av. No. miles represented	1918, 7,541; 1917, 7,440				1918, 4,885; 1917, 4,852				1918, 858; 1917, 803				1918, 1,798; 1917, 1,785			

COMPANIES REPORTING TAXES

Account	United States				Eastern District				Southern District				Western District			
Operating revenues	$11,037,803	$2,007	$1,908	5.19	$5,844,583	$1,672	$1,595	4.83	$696,777	$1,843	$1,638	12.52	$4,496,443	$2,764	$2,642	4.62
Operating expenses	7,707,844	1,402	1,287	8.94	4,263,754	1,220	1,115	9.42	395,079	1,045	896	16.63	3,049,011	1,874	1,748	7.21
Net earnings	3,329,959	605	621	†2.58	1,580,829	452	480	†5.83	301,698	798	742	7.55	1,447,432	890	894	†0.45
Taxes	750,221	136	129	5.43	389,715	112	109	2.75	55,891	148	138	7.25	204,615	187	169	10.65
Operating income	2,579,738	469	492	†4.67	1,191,114	340	371	†8.36	245,807	650	604	7.62	1,142,817	703	725	†3.03
Operating ratio, per cent	1918, 69.86; 1917, 67,45				1918, 72.97; 1917, 69.91				1918, 56.70; 1917, 54.70				1918, 67.80; 1917, 66.16			
Av. No. miles represented	1918, 5,499; 1917, 5,450				1918, 3,495; 1917, 3,463				1918, 377; 1917, 372				1918, 16,627; 1917, 1,615			

† Decrease.

as a whole has increased from 65.68 per cent in 1917 to 71.20 per cent in 1918. The operating ratio of the Eastern district has increased from 66.43 per cent to 73.52 per cent.

Attention, Doubters

A Story from Life for Those Who Still Scoff at the Auto as a Menace

The motor car has put three Kansas railroads and one city railway system out of commission and has hit hard at the revenues of three other city systems in the State. The extent of the losses was not made public until the companies owning the lines asked for reductions in the tax valuations this year on the ground that the property was of such small value in revenue production that the tax values should be reduced. J. T. Kincaid, a member of the Kansas Tax Commission, is quoted in part as follows:

"The city railway system at Fort Scott has been abandoned and it will be assessed purely on the junk basis. The Parsons company has offered to give its system to anyone who would operate it. It shows $21,876 more operating expense than operating revenues in the last year. At Emporia, the home of the State normal school, the operating expenses exceeded the operating revenues by more than $5,000. At Lawrence, the home of the State university, the operating expenses were $4,133 more than the revenues. These city railway systems do not have the same junk value as a railroad because of the extensive repairs necessary to pavements if the lines have to be turn up."

Plan Bay State Reorganization

The committee formed to draw up a plan of reorganization for the Massachusetts Electric Companies and Bay State Street Railway held its first conference on June 21. Wallace B. Donham, receiver of the Bay State Street The other members represent the principal security holders' committee, as follows:

Galen L. Stone, representing Massachusetts Electric common stock, Francis R. Hart, representing Massachusetts Electric preferred; Charles G. Bancroft, representing Massachusetts Electric notes; J. Howard Leman (secretary), representing the Bay State coupon notes, and John R. Macomber, representing the refunding bonds. The committee may be enlarged to take in someone to represent the Bay State preferred stock issue.

Mr. Donham presented to the committee the outline of a suggested plan of reorganization as a basis for further discussion. The various protective committees will urge non-depositing stock and bond holders to turn to their securities so that in the work of drafting a plan they may have as large a representation as possible.

Washington Tax Values Cut

The total electric railway valuations for taxation purposes in the State of Washington have been decreased $513,900 or 1.1 per cent for 1918 as compared to 1917. The similar decrease for steam railroads totals $579,266.

The valuation made by the tax commissioner for 1918 on electric lines comes to $43,970,875, as compared to $44,484,775 in 1917. Steam railroads are reduced from $341,091,137 in 1917 to $340,511,871 in 1918.

TAX VALUATION FOR WASHINGTON ELECTRIC RAILWAYS

	1917.	1918.
Puget Sound International Railway & Power Co.	$ 1,275,000	$ 1,300,000
Grays Harbor Railway & Light Co.	1,050,000	1,050,000
Lewiston-Clarkston Transit Co.	13,700	22,000
Olympia Light & Power Co.	330,000	362,000
Pacific Traction Co.	272,000	290,000
Puget Sound Traction, Light and Power Co.	18,681,600	18,661,500
Seattle & Rainier Valley Ry.	1,200,000	1,100,000
Tacoma Railway & Power Co.	3,450,000	3,385,000
Western Washington Power Co.	37,500	39,000
Willapa Electric Co.	87,000	87,000
North Coast Power Co.	356,125	356,125
Pacific Northwest Traction Co.	2,542,500	2,542,500
Puget Sound Electric Co.	2,800,000	2,800,000
Spokane & Inland Empire R. R.	8,300,000	8,000,000
Washington Water Power Co.	3,372,000	3,245,250
Walla Walla Valley Ry.	325,000	325,000
Yakima Valley Transportation Co.	392,350	405,500
Total	$44,484,775	$43,970,875

The accompanying table gives the detailed comparative valuations of the electric carriers. The Puget Sound Traction, Light & Power Company is reduced $20,000, and the Seattle & Rainer Valley Railway $100,000. The Tacoma Railway & Power Company is reduced $65,000, the Spokane & Inland Empire Railroad $300,000 and the Washington Water Power Company $126,750. Six of the other companies show increases, and six valuations have not been changed.

Financial News Notes

New Northern Ohio Issues Approved.—The Ohio Public Utilities Commission has authorized the Northern Ohio Traction & Light Company, Akron, Ohio, to issue $900,000 of 5 per cent bonds and $180,000 of additional preferred stock.

Maine Road Ordered Sold.—S. Thayer Kimball, receiver of the Rockland, South Thomaston & St. George Railway, Rockland, Me., under a decree of the court made on June 21, will receive bids at his office, 414 Main street, Rockland, Me., until July 23 for the sale of the road and appurtenances, either as a whole or in part. The road is 5.7 miles long.

Warren Bicknell Company Selected as Operators—The directors of the Cincinnati & Dayton Traction Company, Cincinnati, Ohio, have placed the operation of the line with the Warren Bicknell Company, Cleveland, Ohio. It had been operated by the Ohio Electric Railway Company for a number of years. The property was then known as the Cincinnati, Dayton & Toledo Traction Company.

Increase in Stock Approved.—The Massachusetts Public Service Commission has approved the application of the Union Street Railway, New Bedford, Mass., to issue $812,500 of new stock, the proceeds to be applied principally to paying for a new power house. The hearing before the commission on the application was referred to briefly in the ELECTRIC RAILWAY JOURNAL for May 11, page 933.

Receiver for Colorado Road.—The Guaranty Trust Company, New York, N. Y., recently filed application with the United States District Court, which resulted in the Denver & Interurban Railway being placed in the hands of William H. Edmunds, superintendent in charge of operation, as receiver. Default is charged in the payment of interest on bonds secured by a mortgage under which the Guaranty Trust Company acts as trustee.

Interest Default Charged.—The Quebec Savings & Trust Company, as trustee for the authorized issue of 60,000,000 francs 5 per cent thirty-year French currency bonds of the Quebec & Saguenay line of the Quebec Railway, Light, Heat & Power Company, Quebec, Que., dated Jan. 1, 1912, gives notice that the holders of the bonds of the issue will meet in Montreal on July 9 to consider what action, if any, should be taken in view of the company being in default.

Puget Sound Bonds Called.—The entire issue of $10,057,000 of 6 per cent bonds of the Puget Sound Traction, Light & Power Company due on Feb. 1, 1919, has been called for payment at par and interest on Aug. 1, 1918, at the office of the Old Colony Trust Company, Boston, Mass. Funds for taking up the issue were provided by the sale recently of $12,250,000 of 7 per cent three-year mortgage gold notes. In addition to the refunding the new issue will enable the company to take care of construction work now under way including the White River, Georgetown and Western Avenue power developments.

Foreclosure Sale in August.—The property of the Woodstock & Sycamore Traction Company, which has been operating south from Marengo to Genoa and Sycamore, Ill., will be sold at public auction under a decree of foreclosure signed by Judge Carnes of the Circuit Court of DeKalb County, Ill. Service was suspended in May. The affairs of the company were referred to in the department "Financial and Corporate" in the ELECTRIC RAILWAY JOURNAL for Jan. 5, April 27 and June 8.

Purchase of Ohio Road Authorized.—The Ohio Public Utilities Commission has authorized the Chillicothe & Camp Sherman Electric Railway to purchase the property of the Chillicothe Electric Railroad, Light & Power Company for $270,800. It is said that the government will advance funds for the construction of a track between Chillicothe and Camp Sherman and that this is the first move against the jitney bus profiteers who are operating bus lines that furnish the only means of getting to and from the camp.

Offering Equipment for Sale.—H. E. Bucklen, receiver of the St. Joseph Valley Railway, Elkhart, Ind., is offering equipment of that company for sale. Included in the material which he is selling are twenty-five side dump ballast cars, one three-compartment passenger car, one snowplow, one steel underframe trailer, one Edison-Beach storage-battery car, one 60-ft. all-steel Hall-Scott gasoline car with three compartments, 15 miles of No. 9 hard-drawn copper phone wire, 60 miles of No. 10 gage copper. The road was sold under foreclosure recently, and only a short stretch of it in Elkhart will be kept in service.

Minneapolis Bond Extension Arranged.—In a circular to holders of the first mortgage bonds of the Minneapolis, Lyndale & Minnetonka Railway and holders of first consolidated mortgage bonds of the Minneapolis Street Railway, William A. Read & Company, New York, N. Y., announced that they are authorized to offer the opportunity of extending these bonds from July 15, 1918, to Jan. 15, 1922, to bear interest at the rate of 7 per cent, an increase of 2 per cent. The extended bonds will be secured by the same mortgage covering the present issue which is a first lien on the entire railway system of Minneapolis. In addition to increased rate of interest the bonds will be unconditionally guaranteed both as to principal and interest by the Twin City Rapid Transit Company. Bondholders are requested to present bonds on or before July 15, 1918, after detaching the coupon due on that date.

Successor to Dan Patch Being Organized.—Articles of incorporation have been prepared for the Minneapolis, Northfield & Southern Railway to succeed as a reorganization the Dan Patch line from Minneapolis to Northfield, officially known as the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company. The capital is to be $500,000. H. A. Whittier, Northfield, is chairman of the reorganization committee whose plan has been approved by the Minneapolis Civic & Commerce Association. The final payment due on July 11 for the line is $175,000. This the committee is raising. Resumption of traffic on the Auto Junction-Luce Line Junction line leading to the heart of the city is expected as soon as an arrangement can be made with St. Louis Park, the principal point, for an advance on the contract rate of 5 cents per passenger into the city. There will be 52 miles of main track and 14 miles of short line.

Wants to Purchase Subsidiary After Foreclosure.—The New York (N. Y.) Railways has applied to the Public Service Commission for the First District for permission to purchase and acquire the property and franchises of the Central Crosstown Railroad, one of its subsidiaries, whose lines it has been operating for many years. A hearing on the application was held during the week ended June 22. It was stated on behalf of the New York Railways that the Central Crosstown Company is soon to be sold at foreclosure, under an order of the Supreme Court in an action brought by the Guaranty Trust Company, as trustee, because of default of principal and interest under the Central Crosstown's first consolidated mortgage. The latter company, together with the Christopher & Tenth Street Railroad, which it has controlled by lease for a long period, possess certain valuable franchise rights which are utilized in the operation of cars of the New York Railways, namely, parts of the Twenty-third, Fourteenth and Eighth Street lines.

Interborough Wants Bond Terms Changed.—The Interborough Rapid Transit Company, New York, N. Y., at a hearing before the Public Service Commission on June 26, asked for permission to issue $58,000,000 in bonds to meet its obligations during the current year. The commission permitted the company to issue $39,000,000 of bonds last summer for the purpose of financing elevated railroad third-tracking, construction, equipment and power house costs. The bonds were to be issued at not less than 93½ per cent of par, but the company now finds no market for them at that price. The company has appealed to the War Finance Corporation for assistance, and, in order to secure the amount of cash required, counsel for the company stated on June 26 that it would be necessary to make a large deposit of collateral and to issue bonds to the amount of $19,000,000 more than permitted by the commission last summer.

Electric Railway Monthly Earnings

BATON ROUGE (LA.) ELECTRIC COMPANY					
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$20,816	*$10,403	$10,413	$3,695	$6,718
1m., Apr., '17	18,987	*9,849	9,138	3,497	5,641
12m., Apr., '18	237,946	*124,390	113,556	43,661	69,895
12m., Apr., '17	221,302	*104,042	117,260	42,246	75,014
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.					
1m., Apr., '18	$7,510	*$9,706	†$2,196	$1,365	†$3,561
1m., Apr., '17	8,784	*9,769	†985	1,184	†2,169
12m., Apr., '18	120,629	*123,392	†2,763	15,531	†18,294
12m., Apr., '17	125,683	*115,708	9,975	13,533	†3,558
CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.					
1m., Apr., '18	$37,674	*$27,986	$9,688	$6,535	$3,153
1m., Apr., '17	34,508	*21,727	12,781	6,553	6,228
12m., Apr., '18	480,141	*333,326	146,815	78,581	68,234
12m., Apr., '17	413,660	*240,547	173,113	78,606	94,508
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Apr., '18	$94,223	*$39,514	$54,709	$32,797	$21,912
1m., Apr., '17	83,716	*29,751	53,965	28,242	25,723
12m., Apr., '18	1,149,762	*454,419	695,343	375,177	320,166
12m., Apr., '17	955,333	*365,122	590,211	342,377	247,834
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Apr., '18	$89,317	*$51,409	$37,908	$12,997	$24,911
1m., Apr., '17	75,386	*41,843	33,543	11,547	‡23,493
12m., Apr., '18	975,911	*545,543	430,368	148,164	‡306,774
12m., Apr., '17	874,517	*469,944	404,573	113,185	‡292,884
EL PASO (TEX.) ELECTRIC COMPANY					
1m., Apr., '18	$102,665	*$69,344	$33,321	$6,640	$26,681
1m., Apr., '17	101,379	*60,010	41,369	4,649	36,720
12m., Apr., '18	1,274,797	*823,650	451,147	72,941	378,206
12m., Apr., '17	1,179,158	*729,649	449,509	60,573	388,936

* Includes taxes. † Deficit. ‡ Includes non-operating income.

GRAND RAPIDS (MICH.) RAILWAY					
Period	Operating Revenue	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., Apr., '18	$99,937	*$77,931	$22,006	$19,421	$2,585
1m., Apr., '17	103,025	*72,419	30,606	18,187	12,419
12m., Apr., '18	1,289,657	*930,274	359,383	225,412	133,971
12m., Apr., '17	1,310,473	*860,495	449,978	201,197	248,781
JACKSONVILLE (FLA.) TRACTION COMPANY					
1m., Apr., '18	$74,329	*$50,116	$24,213	$15,980	$8,233
1m., Apr., '17	58,675	*38,495	20,180	15,754	4,426
12m., Apr., '18	749,634	*512,744	236,890	191,189	45,701
12m., Apr., '17	647,964	*434,865	213,099	186,148	26,951
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
1m., Apr., '18	$162,982	*$118,610	$44,372	$36,352	$8,020
1m., Apr., '17	138,104	*93,554	44,550	34,458	10,092
4m., Apr., '18	610,640	*466,831	143,809	145,002	†1,193
4m., Apr., '17	518,395	*367,056	151,339	137,584	13,755
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.					
1m., Apr., '18	$267,913	*$157,422	$110,491	$28,236	‡$91,838
1m., Apr., '17	175,359	*104,007	71,352	29,158	42,194
12m., Apr., '18	2,932,282	*1,646,832	1,285,450	345,562	‡1,006,971
12m., Apr., '17	2,028,964	*1,200,271	828,693	348,357	480,336
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., Apr., '18	$24,712	*$16,616	$8,096	$8,014	$82
1m., Apr., '17	23,865	*18,822	5,043	7,196	†2,153
12m., Apr., '18	304,060	*228,035	76,025	93,374	†17,349
12m., Apr., '17	311,379	*229,879	81,500	86,465	†4,965
PENSACOLA (FLA.) ELECTRIC COMPANY					
1m., Apr., '18	$35,008	*$24,138	$10,870	$8,120	$2,750
1m., Apr., '17	24,057	*15,189	8,868	7,813	1,055
12m., Apr., '18	391,640	*238,931	152,709	94,644	58,065
12m., Apr., '17	290,118	*167,831	122,287	92,899	29,388

Traffic and Transportation

Two Days' Session in Atlanta

July 2 Fixed as Date for Filing Briefs in Georgia Railway & Power Rate Case

The hearing before the Railroad Commission of Georgia on the application of the Georgia Railway & Power Company, Atlanta, Ga., for permission to increase rates was resumed on June 12. Judge Arthur G. Powell, chief counsel for the people's committee opposing the increase in rates, opened by cross-examining Preston S. Arkwright, president of the company, on his testimony given at the hearing of the company's evidence in support of its petition.

Among the matters gone over somewhat in detail while Mr. Arkwright was on the stand were depreciation, excess profits, steam power costs, the company's tax returns and the credit of the company. According to Mr. Arkwright, the common stock of the company is quoted at $8 a share, the second preferred at $17.50 a share and the preferred at $78 a share. There is no market for the bonds.

Mr. Arkwright considered the company was justified in paying out $120,000 in dividends in 1917 on its first preferred stock. He contended that it was necessary to pay dividends in order to sustain a corporation's credit and he further contended that the dividend paid in 1917 was not paid from 1917 earnings, but from earnings accumulated since the organization of the company. At the afternoon session Mr. Arkwright was questioned in regard to work already done by the company, work proposed by the company and the history of some of the transactions by which the present company was built up.

At the session on June 13 Chairman Candler announced that the commission had decided to allow the attorneys for the people's committee until June 27 to prepare their evidence and briefs, and thereafter to allow until July 2 for the filing of reply briefs. This was in compliance with the request of the attorneys for the people's committee for an extension of time.

The announcement of the commission's decision with regard to an extension of time was made after George W. Brine, vice-president and general manager of the company, had been examined and cross-examined concerning his estimate of the company's net income for the year 1918.

At this session Joel Hurt, who built the first electric railway in Atlanta and is a past-president of the American Electric Railway Association, went over some of the early financial history of the company. He said that after the sale of his interests in Atlanta public utilities he had been approached by Mr. Atkinson, now chairman of the board of the company, with an offer of common stock in the consolidated company and promise of election as a director, but that he "refused to be a part to any such over-capitalization."

Mr. Arkwright denied Mr. Hurt's assertion in regard to the common stock of the company. He disputed Mr. Hurt both as to the amount of the common stock, and as to the stock issue being excessive. He said that the common stock was not given as a bonus, but was paid to the owners of the various subsidiary street railways consolidated by the Georgia Railway & Electric Company, operated by the Georgia Railway & Power Company, and represented an actual property value. Mr. Atkinson told about his conversations with Mr. Hurt. He said that he "certainly did not tell Mr. Hurt anything about the securities we proposed to issue." W. H. Glenn, vice-president, secretary and treasurer and operating manager, sought to show that Mr. Hurt's testimony was prompted by aminus.

Status of East St. Louis Appeal

Brief references were made in the ELECTRIC RAILWAY JOURNAL of June 8 and June 22 to fare applications by the Alton, Granite & St. Louis Traction Company and the East St. Louis Railway, controlled by the East St. Louis & Suburban Company, East St. Louis, Ill., for permission to increase fares. The appeal is for a rate of 2 cents a mile on the Alton, Granite & St. Louis Traction lines, and for an increase of 10 per cent in commuter rates.

The Alton, Granite & St. Louis Traction Company operates the city lines in Alton and the company is asking for a fare of 7 cents with four tickets for 25 cents, and 1 cent for each transfer.

Transfers in Alton and East St. Louis on the Alton, Granite & St. Louis Traction Company lines will not be accepted as a part of the interurban fare, but only for an extended ride within the city limits of said cities. The Alton Granite & St. Louis Company operates the Venice-Brooklyn-East St. Louis (city limits) line. The company wants a 7-cent fare on this branch.

The hearing before the commission on the 2-cent rate was held on June 18, but the commission has not yet handed down its decision. The date for the hearing on the Alton City and Brooklyn-Venice increased fares has not yet been set by the commission.

On June 20 the East St. Louis Railway filed a petition for increased fares in the city of East St. Louis, as follows: basic fare of 7 cents, five tickets for 30 cents; transfer privileges in East St. Louis will be the same as at present. Hearing of the East St. Louis case has not yet been set.

Home Rule Exponent Speaks

Opponent of Commission Control of Fares Advocates Liberal Attitude by Cities Toward the Railroads

Richard C. S. Drummond, city attornew of Auburn, N. Y., and chairman of the special committee of the conference which conducted the opposition of the cities of New York State to the application of the electric railways to the Public Service Commission for increased fares, was one of the speakers on June 12 before the State conference of mayors and other city officials held at Newburgh. He said that the question of permitting surface railways to increase their fares should be considered on the part of municipal authorities frankly and in a straightforward fashion and without rancor. Each municipality must decide for itself. He is quoted as follows:

"Our ideas upon these questions affecting public utilities and public service enterprises are changing very rapidly. If, in order to exist, the railway companies must have more money, that revenue must be provided. If it can be provided in no other way save by increased fares, increased fares must be granted. Each municipality must decide for itself.

"More or less investigation will be required undoubtedly in each individual case. If the results of such investigation are such as to lead the responsible authorities of a municipality to look with favor upon the proposition that increased fares must be authorized, then in the case of those municipalities which have rate limitations in the railroad franchise, it must be determined how this consent is to be conferred and what terms and stipulations should be insisted upon in respect to the modification or suspension of the rate provisions of the existing franchise contracts.

"It is one of the most perplexing matters with which courts and lawyers have been confronted in many years. The law is unsettled and the extension of existing legal principles to the new conditions is a matter of special difficulty. Nevertheless, the matter is one to which we shall have to address ourselves. It seems practically impossible to escape the conclusion that fares must be increased. Conditions are shifting so rapidly that nothing can be designated as certain or definite.

"If our advice had been heeded by the railways and the commission and if our suggestions had been adopted, a great deal of confusion, expense, bother and uncertainty would have been avoided. But as it was we were gazed upon with cold distrust and suspicion and received snubs and refusals. All of our predictions have come true. From the beginning we insisted that the matter was one to be taken up with the local authorities. Now, by virtue of the decision of the highest court of the State, it has been found that this is the only thing that can be done in these franchise cases."

Buffalo Fare Progress

If Commission Sanctions Six-Cent Agreement Company Wlil Sell Seventeen Tickets for $1

The board of directors of the International Railway, Buffalo, N. Y., at a meeting held on June 20 voted to ratify the agreement made between E. G. Connette, president of the company, and the City Council of Buffalo in which the city recommended to the Public Service Commission that the company be allowed to charge a 6-cent fare on its lines within the city on certain conditions. As soon as the board ratified the agreement, application was made to the Public Service Commission, Second District, for permission to put the 6-cent fare into effect immediately. In a communication to the City Council Mr. Connette said that if the 6-cent fare was approved by the commission, the company would sell seventeen tickets for $1.

WAGE MATTER STILL UNSETTLED

No permanent agreement has been reached between the company and its platform employees in regard to a scale of wages. The company has offered the first-year men 35 cents an hour, second-year, 37 cents; third-year, 39 cents and after three years 42 cents an hour. The company will allow the scale to be retroactive to June 1. The employees have rejected this offer and the matter will probably be left for the War Labor Board to decide.

Two steps have been taken by taxpayers and voters of Buffalo to have the agreement between the City Council and the company set aside. Petitions are now being circulated by associations of businessmen which call for a referendum vote on the agreement. Under the commission charter all actions taken by the Council can be reviewed by the voters at a referendum. About 4000 signatures are required to force a referendum.

OPPOSITION ORGANIZES

The second action has been started by a committee of prominent citizens. Five lawyers have been engaged and application has been made for an injunction to restrain the city from being represented before the proposed hearings before the Public Service Commission, on the 6-cent fare. It is set forth in the petition that the action of the Council is illegal and in violation of the Milburn agreement between the city and the Council which has been approved by the State Legislature. It is pointed out that an act of the Legislature is needed before the Council has authority to agree to a 6-cent fare.

Railways Act Against Jitneys

Acting under a law passed at the last session of the Massachusetts Legislature, the Massachusetts Northeastern Street Railway; Union Street Railway of New Bedford; Bay State Street Railway and Nahant & Lynn Street Railway have appealed to the Public Service Commission for relief from jitney competition in the territories served by these roads.

The Massachusetts Northeastern company appeals against jitney competition in Salisbury and Newburyport. The Union company desires to preserve its rights in New Bedford, where the Board of Aldermen is now considering jitney service and regulations. The Bay State company filed twenty-eight petitions saving its rights in fifty-eight cities and towns having or reported to have jitney service, and asking the commission to investigate the use of jitneys in these places and to issue orders for the relief of the company. The Nahant & Lynn company asks that the commission abolish the jitney service between these two points for numerous reasons, principally on the grounds of irregularity and irresponsibility.

The Connecticut Valley Street Railway has also petitioned the commission for authority to establish a motor-operated freight service between Northampton and Springfield.

Roads Appeal to the I. C. C.

Among applications from electric railways placed on file recently with the Interstate Commerce Commission are the following:

Southern New York Power & Railway Corporation—Increase of 25 per cent in class and commodity rates applicable between points on its line published in Tariffs I. C. C. Nos. 8, 10, 11 and 12, based on increase authorized in Director-General's general order No. 28 of May 25, 1918.

Cleveland, Southwestern & Columbus Railway—Increase of 25 per cent in class and commodity rates between points on its line and from points on its line to stations on connecting lines, published in Tariffs I. C. C. Nos. 18, 22 and 23 to basis authorized by Director-General's general order No. 28 of May 25, 1918.

Cleveland, Southwestern & Columbus Railway—Increase in passenger fares to basis of 3 cents per mile between stations on its line and from stations on its line to points on connecting lines published in Tariffs I. C. C. Nos. 19, 20 and 33.

Grand Rapids, Grand Haven & Muskegon Railway—Increase of 25 per cent in the class rates from points on its line to Milwaukee, Wis., published in Tariff I. C. C. No. 143, based on increase authorized by Director-General's general order No. 28 of May 25, 1918.

Western New York & Pennsylvania Traction Company—Permission to increase both passenger and freight charges to the level of the new steam railroad rates.

On June 13 application for increasing passenger fares to 3 cents a mile and freight rates 25 per cent were filed with the Interstate Commerce Commission by the Buffalo & Lake Erie Traction Company, and the Kansas City, Kaw Valley & Western Railway. The Lackawanna & Wyoming Valley Railroad asked to increase passenger fares to a basis of 2½ cents a mile.

The Courts a Final Resort

St. Louis Sees Last Ray of Hope in Its Fare Case Against United Railways

The city counselor of St. Louis, Mo., has taken steps to appeal from the decision of the Public Service Commission of Missouri granting the United Railways the 6-cent fare.

The city's appeal through the Circuit Court is based on two allegations:

First, that the commission had no authority to set aside the contract rate of 5 cents.

Second, that the 6-cent fare is excessive.

Only recently the Supreme Court of Missouri ruled that the commission has the right to raise as well as to lower rates without regard to contract or franchise stipulations. This was the ruling in the so-called Sedalia case.

The decision of the Supreme Court upholding the power of the Public Service Commission to set aside franchise contracts was unanimous. It was written by Chief Justice Graves. The city of Sedalia had appealed from an order of the commission upholding a franchise contract with the Sedalia Water Company. In discussing the powers of the commission to set aside franchise contracts, under the police power of the State, Judge Graves wrote:

"The sovereign police power of the State is preserved intact, irrespective of contracts with reference to rates for public service. No contract as to rates will stand as against the order of the Public Service Commission for reasonable rates, whether such reasonable rates are lower or higher than the contract rates. Under the constitution and the public service commission act, the commission is exercising the police power of the State by its delegated authority from the Legislature Its rates, therefore, constitutionally and legally supersede any and all contract rates."

Hearing on Albany Fares

A hearing was held on June 18 before the Public Service Commission for the Second District of New York on the application of the United Traction Company, Albany, for establishing a zoning system to increase its revenues. It was preliminary to further hearings by the commission.

Government representatives advocated a 6-cent fare for the Albany and Troy districts and a round-trip fare of 15 cents between Albany and Watervliet for arsenal workers. They advocated there rates as war measures, and wanted the 15-cent round-trip rate for Watervliet arsenal workers at once.

Mayor Watt and the representatives of the Albany Chamber of Commerce are opposed to 6-cent fares, but advocate an equalization of rates between the arsenal and all neighboring communities, so that the government can take advantage of the ample housing facilities of Albany.

Must Abide by Franchise

Ohio Court Rules that Franchise Contracts With Fare Requirements Must Stand as Accepted

The Supreme Court of Ohio on June 20 sustained a ruling of the Public Utilities Commission of that State to the effect that it has no authority to increase the rates of fare of interurban roads which have accepted certain rates in consideration of franchises from the cities and counties through which they pass. Among the companies affected by the decision are the Mahoning & Shenango Railway & Light Company, Youngstown; the Toledo, Bowling Green & Southern Traction Company, Findlay, and the Interurban Railway & Terminal Company, Cincinnati. All of these are subject to franchise conditions. The court views such franchises, accepted by the companies, as contracts which cannot be abrogated under the law. The only relief seems to be with the cities and counties through which they pass or with the Legislature, in case it is found necessary to take action.

The Mahoning & Shenango Railway & Light Company had asked the privilege of increasing its rates of fare between Youngstown and Warren and Youngstown and Hubbard. The court held that the franchises granted by the City Council of Youngstown and the Commissioners of Trumbull and Mahoning Counties must stand, unless altered by the city and the counties mentioned.

In the case of the Interurban Railway & Terminal Company the franchises of the former villages of Pleasant Ridge and Kennedy Heights permitted passenger rates ranging from 7 cents to 10 cents, but provided that in the event of the annexation of these places to Cincinnati a rate of 5 cents should be established. When the annexation was made, however, the company appealed to the commission, which ruled against it. This ruling is the one just approved.

The circumstances surrounding the Toledo, Bowling Green & Southern road are similar to those of the Mahoning & Shenango Railway & Light Company.

Skip Stops Likely for Chicago

Action taken by the committee on local transportation of the City Council of Chicago, Ill., on June 19 paved the way for the adoption of skip-stop operation on the Chicago Surface Lines, and makes it probable that the proposed ordinance will go into effect in a few weeks. At the suggestion of a representative of the federal fuel administration, the committee took the matter under advisement several weeks ago. The public service department of the city reported favorably after a careful investigation. As a result an ordinance was drafted and will be presented soon to the City Council.

The selection of proposed stopping places for cars was made on a novel basis. In Chicago the houses are numbered on an exact basis of 800 to the mile. Some blocks are longer than others, and while in certain districts there are at present only eight stops to the mile, there are many other locations where twice that many stops are made. The proposed ordinance requires that stops be made only where the "hundred number" or multiples of that occur. This will mean a maximum of eight stops to the mile except where added stops are made for safety purposes. The ordinance will go into effect fifteen days after passage and publication.

York Wants Six-Cent Fare

The York (Pa.) Railways, which serves York and adjacent towns, is seeking an increased fare schedule.

Despite the fact that the Attorney General of Pennsylvania rendered an opinion to the Public Service Commission that, notwithstanding municipal franchises, the commission has power to alter franchise rates, the York Railways has taken up the matter of rates with the Council of York. It will then go to the commission. It asks that the Council go on record as favoring the suspension of the rate clause for the period of the war, and a period of readjustment after the war to be fixed by the Public Service Commission.

It is proposed to raise the basic cash fare in York to 6 cents, and the fares on the interurban lines to about 2½ cents a mile. The interurban lines are not governed by fare-limiting franchises.

The proceeding is an emergency action to enable the company to meet increased costs, including an advance in wages and to provide a further increase in wages as soon as higher fares are established.

Pittsburgh Goes to Five Cent-Seven Cent Fares

A 5 cent-7 cent fare was placed in effect on the properties of the Pittsburgh (Pa.) Railways on June 20. It supersedes the 5½ cent fare which has been in effect on the lines of the company since Jan. 22 last.

The city of Pittsburgh has been divided in such a way that a central 5-cent area varying from 2.2 miles to 3 miles in radius covers the main business district. Any passenger passing outside of this area, or vice versa, or riding on the cars entirely beyond this area must pay a fare of 7 cents.

Passsengers boarding the cars in the downtown district pay a fare of either 5 cents or 7 cents as they leave the car depending upon the point of disembarkation. This permits the use of all doors and faster loading during the rush hours. Fares of a like denomination are collected from passengers as they board an unbound car. Tickets are being sold eight for 55 cents.

The new system of fares was inaugurated without friction as the public had been advised in advance of the change and understood the arrangement.

Ohio Interurbans Act

Thirteen Roads in That State Seek Higher Rates, Some Both Passenger and Freight Advances

It was announced by the Public Service Commission of Ohio on June 18 that thirteen interurban railroads had filed applications with the commission for advanced rate schedules. The companies want to increase their passenger fares to 3 cents a mile and their freight rates 25 per cent. Each road's application will be considered separately and the decision of the commission in each instance will be based on whether the roads prove that increases are imperative.

The Northwestern Ohio Railway & Power Company has filed new tariffs providing for a passenger rate of 2½ cents a mile, but it also has a petition on file asking 3 cents in the event other interurbans get that amount.

These interurbans have asked for higher passenger rates only:

Northern Ohio Traction & Light Company; Fostoria & Fremont; Cleveland, Painesville & Eastern; Southeastern Ohio Railway; Cleveland, Alliance & Mahoning Valley. All these want 3 cents a mile. The Detroit, Monroe & Toledo Short Line asks 2½ cents a mile.

These lines want both passenger and freight rates raised:

Western Ohio; Ohio Electric; Stark Electric; Sandusky, Norwalk & Mansfield.

These lines ask freight increases only:

Scioto Valley Traction and Toledo & Western.

Beecher W. Waltermire, member of the commission, made the following statement:

"If one interurban is granted an increase it will not mean that another road more favorably situated will be given a similar increase. Not long ago the interurbans told us the automobile was emptying their cars. To some who have been in to talk about increased rates I have said, 'Now is your chance to fill your cars.'"

Six-Cent Fare for Kansas City

The Public Service Commission of Missouri, declaring that its duty is to see that the public receives service from utilities, and that such service cannot be rendered without adequate returns, on June 22 granted a 6-cent fare in Kansas City, Mo., to the Kansas City Railways.

The 6-cent rate is to go into effect on July 15, for a year. After that time the commission will continue the higher rate if still necessary, or make other adjustment. An intermediate fare is even regarded as a possibility.

Under the decision, the company will continue to give universal transfers. The fare for children will continue at 2½ cents. The commission suggests that the company issue coupon books, or discs, for the convenience of the public.

Transportation News Notes

New B. & W. Freight Tariff.—The Boston & Worcester Street Railway, Boston, Mass., has filed with the Public Service Commission a new freight tariff increasing rates 15 per cent to conform with the recent increase granted to the railroads.

Missoula Wants a Seven-and-a-Half-Cent Fare.—The Missoula, (Mont.) Street Railway has made application to the State Railroad Commission of Montana for permission to increase fares from 5 cents to 7½ cents. A hearing has been set for July 1.

Skip Stops in Louisville.—On June 16 the Louisville (Ky.) Railway started the staggered skip-stop plan on the city lines south of Oak Street, west of Eighteenth Street and east of Shelby Street. Stops are being made at all downtown street intersections.

Rates Over Thirty-Five Cents Raised.—The Texas Electric Railway, Dallas, Tex., announces an increase of 8 per cent on all fares of more than 35 cents, in accord with Section 501 of the war revenue law, defined as an "act to provide revenue to defray war expenses and for other purposes."

Straight Five-Cent Fare in Asheville.—The Asheville Power & Light Company, Asheville, N. C., has announced the discontinuance of the sale of six tickets for 25 cents. Every cent of additional revenue derived from the straight 5-cent fare will be absorbed by a recent wage increase to the trainmen, the company estimates.

Three-cent Rate on W. W. P. Line.—Officers of the Washington Water Power Company, Spokane, Wash., recently filed with the Public Service Commission at Olympia a tariff raising the passenger rates on the Medical Lake and Cheney lines to a flat 3 cents a mile and the freight rates 25 per cent, effective on June 25.

Hearings in July on Increased Fares.—The Public Utilities Commission of Ohio has announced that hearings will be held on July 10, 11 and 12 on application of three or four of the dozen or more roads which recently asked for an increase in the rates of fare. Applications for increased freight rates will not be taken up at that time.

Chattanooga Feels the Pinch.—F. W. Hoover, second vice-president of the Chattanooga Railway & Light Company, Chattanooga, Tenn., recently indicated that there will be an increase in the fares at some future date. An idea of the increased cost of materials was given the people of Chattanooga in a recent advertisement in the papers.

Fare Rebate Slips in Johnstown.—On June 12 the Johnstown (Pa.) Traction Company began to issue slips acknowledging that it was receiving from patrons 1 cent in excess of the prior established rate of fare. The slips will be redeemed by the company if the Public Service Commission should decide that the new fare is excessive.

Four Men Killed in Ohio Wreck.—A car of the Northern Ohio Traction & Light Company, Akron, Ohio, jumped the track and dropped a distance of 75 ft. from the bridge into the Cuyahoga Gorge at Cuyahoga Falls on June 11. The conductor and three other men were killed outright, while the motorman and another man were badly injured.

Many Persons Hurt in Newark Accident.—More than fifty persons were injured when a car on the Newark line of the Public Service Railway between Jersey City and Newark on June 21 ran across an open switch at the Montgomery Street yards, about 100 ft. from the Passaic River bridge at the Lincoln Highway and South Seventh Street, Newark, N. J.

Fare Increases Suspended.—The Public Service Commission for the Second District of New York on June 11 dismissed the petition of the Rochester, Syracuse & Eastern Railroad and the Empire United Railways, Inc., for permission to charge a 6-cent fare. The decision of the Court of Appeals in the Rochester case applied to the application. Rochester asked for a dismissal of the petition.

One-Man Car for Hornell.—The Hornell (N. Y.) Traction Company, now being operated by a receiver, will establish the one-man system on its local lines on July 1. The company has petitioned the Public Service Commission for permission to use the tracks of the Pittsburgh, Shawmut & Northern Railway, which connect with the North Hornell line: It is planned to operate regular service over this line.

Would Reduce Its Fare.—The International Railway, Buffalo, N. Y., has filed application with the Public Service Commission, for the Second District for permission to reduce its rate of fare between North Tonawanda and Buffalo from 30 cents to 25 cents and from North Tonawanda to Lockport from 40 cents to 35 cents. The reduced fares will become effective on July 1, if the commission approves the new schedule.

Increase in Fare Asked at Akron.—The Northern Ohio Traction & Light Company, Akron, Ohio, on June 24 made formal application to the City Council for permission to increase the rate of fare for a continuous ride within the city to 6 cents. The present rate is 5 cents, six tickets for a quarter and twenty-five for $1. The petition has been reprinted in the form of an eight-page pamphlet 6 in x 9 in. for general distribution.

Maine Company Increases Zone Unit.—The Atlantic Shore Railway, Kennebunk, Me., has filed with the Public Utilities Commission of Maine a new schedule of passenger fares to become effective on July 7, 1918, being a change of fares from 6 cents to 7 cents with the exception of the zone between Sanford and Springvale, where the fare will be changed from the present rate of 6 cents to 5 cents. The company proposes to advance the price of ticket strips having nine coupons from 50 cents to 55 cents.

Tri-City Will Seek Increase.—The Tri-City Railway, Davenport, Ia., will probably go before the Public Utilities Commission of Illinois soon to ask a 6-cent fare in Rock Island, Moline, East Moline and Silvis. Similar action will be taken on the Iowa side at the same time. J. G. Huntoon, general manager of the company, said recently: "The company feels that the employees are entitled to more money than they are getting at present and the only way to grant them this increase will be to increase the present fares."

Salamanca Is Willing.—The Common Council of Salamanca, N. Y., has voted to waive the 5-cent fare clause in the franchise of the Western New York & Pennsylvania Traction Company in order that the company may go before the Public Service Commission and ask for an increase in passenger rates. The Council believes that the company is entitled to more money for its passenger service. The agreement of waiver is only temporary, for the grant is for a period of three years, or until a year after the close of the war.

Fare Increase in Quebec.—The City Council of Quebec, Que., has granted fare increases to the Quebec Railway, Light, Heat & Power Company as follows: Five tickets for 25 cents, instead of six; seven workingmen's tickets for 25 cents, instead of eight, which are limited for bona fide workingmen, good between the hours of 6 and 8 a.m. and 5 and 7 p.m., except Sundays. The bylaw which was passed granting the increases became effective on June 16, but will not be enforced by the company until the new tickets are printed.

Houston Company Would Increase Fares.—The Houston (Tex.) Electric Company has made application to the City Commission for authority to increase its fares effective on July 1. David Daly, manager of the company, appeared before the City Commission with an exhaustive financial statement showing the need for a fare increase. The company wants to charge 6 cents with 3 cents for half fares and to continue to give transfers as at present. Mr. Daly estimated that this fare increase would increase the company's income by 10 per cent.

Birmingham Commission Won't Accept Responsibility.—The City Commission of Birmingham, Ala., has refused to adopt a proffered ordinance permitting the Birmingham Railway, Light & Power Company to charge a 6-cent fare for passenger service. The petition containing more than the required 1500 names was automatically referred to the County Election Commission. The commission has the power, it is said, to refuse to call the election, but it is expected the members will act in the customary manner and let the case go before the people for final decision.

Tickets Restored.—The Des Moines (Ia.) City Railway has restored the sale of six tickets for a quarter at its own offices. This action was taken to meet the demand of the City Council and is only temporary. The Council ordered restoration of the sale of tickets until such time as it considered the answers submitted by the City Railway to a questionnaire prepared by the city attorney. No tickets were placed on sale in other than company offices and the sale of tickets is limited to the extent of $1 for each purchaser.

Would Increase Interurban Fares.—The Eastern Wisconsin Electric Company, Sheboygan, Wis., has applied to the State Railroad Commission of Wisconsin for permission to increase its fares on the interurban lines running out of the cities of Sheboygan, Fond du Lac and Oshkosh. The petition of the company does not specify the exact fare increases desired, but merely calls attention to the present inadequate revenue and asks for such relief as may be fair and equitable. It is probable that at the hearings to be held on these petitions, a definite rate per mile will be requested.

Fares Increased One-Half Cent a Mile.—The Lackawanna & Wyoming Valley Railroad, Scranton, Pa., the Laurel Line, has filed with the Public Service Commission of that State a new tariff of rates effective on July 7. The fares in this tariff have been increased from a general basis of 2 cents to 2½ cents per mile. Children's fares are established. Mileage detachments have been reduced in some instances and increased in others. Thirty-trip commutation fares are to be continued at an increase of 10 per cent. The road connects Scranton, Pittston and Wilkes-Barre.

Tells Philadelphia Commission Has Authority.—The street railway committee of the Council of Philadelphia met on June 20 for the purpose of considering an ordinance granting permission to the Philadelphia Rapid Transit Company to increase the fare from 5 cents to 6 cents. Director of City Transit W. S. Twining appeared before the committee and in a statement said that the Public Service Commission had full power to fix the rate of fare and that there was no occasion for the Council to take up the question. The chairman was directed to make a report to that effect to the Council.

Cleveland Alive to Zone System's Advantages.—Fielder Sanders, Street Railway Commissioner of Cleveland, Ohio, is securing data on the zone system in other cities in order to apply it in Cleveland if the necessity should arise. Engineers in his office are working on a scale of zones which will be presented to the Council committee on street railways. The Council requested the committee to consider the zone system some time ago, in order that it might be tested in case the employees of the Cleveland Railway receive an increase in wages that will necessitate a larger income.

Wheeling City Company Seeks Increase.—The Wheeling (W. Va.) Traction Company has applied to the Public Utilities Commission of West Virginia for permission to increase passenger rates between Wheeling Loop and Wellsburg and intermediate points on the Panhandle Division and between Wheeling and Moundsville and intermediate points on the Moundsville division. The company also desires to increase freight rates between Wheeling and Moundsville and intermediate points. The company will also ask permission of the Public Utilities Commission of Ohio to increase rates on its lines on the Ohio side of the river.

An Additional Four-Cent Zone Allowed.—On April 30 the Public Service Commission of West Virginia, as noted in the ELECTRIC RAILWAY JOURNAL of June 8, page 114, authorized an increase in fare charged by the City & Elm Grove division of the West Virginia Traction & Electric Company from 5 cents to 6 cents. This was followed on May 29 by another order, permitting the company to establish a new zone, cutting the ride between Wheeling and Elm Grove approximately in half, and charge an additional 4-cent fare in the new zone. It is expected that these increases in fare will increase this division's income by about $75,000 a year.

Seven Fare Units Replace Four—The Attleboro Branch Railroad and the Interstate Consolidated Street Railway, Attleboro, Mass., both controlled by the New England Security & Investment Company, have applied to the Public Service Commission of Massachusetts for permission to increase the fare upon the 26 miles of track operated jointly. The plan of 5-cent fare units will be retained, but the four fare sections will be shortened and the number increased to seven. For convenience of passengers, the company will print books of twenty tickets to be sold for $1. The commission has suspended the new schedule until Aug. 1, pending a hearing.

Towns and Villages Agree to Fare Raise.—The town boards of Portland, Westfield and Ripley and the village boards of Westfield and Ripley, N. Y., have agreed that the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., may increase its rates for interurban passenger service through these localities, and the Public Service Commission for the Second District will be asked to determine what is a fair and equitable rate. At a joint conference of these village and town boards it was decided that the company is in need of additional revenue, and in view of the recommendation of the commission which held that although the company needed additional revenue, it had no authority to allow the company to raise its rates because of local franchises and agreements.

Fare Appeal Denied.—The Railway Commission of Nebraska has denied the petition of the Lincoln Traction Company for permission to increase its rates in the city of Lincoln and has ordered the cancellation of every dollar of common stock of the company and the return of all dividends paid on this stock since that security was issued in 1909. The amount of the stock ordered cancelled is $1,652,000 and the dividends ordered repaid by the stockholders amount to $198,288. The company has appealed the decision to the Supreme Court. In February the commission denied an emergency appeal of the company. On March 4 it began hearing an appeal for a permanent increase in rates. On April 23 this case was closed. These developments have all been reviewed in the ELECTRIC RAILWAY JOURNAL.

Eight-Cent Zones on Pennsylvania Road.—On June 12 the Schuylkill Railway, Girardville, Pa., filed with the Public Service Commission a new schedule of an 8-cent zone fare over all of its lines, effective on July 12. The average length of zones is 3.55 miles. The average rate per mile at the 8-cent fare, therefore, is 2¼ cents. This increase in fare is made to meet imperative needs of the company and in conformity with the General Order No. 27 of United States Director-General of Railroads William G. McAdoo, issued on May 25, in which Mr. McAdoo explicitly calls upon the managers of all interurban lines to conform as nearly as possible to the federal passenger tariff therein promulgated. On account of the varying lengths of zones on the lines of the Schuylkill Railway the company has in the establishment of the 8-cent fare approached as nearly as it could, in spirit and practice, to the policy outlined in Mr. McAdoo's letter.

Ticket Fares Go in Springfield.—The elimination of fares at less than 5 cents, except for children, will be asked of the Public Service Commission of Missouri by the Springfield Traction Company. The company at first had under consideration an increase of fares to 6 cents. It was decided, however, to try the smaller fare to ascertain if the additional revenue will enable the company to wipe out its monthly deficit of about $1,000. The company has a contract with its men made one year ago which has two more years to run and while the scale of wages is fixed in this contract, the company felt that owing to changed conditions since the contract was made, there was some justification to the request of the men for more pay. As the company is running behind at the rate of nearly $1,000 a month, it is not in position to grant an increase in pay without first finding some way of increasing its revenue The plan is to divide the increased earnings on a fifty-fifty basis with the men. In other words, it is estimated that the increased revenue resulting from the elimination of these tickets will be sufficient to give the men a substantial increase in wages and to just eliminate the company's monthly deficit.

Personal Mention

D. E. Parsons Elected

General Manager of East St. Louis Lines. Made President of the Illinois Electric Railway Association

D. E. Parsons, elected president of the Illinois Electric Railway Association at the meeting in St. Louis, Mo., on June 20, was born at Huntington, W. Va., on Oct. 29, 1882. He received a common school education in the public schools of Huntington and was graduated from the Marshall College Preparatory School at the same place. Mr. Parsons entered West Virginia University for the degree of Bachelor of Science and was graduated in the year 1903.

In 1904 he entered the technical two-year apprenticeship course in the works of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., where at the end of two years he accepted a position in the sales department, and in 1906 was promoted to the head of the export department. In 1908 he represented the mining department in the sales organization at the branch office of the Westinghouse Company in Fairmont, W. Va.

In 1909 he was appointed to represent the railway and lighting department in the Pittsburgh office, handling especially public utility properties throughout eastern Ohio, northern West Virginia and western Pennsylvania. In 1916 Mr. Parsons accepted the position of general manager of the East St. Louis & Suburban Company properties at East St. Louis, Ill. These properties are under the management of the E. W. Clark & Company Management Corporation, Philadelphia, Pa. They comprise more than 100 miles of line operating in the important industrial and mining district, opposite St. Louis, Mo., embracing in addition to East St. Louis the cities and towns of Edwardsville, Collinsville Caseyville, Lebanon and O'Fallon. Included in the system are a number of important interurban electric railway lines.

D. E. PARSONS

Changes in Spokane

Washington Water Power Company Announces Important Changes in Its Personnel. Many Promotions from Ranks.

Numerous changes were announced on June 13 in the personnel of the Washington Water Power Company, Spokane, Wash.

V. G. Shinkle, purchasing agent, who has been associated with the company for nine years, was appointed secretary and treasurer in addition to purchasing agent. He succeeds Y. M. White as treasurer and A. F. S. Steel as secretary, both resigned.

A. C. Haggenmiller, who has been in the purchasing department for some years, was appointed assistant purchasing agent. Both Mr. Steele and Mr. White will remain with the company until all matters in connection with the change are worked out.

As an economy measure it was announced that some of the work formerly handled by the treasurer's department would be transferred to the auditor's department, particularly as to keeping consumer's accounts.

Mr. Steele has been with the company as secretary for seven years. Previous to that he was chief clerk to E. L. Brown, then general superintendent of the Great Northern Railway, now president of the Denver & Rio Grande Railroad. He is a former president of the Rotary Club of Spokane and was formerly northwest district governor of the Rotarians.

Mr. White came to the company in 1912 from Britannia, B. C. where he was secretary, treasurer and manager of stores for the Britannia Mining & Smelting company.

Other changes announced are as follows:

C. F. Uhden chief engineer, has resigned to enter private business. He has been succeeded by J. B. Fisken, who was superintendent of the light and power department of the company.

V. H. Greisser, who was assistant engineer, has been made consulting engineer to report to the general manager.

D. F. Henderson, has been appointed superintendent of distribution.

B. M. Merrill has been appointed superintendent of power. He was assistant superintendent in this department.

M. W. Birkett has been appointed assistant to the general manager.

W. B. Rounsavell has been appointed custodian of the building.

S. E. Waters, custodian of the building, has been assigned to other duties.

The resignation of C. S. McCalla as vice-president and general manager of the company was noted in the ELECTRIC RAILWAY JOURNAL for May 4.

J. H. Van Brunt Elected

General Manager of St. Joseph Lines Made President of the Missouri Association of Public Utilities

J. H. Van Brunt, vice-president and general manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., was elected president of the Missouri Association of Public Utilities at its recent annual meeting. Mr. Van Brunt began his business career with the banking house of R. B. Newcombe & Company, New York, N. Y., in 1885. In 1889 when Newcombe & Company and the other interests purchased the St. Joseph company, Mr. Van Brunt was sent to St. Joseph to take charge of the receipts. He has been identified with the St. Joseph company in different capacities continuously since that time. In 1902 he was elected vice-president and general manager of the company.

J. H. VAN BRUNT

George Williams has been elected a director of the Cities Service Company, New York, N. Y., succeeding John C. Mitchell, Denver, whose Federal Reserve Bank duties prevented attendance at many directorate meetings.

D. L. Fennell has been appointed assistant superintendent of transportation of the Kansas City (Mo.) Railways. Mr. Fennell has been in the service of the railway for the last fourteen years, eight years of which time he has been engaged in work pertaining to the conducting of transportation. At the time of his appointment as assistant superintendent of transportation Mr. Fennell was superintendent of traffic for the company.

H. H. Oellig, master mechanic of the Petaluma & Santa Rosa Railway, Petaluma, Ca., has resigned to accept the position of California State manager of the American Guaranty Company, Pittsburgh, Pa. Mr. Oellig began his railroad career with the Market Street Railway, San Francisco, Cal., and contined with that company and its successors, the United Railroads, San Francisco, until August, 1906, when he resigned as dispatcher to become master mechanic of the Petaluma & Santa Rosa Railway.

A. M. Fisher has been appointed by the board of directors of the Washington Railway & Electric Company, Washington, D. C., to succeed the late C. E. Brown as treasurer of the company. For the last fifteen years Mr. Fisher has been connected with the General Electric Company in an official capacity, with the treasurer's office both at Schenectady and New York city and has had a wide experience in accounting and financial matters involving large transactions.

Henderson W. Knott has been appointed by the United States Fuel Administration to manage the field force of engineers and inspectors which is at work among the 250,000 power plants of the country carrying out a campaign of instruction and inspection designed to bring the use of fuel for the production of power to the highest possible efficiency and economy. Mr. Knott has been the general manager of the Morgan Crucible Company of New York City. He is well known in the electric railway field.

Theodore H. Price, editor of *Commerce and Finance*, has severed his connections with that paper to accept an appointment under Director General of Railroads McAdoo as actuary of the United States Railroad Administration. Mr. Price will compile statistics and make reports concerning the various economic problems connected with the functions of the Railroad Administration. This work will require his presence in Washington a large part of the time and will prevent him from writing unofficially for publication.

Max Thelen has resigned as president of the California Railroad Commission to become supervisor of war contracts under Quartermaster General Goethals. He will act in co-operation with assistant Secretary of War Stettinius. Mr. Thelen is thirty-eight years old. He has been a member of the California Commission since he was thirty-one years old and its president for the last three years. He is a graduate of the University of California and of Harvard Law College. He was lecturer on international law at the University of California before taking up Railroad Commission work.

A. T. Van Diense has been chosen vice-president and general manager of the Columbus, Delaware & Marion Electric Company, Marion, Ohio, the successor to the Columbus, Delaware & Marion Railway. Eli M. West, who has managed the road for nine years, remains as president. Mr. Van Diense will make his headquarters in Columbus. He was formerly general manager of the Springfield Gas & Electric Company and the Springfield (Mo.) Traction Company. He was graduated from Purdue University and was connected with the Westinghouse Electric & Manufacturing Company before entering the public utility field.

A. B. Metcalfe has resigned as master mechanic of the Empire State Railroad and the Auburn & Syracuse Electric Railroad to enter the machinery and supply business under the firm name of the Reliable Supply Company, at Syracuse, N. Y. Mr. Metcalfe has been connected with street and electric railway work for the last twenty-seven years. He started in Scranton in 1891. In 1893 he became connected with the Brooklyn Rapid Transit Company. He remained with that company, for thirteen years, finally becoming assistant master mechanic. He left Brooklyn to become master mechanic with the Rochester, Syracuse & Eastern Railroad in 1906. In 1908 he accepted a position with the S. T. Baker Oil Company in its mechanical expert department. He continued in this position for a year. In 1909 Mr. Metcalfe became master mechanic of the Syracuse, Lake Shore & Northern Railroad, later known as the Empire United Railways. When the Empire United Railways was reorganized as the Empire State Railroad he was appointed master mechanic of the entire system, cluding the Auburn & Syracuse line.

Edward G. Buckland, New Haven, was elected president of the New York, New Haven & Hartford Railroad on June 25. For twenty-five years and more Mr. Buckland has been connected with the New Haven Railroad. Formerly he was assistant professor of law at Yale University, of which he is a graduate. Later on he was local attorney for the company at New Haven and still later Mr. Buckland gave up the general practice of law at New Haven and became attorney for the company at Providence for its Rhode Island affairs. In 1894 Mr. Buckland became attorney for the company and had charge of its affairs in Connecticut, Rhode Island and New York. In 1906 Mr. Buckland was elected vice-president in charge of the company's interests in Rhode Island, including the electric railways there, and was its representative in Washington. In 1910, when he returned to New Haven he was in charge of the company's Connecticut affairs, including the electric railways and the New England Steamship water lines. In 1914 Mr. Buckland was elected general counsel in addition to his vice-presidential office. His election as president of the company is a culmination of his long and active service. Mr. Buckland, as president, succeeds Edward J. Pearson, who has just been appointed federal manager of the New Haven. Howard Elliott, former president of the company and chairman of the board of directors, will remain with the company in an advisory capacity and as chairman of the committee on intercorporate relations, paying particular attention to the New Haven's non-railroad properties, especially the electric railways.

Obituary

J. L. Earley, sixty-two years old, the oldest employee of the Louisville (Ky.) Railway in point of service, died at his home recently. Mr. Earley entered the service of the company when he was eleven years of age.

P. T. Glidden, for several years manager of the Northern States Power Company, St. Paul division, died on June 18 after a lingering illness. Mr. Glidden became associated with the Byllesby interests at the time of the consolidation of the gas and electric companies of Louisville, Ky., into a single operating unit. He was born in Massachusetts in 1870. He began his business career with the Holtzer-Cabot Electric Company in Boston in 1889.

J. Lawrence Field, fifty-five years old, for the last thirty-three years identified with the Louisville (Ky.) Railway, died suddenly of apoplexy at his home, on the night of June 19. Mr. Field was a native of Louisville. He went to work for the railway as a driver of a mule car at the age of twenty-two. When the mule cars were abandoned he became a motorman. About twenty-seven years ago he entered the claim department and at the time of his death he was chief adjuster in that department.

New Publications

Fuel Economy in the Operation of Hand-Fired Power Plants

Prepared by a special committee of the research staff of the Engineering Experiment Station, University of Illinois, Urbana, Ill. Published by the Station as circular No. 7, for free distribution.

The Experiment Station has prepared this booklet for the purpose of showing how fuel can be saved. In compiling it the research staff has had the advice of a number of experts in the field of power generation. It demonstrates how the average small power plant can save 15 per cent of its fuel by the exercise of greater care in equipment and operation. Features of installation essential to the proper combustion of fuel are discussed, the practice to be observed in the operation of the plant is outlined, and the employment of simple devices for indicating conditions of operation is prescribed.

The Oklahoma City (Okla.) Railway feels the need of increased revenue. As an expedient the company has under consideration the matter of charging 2 cents for each transfer. The company operates 141 miles of line.

Construction News

Construction News Notes are classified under each heading alphabetically by States. An asterisk (*) indicates a project not previously reported.

Recent Incorporation

Minneapolis, Northfield & Southern Railway, Minneapolis, Minn.—Articles of incorporation have been drawn for the Minneapolis, Northfield & Southern Railway, which will be the corporate title of the reorganized Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company. The new company is to be capitalized at $500,000, with 5000 shares of $100 par value.

Franchises

East Cleveland, Ohio.—By a vote of 1006 to 189 the electors of East Cleveland approved the franchise recently granted the Cleveland Railway by the City Commissioners. It covers a term of twenty-five years and calls for a 5-cent fare, with provision for a readjustment every five years. The schedule will be about what is at present furnished.

Burlington, Vt.—The franchise of the Burlington Traction Company, especially that part which relates to North Street, from Winooski Avenue to North Avenue and North Avenue from North Street to the Institute Road will be amended in the near future.

Track and Roadway

***Grass Valley, Cal.**—The Empire Mines Company is building an electric railway from the Pennsylvania mine to the Empire mill.

Hammond, Whiting & East Chicago Railway, Chicago, Ill.—The Public Service Commission of Indiana has ordered the Hammond, Whiting & East Chicago Railway to construct side or passing tracks in sufficient size to meet all requirements between the Michigan Central tracks and the Indiana Harbor Railway crossing and the Calumet River bridge on Calumet Avenue; also between Carroll Street and Williams Street on South Hohman Street.

Fort Madison, Ia.—Plans are being made by C. W. Petsch and H. S. Payne, promoters of the proposed electric railway between Fort Madison and Nauvoo, for the construction of the line this year. (Apr. 27, '18.)

Independence & Sugar Creek Railway, Independence, Kan.—The projectors of the proposed electric railway from Independence to Sugar Creek have named it the Independence & Sugar Creek Railway and have decided to incorporate it under that name. Committees have been appointed to solicit subscriptions for the balance of the $50,000 necessary to build the road, a part already having been subscribed. The Kansas City Railways has agreed to build and operate the road as a part of its system, connecting in Independence with the north end of the crosstown line.

Joplin & Pittsburg Railroad, Pittsburg, Kan.—About 45 miles of railway will be built by the Joplin & Pittsburg Railroad at Pittsburg, Columbus and Miami at a cost of about $400,000. The plans include the construction of a carhouse, power plants, etc., and involves 45 miles of wooden poles, transmission line, trackage, etc.

Scottsbluff, Gering & Southern Railway, Scottsbluff, Neb.—Washington Aldridge, Omaha, has been appointed manager of the Scottsbluff, Gering & Southern Railway, which proposes to construct a line to connect Scottsbluff and Gering. [May 11, '18.]

Ohio Electric Railway, Springfield, Ohio.—Work will soon be begun by the Ohio Electric Railway on the construction of a new bridge over the Scioto River at Town Street. It will be placed just south of the present Town Street bridge, which is soon to be replaced by a new span.

Darby, Pa.—A contract to construct a second track along the Chester Pike, between Darby and Eddystone, a distance of 6 miles, has been awarded by the United States Shipping Board Emergency Fleet Corporation to MacArthur Brothers, New York. The work is to be completed in two months. The line is to provide transportation to the shipyards and munition plants south of Philadelphia, including Chester, and will be operated in conjunction with the existing single track of the Southern Pennsylvania Traction Company. The cost is estimated at $1,000,000. An item in regard to the construction of this line was published in the issue of the ELECTRIC RAILWAY JOURNAL for June 22, page 1202.

Seattle (Wash.) Municipal Street Railway—Bids will be received by William D. Freeman, purchasing agent of the City of Seattle, until July 5 for furnishing the following material for the Seattle Municipal Street Railway: galvanized guy wire, copper trolley wire, rail bonds, welding flux wire, trolley suspensions, ears and frogs.

Ohio Valley Electric Railway, Huntington, W. Va.—Application has been made by the Ohio Valley Electric Railway to the City Commissioners of Huntington for permission to postpone the construction of its Eleventh Avenue line until twelve months after the war ends. This request is made, according to representatives of the company, in accordance with the suggestion made in a bulletin issued by the American Electric Railway Association War Board that the government opposes all new undertakings in cities, counties and states unless the object and purpose is connected in some manner with winning the war. The company finds it impossible to secure steel rails, copper wire and additional cars. The company also states that no funds are available with which to defray the cost of extension and it cannot sell bonds.

Shops and Buildings

United Railways of St. Louis, St. Louis, Mo.—Fire recently destroyed a section of the carhouse of the United Railways of St. Louis, at Delmar Boulevard and DeBalivere Avenue, together with thirty-two cars. The loss is estimated at $300,000.

Houston, Richmond & Western Traction Company, Houston, Tex.—Property has been purchased by the Houston, Richmond & Western Traction Company at the corner of Texas Avenue and Louisiana Street, Houston, for the construction of a terminal. Ed Kennedy, Houston, president.

Power Houses and Substations

Union Street Railway, New Bedford, Mass.—The Public Service Commission of Massachusettes has authorized the Union Street Railway to issue $812,000 of new capital stock, the proceeds to be used in paying for a new power house and carhouse.

Kansas City (Mo.) Railways.—The general contract for the construction of substation No. 2 at 101 Oak Street has been awarded by the Kansas City Railways to L. Breitag & Son Construction Company, Kansas City. The proposed building will be 82 ft. x 48 ft., and will cost about $25,000. Contracts for electric wiring, heating, plumbing, etc., will soon be awarded.

Public Service Railway, Newark, N. J.—Plans have been prepared by the Public Service Railway for the construction of a one-story plant, about 50 ft. x 162 ft. in size, at Bloomfield Avenue and Lake Street.

Seattle (Wash.) Municipal Railway.—Specifications have been approved by the Board of Public Works for a 1000-kw. motor generator set for the proposed elevated line of the Seattle Municipal Railway.

Washington Water Power Company, Spokane, Wash.—Plans are being made by the Washington Water Power Company to take over the electric plant in La Crosse and to extend its line from Endicott to La Crosse.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS

FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES • MARKET QUOTATIONS • BUSINESS ANNOUNCEMENTS

Nearly 100 per Cent Advances in Three Years

Western Railway Submits List of Increased Cost for Equipment and Materials.

In commenting upon the necessity of increased revenues for electric railways. The *Railwayman*, published by the Kansas City (Mo.) Railways, says: "During the past two years there has been an ever-widening gulf between the cost of service and the prices received from the people." Emphasizing the increased cost of equipment, rolling stock and other materials the Kansas company furnishes the following figures, showing the advances made in the price on items in every-day use between 1915 and 1918:

Article	1915	1918
Street cars (each)	$6,000.00	$8,000.00
Steel rails (ton)	36.50	52.50
Ties (each)	.53	.78
Spikes (cwt.)	1.58	3.05
Trolley wheels (each)	1.10	1.85
Trolley poles (each)	1.75	3,05
Steel street poles (5 in. x 30 ft.) (each)	25.75	41.50
Electric switches (approximately 140 in service) (each)	160.00	180.00
Paint (gallon)	1.15	2,00
Boiler tubes (50 boilers, 280 tubes each) (each)	4.60	18.00
Steel sheets (cwt.)	3.50	7.00
Steel bars (cwt.)	1.67	4.50
Cement (30,000 bbls. annually) (bbl.)	.80	2.00
Crushed rock (cubic yard)	.85	1.35
Trolley wire (½ lb. per foot) (lb.)	.13	.38
Lumber (M ft.)	25.00	35.00

As compared with current prices the foregoing, in not a few instances, is much below the market. Rails are higher, so are cars, trolley wire, cement and a number of other articles.

Revised Prices on a Higher Level Announced

Car Heaters and Other Articles in the List—Brisk Demand for Fare Boxes

Some time ago an advance of 15 per cent was made on its products by the Gold Car Heating & Lighting Company. Another increase of 25 per cent was announced a few weeks ago, and a still further mark up to 15 per cent may occur later on. The latest revision represents only the second change within a year, occasioned by the increasing cost of production.

Cement of which one traction road alone used 25,000 lb. in a year, went up 8 cents a barrel on Tuesday of this week, with the exception of the New York City territory.

Large size motors from 150 hp. up have not improved on delivery. Their cost and shipment depends upon factory conditions, which at present are very much congested.

While a manufacturer of car curtain goods and headlinings has not changed his prices recently, a rule that quotations will be withdrawn in thirty or sixty days, according to the standing of the buyer, is followed. The customer is protected during this period should a higher price prevail. If an increase is announced in advance, no concern is permitted to "load up" with the firm's specialties.

Inquiries for fare boxes are coming in as rapidly as the railways are accorded the 6-cent and 7-cent fares. The outlook for a brisk demand for these goods is promising.

Record Amount of Bituminous Coal Mined Last Week

Shortage in Quantity of Anthracite Produced—Labor Situation Cause for Deep Concern

During the week ending June 15 production of bituminous coal equaled and even exceeded the record production of the week preceding. The output of soft coal (including lignite and coal made into coke) is estimated at 12,571,000 net tons, an increase over the week of June 8 of 170,000 net tons or 1.4 per cent, and over the current week of 1917 of 1,137,000 net tons or 10 per cent. According to the figures furnished by the United States Geological Survey, the large gain in production is attributed to both improved supply of coal cars and labor conditions.

Shortage of labor and the new draft, next week, threatens to cut down by 1,500,000 tons the production of anthracite this year, the output of the Delaware & Hudson Coal Company. Such loss in tonnage under existing conditions is serious. It illustrates similar straightened conditions with all the mines in the anthracite region.

Shipments of anthracite last month fell 30,000 tons under the total for the same month in 1917. Labor shortage makes the explanation.

The current orders for coal far outran the production, as they have been doing right along, so that there existed the strongest business reason for the industry to get out a maximum of anthracite. This was done to the extent possible with every effort put forward to stimulate production. All that could be done under the circumstances was to get out for market an average of 265,000 tons for each of the twenty-six working days, the total for last month being 6,887,000 tons shipped.

Cost of Railway Material Gone Up 110 per Cent

Further Advance of 15 per Cent Predicted on Entire Line—Opinions on Steel Supply Varies

Opinions are at variance over the supply of material for the manufacturer of electric cars, accessories, fittings, and furnishings. The only increase in price made by the War Industries Board, and approved by the President on June 22, was 45 cents a ton on iron ore.

The price on finished steel, f.o.b. Pittsburgh, and all other maximum prices now prevailing, are continued in effect from July 1 to Sept. 30. The schedule was maintained despite the arguments for an increase in view of the advance in freights in effect on June 25, and costs.

A selling agent for gears and pinions, in stating that a number of traction roads had booked their requirements for 1919 on a generous basis, said that since the government had taken over the control of steel and iron the market was easier for material. He further believed the trade's required quota would be fully satisfied in due course. Under the circumstances the manufacturer felt justified in making definite arrangements for delivery. Price, however, on the orders for gears and pinions referred to will not be quoted until the date of shipment.

With a manufacturer of heaters and ventilators a different view was taken. While having in stock a fair supply of material its scarcity could not be questioned. He felt uneasy over the future, the danger of a shortage was real beyond a doubt. The statement was also made that there has been an advance of 110 per cent—some articles very much higher—on railway equipment and accessories since the pre-war period. A further advance of at least 15 per cent was predicted on the entire line.

Being in class B of the preferential list, a manufacturer of track specialties declared that for certain purposes steel would be furnished by the mills. For electric railway material this supply would be uncertain and distributed by the mills after all government requirements had been met and under the regulations prescribed by the War Industries Board. In about six months, however, conditions would be greatly improved.

The opinion generally expressed is that the demand for and sale of railway goods would materially increase and business become brighter and better in the not distant future.

Alloy Steel Eliminated in Car Axles and Gearing

Reported Action of Government Disputed—Requirements for 1919 Appearing—Promises Declined

About this time the traction roads which look ahead and provide for their requirements in car axles, wheels, springs, gears and pinions are in the market for the 1919 supply. So far no outstanding orders have been placed on account of the peculiar conditions, but inquiries are frequent, and requests for quotations, deliveries and specifications are coming into the mills, manufacturers and sales agents.

Being so far ahead, in time, no one is making any definite quotations as far as can be ascertained, or promise of shipment. Acceptances and deliveries at the convenience of the mills, it is learned, are the only terms offered. The foundries say it is impossible to act otherwise, as no one can foretell with any degree of certainty what may occur between now and 1919. Price is generally regarded as secondary. Delivery is the primary consideration. Old and steady customers are given the preference on orders and the selling figures are arranged accordingly.

It is also reported that the government has requisitioned the entire output of ferro-manganese in every form for the production of munitions, certain parts of aeroplanes and other purposes. Some axles and gears for electric cars are made of chrome steel, and one concern doing an extensive business in this line has been instructed by its foundry to notify prospective buyers that alloy steel will be eliminated in that particular company's production. High-tension steel of the required test strength will be substituted.

Careful inquiry has failed to find more than one other mill having heard anything whatever of the government's attitude toward alloy steel referred to above. In fact, several of the largest factors in the line state they had no knowledge of such an order. They admit steel in any form is hard to get, but in a couple of months after the mills have been speeded up all the government's requirements will be met, and there will be an ample supply for commercial consumers. These firms aver malleable iron is in shorter supply than steel. Prices now current on the official schedule, while officially arranged on a three-month basis, are freely predicted to stand for the next six months.

Further Installations of Combination Wood and Steel Tie

The Standard Steel Tie Company, Dallas, Tex., whose combination steel and wood tie was described in the ELECTRIC RAILWAY JOURNAL of March 16, 1918, recently received orders for 100 ties each from the Northern Texas Traction Company for installation on the Dallas-Fort Worth interurban between the end of the Boundary Street car line in Dallas and Merifield station; 100 ties for the Texas Electric Company for installation between Oak Cliff and Morris, and 100 ties for the Dallas Railway on the Fair Park and Second Avenue lines.

This tie company recently made inquiry of the Pittsburgh Railways, the Pennsylvania Railroad and the New York Central Railroad concerning the behavior of experimental sections placed in 1914. Satisfactory replies were received from all the users.

Publicity Man Promoted

A. B. Cole Becomes Assistant Manager of Publicity of Westinghouse Electric & Manufacturing Company

A. B. Cole has been appointed assistant to manager, department of publicity, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., to succeed M. C. Turpin, who has accepted a position in the Ordnance Department at Washington, D. C. Mr. Cole will have charge of the editorial work, including the preparation of literature and supplying information to the press.

He started his career as general carshop laborer for the Grand Rapids, Grand Haven & Muskegon Railway, with the idea of obtaining a first-hand working knowledge of electric railway operation. In June, 1909, he graduated from the School of Electrical Engineering, Purdue University, where he made a specialty of steam and electric railway studies.

On July 15, 1909, he entered the engineering apprenticeship course of the Westinghouse Electric & Manufacturing Company and completed this work on Feb. 6, 1911. While on the course he was engaged, in addition to the regular shop testing, on railway project work in the general engineering division and as a railway sales correspondent at East Pittsburgh and afterward in the Cincinnati district office.

In November, 1912, Mr. Cole was transferred to the department of publicity to prepare railway publications and a year later was placed in charge of railway and large power apparatus publicity. Later he was appointed in charge of railway, power, marine and R. D. Nuttall Company publicity, a position which he has held until the time of his appointment as assistant to manager.

Recently Mr. Cole has been co-operating on publicity matters with the American Electric Railway War Board at Washington, D. C., spending one-half of his time in Washington and the remainder in East Pittsburgh.

The Westinghouse Electric & Manufacturing Company a few months ago delegated Mr. Cole to make a general freight survey of a large number of the electric railways of Indiana, Ohio, Michigan, Illinois, Wisconsin and Iowa to determine what possibilities existed for a more extensive use of transportation facilities for hauling freight, relieving the steam road congestion, and thus helping win the war. The results of this investigation appeared in the issue of this paper for May 11, co-ordinated with data secured by the American Electric Railway War Board. It attracted wide attention and has been reprinted in pamphlet form.

Rolling Stock

International Railway, Buffalo, N. Y., had one of its electric locomotives destroyed by fire on the Lockport & Olcott division.

Monongahela Valley Traction Company, Charleston, W. Va., has been authorized to purchase ten double-truck passenger cars by its board of directors. At the same meeting the regular dividend of the company was declared.

United Railways, St. Louis, Mo., on June 14 is reported to have had thirty-one cars and a snow sweeper destroyed by fire. The carhouse where the rolling stock was stored was also seriously damaged. The loss is estimated at $200,000 to $250,000.

Pittsburg County Railway Company, McAlester, Okla., has just received two new all-steel cars from St. Louis, Mo., and four others have been ordered and will be received soon. The new cars will be put in service on the lines in McAlester and between North and South McAlester.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., as noted in the ELECTRIC RAILWAY JOURNAL of May 18, has placed an order for ten single-truck and sixteen double-truck cars with the Cincinnati Car Company for delivery in August. The following are the specifications for the single-truck type:

Number of cars ordered	10
Date of delivery	August
Builder of car body	Cincinnati Car Co.
Type of car	Single-truck one-man
Seating capacity	32
Weight (total)	13,000 lb.
Length over bumpers	27 ft. 9½ in.
Width over all	8 ft. 3 in.
Body	All steel
Interior trim	Cherry
Headlining	Carline finish
Roof	Arch
Air brakes	Safety Car Devices Co.
Axles	Laclede Steel Co.
Bumpers	Channel
Conduits and junction boxes	Duraduct
Control, type	K-10
Couplers	Bar type
Curtain fixtures	Curtain Supply Co. No. 88 Ring
Curtain material	Pantasote
Designation signs	Keystone
Door operating mechanism	Safety Car Devices Co.
Fare boxes	Johnson
Fenders or wheelguards	Company's standard
Gears and pinions	Nuttall
Hand brakes	Cincinnati drop handles
Heaters	Consolidated
Headlights	Golden Glow
Journal boxes	Symington
Lightning arresters	Westinghouse
Motors, type and number	Two West. 506, inside hung
Paint, varnish or enamel	Flood & Conklin
Registers	International
Sanders	Safety Car Devices Co.
Sash fixtures	Cincinnati
Seats, style	Hale & Kilburn
Seating material	Rattan
Step treads	Feralun
Trolley catchers or retrievers	Ideal catchers
Trolley base	U. S. No. 14
Trolley wheels or shoes	U. S.
Trucks, type	Cincinnati
Ventilators	Utility
Wheels (type and size)	C I, 24 in.

Trade Notes

Railway Improvement Company, New York, N. Y., advises that it has received an additional order for fourteen Rico coasting recorders from the Havana (Cuba) Central Railroad. The recorders are to be used on the lines of the United Railway of Havana.

Pittsburgh Crane & Equipment Company, Pittsburgh, Pa., has placed the selling agency of its electric overhead traveling cranes, wall-type jib and hand power cranes for the metropolitan district with John H. Barker, 95 Liberty Street, New York, N. Y.

Electric Service Supplies Company, Philadelphia, Pa., reports that, measured in volume, its railway and central station business is practically the same as last year, while on a percentage basis this business is only one-half of its total as against three-fourths in the pre-war period. This is due to the extension of the company's business into other lines resulting in large business from various industries such as mines, industrial plants, shipyards, government activities, etc.

The Arthur Power-Saving Recorder Company, New Haven, Conn., reports, as an indication of the widespread interest in fuel conservation which exists throughout the world to-day, that during the past few weeks orders for power-saving recorders have been received from Australia, New Zealand, the Philippine Islands, and in addition, eight orders from six states of the Union.

General Electric Company, Schenectady, N. Y., has supplied three 1000-kw. rotary converters, with transformers, to the Public Service Railway for its three substations in Camden, N. J. This is additional equipment for the company's power plants in that place. The New York Central Railroad will order a 22,000-kw. turbine for its Yonkers, N. Y., power house from the General Electric Company when the requisition for this equipment is indorsed by the United States Railroad Administration.

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, reports that through its Chicago representatives, the Hegeman-Castle Corporation, it has received an order from the Chicago Surface Lines for 1060 gears and 1060 pinions. These are to be used on a ratio change for the cars operating on both the West Side and South Side. The company also reports that through its Eastern selling representatives, the National Railway Appliance Company, New York, N. Y., it has just received the order from the Brooklyn (N. Y.) Rapid Transit Company covering its entire requirements for gears and pinions for 1919 on its surface lines, subway and elevated systems. The company has had a similar order from the Interborough Rapid Transit Company for its requirements.

New Advertising Literature

Bussmann Manufacturing Company, St. Louis, Mo.: Bulletin describing and illustrating the company's fuses for all types of electric circuits.

U. S. Ball Bearing Company, Chicago, Ill.: Data sheets compiled to furnish in a convenient form essential information regarding the dimensions of all types of Strom bearings.

Mitchell-Rand Manufacturing Company, New York, N. Y.: Card to which is attached a sample of "Tuftex" red-rope paper for use in armature slots and various other places in generators and motors.

U. S. Ball Bearing Manufacturing Company, Chicago, Ill.: Data sheets of information regarding dimensions of all types of Strom bearings, engineering data and other information of interest are also included in this catalog.

New Departure Manufacturing Company, Bristol, Conn.: First edition of the "New Departure Ball Bearing Manual," which is a practical guide for users of ball bearings. This is a complete and concise treatise on ball bearings, and discusses the best installation practice and also improved methods of lubrication and adjustments. It includes full descriptions and dimensions of the "New Departure" double-row and single-row "Radax" magneto ball bearings.

NEW YORK METAL MARKET PRICES

	June 19	June 26
Copper, ingots, cents per lb	23½	23½
Copper wirebase, cents per lb	26½	26½
Lead, cents per lb	7.235	.8
Nickel, cents per lb	40	40
Spelter, cents per lb	8	8.62½
Tin, Chinese*, cents per lb	90	925
Aluminum, 98 to 99 per cent., cents per lb	†33.00	†33.00

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* Nominal. † Government price in 50-ton lots or more, f. o. b. plant.

OLD METAL PRICES—NEW YORK

	June 19	June 26
Heavy copper, cents per lb	22	22
Light copper, cents per lb	19½	19½
Red brass, cents per lb	19	19
Yellow brass, cents per lb	13	13
Lead, heavy, cents per lb	6½	6½
Zinc, cents per lb	5½	5½
Steel car axles, Chicago, per net ton	$41.52	$41.52
Old carwheels, Chicago, per gross ton	$29.00	$29.00
Steel rails (scrap), Chicago, per gross ton	$34.00	$34.00
Steel rails (relaying), Chicago, gross ton	$60.00	$60.00
Machine shop turnings, Chicago, net ton	$16.00	$16.25

ELECTRIC RAILWAY MATERIAL PRICES

	June 19	June 26
Rubber-covered wire base, New York, cents per lb	27 to 30	27 to 30
Weatherproof wire (100 lb. lots), cents per lb., New York	35 to 37.10	32½ to 37.10
Weatherproof wire (100 lb. lots), cents per lb., Chicago	35.42 to 38.35	35.00 to 35.43
T rails (A. S. C. E. standard), per gross ton	$70.00 to $80.00	$70.00 to $80.00
T rails (A. S. C. E. standard), 100 to 500 ton lots, per gross ton	$67.50	$67.50
T rails (A. S. C. E. standard), 500 ton lots, per gross tons	$62.50	$62.50
T rail, high (Shanghair), cents per lb	4½	4½
Rails, girder (grooved, cents per lb	4½	4½
Wire nails, Pittsburgh, cents per lb	3½	3½
Railroad spikes, drive, Pittsburgh base, cents per lb	4½	4½
Railroad spikes, screw, Pittsburgh base, cents per lb	8	8
Tie plates (flat type), cents per lb	*3¼	*3¼
Tie plates (brace type), cents per lb	*3¼	*3¼
Tie rods, Pittsburgh base, cents per lb	7	7
Fish plates, cents per lb	*3½	*3½
Angle plates, cents per lb	*3½	*3½
Angle bars, cents per lb	*3½	*3½
Rail bolts and nuts, Pittsburgh base, cents per lb	4.90	4.90
Steel bars, Pittsburgh, cents per lb	5	5
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.90	4.90
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.80	5.80
Galvanized barbed wire, Pittsburgh, cents per lb	4.35	4.35
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95	3.95
Car window glass (single strength), first three brackets, A quality, New York, discount	80%	80%
Car window glass (single strength, first three bracketl, B quality), New York, discount	80%	80%
Car window glass (double strength, all sizes AA quality), New York discount	82 & 3%	82 & 3%
Waste, wool (according to grade), cents per lb	11½ to 22	11½ to 22
Waste, cotton (100 lb. bale), cents per lb.	13 to 13½	13 to 13½
Asphalt, hot (150 tons minimum), per ton delivered	$38.50	$38.50
Asphalt, cold (150 tons minimum, pkgs. weighed in, F. O. B. plant, Maurer, N. J.), per ton	$42.50	$42.50
Asphalt filler, per ton	$45.00	$45.00
Cement (carload lots), New York, per bbl	$3.20	$3.20
Cement (carload lots), Chicago, per bbl	$3.26	$3.34
Cement (carload lots), Seattle, per bbl	$3.60	$3.68
Linseed oil (raw, 5 bbl. lots), New York, per gal	$1.59	$1.60
Linseed oil (boiled, 5 bbl. lots), New York, per gal	$1.58	$1.60
White lead (100 lb. keg), New York, cents per lb	10	10½
Turpentine (bbl. lots), New York, cents per gal	42½	70

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* Government price.

Engineering Library

R

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc.

June 29, 1918

SO. AUSTIN
LWAY

The General Electric No. 258 Motors on the safety cars of the Austin Street Railway are SKF equipped. To protect *your* motors from lubrication troubles specify ball bearings marked SKF.

SKF

A Conclusion

"I'm glad you referred me to the 'Electric Railway Journal' of May 11th when you were here last week," said the Vice President. "It is difficult for me to realize just why we have never gone into this freight question before. I am of the opinion that we should make a complete investigation of the freight haulage possibilities in our communities. We must get in touch more with the Boards of Trade and Merchants Associations in the business centers that we serve, and make it clear to them all how effectively we can serve them."

"All right, sir," replied the General Manager, "I am confident that they will co-operate with us. I am going to ask the Westinghouse Electric people to give us the benefit of their experience, and believe that they are in a position to furnish prompt and expert advice. They have standardized freight motors and locomotives, both of which are performing regular freight service successfully on a number of the foremost roads of the country."

"I believe you are right," said the Vice President. "They must have made an exhaustive study of Electric Freight Haulage requirements, before going into it so extensively."

Westinghouse Electric & Manufacturing Co.

East Pittsburgh Pennsylvania

THIS NUMBER CONTAINS THE INDEX FOR VOLUME 51

Vol. 51, No. 26 New York, June 29, 1918 *Pages* 1219 *to* 1262

Electric Railway Journal

H. W. BLAKE, *Editor*

Contents

Raise Rates to Permit Payment of Higher Wages

Living wages must be paid, but the War Labor Board should not disregard financial condition of properties. Federal aid is needed to secure compensating fare increases.......................................Page 1223

Progress in Power Generation and Transmission

American Institute of Electrical Engineers held its annual convention at Atlantic City this week with a program of valuable papers on lightning protection, power production and distribution, and related subjects.......................................Page 1229

New York Association Holds Meeting at Bluff Point

The economic situation was considered in several papers and reviewed by speakers in the discussion. Publicity as a solution recommended by Ivy L. Lee and B. A. Hegeman, Jr. Association pledges its support to the government.......................................Page 1232

EDITORIALS 1219

THE STREET CAR NICKEL....................1228

WAR BOARD ACTIVITIES DISCUSSED AT ILLINOIS MEETING 1231

PREVENTING DISINTEGRATION OF PAVING ALONG THE RAIL HEAD..........................1241

LOW-TENSION DEAD-FRONT SWITCH PANEL PROVIDES SAFETY FOR OPERATORS................1241

TAKING UP WEAR ON BRAKE HANGERS BY SPOT-WELDING 1242

A SAFETY SIDING THAT SAVED NINE LIVES.....1242

AMERICAN ASSOCIATION NEWS...............1244

NEWS OF THE ELECTRIC RAILWAYS...........1245

Pittsburgh's New Revenue.
Winnipeg Tied Up Three Days.
Wage Disputes Before War Board.
New York Men Appeal to Public.
Boston Trustees Named.
Wages Increased in Spokane.
Massachusetts Commission Reduced.

FINANCIAL AND CORPORATE..................1249

Electric Railway Statistics.
Attention, Doubters.
Plan Bay State Reorganization.
Washington Tax Values Cut.

TRAFFIC AND TRANSPORTATION............... 1252

Two Days' Session in Atlanta.
Status of East St. Louis Appeal.
Home Rule Exponent Speaks.
Buffalo Fare Progress.
Railway Acts Against Jitneys.
Bonds Appeal to the I. C. C.
The Courts a Final Resort.
Hearing on Albany Fares.
Must Abide by Franchise.
Skip Stops Likely for Chicago.
York Wants Six-Cent Fare.
Pittsburgh Goes to Five Cent-Seven Cent Fares.
Ohio Interurbans Act.
Company Publication Enlarged.

PERSONAL MENTION........................ 1257

NEW PUBLICATIONS........................1258

CONSTRUCTION NEWS.......................1259

MANUFACTURES AND MARKETS................1260

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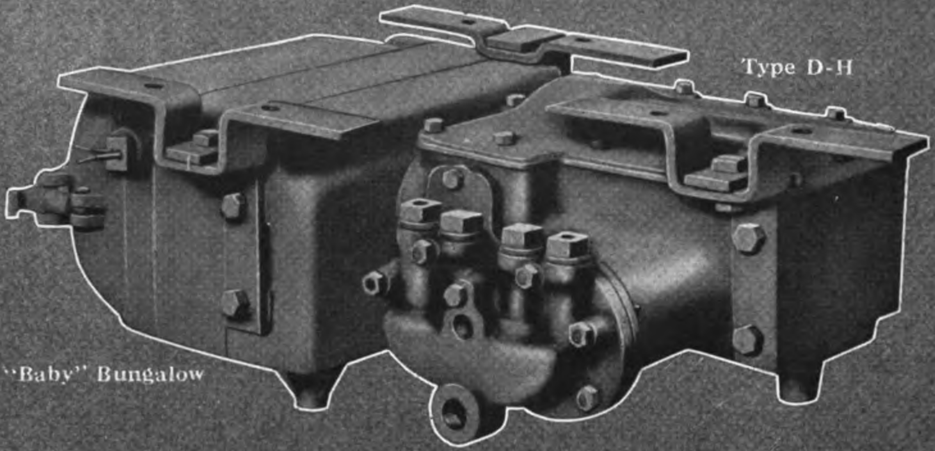
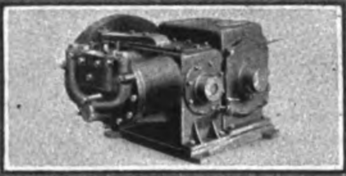


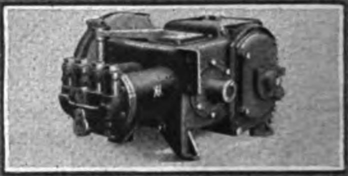
Air Compressors



Type D-4-K

Type D-2-R

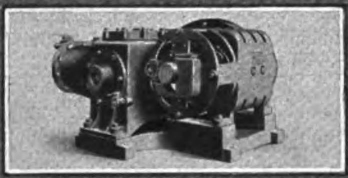
Westinghouse Air Compressors cover a broad field of service. Meet all operating conditions. Can be fitted to any current. Capacities range from 10 to 150 cubic feet per minute. Write to our nearest office.



Type D-1-F

Type D-2-EG

Type D-2-L



Type C-60

Type D-3-La

Brake Building our Business for a Lifetime

Westinghouse Traction Brake Company

General Offices and Works, Wilmerding, Pa.

Atlanta, Ga.
Boston, Mass.
Chicago, Ill.
Columbus, O.

Denver, Col.
Houston, Tex.
Los Angeles, Cal.

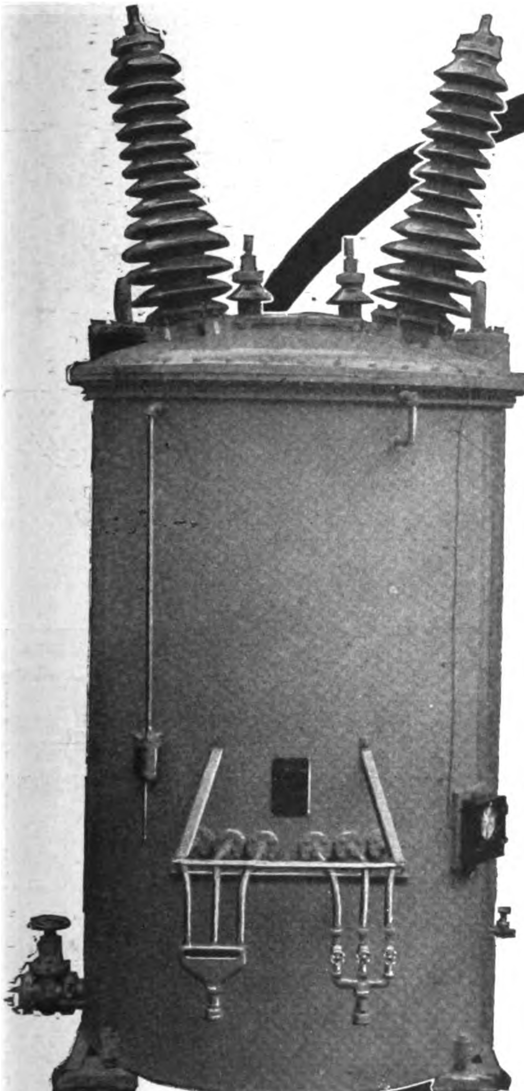
Mexico City
New York, N. Y.
Pittsburgh, Pa.

San Francisco
Seattle, Wash.
St. Louis, Mo.
St. Paul, Minn.

Over the Top

of Westinghouse High-Tension Transformers

Are the Condenser-Type Bushings



The construction of Westinghouse Condenser-Type Bushings is such, that the voltage stress upon the insulation is practically uniform from the surface of the conductor to the grounded flange outside.

The fall of potential is also uniform along the outer surface of the insulation, from the grounded flange toward the point at either end where the high potential conductor emerges from the insulation.

The uniformity of dielectric stress along the surface, and approximate uniformity of dielectric stress in the insulating wall, together with strength of the materials, make a bushing of unusual electric and mechanical strength.

Westinghouse Electric & Manufacturing Company
East Pittsburgh, Pa.

Sales Offices in All Large American Cities

W
WESTINGHOUSE ELECTRIC

Westinghouse

Phono-Electric

For SAN FRANCISCO LINE PERFECTION

The United Railroads of San Francisco recently ordered 10 miles of No. 00 round Phono-Electric Trolley Wire.

This wire was used for installation at important intersections where uninterrupted service counts for something.

And, of course, Phono-Electric isn't going in on our **claims,** but on Phono-Electric achievements at San Francisco's hardest place—the double loop at Market Street ferry.

PHONO-ELECTRIC

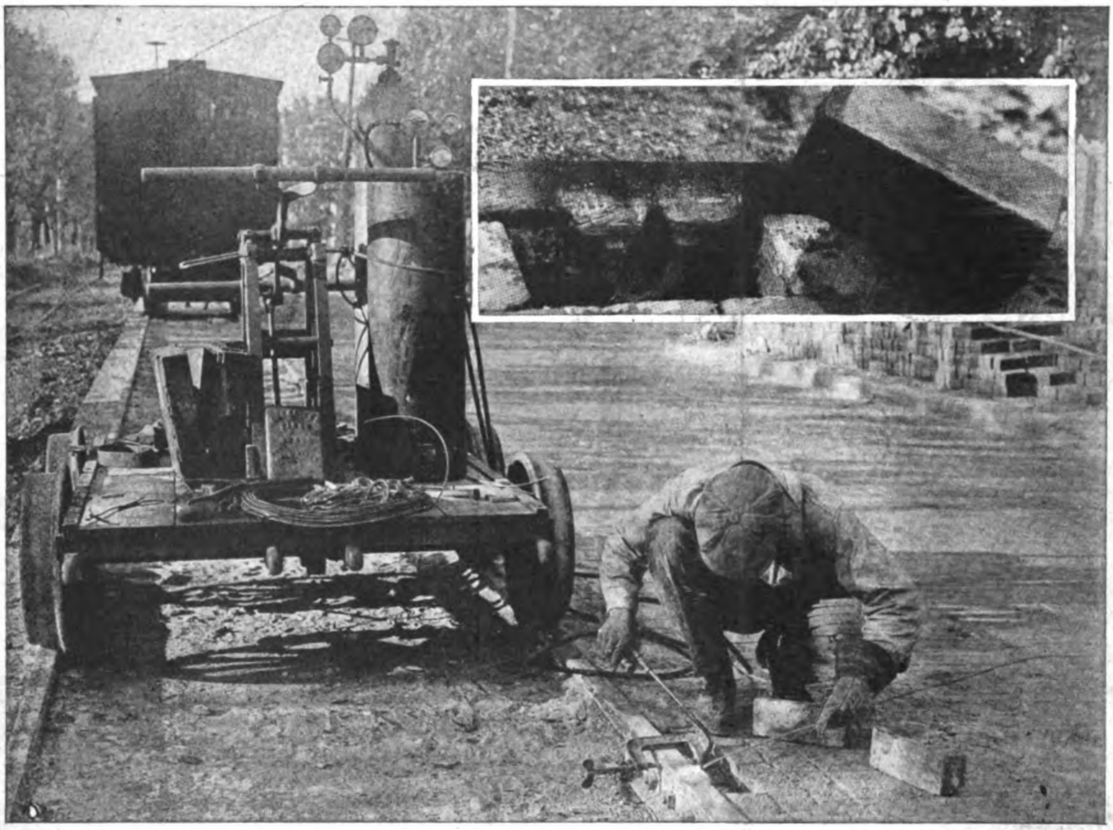
Users Can Put Off Metal Price Worries for Years

Bridgeport Brass Company

Bridgeport Connecticut

SCUIT CO
LENNON

OB PRODUCTS



O-B Gas-Weld Bonds are particularly suited for paved streets. Only one or two bricks need be removed. The splice-plate is not disturbed—a valuable feature on any kind of rebonding.

O-B Rail Bonds Score Four Big Points

One large electric railway commenced rebonding two years ago and has used for the work a total of 5500 O-B Gas Weld Bonds.

Recently the road reported that due to the O-B Bonds:

It has cut power cost.

It has given better service.

It has reduced the number of burnt-out armatures.

It has kept better schedules.

Good bonding always saves money and improves operation. Any O-B Bond is a good bond.

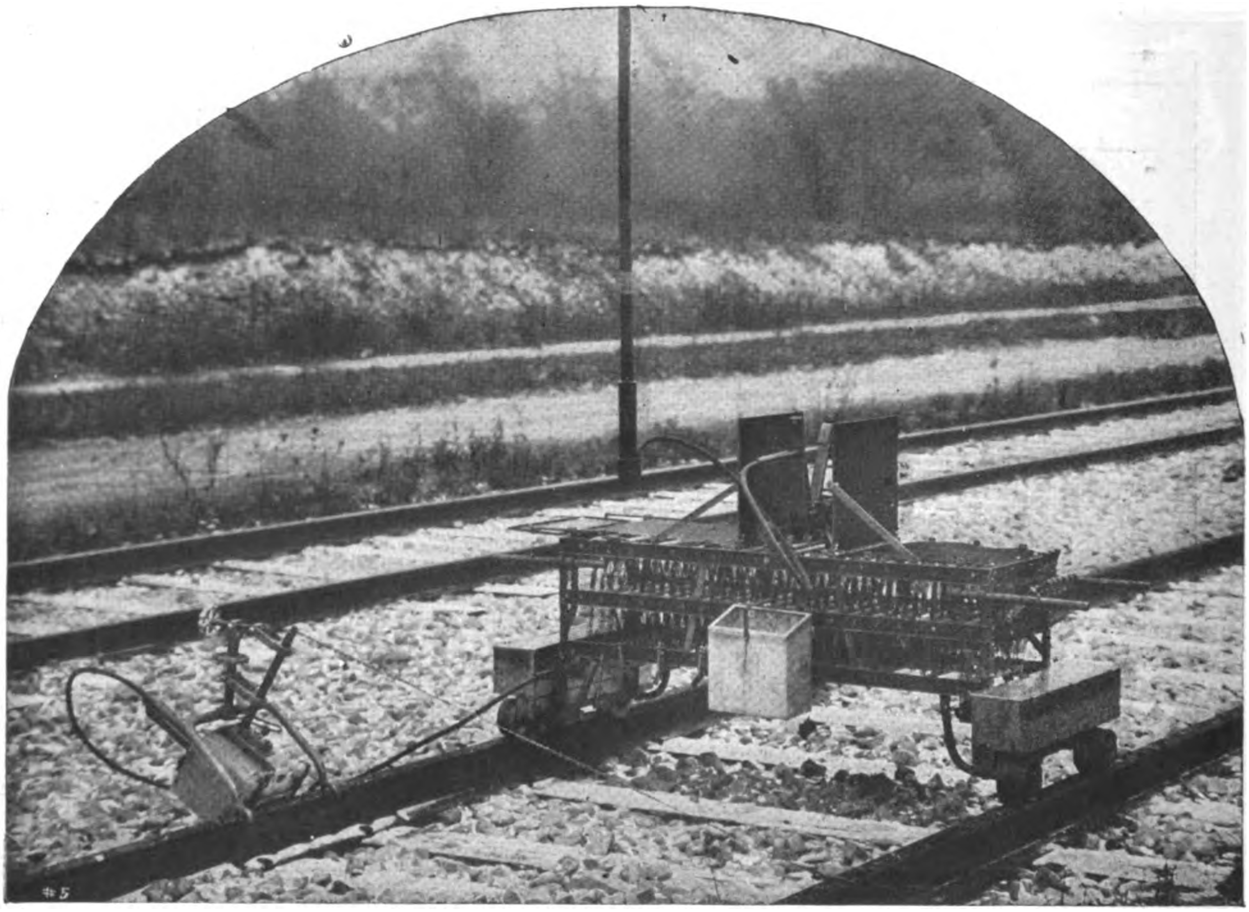
There are several types—one for each condition. Take up your problems with our bonding specialists.

THE OHIO BRASS CO., Mansfield, Ohio

New York Philadelphia Pittsburgh Chicago San Francisco Los Angeles

ERICO
THE LINE OF LEAST RESISTANCE

[redacted]



Where Voltage is Low

as, for instance, at the end of the line, the Erico Portable Welder shows its great flexibility and usefulness as clearly and undeniably as anywhere else along the track.

Switches are so arranged that the outfit will weld rail bonds on voltages from 250 to 750.

Full information on request.

The Electric Railway Improvement Co.
Cleveland, Ohio

Wasted—

35% to 50% of TRACK MATERIAL

INTERNATIONAL
STEEL TWIN TIES

Obviate this wasted material and labor

Of What Engineering Value Is the Concrete or Ballast Between Wooden Ties? Absolutely None. It Represents an Economic Loss of Track Material and Labor.

Steel Twin Ties are designed to overcome just that condition. The effective tie bearing area is placed at the top of the tie and parallel with the rail.

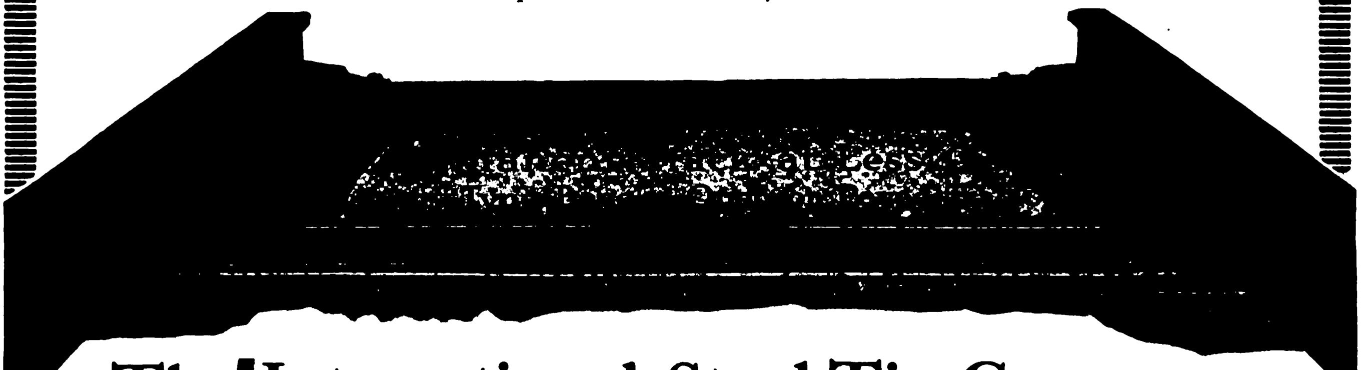
There is an engineering reason for every ounce of metal in a Steel Twin Tie. The 13 in. x 36 in. trussed plates carry the track loads and the 3 in. channels serve as anchorages and tie rods.

Several inches of concrete beneath the tie plate puts just that much in effective bearing. An inch more than is usually used. And at the same time the excavation and concrete quantities below base of rail are reduced one-half.

Any way you look at them they are engineeringly right. The longer you delay your purchase of some of these ties the more money you waste in extraneous track materials and labor.

Ask our users if you want our best sales argument. If you are convinced ask us for a quotation and delivery.

Prompt deliveries made from stock.



The International Steel Tie Company

Manufacturers of Steel Twin Ties and Crossing Foundations

General Sales Office and Works: Cleveland, Ohio

REPRESENTATIVES:

Western Eng'g Sales Co.
Los Angeles, Cal.

San Francisco, Cal.
Seattle, Wash.

R. J. Cooper Co.,
Salt Lake City, Utah.

J. E. Lewis & Co.
Dallas, Texas.

Maurice Joy,
Philadelphia.

William H. Ziegler,
Minneapolis, Minn.

AMERICAN
ARMCO
INGOT IRON

ACETYLENE ELECTRIC

ARMCO WELDING RODS

—the kind that make **safe** welding easy
on new construction and repair work.

ARMCO Filler **Rods are offered** with two strong initial **recommendations:**

First: Manufacture of the raw iron with the skill and fidelity associated with all products of the American Rolling Mill Co., and

Second: Drawing and control of all finishing operations under direction of the laboratory specialists of the Page Steel & Wire Co.

Together these antecedents mean a reliability and uniformity heretofore not to be had, even in the best grades of Norway and Swedish irons.

ARMCO Rods being 99.84% pure iron, are peculiarly free from the sulphur, phosphorous, slag, oxides and other impurities that ordinarily destroy the homogeneity of the weld by introducing brittle, hard or weak spots, pin holes, blow holes, etc.

A weld made with ARMCO Rods closely approaches the original strength per square inch of the original metal section and lends itself particularly well to subsequent hammering or other finishing treatment.

The standardizing of two ARMCO Rods, one for acetylene and another for electric, *to do well* what has heretofore required a selection of one from ten to twenty grades greatly simplifies welding work, and ARMCO Rods now cost much less than any imported metal of approaching purity.

If interested in modern welding developments you will find it decidedly to your advantage to at least give ARMCO Rods careful test.

Ask us for performance records and reference to important users.

PAGE STEEL & WIRE CO.

Established 1883 *as Page Woven Wire Fence Co.*

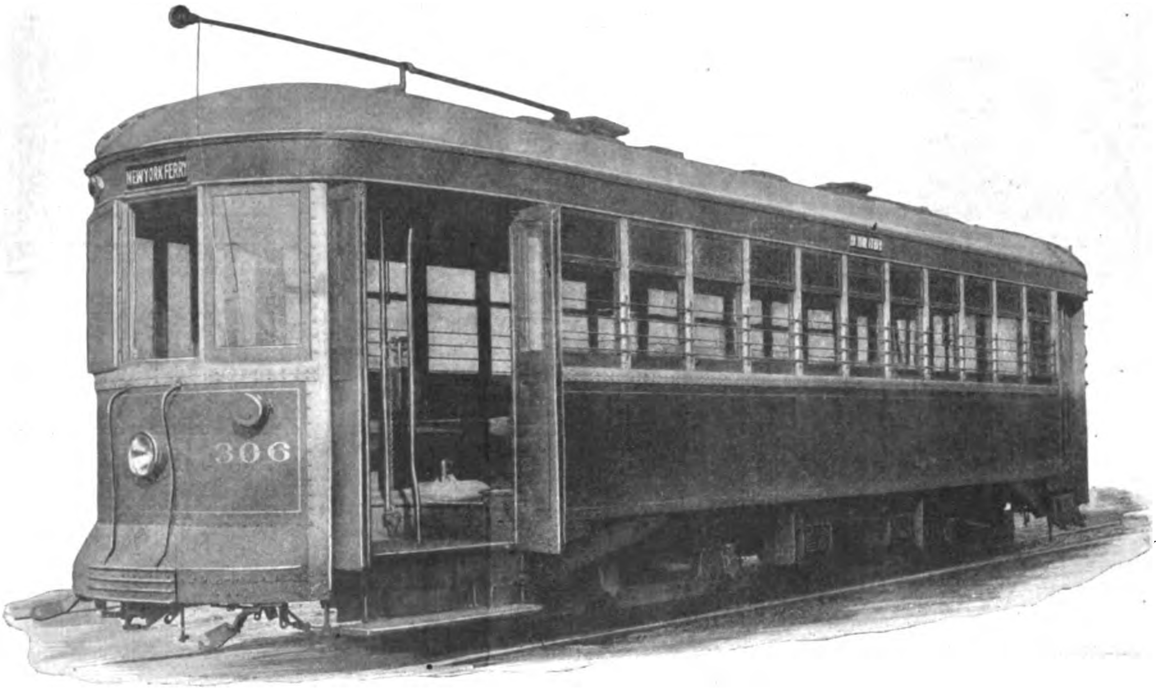
Makers of Copperweld Copper Clad Steel Wire; Armco Welding Rods and Electrical Wire; Wire Mill Products, Plain and Galvanized; Wire Fencing for all Purposes; Factory Gates; Wire of Special Analysis; Ornamental Iron Fence; Machine Guards; Tool and Stockroom Partitions; Architectural Iron.

FACTORIES: Monessen, Pa., and Adrian, Mich.

GENERAL SALES OFFICES:
30 Church Street
New York

WESTERN REPRESENTATIVES:
Steel Sales **Corporation**
Chicago

STEEL AND WIRE
PAGE
QUALITY PRODUCTS



Car operated by the Richmond Light and Railroad Co., New Brighton, N. Y.

Illuminated Car Signs and "Golden Glow" Headlights—Sure Signs of a Progressive Railway Company

The Richmond Light & Railroad Company know well the great value of Keystone and Hunter Illuminated Destination Signs. Their signs attract riders for them and advertise their service, and besides, make easy the re-routing of their cars.

Their "Golden Glow" Headlights project powerful but soft non-blinding beams of golden light, thus lighting up a path of safety before their cars. In this manner "Golden Glow" Headlights inspire a certain confidence in both operators and riders.

Write for complete data on this equipment.

Typical Keystone Type Sign

"Golden Glow" Headlight
Type SR-95

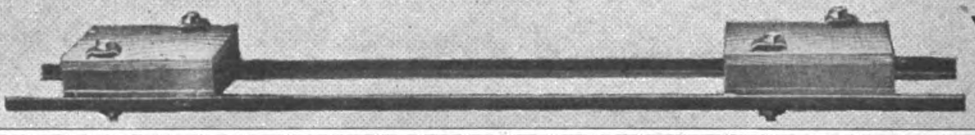
ELECTRIC SERVICE SUPPLIES CO.

Manufacturer of Railway Material and Electrical Supplies

PHILADELPHIA	NEW YORK	CHICAGO
17th and Cambria Sts.	50 Church St.	Monadnock Bldg.

Canadian Distributors: Lyman Tube & Supply Co., Montreal, Toronto, Winnipeg.

The MECHANICAL RAILWAY TIE

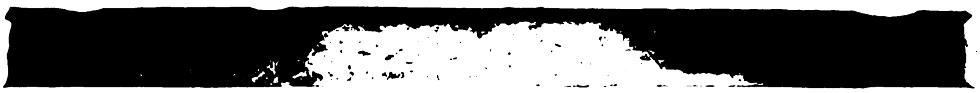


The asphalt cushion in D-M Ties saves your rails, your track and your rolling stock

A 6″ Steel I-Beam used as a Tie showed Indentations like THIS!

What must have been the effect on the rolling stock to produce a dent like THIS?

In the above small circular picture is shown a stretch of new track with D.M. Ties, ready for the concrete to be poured in to make a unit structure.

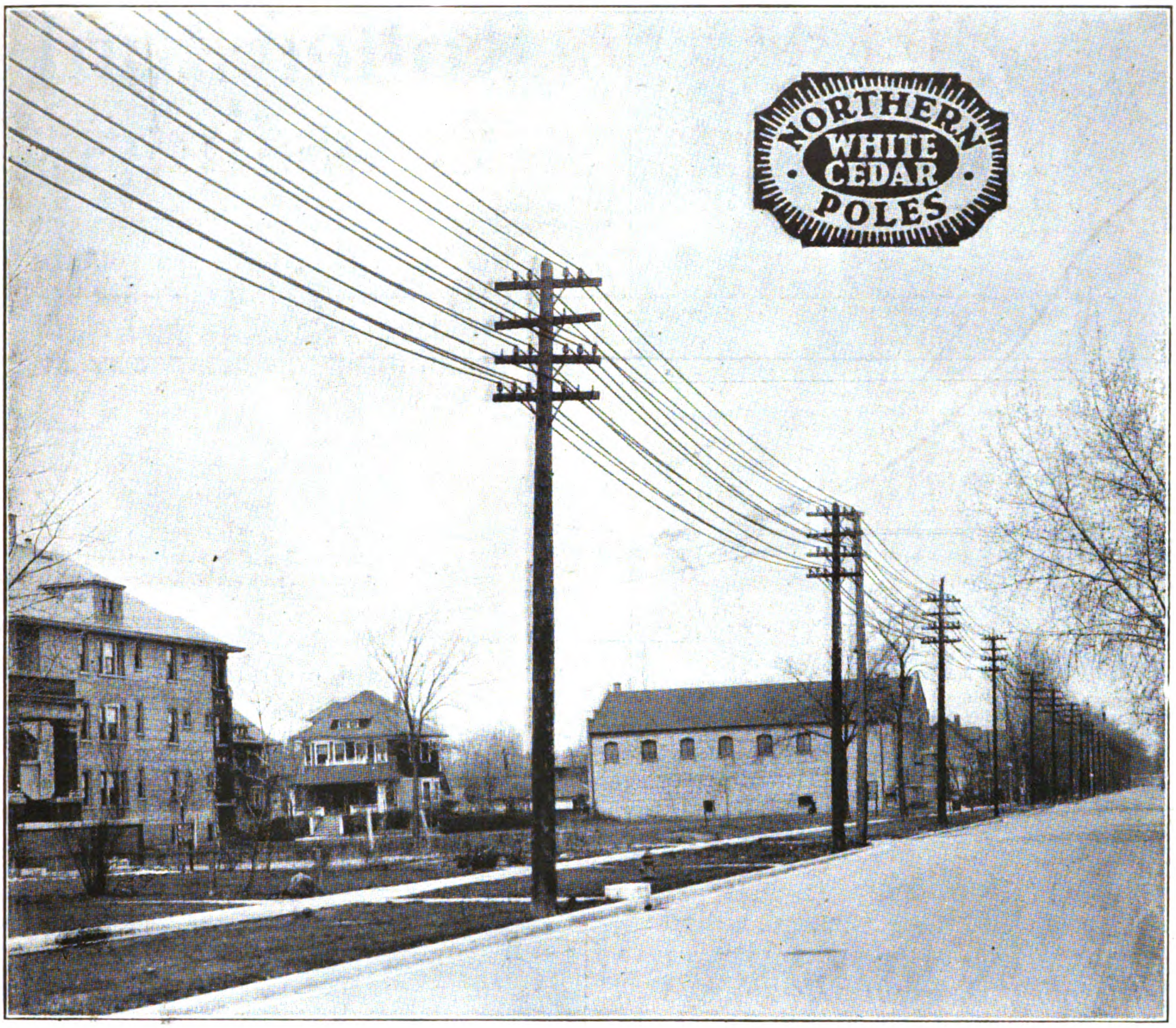


When a steel I-Beam fully 6 in. deep can be hammered and distorted as shown in this picture, enormously powerful blows must have rained upon it. It was the absence of a resilient cushion that made this tie suffer. Such destruction could not have occurred to D.M. Ties, which have wooden blocks, set in asphalt, joined by steel twin bars.

Rigid—Resilient—Permanent.

Ask for details

THE DAYTON MECHANICAL TIE CO.
201 Third Street Arcade
DAYTON, OHIO



These Poles Have Rendered Long and Sturdy Service

Northern White Cedar Poles

Lines of the Chicago & West Towns Railway Company at 64th Ave. South from Ridgeland Ave., Oak Park, Illinois.

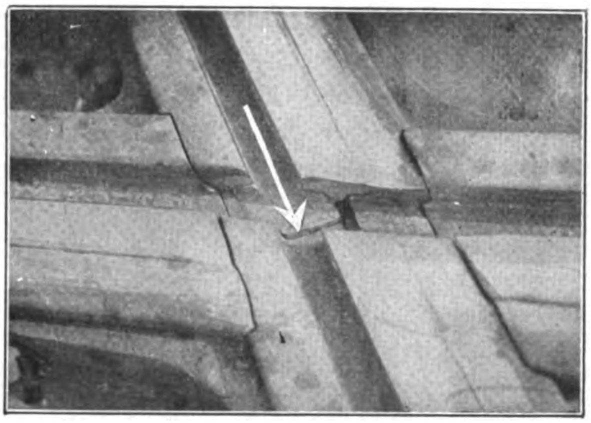
Kind of poles—Northern White Cedar
Height —50 and 55 ft.
When set —In the days of the old County Traction Company. No records available.

Load carried—13 feeder cables. 350,000 and 500,000 Cir Mils capacity. Leading from Ridgeland P. House.

Present condition of poles is good.
The Chicago & West Towns Ry. connects Oak Park, River Forest, Maywood, Melrose, Cicero, Berwyn, Riverside, Lyons, La Grange & Forest Park. It was formerly controlled by County Traction Company and operated by the Chicago Railway Company.

Northern White Cedar Poles are Light in weight, Easy to Transport and Erect. They make the Sturdy, Serviceable, Attractive line.

Northern White Cedar Association, Lumber Exchange, Minneapolis, Minn.



Main filling or backbone of rolled rail crossing broken at flangeway intersection

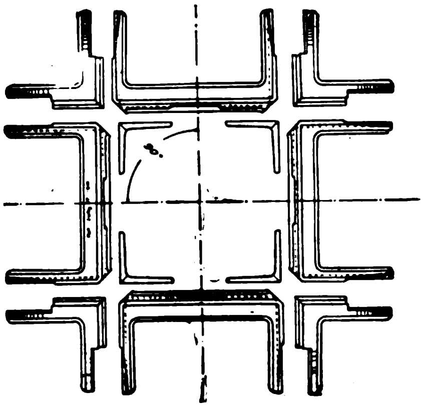
Rolled Rail Crossings

develop frequent fractures at the point shown in the picture to the left. Such breaks are unavoidable because of the lack of flexibility at the flangeway intersections.

Experience has demonstrated that rolled rail wears out in less than one-quarter the time of cast manganese.

As a result these crossings have to be replaced frequently so that their apparent lower first cost, when compared with that of articulated cast manganese crossings, is deceptive.

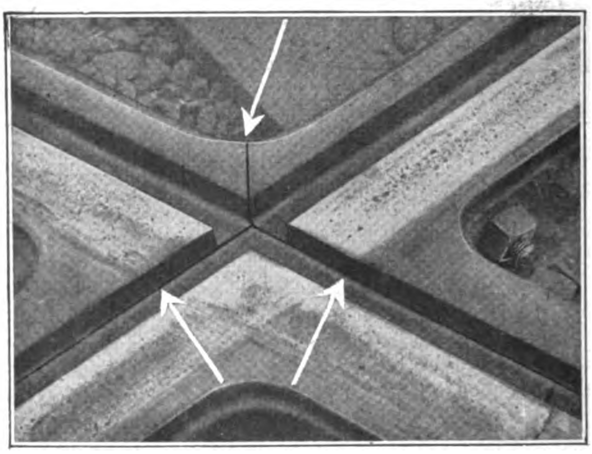
Balkwill Articulated Cast Manganese Crossings



Joints at the flangeway intersections of Balkwill Articulated Cast Manganese Crossings positively eliminate breakage

have scientifically designed joints at the places where breakage formerly occurred. It takes several rolled rail crossings to equal the life of but *one* Balkwill Articulated Cast Manganese Crossing. Therefore the Balkwill Crossing is the cheapest in the long run.

It saves interruption to traffic, makes less demand on labor, which is now so scarce, and also reduces the cost of making replacements frequently.



Joints in Balkwill Articulated Cast Manganese Crossings are life savers. They positively prevent breakage at flangeway intersections, permitting 100% wear before renewal is necessary

In other words, it gives you

MORE WEAR PER DOLLAR THAN
ANY OTHER CROSSING YOU CAN BUY

Order Balkwill Articulated Cast Manganese Crossings Direct from Your Special Work Manufacturers

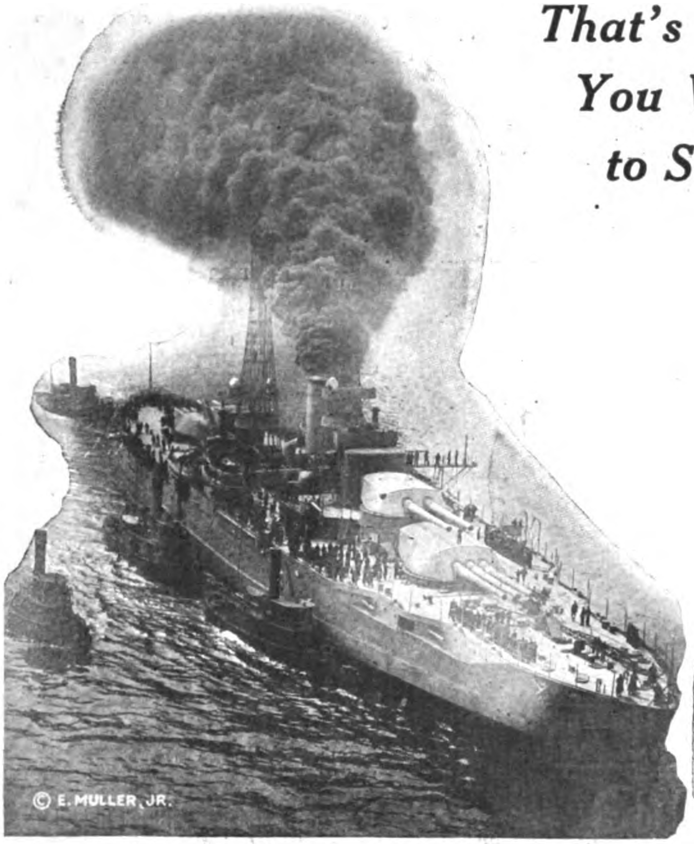
Write us for detail information and list of installations. Don't accept a substitute as there is none.

The Balkwill Manganese Crossing Co.

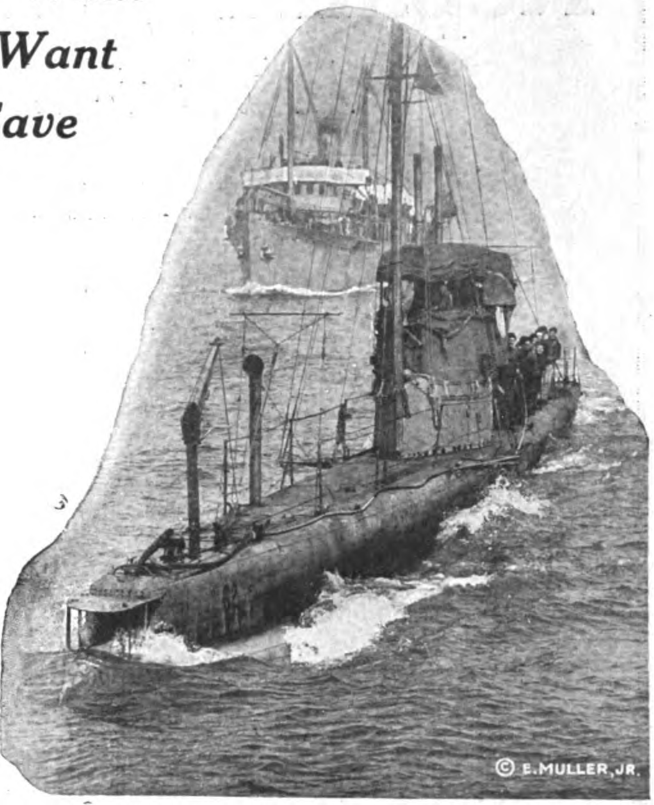
506 Williamson Building, Cleveland, Ohio

METER YOUR CAR ENERGY—

That's What
You Want
to Save



On Battleships



On Submarines

The Sangamo Economy Meter

Is a Rugged Device!

The Sangamo ECONOMY Railway Meter is a rugged, time-tried device, with an excellent record for power saving. This meter has the same element as in the well-known Sangamo d.c. mercury flotation meters for every electrical service. It is of the same design as the element of the meters which control the lighting equipment on all the cars of the Pullman Company and on several steam railways, and on battleships and all the submarines of the U. S. Government. Sangamo mercury meters are standard on the electric trucks of nearly all manufacturers of electric vehicles.

In fact, the mercury meter is widely used wherever there is need for an electrical energy-measuring device that has demonstrated its ability to withstand the punishment of rough usage, including the jarring incident to electric railway operation.

Economy Electric Devices Co.

L. E. Gould, Pres.

Exclusive Sales Agent
Sangamo Economy Railway Meter
Old Colony Bldg., Chicago

The electrical characteristics of the ECONOMY Meter are guaranteed. Its cost for maintenance as definitely established by one large property over a period of two and a half years, based on the use of 100 meters, is not more than $1.00 per meter per year.

ECONOMY Meters on your cars will decrease operating costs.

The ECONOMY Meter induces saving by a method which does not encourage practices contrary to "safety first."

It will start paying for itself immediately.

Let us send you further details. Write for our new booklet on Efficient Electric Railway Operation.

"The Watchdog of Your Power"

Repairing and Reclaiming
A War-Time Necessity

"The Indianapolis Method"

CONSERVE

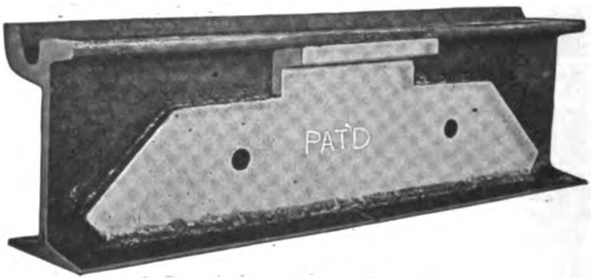
- Skilled Labor
- New Material
- Heavy Overhead
- Current Losses

RECLAIM

- Broken Track
- Worn Track
- Damaged Frogs
- Worn Switches

Portable Electric Welder

The "Simplex" Joint for High Tee Rails



The "Apex" Joint for Guard and Girder Rails

The ever-increasing prohibitive price of new material—the excessive cost of skilled labor and the shortage of both, present a difficult problem to the roads.

Trains and trolleys must be kept running. Delays must be prevented. Tracks and switches must be kept in perfect condition.

The logical answer is the Indianapolis Portable Electric Welder, the quickest and most satisfactory of track repairers and reclaimers.

Can be operated by unskilled labor.

Economical in first cost and future maintenance.

Positive in results.

Indianapolis Joints and Bonding Plates are electrically welded and show greater conductivity than the rail itself. They eliminate current losses.

Let us send you full particulars.

95% of the important Electric Railways NOW using Indianapolis Welder and Joint

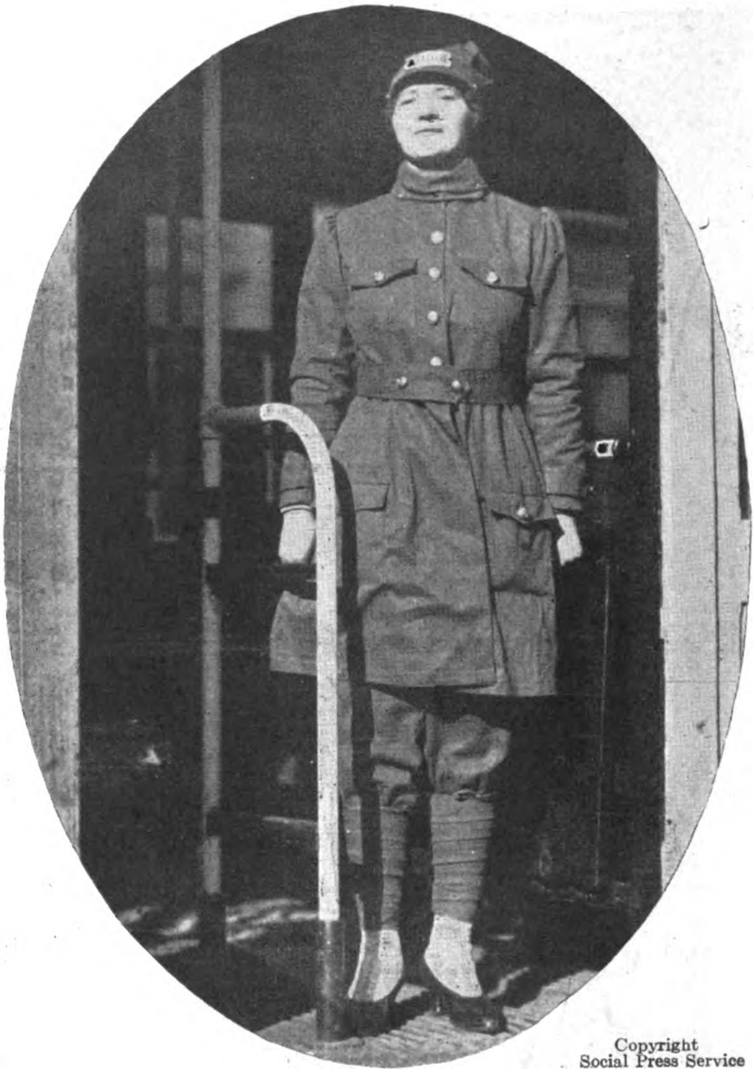
Users of Indianapolis Patented Welders, Joints and Welding Supplies Fully Protected

Indianapolis Switch & Frog Company, Springfield, Ohio

Attention!

America's First Surface Car Conductress Made Possible by

National Pneumatic Control



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Spic, span and smiling she stands ready to fill the gap made by a lad who has gone "over there."

But, fortunately, her employer—the New York Railways—had already made the job of **car cashier** an easy one.

Behind a grill and fare box she will sit at ease, and have full control of all exit and entrance through the use of a foot trip which actuates the National Pneumatic door engines. In fact, she is literally

Queen of the Air

NATIONAL PNEUMATIC COMPANY
INC.

50 Church St. New York

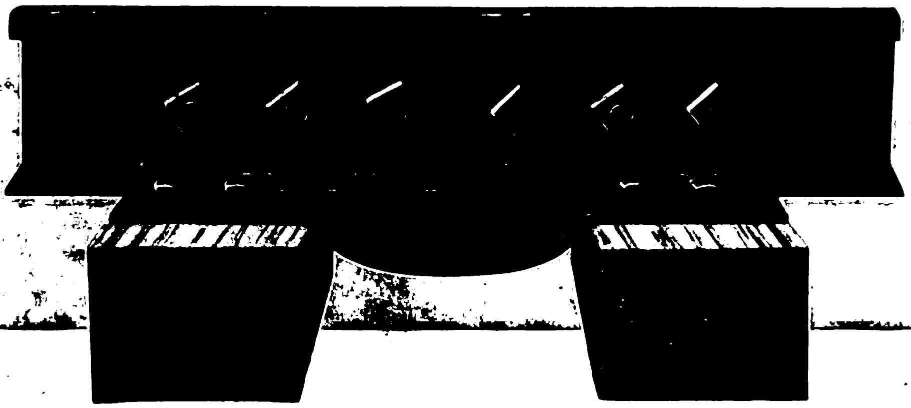
515 Laflin St. Chicago

Flat-ended ABBOTT RAIL-JOINT PLATES

The ABBOTT RAIL JOINT PLATE
"BUILT LIKE A BRIDGE"

offer the best solution for the joint problem with high T or girder rails in paved streets

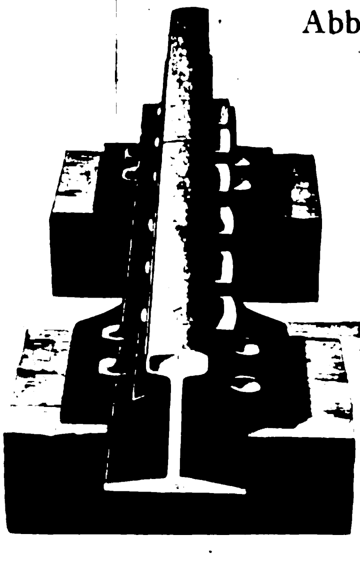
The ABBOTT RAIL JOINT PLATE
"BUILT LIKE A BRIDGE"



THE flat-end pattern of Abbott Plate gives the joint a strong unfailing support that preserves track surface and keeps the rail ends from battering and does so without imposing any obstructions to interfere with paving. The blocks or bricks will fit close against the joint without chopping or the use of special shapes.

The relief of the splice bars from excessive wheel load greatly prolongs their useful life by reducing the wearing and cutting from back action and also lessens the tendency of holes to shear and nuts to loosen.

Many installations of long standing have demonstrated an appreciable saving in renewals and maintenance costs, to say nothing of the smoother riding qualities of the track.



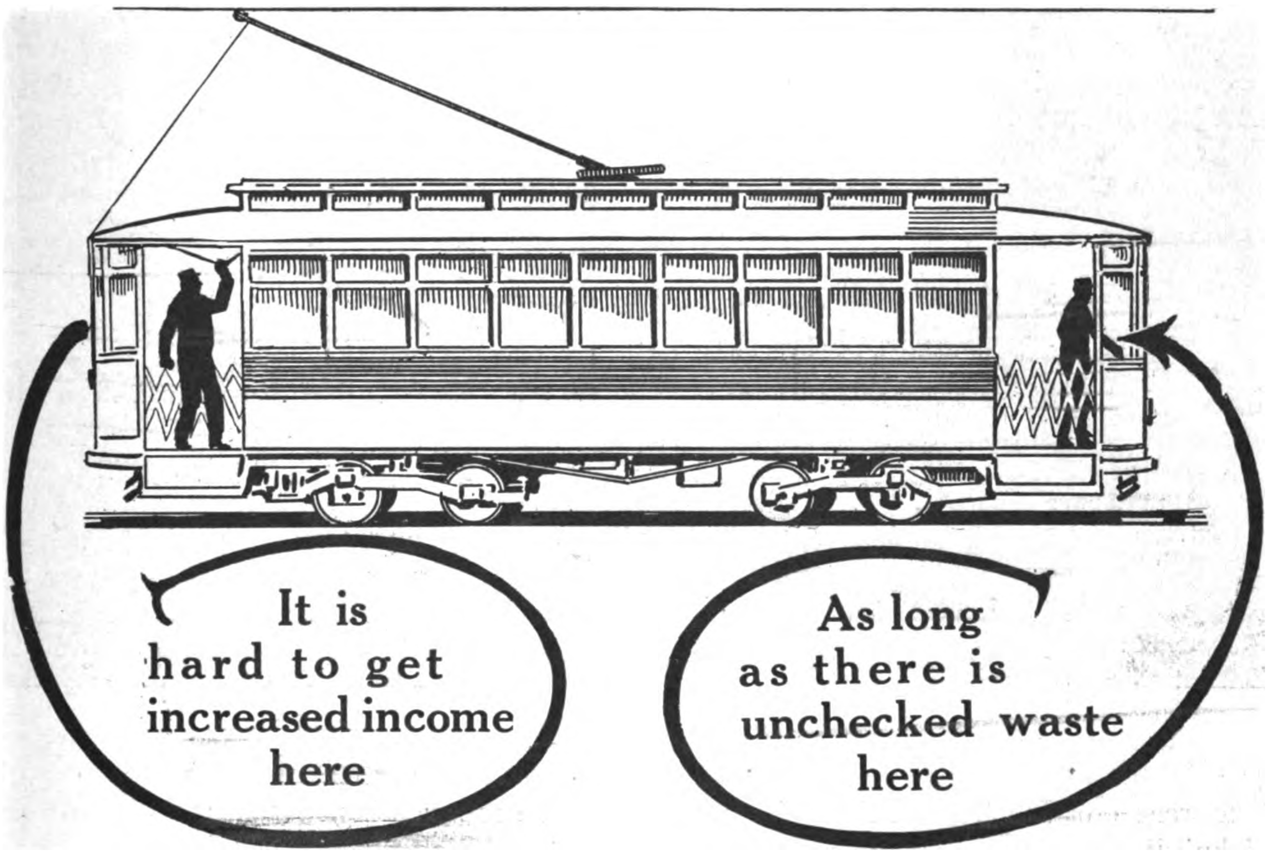
Abbott Plates are made in patterns and sizes to meet every requirement of new track in electric railway service, and can often be utilized to decided advantage in prolonging the life of old track.

Write for our Book,
"Improved Track Appliances."

312

Lackawanna Steel Company

LACKAWANNA, N. Y.
ATLANTA CHICAGO DETROIT ST. LOUIS
BUFFALO CLEVELAND PHILADELPHIA
BOSTON CINCINNATI NEW YORK
SAN FRANCISCO HAVANA


It is hard to get increased income here
As long as there is unchecked waste here

When one of your department managers comes to you and says he has to have more money to run things (a mighty common experience nowadays), your first impulse is to try to determine how he can economize, isn't it?

And naturally the public and the Public Service Commissions ask the same question when the electric railways ask for more revenue.

The only decisive answer is to show that you are doing everything possible to lower costs of operation.

You cannot make that answer unless you have *some* means of showing that your car crews are being led to use the minimum amount of power necessary to first-class operation.

There are many ways of doing this. It is our belief that

The Arthur Power-Saving Recorder

is a successful, economical and efficient way.

That belief is also held by experienced railway men who are using the Arthur Recorder on their cars.

You might not agree with this opinion, but you certainly owe it to yourself to be sure that you know all the facts before you reach your conclusion.

The Arthur Power-Saving Recorder Co.
Second National Bank Building, New Haven, Conn.

A Clear Track!

BECAUSE of the many requests that we have received asking us to rent our DYNAMOTOR for rail bonding, shop-welding and building up cupped rails, we have inaugurated a selling plan whereby small monthly payments may be made; all rent to apply on the purchase price, if it is decided later to keep the machine.

The superiority of the LINCOLN DYNAMOTOR, from the standpoints of efficiency and economical operation, has been demonstrated by many street railway companies. The monthly saving by using our DYNAMOTOR will amount to more than three months' rental.

This is an opportunity for you to equip properly for rail bonding, shop welding and repair work, without having to charge the entire price of a machine to your operating expense or machinery investment account. Just place us on your payroll.

Full details regarding the plan will be given you if you fill in and return the coupon.

This is an exceptional opportunity for you—get busy!

THE
LINCOLN BONDING
COMPANY

General Offices: CLEVELAND
New York Office: 30 Church St.

AGENTS:

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PHILADELPHIA, Railway Track-work Co.
PITTSBURGH, Electrical Engineering & Manufacturing Co.
CHICAGO, Holden & White, Inc.
ST. LOUIS, W. L. Rose Equipment Co.
CANADA, Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Winnipeg.

The
Lincoln
Bonding Co.
Cleveland, O.

Please give me details of your new rental plan for Lincoln Dynamotors.

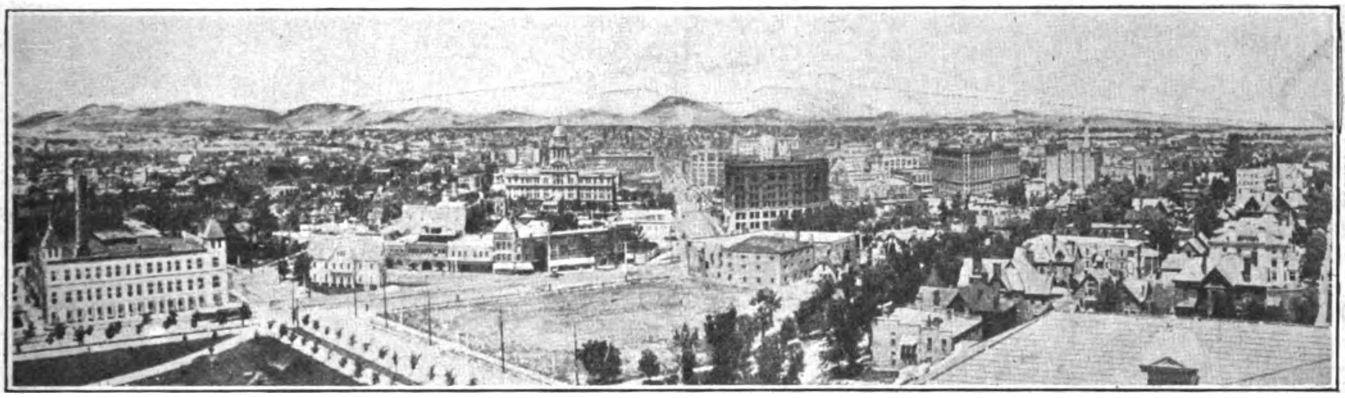
Name............................

Title...............................

Address...................................

City.............. State.............. E. R. J.

Denver as seen from the Capitol Site—1870.



Denver as seen from the Capitol Dome—1902.

Denver, the Beautiful—originally called *"Auraria,"* "The Land of Gold" (now West Denver) and St. Charles (Denver proper).

"Pike's Peak or Bust!"

the great rallying cry of the gold hunters of 1858, proved a false slogan, for no gold has ever been found in the immediate vicinity of the Peak itself.

When the first batch of prospectors in this region found that signs of gold were few and far between a reaction set in and the tire of migration flowed back from Denver eastward and southward, stemming the westward tide and causing vast disappointment among those who believed these stories and turned back after coming within easy distance of their goal.

Horace Greeley, of the *New York Tribune,* set out to see for himself what the conditions were, and his truthful reports restored the confidence of the people in the ultimate prosperity of the new territory.

On June 6, 1859, Greeley reached Denver (the name had just been adopted in honor of Governor James W. Denver, of Kansas, whose territory at that time included Colorado). He put up at the "Eldorado Hotel" and there became the chief actor in the famous $5 shave—the story of which traveled all over the world and did more to make Denver famous than all the optimistic tales of the years before.

A year later occurred the great attack by outlaws on the *Denver News,* and for months afterwards, editors, reporters and "comps" worked with revolvers close at hand and Winchester rifles on their desks and across their type cases. Silver and other precious metals finally were discovered in quantity; the city grew rapidly and became a Mecca for the ailing and weak, whose health was rebuilt in the rarified atmosphere of the Mile-High City. Transportation facilities kept pace with the growth of the community and, despite a few early disappointments, reached a high state of efficiency.

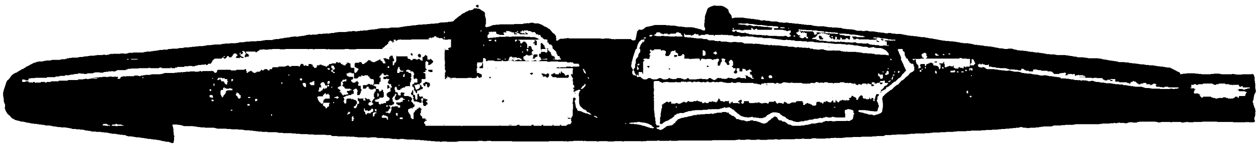
Galena Oils

in the dry, rarified atmosphere of mountain districts give the same satisfactory results as in the dense humid air along the seashore, while Galena Service through its national organization reaches into the farthest corners of the United States with the same efficiency and reliability as it does in the immediate neighborhood of our refineries.

Galena-Signal Oil Co.

Franklin, Pa.

Splicing Sleeves



FOR a low cost, light weight splicing sleeve of exceptional strength, the R2 cannot be excelled.

LARGE corrugated wedges of forged steel hold the wire in a tight grip.

CLINCH ends transfer the trolley wheel from the wire to the sleeve without pounding or arcing.

THE trolley clearance on the under run is good.

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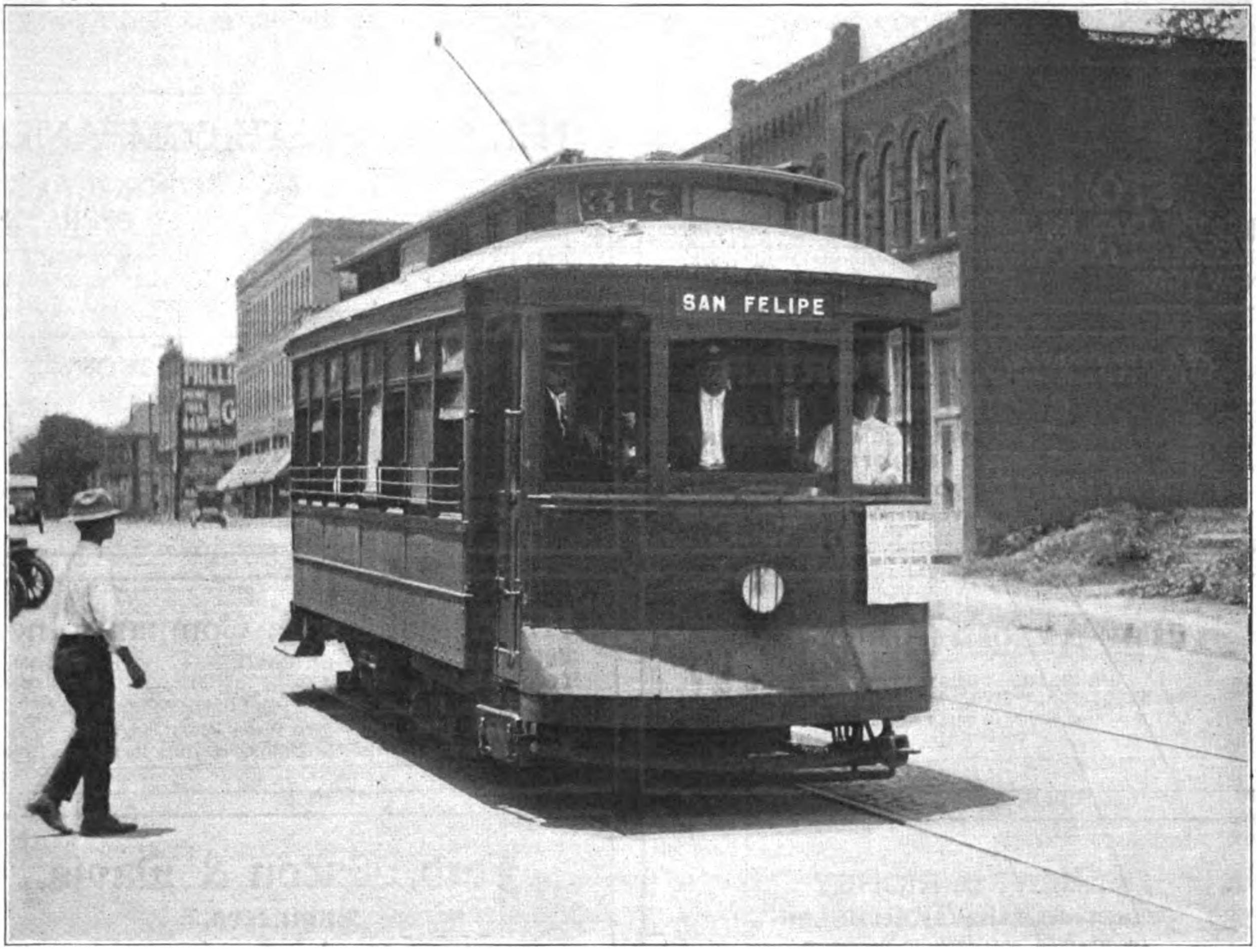
*Southwest General Electric Company. For Canadian Business refer to Canadian General Electric Company, Ltd., Toronto, Ont.
General Foreign Sales Offices, Schenectady, N. Y.; 120 Broadway, New York City; 83 Cannon St., London, E. C., England. 7571



At Houston, Tex.
128 PEACOCKS

The Houston Electric Company is another property where the Peacock Brake pays for itself. There are 128 of them in service on cars which have no other brake equipment.

And if you were to ask what trouble does the Peacock give, you would learn that there's no such animal.

The Peacock just does its duty day in and day out with most trifling maintenance charges.

What more can you ask of a brake except low first cost?

And the right Peacock for the right car is low in first cost, too.

National Brake Co.
Buffalo, N. Y.

The Eccentric Drum

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You are a faithful subscriber and reader of the Electric Railway Journal. You know how useful it is to you. Why not give us the names of those of your electric railway friends who would also benefit by being subscribers to the Electric Railway Journal? We will be glad to send specimen copies to any names and addresses that you mention.

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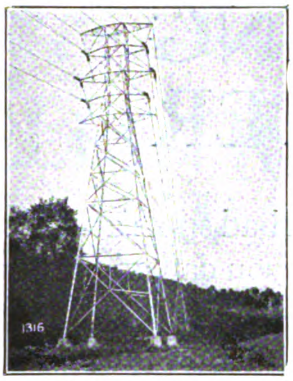
Manufacturers of Steel Structures of all classes particularly **BRIDGES AND BUILDINGS**



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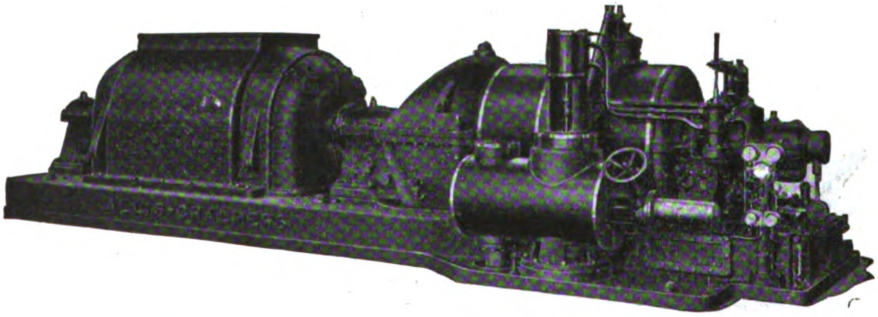
EFFICIENCY — RELIABILITY — SIMPLICITY

Allis-Chalmers Steam Turbines

Show sustained economy after years of operation
Units built in sizes from 200 kw. up



3200 KW., Max. 3600 R.P.M., H.P. Condensing Steam Turbine and Alternator. Unit of this size installed in the plant of the Eastern Pennsylvania Ry. Co., Palo Alto, Pa.

Allis-Chalmers Manufacturing Co.

Milwaukee, Wis.

For all Canadian Business refer to Canadian Allis-Chalmers, Ltd., Toronto, Ont., Canada

What does it Cost You per Mile per Year to Maintain Track?

The chances are that if your maintenance methods do not include the consistent and regular use of a

RECIPROCATING TRACK GRINDER

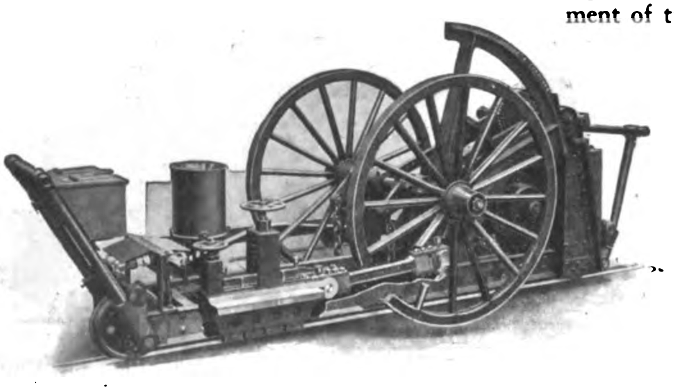
for grinding out bad spots and keeping rails smooth you can add to your present methods the cost of equipment and labor for that purpose

Without Adding to Your Annual Cost per Mile

Cupped joints and corrugations are not damaging merely to the rail and rolling stock. They also are the direct cause of much damage to the *track structure itself*.

The tremendous shock of cars passing at normal speed over such bad spots causes breaks and rapid deterioration of foundations, loosens bolts and joints, throws track out of alignment.

Consequently, if such spots are consistently cared for and ground out *before* they develop to a serious stage the result is a direct saving of much of the repair work necessary on foundations, joints, realignment of track and replacement of ties.



The use of Reciprocating Grinders, therefore, not only insures longer life of rail, smoother running of cars, decrease of wear on car equipment by elimination of shocks, but by removing the direct cause for much of the damage to *track structures* it decreases instead of adding to the total cost of track maintenance.

That is the experience of the hundred or more companies that use these efficient machines.

Railway Track-work Company

30th and Walnut Streets, Philadelphia

AGENTS: Holden & White, Inc., 343 S. Dearborn St., Chicago.

The kind of information you can use *daily*—

Facts, thousands of facts covering every branch of electric railway construction, operation and maintenance, modern, reliable information based on the experience of four of the biggest electric railway specialists, information that will help you as it is helping thousands of electric railway men throughout the country this is the kind of material presented —in the

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If you believe in making use of the experience of others, these books can be of great service to you. They present more information about electric railways than any one man could gather in a lifetime of experience. They abound in methods and devices that have proved successful in cutting costs and increasing efficiency for others.

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The one book — the handbook — is pocket size with flexible binding so that it may be carried about conveniently. It is an encyclopedia of electric railway construction, operation and maintenance. Electric Railway Engineering is a thorough and practical manual on the broader engineering problems. Electric Railway Transportation covers the business side of the subject—the relation of traffic to profits. It is packed full of priceless information on traffic conditions, their causes, and their relation to electric railway efficiency. Electric Car Maintenance has saved money for hundreds of companies that have purchased it. It is a complete treatment of this subject.

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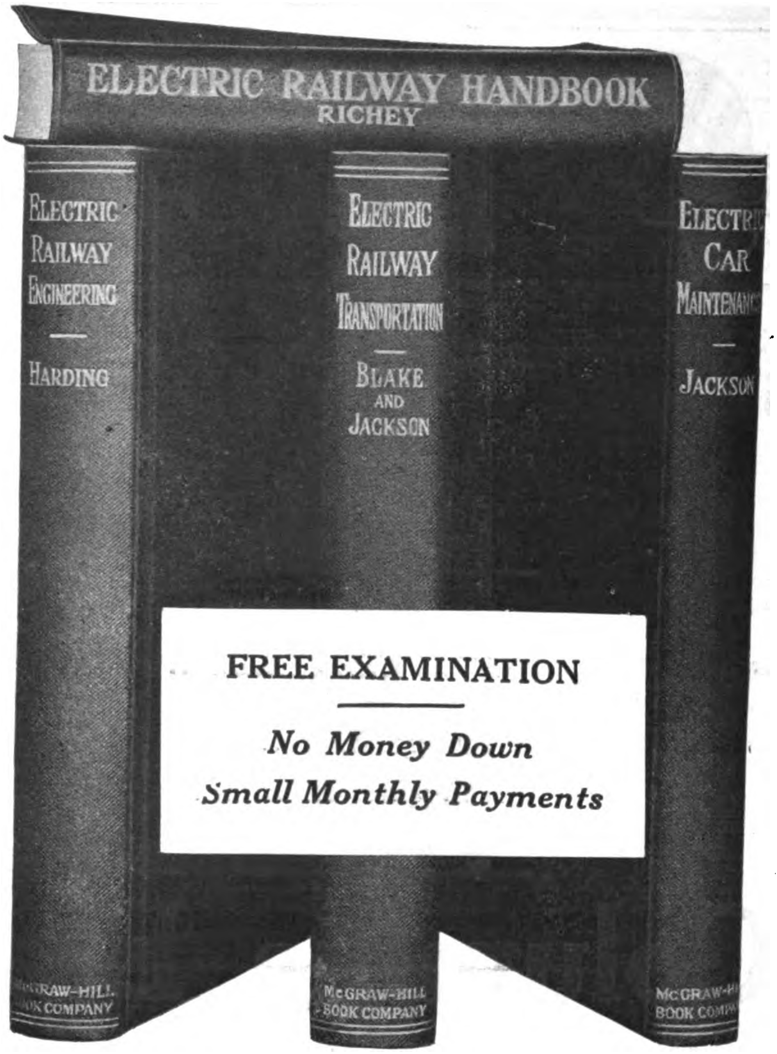

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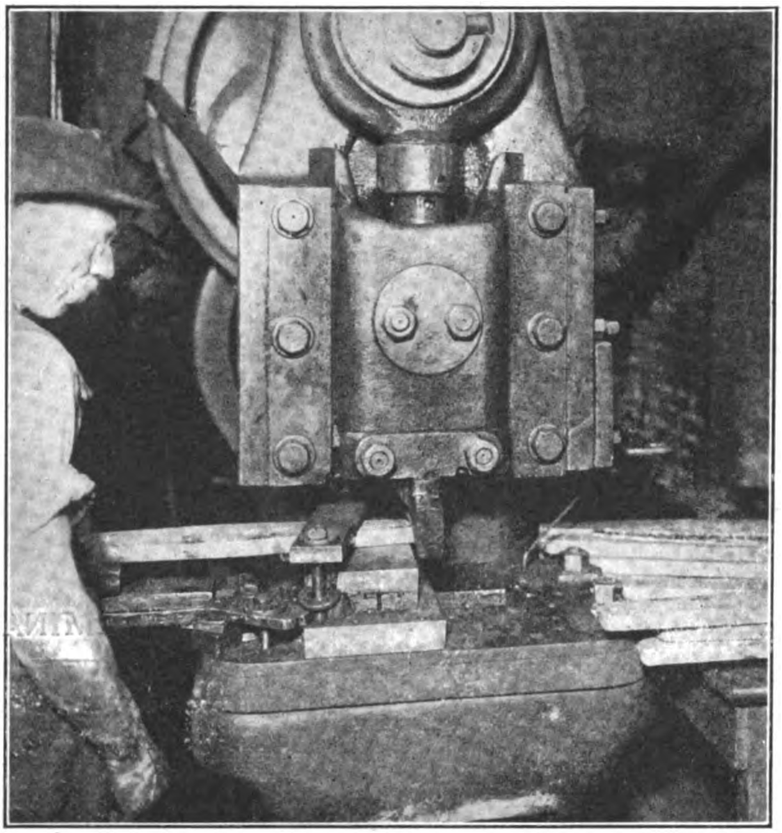

Columbia Brake Levers

No. 3 *Squaring Off the Ends*

AFTER a hot time in the furnace and the forging by a 5-ton hammer, the brake lever is allowed to cool off. First, a template is applied to the brake lever to mark off its exact shape and then it is brought to a powerful press by means of which the bars are squared off as easily as a grocer slices cheese.

Step No. 4 will show the rounding of the ends

Don't let our "Brake Lever Movie" make you overlook other Columbians listed below

Columbia Machine Works & Malleable Iron Co.

Atlantic Ave. and Chestnut St.
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W. R. Kerschner Co., Inc., N. Y.
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TOOLS

- Armature and Axle Straighteners
- Armature shaft straighteners
- Armature buggies and stands
- Babbitting molds
- Banding and heading machines
- Car hoists
- Car replacers
- Coil taping machines for armature leads
- Coil winding machines
- Pinion pullers
- Pit jacks
- Signal or target switches
- Tension stands

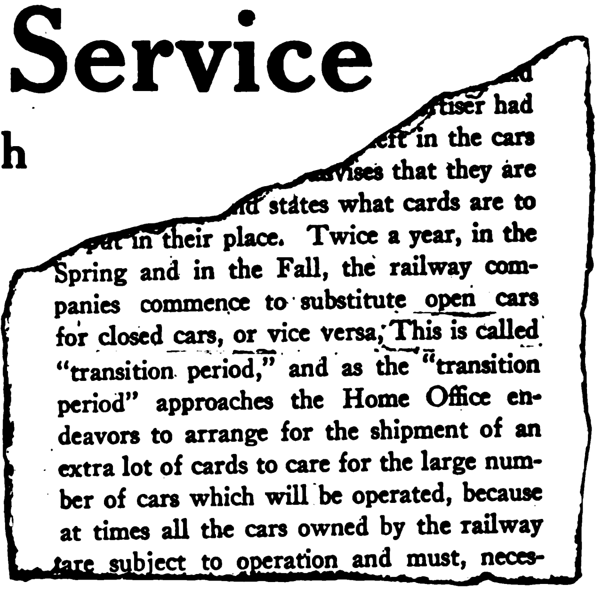
CAR EQUIPMENT

- Armature and Axle Bearings
- Armature and field coils
- Bearings (Axle and Armature)
- Brush-holders and brush-holder springs
- Brake, door and other handles
- Brake forgings, riggings, etc.
- Car trimmings
- Commutators
- Controller handles
- Forgings of all kinds
- Gear cases (steel or mall. iron)
- Grid resistors
- Third-rail shoe beams and accessories
- Trolley poles (steel) and wheels

Collier Service

at Savannah

A recent visitor to the car shops of the Savannah Electric Co. would have observed that this company was converting a number of open cars into closed cars for all-year-round operation to the new shipyards.



tiser had
in the cars
ises that they are
states what cards are to
in their place. Twice a year, in the Spring and in the Fall, the railway companies commence to substitute open cars for closed cars, or vice versa. This is called "transition period," and as the "transition period" approaches the Home Office endeavors to arrange for the shipment of an extra lot of cards to care for the large number of cars which will be operated, because at times all the cars owned by the railway are subject to operation and must, neces-

This, for example, shows that one of the most important items in Collier Service is to watch the comings and goings of the cars as regards their use at different seasons; and also to check carefully the reconstruction of cars, withdrawals and additions.

In other words, we very carefully maintain a continuous inventory of card spaces so that the user of space in Collier Service Cars will at all times receive full value from his investment.

By consistently following this policy, Collier Service has established that degree of confidence which assures to electric railways a permanent, stabilized income from car card advertising.

Barron G. Collier INCORPORATED

Candler Building

220 West 42nd Street, New York City

JOHNS-MANVILLE SERVICE
COVERS THE CONTINENT
600 VOLTS 200 AMPS
UND. LAB. INSPECTED
CAT. NO. 4662
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NOARK
FUSE

Every Noark Fuse gets the Third Degree

MOST tests are a matter of averages. One out of every hundred — or thousand — is chosen, and the others get by. If the average of those selected is high it is assumed that all must be good.

Not so with Noark fuses. Every Noark fuse — no exceptions — must pass the test, not one test, but many tests. In the Noark factory life for a fuse is one test after another.

What does all this mean to you? It simply means this: That buying a fuse with the Noark label on it is buying a fuse whose performance is known beforehand. And that is what you want to know about a fuse, and is just what makes a Noark fuse different from others.

H. W. JOHNS-MANVILLE CO.
New York City
10 Factories—Branches in 61 Large Cities

Manufactured by the Johns-Pratt Co., Hartford, Conn.
H. W. Johns - Manville Co., Sole Selling Agents.

NOARK
APPROVED
FUSES

CYPRESS

"THE WOOD ETERNAL"

is NOT the *Best Lumber for ALL Railway Purposes*. For certain specific applications, however, in which railways have large lumber requirements, the use of all-heart Cypress develops very large *economies* in *maintenance costs*. For example, the Railway Signal Association in its standard specifications for wood to be used for "Trunking and Capping" has always placed all-heart Cypress among the first choices in the list of suitable woods.

The Railway Signal Association makes its recommendations as a result of definite *knowledge* of the subject, and its membership includes many able men who are Cypress enthusiasts. We gladly refer all doubters as to Cypress superiority to any well-posted railway engineer who has had experience with Cypress, "the wood eternal."

The same conditions of service which make Cypress superior for "Trunking and Capping" are present in many other railway lumber requirements, such as

FENCING

and similar purposes where the material is exposed constantly to the weather, and where it is consequently essential that it shall be highly capable of *resistance to decay*. That is the great and particular value of Cypress—it is *highly resistant to decay*. (All-heart especially.)

If railway men in general will study the question of wood durability for other uses as carefully as Railway Signal men have studied it in connection with "Trunking and Capping," there will be a lot more all-heart Cypress used in railway service—*to the very great economy of the companies using it.*

Our data is at your service.

SOUTHERN CYPRESS MFRS' ASS'N
1265 Hibernia Bank Building, New Orleans, La., or
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"STANDARD"

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Solid Rolled Steel Wheels
O. H. Steel and Malleable Iron Castings
Solid Forged Gear Blanks
Steel Forgings Iron Forgings
Forged and Rolled Steel
Pipe Flanges
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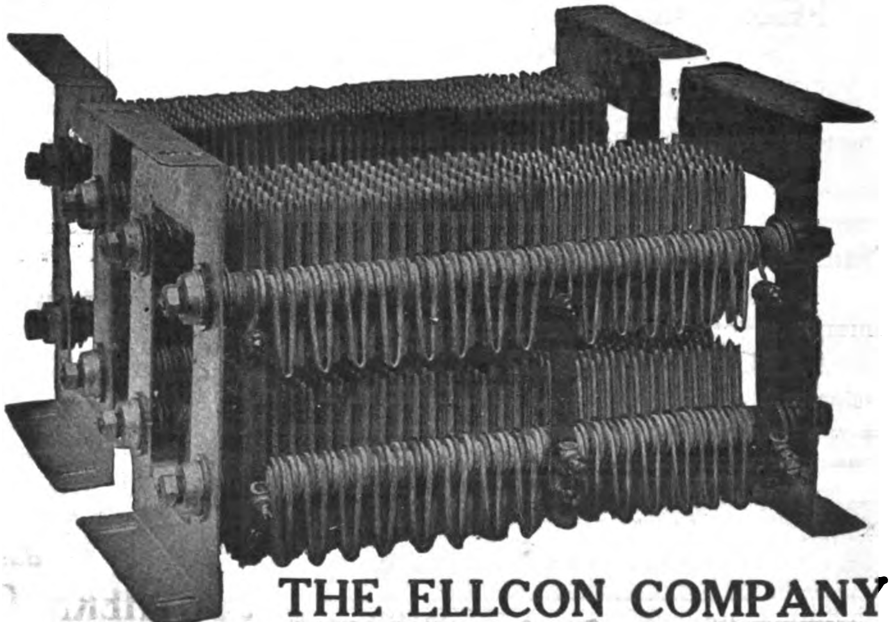

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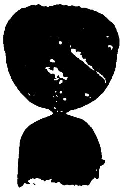

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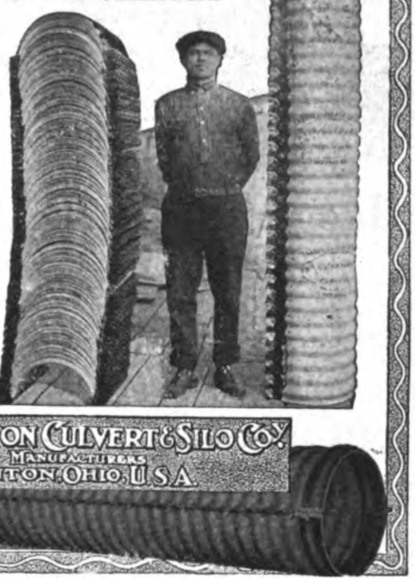

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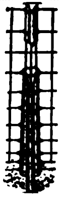

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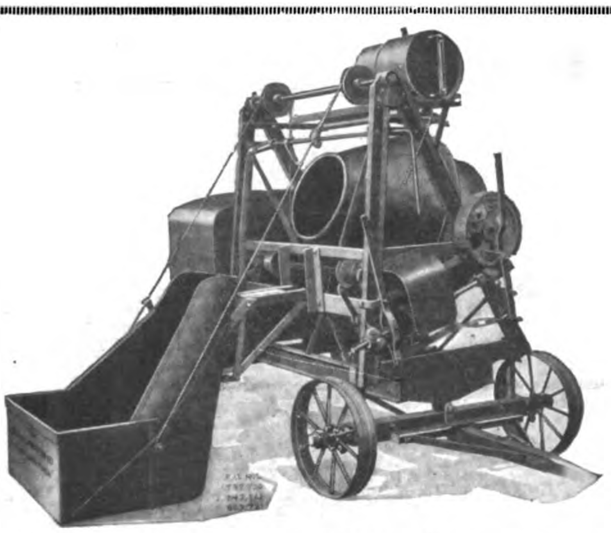

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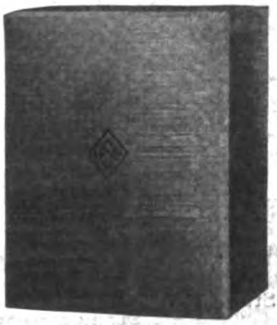

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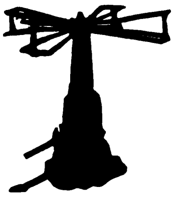

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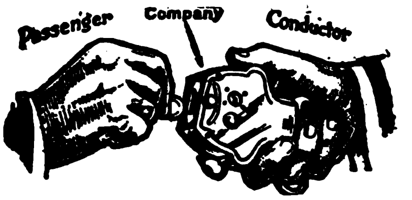

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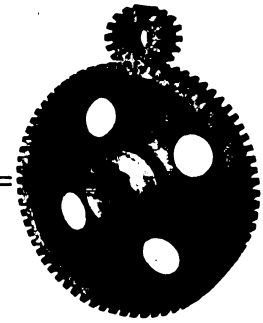

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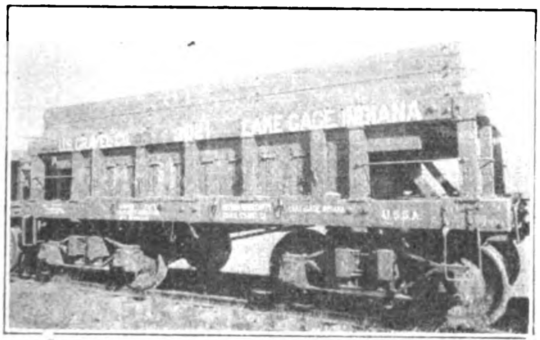

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Have new boards, bolts, posts for all 25 cars. Standard gage; 24 ft. outside overall. Inside total, 17 ft. Degree incline, 45 per cent.; over body, 22 per cent. Incline bottom, 3 ft. Flat bottom, 11 ft. Width overall, 8 ft. 10 in.; inside, 7 ft. 11 in.; rail to top, 7 ft., inside, 3 ft. Rail to top floor, 4 ft. Independent dump. Doors, 16 x 28 in. Westinghouse brakes. Steps and Grab Irons all M.C.B., standard. Four doors each side. Tower steel couplers, 5 x 5 shank. Total wheelbase, 19 ft. 4 in., 33-in. cast wheels. 9 x 11 wood bolsters. National hollow steel brake beams. 8 x 10 malleable journal boxes. Weight, 21,500 lb. Truck wheel base, 5-ft. twin full elliptic springs hung inside. 4½ x 8 journal brasses. Cars take 42 ft. radius curve, coupled M.C.B. Painted; fine condition. Cash price, $650 each.

ALSO

1—Good three-compartment **Trolley Car,** G. E. 57, 4 motors, 55 ft. long.
1—**Snow Plow.**
1—Steel underframe **Trailer.**
1—Edison-Beach **Storage Battery Car,** 8 wheels, 55 ft. long, four motors steel underframe, modern, fine shape.
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60—Miles **Copper No. 10 Gage,** with porcelains for immediate delivery, price 32c. a lb., Elkhart, Ind. Act quickly. Now selling.

Small way stations, car barns, scales, etc.

H. E. BUCKLEN, *Receiver,* Elkhart, Ind.

RECEIVER'S SALE

of Rockland, South Thomaston and St. George Railway

STATE OF MAINE
Knox, ss. Supreme Judicial Court
In Equity

Security Trust Company
vs.
Rockland, South Thomaston & St. George Railway
and
Waldo Trust Company

Under and by virtue of decree in the above-entitled cause made on the twenty-first day of June, 1918, and filed in the office of the Clerk of Courts, Knox County, Maine, the undersigned Receiver, being thereunto duly authorized and directed, will receive bids in accordance with the terms and conditions of said decree, bids to be received by the Receiver at his office, 414 Main Street, Rockland, Maine, not later than twelve o'clock noon,

July 23, 1918

for the following property: All and singular, the real estate, buildings, road-bed, privileges, tracks, poles, lines, wires, material, machinery, equipment, tools, implements, supplies, property rights, easements, appurtenances and franchises, and all contracts and choses in action belonging to said Railway.

The aforesaid premises, property and franchises will be sold without valuation or appraisement. The Receiver will receive sealed bids for the property as an entirety or for any part or parcel thereof, as scheduled, with the right to reject any or all bids; each bid to be accompanied by a certified check for ten per cent. (10%) of the amount of the bid. Property will be sold free from all liens and claims of every character and of every name and nature whatsoever. No bid will be received by said Receiver from any person who shall not accompany his bid with a certified check for ten per cent. (10%) of the amount of the bid as a pledge and as part payment on account in case his bid is accepted. Deposits so received from unsuccessful bidders will be returned; that received from a successful bidder retained to be applied to the purchase price or forfeited in case the bid shall not be made good or the purchaser shall fail to comply with any order of Court relating to the payment for said property when and after said sale shall be confirmed; if sale not confirmed, deposit returned to bidder. Sale to be made subject to confirmation by the Court. Court reserves the right to re-sell the property in case the purchaser shall fail to make payments as required on confirmation of sale. Condition of sale more fully set forth in said decree, and title to be given in accordance therewith. All the above sold, condition and completeness as is; as seen and inspected; and as now located. By said decree all claims to said property and liens thereon are transferred to the funds derived from said sale, and the rights of all parties making such claims are to be adjudicated in the receivership proceedings and protected in the distribution of the funds. Brief schedule will be furnished by Receiver.

Dated at Rockland, Maine, June 21, 1918.

S. THAYER KIMBALL,
Receiver

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2—283-hp. Babcock & Wilcox, 160-lb. pressure.
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125 hp. return tubular fire tube boiler. A. D. Ward, Augusta, Maine. Age 25 years.

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Holden & White, Inc.

Alloys, Steel & Iron
Titanium Alloy Mfg. Co.

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Standard Steel Works Co.
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Ohio Brass Co.

Hose, Pneumatic and Fire.
Johns-Manville Co., H. W.
Westinghouse Traction Brake Co.

Hydraulic Machinery.
Allis-Chalmers Mfg. Co.
Niles-Bement-Pond Co.

Inspection.
Electrical Testing Lab's.

Instruments, Measuring, Testing and Recording.
Economy Electric Devices Co.
General Electric Co.
Johns-Manville Co., H. W.
Westinghouse Elec. & M. Co.
Weston Elec'l Instrument Co.

Insulating Cloth, Paper and Tape.
General Electric Co.
Johns-Manville Co., H. W.
Mitchell-Rand Mfg. Co.
Standard Woven Fabric Co.
Westinghouse Elec. & M. Co.

Insulation. (See also Paints.)
Anderson M. Co., A. & J. M.
Drew Electric & Mfg. Co.
Electric Service Supplies Co.
General Electric Co.
Holden & White, Inc.
Johns-Manville Co., H. W.
Mitchell-Rand Mfg. Co.
Westinghouse Elec. & M. Co.

Insulators. (See also Line Material.)
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Johns-Manville Co., H. W.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Insulator Pins.
Electric Service Supplies Co.
Hubbard & Co.

Jacks. (See also Cranes, Hoists and Lifts.)
Brill Co., The J. G.
Buckeye Jack Mfg. Co.
Columbia M. W. & M. I. Co.
Duff Manufacturing Co.
National Ry. Appliance Co.
Templeton, Kenly Co., Ltd.

Joints, Rail.
Carnegie Steel Co.
Lackawanna Steel Co.
Zelnicker Sup. Co., W. A.

Journal Boxes.
Bemis Car Truck Co.
Brill Co., The J. G.
S K F Ball Bearing Co.

Junction Boxes.
Johns-Manville Co., H. W.

Laboratory.
Electrical Testing Lab's.

Lamp Guards and Fixtures.
Anderson M. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Arc and Incandescent. (See also Headlights.)
Anderson M. Co., A. & J. M.
General Electric Co.
Westinghouse Elec. & M. Co.

Lamps, Signal and Marker.
Nichols-Lintern Co.
Ohio Brass Co.

Lathes, Car Wheel.
Niles-Bement-Pond Co.

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Holden & White, Inc.

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Ohio Brass Co.
Westinghouse Elec. & M. Co.

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Milburn Co., The Alex.

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Holden & White, Inc.
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More-Jones B. & M. Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

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Brill Co., The J. G.
General Electric Co.
McGuire-Cummings Mfg. Co.
Westinghouse Elec. & M. Co.

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Galena-Signal Oil Co.

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Galena-Signal Oil Co.

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Niles-Bement-Pond Co.

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Columbia M. W. & M. I. Co.
Holden & White, Inc.

Mats.
Johns-Manville Co., H. W.

Meters, Car, Watt-Hour.
Economy Electric Devices Co.

Meters. (See Instruments.)
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Wood Co., Chas N.

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Bemis Car Truck Co.
Columbia M. W. & M. I. Co.
Hubbard & Co.
Lackawanna Steel Co.

Oils. (See Lubricants.)

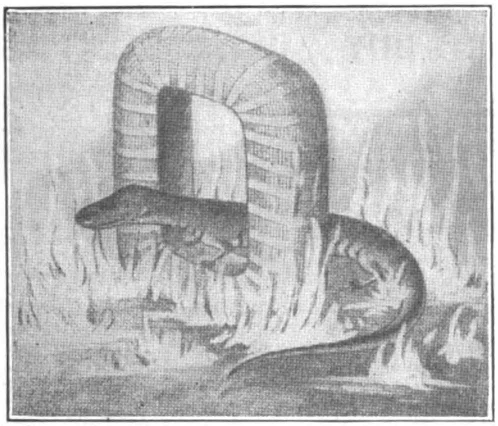
Oxy-Acetylene. (See Cutting Apparatus, Oxy-Acetylene.)

Packing.
Johns-Manville Co., H. W.
Power Specialty Co.
Westinghouse Traction Brake Co.

Packing Rings.
Johns-Manville Co., H. W.

Paints and Varnishes. (Insulating.)
Mitchell-Rand Mfg. Co.

Paints and Varnishes. (Preservative.)
Johns-Manville Co., H. W.



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SECTION

32

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Nelsonville Brick Co.

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Electric Service Supplies Co.
Ohio Brass Co.

Pinion Pullers.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Wood Co., Chas. N.

Pinions. (See Gears.)

Pins, Case Hardened, Wood and Iron.
Bemis Car Truck Co.
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

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National Tube Co.

Pipe Fittings.
Power Specialty Co.
Standard Steel Works Co.
Westinghouse Traction Brake Co.

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Electric Service Supplies Co.
National Railway Appliance Co.

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Hubbard & Co.

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Lindsley Bros. Co.

Poles, Metal Street.
Hubbard & Co.

Pole Sleeves.
Drew Elec. & Mfg. Co.

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Lindsley Bros. Co.
Northern White Cedar Assn.
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White Marble Lime Co.

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Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
National Tube Co.
Nuttall Co., R. D.

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National Tube Co.

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Ohio Brass Co.
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Allis-Chalmers Mfg. Co.

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Bonney-Vehslage Tool Co.
International Register Co., The
Wood Co., Chas. N.

Purifiers, Feed Water
Scaife & Sons Co., Wm. B.

Rail Grinders. (See Grinders.)

Rail Welding. (See Brazing and Welding Processes.)

Rails, Relaying.
Zelnicker Supply Co., W. A.

Rattan.
Brill Co., The J. G.
Electric Service Supplies Co.
Hale & Kilburn Co.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.

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Arthur Power-Saving Recorder Co

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Bonham Recorder Co.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Rooke Automatic Register Co.

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American Steel & Wire Co.

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Electric Service Supplies Co.

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General Electric Co.
Independent Lamp & Wire Co.
Westinghouse Elec. & M. Co.

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Electric Service Supplies Co.
Reading Specialties Co.

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Columbia M. W. & M. I. Co.
Ellcon Co.

Resistance, Wire and Tube.
General Electric Co.
Westinghouse Elec. & M. Co.

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Rheostats.
Ellcon Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Roofing, Building.
Barrett Co., The
Johns-Manville Co., H. W.

Roofing, Car.
Johns-Manville Co., H. W.

Sanders, Track.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Holden & White, Inc.
Nichols-Lintern Co.
Ohio Brass Co.
St. Louis Car Co.

Sash Fixtures, Car.
Brill Co., The J. G.

Sash Metal, Car Window.
Hale & Kilburn Co.

Scrapers, Track. (See Cleaners and Scrapers, Track.)

Seats, Car.
Brill Co., The J. G.
Hale & Kilburn Co.
St. Louis Car Co.

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Archer & Baldwin.
MacGovern & Co., Inc.

Shades, Vestibule.
Brill Co., The J. G.

Shovels.
Hubbard & Co.

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Allis-Chalmers Mfg. Co.

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Electric Service Supplies Co.
Federal Signal Co.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.
Wood Co., Chas. N.

Signals, Car Marker
Nichols-Lintern Co.

Signals, Car Starting.
Consolidated Car Heating Co.
Electric Service Supplies Co.
National Pneumatic Co.

Signal Systems, Highway Crossing.
Nachod Signal Co., Inc.
U. S. Electric Signal Co.

Slack Adjusters. (See Brake Adjusters.)

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Columbia M. W. & M. I. Co.
Drew Electric & Mfg. Co.
Holden & White, Inc.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.

Snow-Plows, Sweepers and Brooms.
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Consolidated Car Fender Co.
McGuire-Cummings Mfg. Co.

Solderless Connectors.
Westinghouse Elec. & Mfg. Co

Soldering and Brazing Apparatus. (See Welding, Processes and Apparatus.)

Speed, Indicators.
Johns-Manville Co., H. W.

Spikes.
American Steel & Wire Co.
Lackawanna Steel Co.

Splicing Compounds
Johns-Manville Co., H. W.
Standard Woven Fabric Co.
Westinghouse Elec. & Mfg. Co.

Splicing Sleeves. (See Clamps and Connectors.)

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American Steel & Wire Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Standard Steel Works Co.
Union Spring & Mfg. Co.

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Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.

Steps, Car.
American Mason S. T. Co.
Universal Safety Tread Co.

Stokers, Mechanical.
Babcock & Wilcox Co.
Green Engrg. Co.
Westinghouse Elec. & M. Co.

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Strand
Roebling Son's Co., J. A.

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Holden & White, Inc.

Structural Iron. (See Bridges.)

Superheaters.
Babcock & Wilcox Co.
Power Specialty Co.

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Switches, Lock.
Weiss Switch Lock Co

Switch Stands.
Indianapolis Switch & Frog Co.
Kilby Frog & Switch Co.
Ramapo Iron Works.

Switches, Track. (See Track, Special Work.)

Switches & Switchboards.
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Anderson Mfg. Co., A. & J. M.
Electric Service Supplies Co.
General Electric Co.
Nichols-Lintern Co.
Westinghouse Elec. & M. Co.

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Ingersoll-Rand Co.

Tapes and Cloths. (See Insulating Cloths, Paper and Tape.)
Telephones and Parts.
Electric Service Supplies Co.

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Elec'l Testing Laboratories.

Testing Instruments. (See Instruments, Electrical Measuring, Testing, etc.)

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Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Railway Utility Co.
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Ticket Choppers & Destroyers.
Electric Service Supplies Co.

Ties, Mechanical.
Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel.
American Bridge Co.
Barbour-Stockwell Co.
Carnegie Steel Co.
International Steel Tie Co.

Ties, Wood Cross. (See Poles, Ties, Posts,, etc.)

Tools, Track & Miscellaneous.
American Steel & Wire Co.
Columbia M. W. & M. I. Co.
Electric Service Supplies Co.
Hubbard & Co.
Johns-Manville Co., H. W.
Railway Track-work Co.

Torches, Acetylene. (See Cutting Apparatus.)
Oxweld Acetylene Co.

Towers & Transmission Structures.
American Bridge Co.
Archbold-Brady Co.
Westinghouse Elec. & M. Co.

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Indianapolis Switch & Frog Co.
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American Bridge Co.
Archbold-Brady Co.

Transformers.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

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Universal Safety Tread Co.

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Electric Service Supplies Co.
General Electric Co.
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Ford Chain Block & Mfg. Co.

Trolley Shoes.
Holden & White, Inc.

Trolley Wheels. (See Wheels, Trolley.)

Trolley Wire
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Allis-Chalmers Mfg. Co.

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Perey Mfg. Co., Inc.

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Ohio Brass Co.
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Railway Utility Co.
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Scaife & Sons Co., Wm. B.

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Electric Ry. Improvement Co.
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Wheel Presses. (See Machine Tools.)

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Bemis Car Truck Co.
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Standard Steel Works Co.

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Electric Service Supplies Co.
Eureka Co.
General Electric Co.
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Johns-Manville Co., H. W.
More-Jones B. & M. Co.
Nuttall Co., R. D.
Star Brass Works.

Whistles, Air.
General Electric Co.
Ohio Brass Co.
Westinghouse Traction Brake Co.

Wire Rope.
American Steel & Wire Co.
Roebling's Sons Co., John A.

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American Elec'l Works
American Steel & Wire Co.
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D & W Fuse Co.
General Electric Co.
Roebling's Sons Co., John A.
Westinghouse Elec. & M. Co.

Woodworking Machinery
Allis-Chalmers Mfg. Co.

Wood Preservatives.
Lindsley Bros. Co.

ALPHABETICAL INDEX TO ADVERTISEMENTS

A

Page

Allis-Chalmers Mfg. Co........ 25
Aluminum Co. of America.... 32
Amer. Brake Shoe & Fdry. Co.. 47
American Bridge Co.......... 25
American Car Co............ 51
American Electrical Works..... 32
American Mason S. T. Co..... 37
American Steel & Wire Co.... 34
Anderson Mfg. Co., A. & J. M.. 32
Archbold-Brady Co........... 32
Archer & Baldwin, Inc....... 41
Arnold Co., The............. 24
Arthur Power-Saving Recorder Co., The 19

B

Babcock & Wilcox Co........ 35
Balkwill Manganese Crossing Co. 14
Barbour-Stockwell Co........ 33
Beeler, John A.............. 24
Bemis Car Truck Co.......... 38
Bonham Recorder Co.......... 37
Bonney-Vehslage Tool Co..... 36
Bridgeport Brass Co........... 6
Brill Co., The, J. G.......... 51
Buckeye Jack Mfg. Co........ 35
Byllesby & Co., H. M......... 24

C

Canton Culvert & Silo Co..... 33
Carnegie Steel Co............ 34
Carney & Co., B. J.......... 32
Cleveland Armature Works.... 39
Cleveland Frog & Crossing Co.. 33
Collier, Inc., Barron G........ 29
Columbia M. W. & M. I. Co... 28
Consolidated Car Fender Co.... 38
Consolidated Car Heating Co... 37
Cooper Heater Co., The....... 37

D

D & W Fuse Co.............. 36
Dayton Mechanical Tie Co.... 12
Drew Elec. and Mfg. Co....... 33
Drum & Co., A. L............ 24
Duff Manufacturing Co....... 36
Duquesne Elec. & Mfg. Co...... 41

E

Economy Electric Devices Co... 15
Ellcon Co. 31
Electric Equipment Co........ 41
Electric Railway Improvement Co. 8
Electric Service Supplies Co... 11
Electric Storage Battery Co.... 38
Elec'l Testing Laboratories..... 24
Eureka Co.................. 32

F

Federal Signal Co........... 32
Ford, Bacon & Davis.......... 24
Ford Chain Block & Mfg. Co... 35
For Sale Ads..............39-41

G

Galena-Signal Oil Co......... 21
General Electric Co., 22, Back Cover
General Engineering & Construction Co................ 34
Gold Car Heating & Lighting Co. 36
Green Eng'g Co............. 34
Gurney Ball Bearing Co...... 50

H

Hale & Kilburn Corp.......... 37
"Help Wanted" Ads.......... 40
Holden & White, Inc......... 38
Hubbard & Co............... 32

I

Imperial Brass Mfg. Co...... 36
Independent Lamp & Wire Co.. 45
Indianapolis Switch & Frog Co. 16
Ingersoll-Rand Co............ 45
International Register Co., The. 36
International Steel Tie Co.... 9

J

Jaeger Machine Co........... 34
Jeandron, W. J............... 45
Johns-Manville Co., H. W..... 30

K

Kilby Frog & Switch Co...... 33
Kuhlman Car Co., G. C...... 51

L

Page

Lackawanna Steel Co......... 18
Lincoln Bonding Co........... 20
Lindsley Bros. Co............ 32

M

MacGovern & Co., Inc......... 41
McGraw-Hill Book Co., Inc..... 27
McGuire-Cummings Mfg. Co... 41
Milburn Co., The Alexander.... 34
Mitchell-Rand Mfg. Co....... 36
More-Jones Brass & Metal Co.. 38
Morgan Crucible Co.......... 47

N

Nachod Signal Co., Inc........ 33
National Brake Co........... 23
National Carbon Co., Inc...... 35
National Pneumatic Co., Inc.. 17
National Railway Appliance Co. 47
National Tube Co............ 32
Nelsonville Brick Co......... 33
New York Switch & Cross Co.. 34
Nichols-Lintern Co........... 38
Niles-Bement-Pond Co........ 35
Northern White Cedar Assn..... 13
Nuttall Co., R. D............ 38

O

Ohio Brass Co. 7

P

Page Steel & Wire Co......... 10
Perey Mfg. Co............... 36
Positions Vacant & Wanted.... 40
Power Specialty Co.......... 35
Pugh, S. D.................. 24

R

Railway Track-work Co...... 26
Railway Utility Co.......... 37
Ramapo Iron Works......... 34
Richey, Albert S............ 24

Page

Roebling's Sons Co., John A.. 32
Rooke Automatic Register Co.. 37

S

S K F Ball Bearing Co..Front Cover
St. Louis Car Company, The.. 47
Samson Cordage Works....... 38
Sanderson & Porter.......... 24
Scaife & Sons Co., Wm. B.... 35
Scofield Engineering Co...... 24
Searchlight Section.........39-41
Sloan, Huddle, Feustel & Freeman 24
Smith Heater Co., Peter...... 37
Southern Cypress Mfrs. Assn... 30
Standard Steel Mould Co...... 33
Standard Steel Works Co...... 31
Standard Woven Fabric Co.... 36
Star Brass Works............ 36
Stone & Webster............. 24

T

Templeton Kenly Co., Ltd...... 36
Titanium Alloy Mfg. Co....... 49

U

Union Spring & Mfg. Co...... 38
U. S. Electric Signal Co...... 32
United States Graphite Co.... 35
Universal Safety Tread Co.... 37

V

Van Dorn Coupler Co........ 38

W

"Want" Ads................. 40
Wason Mfg. Co.............. 51
Weiss Switch Lock Co........ 34
Westinghouse Elec. & Mfg. Co. 2, 5
Westinghouse Traction Brake Co. 4
Weston Elec'l Instrument Co... 43
White Companies, The J. G..... 24
White Marble Lime Co........ 32
Wisch Service, The P. Edw.... 24
Wood Co., Chas. N............ 32
Woodmansee & Davidson Engineering Co................. 24

Z

Zelnicker Supply Co., Walter A. 40

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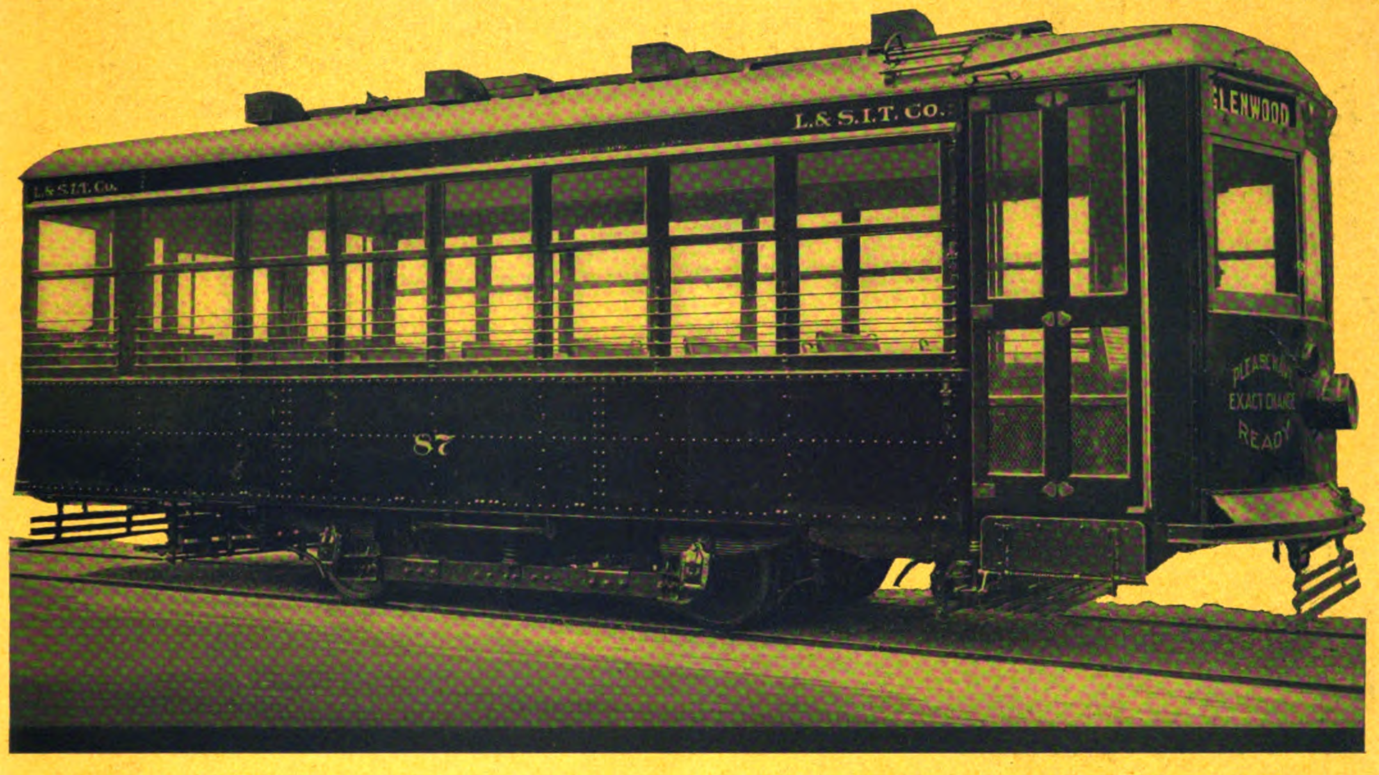

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SAFETY CARS are being ordered in lots of ten, twenty, thirty at a time. The last order booked was for twenty. A Stone & Webster order for ninety-two is being filled. See list of fifty companies on back cover of last issue of Brill Magazine; also look up article "The Standardized Safety Car" in the February issue. (Would you like an extra copy?) The Safety Car needs no experimental introduction on any line no matter where. You know exactly what is going to happen when you put it in service. North, south, east and west; big city, little city; the record is the same everywhere—a complete success, a revelation in earning and saving power. The car has every element to produce the results you are after; nothing is omitted. The public gets the service it clamors for, your operators are pleased. Everybody satisfied.

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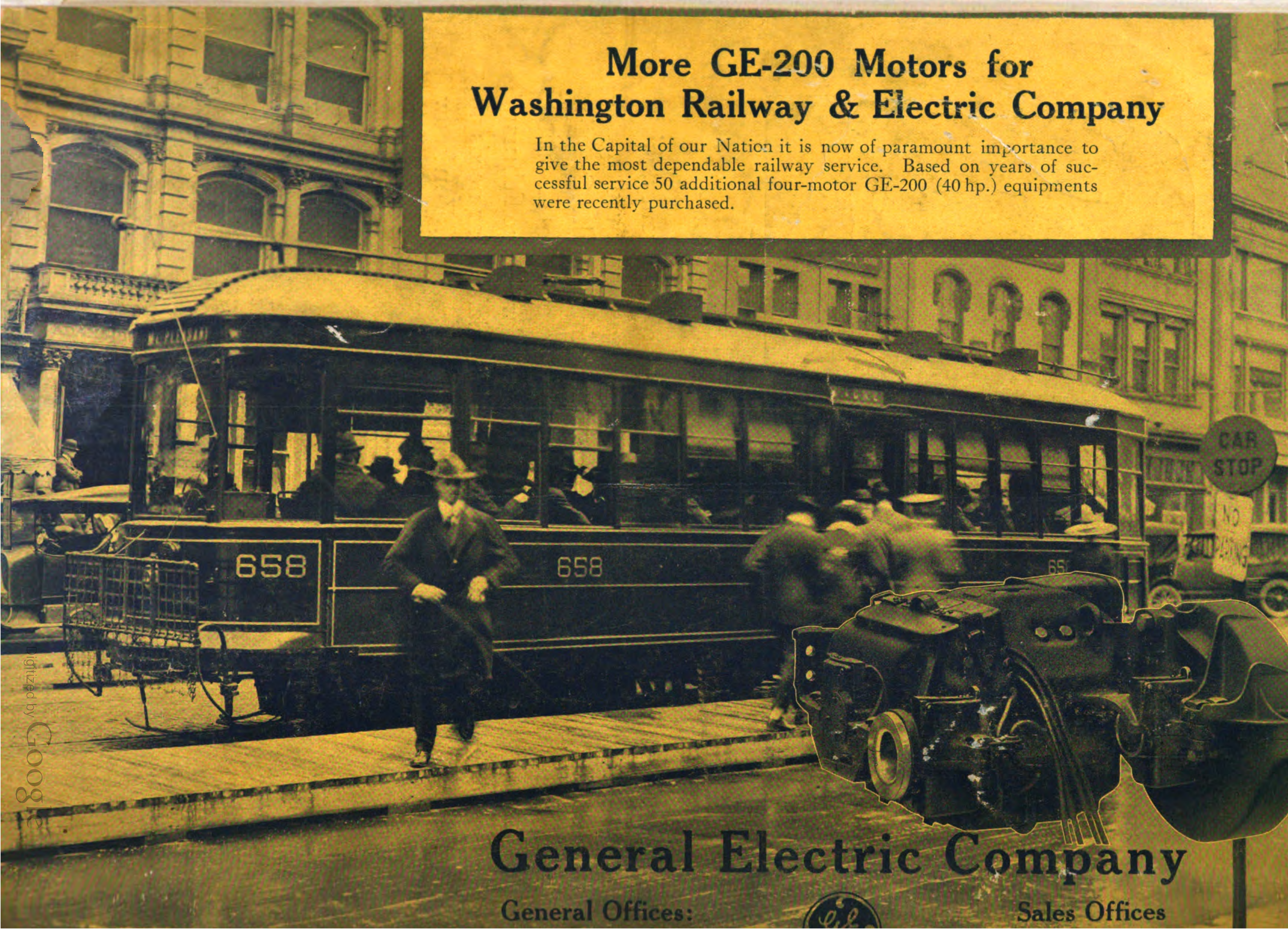

More GE-200 Motors for Washington Railway & Electric Company

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General Electric Company

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